COUNTY of SAN LUIS OBISPO

Diablo Canyon Power Plant Decommissioning Project

Draft Environmental Impact Report Appendices

State Clearinghouse # 2021100559
Development Plan/
Coastal Development Permit/
Conditional Use Permit
DRC2021-00092 (ED21-174)

July 2023

Appendix A

Environmental Impact Report
Distribution List

Appendix A
EIR Distribution List

Appendix A includes agency staff, representatives of organizations, and individuals who participated in the scoping process or otherwise requested notification and to whom the County of San Luis Obispo, Department of Planning and Building staff provided the Notice of Availability of the Diablo Canyon Power Plant Decommissioning Project Environmental Impact Report (EIR) by mail or email along with a link to the EIR on the County website:

www.slocounty.ca.gov/DCPPDecom

Table A-1. EIR Distribution List – Agencies and Organizations

Name	Affiliation
AGENCIES	
Kelley Abbas	Legislative Assistant for Supervisor Dawn Ortiz-Legg
Sylvia Aldana	San Luis Obispo County Building Department
Myron H. Amerine	Bicycle Advisory Committee
Jon Ansolabehere	County of San Luis Obispo
Craig Bailey	California Department of Fish & Wildlife
Crystal Baker	Coastal Band of Chumash Nation
Doug Barker	California Department of Parks & Recreation
J.R. Beard	San Luis Obispo County Public Works
Mary Jo Borak	California Public Utilities Commission
Rene Brill	San Luis Obispo County Public Works
Bruce Buckingham	City of Grover Beach
John W. Burch	Salinan Tribe of Monterey & SLO Counties
Lauren Burrus	San Luis Obispo County Building Department
Dennis Byrnes	CAL FIRE
Lucinda Calvo	California State Lands Commission
Cody Campagne	Native American Heritage Commission
Amanda Canepa	California Department of Fish & Wildlife
Christina Castellon	Bureau of Land Management
Cindy A. Chambers	County of San Luis Obispo Planning Department
Bryant Chesney	NOAA National Marine Fisheries Service
Brendan Clark	San Luis Obispo County Public Works
Brendan Clark	Water Resources Advisory Committee
James Cooper	San Luis Obispo County Public Works
Michael Cordero	Coastal Band of Chumash Nation
Rebecca Cox	City of San Luis Obispo
Jeremiah Damery	San Luis Obispo County Environmental Health

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Name	Affiliation
Mandy Dawson	San Luis Coastal Unified School District
Stephen Delear	Bureau of Land Management
Genaro Diaz	San Luis Obispo County Public Works
Christopher Diel	US Department of Fish & Wildlife
John D'Ornellas	Port San Luis Harbor District
Nicole Dobroski	California State Lands Commission
Matt Downing	City of Pismo Beach
Patty Dunton	Salinan Tribe of Monterey & SLO Counties
Dana Eady	City of Santa Maria
Nicole Ellis	County of San Luis Obispo Planning Department
Mark Elvin	US Fish & Wildlife Service
Ashley Estwin	HealSLO
Rene Ferini	County of Santa Barbara
Blake Fixler	Legislative Assistant for Supervisor Gibson
Todd Frederick	San Luis Obispo Community College District
Michelle Freeman	San Luis Obispo County Building Department
Katarina Galacatos	Army Corps of Engineers
Tim Gillham	San Luis Obispo Council of Governments
Kathleen Goble	Legislative Assistant for Supervisor Arnold
Scot Graham	City of Morro Bay
Andrew Green	Native American Heritage Commission
David Grim	San Luis Obispo County Public Works
Bradley Hagemann	Avila Beach Community Services District
Stephen Hanamaikai	San Luis Obispo Council of Governments
Phillip Hammer	Regional Water Quality Control Board
Gerry Hildago	Army Corps of Engineers
Cynthia Herzog	California State Lands Commission
Mandy Ingham	NOAA National Marine Fisheries Service
Andy Jackson	County of San Luis Obispo
Scotty Jalbert	San Luis Obispo County Office of Emergency Services
Vicki Janssen	Legislative Assistant for Supervisor Peshong
Tom Jones	PG&E
Cheryl Journey	San Luis Obispo County Building Department
Elizabeth Kavanaugh	County Parks
Glen Knowles	US Department of Fish & Wildlife
Lorie Laguna	YTT Northern Chumash

Table A-1. EIR Distribution List – Agencies and Organizations

Name	Affiliation
Mark LaRue	County of San Luis Obispo Planning Department
Scott Lathrop	YTT Northern Chumash
Samson Lee	US Nuclear Regulatory Commission
Chelsea Lenzi	Santa Barbara County Clerk of the Board
Brian Leveille AICP	City of San Luis Obispo
Mary Lindquist	USDA Soil Conservation Service
Tom Luster	California Coastal Commission
Cynthia Malain	NOAA Fisheries
Jenny Marek	US Fish & Wildlife Service
Gavin McCreary	Department of Toxic Substances Control
Kevin McLean	CAL FIRE
Loree McRoberts	CAL FIRE
Peter Moreci	San Luis Obispo County Public Works
Chris Munsen	Port San Luis Harbor District
Andrew Mutziger	SLO County Air Pollution Control District
Mona Olivas	Northern Chumash Tribe - yak tit^{y}u tit^{y}u yak tiłhini
Hon Dawn Ortiz-Legg	County of San Luis Obispo
Sarah Paulson	California Department of Fish & Wildlife
Molly Pearson	Santa Barbara County Air Pollution Control District
Brian Pedrotti	City of Arroyo Grande
Tamara Presser	Regional Water Quality Control Board
Annett Ramirez	San Luis Obispo County Clerk of the Board
Lyn Reardon-Smith	City of Arroyo Grande
Kathy Richardson	Avila Beach Community Services District
Roger Root	US Department of Fish & Wildlife
Alyssa Roslan	San Luis Obispo County Air Pollution Control District
Peter Sanchez	Lucia Mar Unified School District
Katy Sanchez	Native American Heritage Commission
Sara Sanders	Water Resources Advisory Committee
Jenna Schudson	California Department of Transportation
Anthony Schuetze	San Luis Obispo County Building Department-Storm Water
Fred Segobia	Salinan Tribe of Monterey & SLO Counties
Kelsey Shaffer	YTT Northern Chumash
Lucas Sharkey	Regional Water Quality Control Board
Drew Simpkin	California State Lands Commission
James SoFranko	Legislative Assistant for Supervisor Paulding

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Name	Affiliation
Merideth Sterkel	California Public Utilities Commission
Michael Stoker	San Luis Obispo County Building Department
Melissa Streder	California Department of Transportation
Tom Swanson	CAL FIRE
Antal Szijj	Army Corps of Engineers
Leilani Takano	US Department of Fish & Wildlife
Leslie Terry	San Luis Obispo County Environmental Health
Mona Tucker	YTT Northern Chumash
Julie A. Vance	California Department of Fish & Wildlife
Kris Vardas	PG&E
Garrett Veyna	CAL FIRE
Chief Mark Vigil	San Luis Obispo County Chumash Council
Peter von Langen	Regional Water Quality Control Board
Esme Wahl	California Coastal Commission
Violet Walker	Northern Chumash Tribal Council
Dell Wells	CAL FIRE
Karen White	Xolon-Salinan Tribe
Duane Whittemore	Lucia Mar Unified School District
Peter Williamson	SLO Regional Rideshare
J. Ybarra	County of Santa Barbara
John Zorovich	Santa Barbara County Planning & Development
Administration	Port San Luis Harbor District
CEQA - General	California Department of Fish & Wildlife
County Clerk	County of San Luis Obispo
Name not Provided	Avila Beach Community Services District
Name not Provided	Lucia Mar Unified School District
Name not Provided	Coastal San Luis Resource Conservation District
Name not Provided	Avila Fire District
Name not Provided	City of Arroyo Grande
Name not Provided	City of Santa Maria
Name not Provided	City Clerk, City of Santa Maria
Name not Provided	City Clerk, City of Pismo Beach
Name not Provided	City of Pismo Beach
Name not Provided	San Luis Obispo County Sheriff's Department
Name not Provided	Santa Barbara Co Flood Control & WCD
Name not Provided	County of San Luis Obispo

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Name	Affiliation
Name not Provided	Santa Barbara Co Flood Control & WCD
Name not Provided	US Coast Guard
Name not Provided	US Department of Transportation
Name not Provided	US Environmental Protection Agency
Name not Provided	State Department of Parks & Recreation
Name not Provided	California Air Resources Board
Name not Provided	State Water Resources Control Board
Name not Provided	California Division of Occupational Safety and Health
Name not Provided	California Office of Historic Preservation
Name not Provided	California Department of Fish & Wildlife
Name not Provided	California Highway Patrol
Name not Provided	Coastal Band of Chumash Nation
Name not Provided	Salinan Tribe of Monterey & SLO Counties
Name not Provided	Salinan Tribe of Monterey & SLO Counties
Name not Provided	Salinan Tribe of Monterey & SLO Counties
Name not Provided	San Luis Coastal Unified School Dist
Parks Department	County of San Luis Obispo
USACE General Inbox	Army Corps of Engineers
Xielolixii	Salinan-Chumash Nation
ORGANIZATIONS	
Name not Provided	141 First St Properties LLC
Name not Provided	147 San Antonia LLC
Mike Gatto	Actium LLP
Lisa Blewitt	Aspen Environmental Group
Name not Provided	Avila Beach Colony Townhomes LLC
Name not Provided	Avila Front LLC
Name not Provided	Avila Lighthouse Suites Inc
Steve Benedict	Avila Valley Advisory Council
Jim Hartig	Avila Valley Advisory Council
Name not Provided	Avila Villa Ventures LLC
Name not Provided	Betteravia Investments LLC
Name not Provided	Cal-Coast Irrigation Inc
Gene Nelson	Californians for Green Nuclear Power
Hannah Bielcik	Cal Poly
Cole Cleminshaw	Cal Poly
Tristan De Lemos	Cal Poly

Table A-1. EIR Distribution List – Agencies and Organizations

Name	Affiliation
Chris Hamma	Cal Poly
August Hogen-Esch	Cal Poly
Brandon Howell	Cal Poly
Ryan Hudson	Cal Poly
Owen Kaufman	Cal Poly
Drake Mossman	Cal Poly
Luke Moylan	Cal Poly
Sam Roth	Cal Poly
Kendall Steeves	Cal Poly
Jordan Skow	Cal Poly
Jesus Velasquez	Cal Poly
Bastiaan Weststrate	Cal Poly
Brandon Williams	Cal Poly
Deanna Cantrell	Cantrell-Kehl Family Trust
Name not Provided	Charco Properties LP
Andy Pease	City of San Luis Obispo Council Member
Kenderick Kelly	Coastal Vacation Rentals
Name not Provided	Coker Ellsworth Development LLC
Name not Provided	Cool Properties LLC
Name not Provided	Consolidated Enterprises LLC
CEQA - General	Corporate International Investors
Name not Provided	Degroot Investment Group LLC
Name not Provided	Dun Sailing Partners LLC
Kimberly Toy	Eureka Energy Company
Pacho LP Tax Department	Eureka Energy Company c/o PG&E
San Luis Bay LP	Eureka Energy Company c/o PG&E
Tax Department	Eureka Energy Company c/o PG&E
Name not Provided	Eureka Energy Company
Name not Provided	Eureka Energy Company c/o PG&E
Name not Provided	Four Deer Ranch LLC
Michelle Call	GALA Pride & Diversity Center
Name not Provided	Heritage Square Homeowners Assn
Name not Provided	Hole in the Clouds Homeowners Association
Name not Provided	J&N Avila LLC
Name not Provided	Kingfisher Canyon Homeowners Assn
Name not Provided	Luigi Marre Land & Cattle Co

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Name	Affiliation
Name not Provided	Mallard Green Homeowners Assn
Sophia Zavala	Martinez Trust
Name not Provided	Mid Coast LLC
Scott Butterfield	Nature Conservancy
Name not Provided	NHP LLC
Name not Provided	Night Hawk LLC
Susan Harvey	North County Watch
Harrison Fugate	North Wind Group
C. M Florence	Oasis Associates
Name not Provided	Pacific Bell Telephone Company
Carina Corral	Pacific Gas & Electric Company
Eric Daniels	Pacific Gas & Electric Company
Tax Department	Pacific Gas & Electric Company
Name not Provided	Pacific Rim Fund
Name not Provided	Playa Dulce LLC
Michael P Salucci	Salucci Holdings LLC
Name not Provided	San Luis Bay Inn Timeshare Assn
Name not Provided	San Luis Bay Estates Homeowners Assn
Name not Provided	San Luis Bay Inn Timeshare Assn
Molly Kern	San Luis Obispo Chamber of Commerce
General Inbox	San Luis Obispo Land Conservancy
Linda Seeley	San Luis Obispo Mothers for Peace
Jane Swanson	San Luis Obispo Mothers for Peace
Jill ZamEk	San Luis Obispo Mothers for Peace
Name not Provided	San Luis Resort Partners LLC
Name not Provided	SCM Avila Beach Partners LLC
Andrew Christie	Sierra Club Santa Lucia Chapter
Sue Harvey	Sierra Club Santa Lucia Chapter
Name not Provided	Silver Oak Estates HOA
Name not Provided	Skylark Homeowners Assn
Chuck Anders	Strategic Initiatives
Jim Miers	Surfrider Foundation San Luis Obispo Chapter
Name not Provided	Tara Lachen Limited Partnership
Name not Provided	TBSW Properties LLC
Name not Provided	Toretta Ltd I LP
Francisco Castillo	Union Pacific Railroad Company

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Name	Affiliation
Liisa Stark	Union Pacific Railroad Company
Name not Provided	Union Pacific Railroad Company
Name not Provided	US Vacation Resorts Inc
Name not Provided	Western Equipment & Truck Inc
Name not Provided	XMG Holdings LLC

Table A-2. EIR Distribution List - Individuals

John Abbate
Suzanne Abraham
Fatima Abdul-Khabir
Graeme Agate
Arthur Aguilar Jr
Scott Ahles
Sylvia Alcon
Leo Alford
Donald Allen
Robert Allen
William Almas
Mark Amberg
Lukas Amler
Charles Anders
Chuck Anders
Betty Anderson
Earl Appleton Jr
Hector Aragon
Harry Aspden
Thomas Athey
Valley Avila
Rudolph Bachmann
Caron Baker
Charles Baker
Charles Baker
Sheila Baker
Warren Baker
Peter Baldwin
Salvador Barajas
Karl Bareither
Ted Barnard Jr
Donald Barrett Jr
Andrew Beaton
James Becker
Kurt Beckett
Lewis Bedell
Steven Behel
Judith Belanger
Nanci Bell
Gloria Bello
Steven Belsley
Veronica Benavidez
Maxine Bennett
Richard Berard
Kay Bergman
Kristin Berry
Martin Berry
P. Best
Ronald Bettencourt
Alan Bishop
Larry Bittner
Steve Black
Steven Black
Vernon Black
William Black III
Brian Blackwell
Scott Blaising
Sam Blakeslee
Clifford Blankenship
Karin Blau
Gail Blue
Karen Blue
Melissa Boggs
Jimmy Bognuda
Livio Bognuda
Steven Boiani
Richard Bond
Richard Bontempi
David Book
Richard Boragno
Lucinda Borchard
Thomas Bormes
Wyatt Bourdet
Thomas Bower
Nancy Boyle
Ruth Braeckman
Brent Branco
Diane Brandt
Mary Brasil
Zoe Brazil
James Breese
Lynn Bretz
Elizabeth Bright
Kevin Bright
Sharon Bromby
Gerald Brooks
David S Brooks Heirs
Frances Broughton
Anne Brown
Lauren Brown
Marty Brown
Patricia Brown
Patricia Brown
Robert Brown
Timothy Brown
John Brunson
Sofia Bryukhova
Carson Buckley
Grahem Buksh
Christine Burkett
Dennis Burns
Mark Burton
Paulina Burton
Craig Butler
Timothy Butzow
Steven Cabalka
Brian Calbeck
Michael Caldwell
Barry Camp
Constance Campanelli
Henry Campbell

Jason Campbell
Robert Campbell
Fermin Campos
Richard Capen
Thomas Capen
John Caradonna
Claire Carlson
Joan Carlson
Barbara Carroll
Howard Carroll
Lillia Carvalho
Anthony Castro
Dolores Catalina
Stephen Caton
Barbara Ceran
Irene Chadwick
Kevin R & Blake Chaffee
Iris Chao
Michael Chapman
Bruce Cheek
Ronald Chilcott
Frank Ciano
Angela Clark
John Claudy
James Clayton
Michael Clayton
Adam Cleary
Richard Coascia
Jay Cobb
Hugh Cocke
Hugh Cocke
Richard Cohen
Lawrence Cohn
Curtis Cole
Spencer Cole
Paul R & Katy L Collier
Debra Collins
Michael Collins
Raylene Collins
Debra Collins-Stevenot
Edward Colson
Brian Conner
Ryan Conolley
Patrick Conroy
Ramon Coo
Frederic Cook
Erica Coppola
Janell Cote
John Cote
Paul Courcy
Ernest Couture Jr
Michaela Craighead
Norman Cram Jr
Richard Cramer
William Crewe
Tom Crotty
Fred Cummings
Maria Cunanan
Susan Cutts
Randall Dahling
Sherri Danoff
Melissa Dasilva
Mark Daugherty
Daniel Davies
Charlene Davis
Alan Day
John Day
Billy Joe Deal Jr
Mark Decker
Patricia Degrazzio
Randall Degroot
John Delehant III
Joyce Deline
Gregg Delong
Dennis Dempsey
Diane Dent
Donald Deyoung
Tina Diad
Rita Diebel
Chris Diedrichsen
Christopher Dietrich
Carey Diment
Kathi DiPeri
William Doak
Joann Dodson
Eric Doelling
Slavo Doko
Thomas Donnelly
Gary Doore
John Dornellas
David Dotson
David Dotson
Jerilee F Doty
Jospeh Doud
Carter Doupnik
Erin Down
Robert Draine
Bruce Drolen
Donald W & Saralee M Duffy
Sandell Dumont
Dominique Dunn
John Dunn
James Dunne
Bobby Duran
Robert Dusair Jr
Michael Ebersole
Christopher Eckert
George Edmondson
Mark Edmondson
James Efird
John Egbert
Gregory Egger
Richard Eichhorn
Gordon Eiland
Craig Eisenberg
Louis Eisenberg
James Ellsworth
Tony Emanuel
Jeffrey Emrick
Edward Ender
Gary Englund
Dwight Ensor
Benita Epstein
Benita Epstein
Manuel Espinola
Ben Evenett
Loren Eyler
William Eyler
Robert Fagan
Eileen Falcinella
Madalene Farris
Harry Fawcett
Raymond Feeser
Artha Fellows
Michael Felts
Terry Fiore
Greg Firpo
Jerome Fitch
Karen Flagg
David Florence
Linda Flynn
Lawrence Fogel
Fred Folta
Kay Folta
Melinda Forbes
Frank Fornasero
Lois Fox

Daniel Frainer
Tobe Frangie
Terri Frank
James Franklin
Vivian Franklin
Robert Frasene
Grant Fraysier
Sandra Fredericks
Charles Freeman
Jon Freitas
Margaret Frerking
Pier Front
Harrison Fugate
Michael Furlow
Robert Fusinati
Gauthier-Kreutz Gale
Janne Gallion
Nora Gallison
Jeffrey Garcia
Rob Garcia
Bonnie Gardner
John Gardner
Kendall Gardner
Paul Garoogian
Thomas Garris
Joseph Garvey
Mike Gatto
Laura Gaumer
Gregory Gauthier
Lila Geddes
John Geesman
Victoria Geissinger
Victoria Geissinger
Brian Getz
Margaret Giacomazzi
Jeffrey Gibbons
Michael Gibbs
Winifred Gifford
John Gilbert
Timothy Gill
Val Gillespie
Cynthia Gin
Michael Ginn
Pete Giotta
James Glaser
Constance Glass
Edward Glass
Neil Glines
Michael Gnos
Gary Goble
Ryan Gobler
David Goldberg
Saul Goldberg
Allen Gomes
Carol Gomes
F. Goodill
Carolyn Gordon
Cheryl Gorman
Stephen Granger
Leonard Grant
Karen Gray
Daniel Green
Lori Green
Carla Greene
Eric Greening
Eric Greening
Timothy Griffin
Edward Grimshaw
Svetlana N Grishchenko
Marc Gronet
Gail Grot
Rudolph Santos Gutierrez III
Ronald Gwin
Erich Haas
Lisa & Ralph Hackett
Anne Hall
Debra Hall
Geraldine Hall
Jille Hall
Chalmers Hall III
Beverly Halleman
Patricia Hallock
Edward Halpin
Sharon Hammond
James Hannon
Warren Hansen
Anni Harnois
Mark Harris
James Hartig
John Hartley
Susan Harvey
Joseph Hasay
James Hathaway
Carol Hayden
David Heiges
William Heim
Joseph Heine
Christopher Helenius
Elaine Henfling
Donald Hennelly
Kathryn Hennigan
Bonnie Henry
David Henry
Russell Henry
Gordon Hensley
Steven Herbekian
Larry Herron
John Hertel
Cynthia Herzog
Lois Hesch
Linda Hicks
Terri Hicks
James Hilferty
Sue Hill
Leo Hinds
Carol Hisasue
Michael Hoffman
Rita Hoffman
Charles Hogue
Thomas Holbrook
Ronald Holcombe
Benjamin Holland
Janet Holland
Mark Horton
Sam Hosey
John Hostetter
Arthur Hotchkiss
Roger House
Bruce Howard
James Hoxter
John Hrdlicka
Kelly Hubbard
David Humphreys
Peter Hunt
Lisa Hunter
Evelyn Hutzly
Robert Hyde
Christopher Hydock
Judith Ikle
Joel Iliff
Steve Illes
Robert Ingraham
Usman Iqbal
Judith Ivarie
Debra Jackson
Sybil Jacobs
Terrel Jacobs

Jack Jacobson
Arthur F Jacqmin Heirs
Brett James
Melissa James
John Janowicz
Francine Jansen
Kathleen Janssen
Sanjay Jasuja
David Javitz
Donald & Donna Jeffries
Jack Jenkins
Jacquelynne Jennings
James Jennings
Gary Jensen
Larry Jett
Frank Jimenez Jr
Larry Johanson
Bradley Johnson
Christopher Johnson
Malcolm Johnson
Troy Johnson
Gerald Johnston
Thomas Johnstone
Jerry Jolly
Percy Jones Jr
Yvonna Jordan
Jamie Joyce
Joseph Kaatz
Leslie Kaplan
Aron Kardashian
Barsam Kasravi
Elizabeth Katsaris
Keone Kauo
Jeffery Kearns
Jimmy Keene
Jim Keene Jr
James Keeney
John Keese
William Keese
Frank Keever
Peter D & Carol Keith
Trevor Keith
James Keller
Brooke Kellogg
Kenderick Kelly
Shawn Kelly
Richard Kelsey
Paul Kemp
Ernest Kendler
Josephine Kendrick
Stephen Kennedy
Molly Kern
Karl Kersten
Karl Kersten
Karl P & Maryanna Kersten
Irving Keschner
Hamid Keshtgar
Drew Ketelsen
David Kikuta
Virginia Kinder
John King
Judd King
Margaret King
John Kirby Jr
David Mitchell & Lorna
Elizabeth Kirk
George Kirk
Daniel Kleinsmith
Robert Klempen
Anne Klinger
Michele Knapp
Christopher Knauer
Kenneth Knauss
Philip Knightbridge
Robert Knowles
Sebastian Koran
Patricia Koriner
Jack Krasner
Paul Krause
Kenneth Krone
Edmund Kurtz
Mark Kuykendall
Edward Labanara
Wynnette Labrosse
Stephen Lakowske
Vincent Laman
Elizabeth Lamb
David R Lampert
Gloria Landers
Donald Langerman
Jennifer Langford
John Lathrop
Elnora Lavallee
Murray Leclair
Ben Lee
Robert Leone
Michael Levin
Kevin Lewis
Linda Lewis
Wayne Lewis
Albert Liddicoat
Albert Liddicoat
Albert Liddicoat
Jona Liebrecht
Richard Lindberg
Linda Lindsey
Mary Linthicum
Brent Lintner
Robin Lipps
Robert M Livesey Heirs
Sara Loaiza
Jeanette Locker
Gail Long
Jennifer Long
Victor Lozano
Matthew Lucas
Dominic Lucero
Timothy Luken
Andrew Lynn
Ellen Kaye MacDonald
Nigel MacKay
Devon Madson
Lois Madson
Kathy Maggio
June Maguire
Lorraine Maksoudian
Roger Malkus
Philip Maniaci
Philip Maniaci
Sheryle Mann
Rodney Marble
Leonard Marino
Michael Markham
Thomas Marré
Jamison A & Patricia C Marshall
Molly Marshall
Brenda Martin
Evelyn Martin
Glenn Martin
Harold Martin
John Martinet
Renato Mascardo
Michael Mastrandrea
George Matakovich
Mary Matakovich
Vi Matlin

Jean Matter
Thomas Matter
Gary Mattevi
C. Mattison
Craig Maxwell
Stephen May
Lawrence McAdam
Robert McCarthy III
Gary McClanahan
Jonathan McClarty
Michael McClure
Matthew McEuen
Michael McGee
Lynn McGowan
Sharon McLain
Neil McLellan
Valerie McMillan
Harold McNeer
William McRee
John McVeigh
Douglas Mello
Debbie Mellow
May Mellow
Markian Melnyk
James Menefee
Sandra Menge
Pauline Menon
Remzi Mertogul
Jean Merrigan
Paul Metchik
John Michalak
Jessica Micklus
James Miers
Jim Miers
Taggart Mike
Daniel Milei
Coleman Miller
Bill Miller
Jane Miller
Mary Miller
James Mills
Floyd Mize
Dana Mohan
Robert Mohle Jr
Manuel Monteiro
Victor Montgomery
Victor Montgomery
Nancy Moore
Thomas Moore
Joseph Moreno
Adam Morley
Albert Moro
Martin Moroski
Renelle Morris
Mary Morrison
Victoria Morrow
Dawin Morton
Steven Morton
Kevin Mounts
Pat Mullen
Max Munn
Thomas Munson
Corinne Muriset
Susan Murphy
Tim Murphy
Helen H Murray Heirs
Kim Murry
Andrew Mutziger
Donna Myers
Babak Naficy
Grant Nakamura
Colleen Nelson
Daniel Nelson
Gary Nelson
Gene Nelson
James Nelson
James Nelson
Raymond Nelson
Pamela Nesbitt
Joel Nessa
Samantha Neumyer
Bert Nevins
Ivan Newberry
Elizabeth Newton
Jeffrey Newton
Howard Nicholson
Richard Nitzberg
John Niven
Craig Nobili
Margie Noble-Englund
Ernest Nolte
Michael Nordstrom
Lawrence North
Taylor North
Nancy Northcote-Sprague
Bret Northington
Charles Nuno
Susan Oakley
Scot Obler
Wendy Patience O'Brien
Joseph O'Connor
Glenn Oden
Jeffrey Oetman
Greg O'Hara
Timothy W O'Hara
William Olson
Paul O'Malley
Patrick O'Meara
Daniel O'Neill
James O'Neill
James Ornellas
James Orth
Bobbie Osburn
Robin Ostrosky
Patricia Page
Dennis Pall
Jianbiao Pan
Rogelio R Paniagua
Sean Parent
Brent Parker
David Parkinson
Jack Parmelly Jr
David Parrish
Kirk Parrish
Thomas Passanisi
Neil Paton
Richard Paul Jr
Douglas Paulk
Thomas Payne
Ebe Pearson
Sylvia Pearson
Dennis Peck
John Penvenne
Frederick Pera
Cynthia Perkins
Michael Perry
Brian Petersen
David Peterson
Joel Peterson
Jon Peterson
Robert Peterson
Maia Petrovic
Justin Phalen
Hilary Phillips
John Phillips
Nanci Phillips
John Phirman

Eric Phister
Russell Piazza
Patricia Pinto
Lionel Pires
Gilbert Pitt
Lena Platt
Joe Phelan
Lauren Poe
Joe Politi
Edward Pollard
Elsie Pope
Philip Portwood
Carolyn Poulet
Paul Prather
Daniel Preston
E Price
Jana Price
William Price
Debra Pritchard
Scott Pruett
Julie Pruniski
Tara Purchase
Edward Purdy
Robert Pusanik
Alan Pye
Mike Radakovich
Susan Rains
Javier Ramos
Lawrence Ramsey
Jennifer Randall
Darin Rapko
Bruce Rasher
Trevor Rebel
Ann Reeves
Barry Reid
Jan Reid
Ramona Reifman
Robert Reinertson
Michael Reiniche
Alvin Remmenga
Scott Remmenga
Samuel Resnick
Valeri Reynolds
Bruce Richard
Mary Richert
Peter Rietkerk
Russell Ringl
George Risher
Family Ritter
Saro Rizzo
Thomas Robb
Jim Robelen
David Robertson
Gary Robinson
Richard Robinsonan
Ann Roen
Darren Rogers
Susanne Rogers
Scott Rogoway
Angelica Roldan
Gennaro Rosato
Lee Rosenwasser
Gary Ross
Rob Rossi
Robin Rossi
John & Marcy Rourke
Jefferson Rudd
Marilyn Ruel
Gary Ruggerone
Albert Rybar
Mandy Sackett
Sandra Sailer
M Sampson
Miguelito San
John Sanders
James Sanderson
Van Sansoe
James Sargen
Sarah Sartain
David Satterwhite
Richard Saval
Rosemary Savoy
Kimberly Sawyer
Owen Schafer
Noel Schanz
William Schene
Douglas Schoen
Patrick Schoenburg
Peggy Schotz
Schotz Family Trust
Mary Schrader
Sean Schuur
Claire Schwan
James Scoggin
Kristine Scott
Louise Scott
Linda Seeley
Doug Seidewitz
Sybil Senes
Michael Shane
Guy Sharp
Peggy Sharpe
Robert Sharpe
Vince Shay
Gerald Shea
Troy M & Regina M Sheldon
Joseph Shepard
Stephen Sheppard
James Shiffer
Gerald Shirley
Larry Shupnick
Timothy Shur
Susan Silva
Gene Silveira
Randall Silver
Robert Simas
Melvin Simoes
Ronald Sinclair
David Singelyn
David Singh
Torben Skov
Eric Slater
Jeffrey Small
George Smith
Glen Smith
Mary Smith
Mona Smith
Richard Smith
Sheldon Smith
Wynn Smith
Eric Snelling
Donald Snyder
Phillippe Soenen
Brian Somodi
Marvin Southard
Samuel Sparta
Kenneth Spearman
Kristina Spearman
M Spraggins
Christina Suminski Spreafico
Shirley Stack
Guy Stadig
Shawn Stallcup
Connie Stamolis
David Starkey
Evan Steed
David Stein

Gary Steinke
Christopher Stellpflug
Julie Stempin
Barbara Stennett
Larry Stevens
Chuck Stevenson
Chip Stickerod
Clyde Stokes
Craig Stoller
Michael Stow
Susan Strachan
Pierre Street
Vikki Sturgeon
George Sturges Jr
Martin Suits
Michael Suits
Christopher Sutton
Jeffrey Sutton
Sharon Sutton
Jane Swanson
Lucy Swanson
Anthony Sweet
Genevieve Sweet
Ron Symm
Eva Szytel
Bryan Tahmazian
Doug Tait
Ardeshir Talieh
Evelyn Tankersley
David Tanner
Byron Taporco
John Tarrant
Kent Taylor
Nancy Taylor
Randy Teeters
Kathleen Terzian
Stephen Tetmeir
Deanna Tetterton
Lyle Teunissen
Cynthia Thacker
William Thoma
Kenneth Thompson
Gregery Tidwell
James Tollefson
William Toman
Denise Toombs
Mario Travalini
Jacqueline Trayner
Susanne Treacher
Justin Treadwell
Ed Trejo
James Trigueiro
Gilbert Trujillo
Mary Tucker
Mona Tucker
Diana Turk
Terry Turney
Douglas Twisselmann
N Tyni
Tiemey Van Note
Grace Vanderheyden
Kathleen Vanderzwaag
Thomas Vassar
Melinda Veregge
Anne Vernacchia
John Verwey
Deborah Vila
Benjamin Villar
Jerry Virzi
David Vizithum
Vlahos Family Trust
Thomas Volkmann
James Vrzak
Theodore Waddell III
Bruce Wagner
William Waitkus
George Wake
Larry Wallace
John Waller
John Waller
Robert Wasnick
Richard Watkins
Philip Weary
Kirste Webb
Weary Family Trust
Marjorie L Weed Heirs
Roberta Weed-Brown
Gage Wetzel
Ditta Weiner
Eric Weinreich
Evelyn Weiser
David Weisman
Jason Wells
Robert Werner
William Wesnousky
Greg Wheeler
Dennis Wheeler Jr
Jeff Wheelwright
E White
Edmund Widdicombe
Sandra Wik
Wendell Wikes
Bert Wilgenburg
Gerald Williams
Philip Williams
Steven Williams
Todd Williams
David Willoughby
Jean Wilson
Traci Wilson
Robert Windhorst
Charles Winslow
T Winterbottom
Jon Wiseman
Gordon Withers
Laurie Wolf
Victoria Wood
Richard Woodall
Kara Woodruff
Margarita Woodward
Betty Woody
Jennifer Wright
Richard Wright
Russell Wright
Silvia Yanez
Gary Young
Melanie Zacharias
Kathleen Zacky
Jill ZamEk
Kenneth Zaucha
Walter Zaucha
Steven and Zoe Zawalick
Steven Zawalick
Paul Zehner
William Ziegler
Thomas Zimmerman
Edward Zorns
Edward J & Lorraine Zorn

Appendix B

Public Scoping Documents

Appendix B1

Summary of Comments Received During Scoping Period

Aesthetics

- Analyze the impact of bright lighting at the Pismo Beach Materials Handling Facility during coastal fog events and decommissioning activities.

Air Quality

- Mitigate and minimize marine vessel emissions by specifying the required operational parameters that maximize fuel efficiency and minimize air pollutant emissions (e.g., vessel speed, load factor, fuel type, engine characteristics/tier level) and include them as project conditions of approval. (SLOAPCD) [1]
- Quantify the impacts from the project including criteria pollutants, greenhouse gases, and toxics (health risk assessment) inside and outside of SLO County. (SLOAPCD)
- Use HARP2 for the air quality risk assessment to evaluate inhalation risk and multi-pathway toxic risks. For within SLO County, recommend isopleth plots for the project impacts with increments of 1 in a million, 5, 10, etc. For outside of SLO County, recommend a plot of risk relative to distance from the rail line, truck route, and receiving port. (SLOAPCD)
- Reassess the air quality impact analyses if project schedule and phasing changes over time. (SLOAPCD)
- Complete an air quality impact assessment of the project that quantifies the impacts, and incorporates mitigation if impacts are above the APCD's significance threshold values identified in Table 2-1 of the CEQA Air Quality Handbook (ROG+NOx, DPM and PM10 only). Mitigate impacts in excess of the threshold values as outlined on Page 2-2 of the APCD's CEQA Handbook. (SLOAPCD)
- Compare the risk for the different material transport options (e.g., trucking/rail versus barge). The engine emission standards for the trucking fleet, rail, and marine vessels that the project could use for the different decommissioning scenarios need to be factored into the risk assessment. Determine the engine standards the project proponents are willing to commit to use prior to conducting the risk assessment. Determine routes to minimize toxic risk to sensitive receptors. (SLOAPCD)
- Describe the types of equipment that may be present during the project. Portable equipment, 50 horsepower (hp) or greater, used during project activities may require California statewide portable equipment registration (issued by the California Air Resources Board) or an APCD

[1] The following acronyms are used herein: **CDFW** = California Department of Fish and Wildlife; **CPUC** = California Public Utilities Commission; **CPB** = City of Pismo Beach; **CSLO** = City of San Luis Obispo; **CSM** = City of Santa Maria; **SBCP&D** = Santa Barbara County Planning and Development Department; **PSLHD** = Port San Luis Harbor District; **SBCAPCD** = County of Santa Barbara Air Pollution Control District; **SLOAPCD** = San Luis Obispo Air Pollution Control District; **USFWS**; United States Fish and Wildlife Service.

permit. Refer to the Technical Appendices, page 4-4, in the CEQA Air Quality Handbook (April 2012). (SLOAPCD)

- Describe notification requirements should any hydrocarbon contaminated soils be identified as well as measures to be implemented immediately. (SLOAPCD)
- Ensure that there is no proposed developmental burning of vegetative materials related to demolition and decommissioning activities. (SLOAPCD)
- Ensure proper permitting, handling, abatement, and disposal of asbestos-containing material (ACM). ACM could be encountered during the demolition or remodeling of existing structures or the disturbance, demolition, or relocation of above or below ground utility pipes/pipelines (e.g., transit pipes or insulation on pipes). (SLOAPCD)
- Ensure proper abatement of lead-based coated structures during demolition, remodeling, sand sandblasting and heat gun use. (SLOAPCD)
- Incorporate state laws for the idling of diesel engines into the project. (SLOAPCD)
- Evaluate proposed routes to move material to ensure that routing patterns have the least impact to residential dwellings and other sensitive receptors, such as schools, parks, day care centers, nursing homes, and hospitals. (SLOAPCD)
- Incorporate APCD Rules pertaining to fugitive dust mitigation including those pertaining to opacity limits and public nuisance impacts required of projects with grading areas more than 4 acres and/or within 1,000 feet of any sensitive receptor. (SLOAPCD)
- Ensure that pipeline purging operations are properly permitted or exempted with the APCD. (SLOAPCD)
- A Decommissioning Activity Management Plan (DAMP) that includes all APCD mitigation in Section 2.3 of the CEQA Air Quality Handbook is recommended as well as meeting reporting requirements on actual air quality impacts. (SLOAPCD)
- Ensure that a geologic evaluation is conducted to determine if the area disturbed is or is not exempt from the CARB Asbestos Air Toxics Control Measure (Asbestos ATCM) for Construction, Grading, Quarrying, and Surface Mining Operations (Title 17 CCR Section 93105) regulation as well as meet any APCD requirements. (SLOAPCD)
- Include air pollutant emissions for all proposed operations and equipment in the project's air quality and greenhouse gas impact analysis and mitigation. (SBCAPCD)
- Ensure consistency with local and regional plans, including the District's 2019 Ozone Plan, and evaluate whether direct and indirect emissions associated with the project are accounted for in the Ozone Plan's emissions growth assumptions. (SBCAPCD)
- Address concerns with land use incompatibilities and potential air quality and health impacts associated with changing and intensifying activities at the Santa Maria Valley Railroad (SMVR) locations in Santa Barbara County. (SBCAPCD)
- Complete and incorporate a Health Risk Assessment demonstrating that project related equipment does not cause significant risk to surrounding communities and sensitive receptors; mitigation measures should be applied to reduce the health risk to a less than a significant level. (SBCAPCD)
- Evaluate air quality impacts associated with stationery and area source emissions including, but not limited to, locomotive engines, off-road/construction equipment, on-road equipment (on-road heavy-duty trucks, light-duty trucks, and passenger vehicles), marine vessel/barging

activities, and all stationary and portable diesel engines, all based on project-specific information and supported by technical studies including traffic studies. (SBCAPCD)

- Add stationery and area source emissions to transportation source emissions prior to applying the project-specific thresholds of significance. Include a Mitigation Monitoring and Reporting Plan that explicitly states the required mitigations and establishes a mechanism for enforcement. (SBCAPCD)
- Describe methods to monitor and minimize impacts from dust, CO2 emissions, harmful chemical release, odors, and emissions from trucks, trains, and barges resulting from facility decommissioning.
- Assess use of the temporary 400-ton gantry crane and two truck-mounted cranes, including the number and function of engines (e.g., what crane operational mode they will power, engine size in brake horsepower (bhp), fuel type and the duration of the operation on site. Additionally, for emissions quantifications, specify bhp for the proposed diesel-powered scissor lifts, reach lifts, and forklifts. (SBCAPCD)
- Include air quality impacts associated with truck trips and train hauling in the City of Pismo Beach, more specifically to sensitive receptor areas, which includes Judkins Middle School and single and multifamily residential homes. (CPB)
- Consider using electric tractor trailer trucks to haul materials to reduce CO2 emissions.

Biological Resources

- Assess the many special status species that are present in the project area using qualified wildlife biologists and appropriate protocols. (CDFW)
- Identify specific and clearly defined mitigation measures for special status species providing quantifiable and enforceable measures to reduce impacts to less than significant levels. (CDFW)
- Utilize mitigation measures identified in the biological assessments prepared by Terra Verde Environmental Consulting. (CDFW)
- Follow specific and identified recommendations for black abalone, California tiger salamander, special status plants, Habitat Areas of Particular Concern, lake and streambed alteration, nesting birds, federally listed species, scientific collecting permits, use of underwater explosives, water circulation studies, the Marine Habitat Restoration Scientific Technical Advisory Team, and oil spill response. (CDFW)
- Assess the proper duration for restoration monitoring.
- Analyze continued historic grazing practices on the North and South Ranch to protect biological resources including sustainable grazing at the South Ranch that protects and encourages grassland birds.
- Thoroughly analyze all terrestrial and marine biological resources that are present onsite including species abundance, distribution, and status. (USFWS)
- Conduct protocol surveys for sensitive and federally listed species as soon as possible and fully analyze potential effects of the project on these species. (USFWS)
- Fully analyze effects on the California red-legged frog (*Rana draytonii*) after protocol surveys are completed. (USFWS)

- Conduct botanical surveys during a year with average or above average precipitation and during the appropriate time, including ensuring that blooming plants are adequately surveyed. (USFWS)
- Reassess findings in the Terra Verde Environmental Consulting 2020 Report, Appendix K, p. 20 of 86, particularly as related to the San Diego viguiera (*Bahiopsis* [*Viguiera*] *laciniata*), Diablo Canyon bluegrass and the Pismo Clarkia (*Clarkia speciosa* subsp. *immaculata*). (USFWS)
- Assess decommissioning operations for impacts to southern sea otters (*Enhydra lutris nereis*) that regularly use the cooling water discharge structure, water intake structure, breakwaters, boat dock, and harbor. (USFWS)
- Conduct protocol level surveys for the tidewater goby (*Eucyclogobius newberryi*) in all project area locations that contain suitable habitat and analyze project effects. (USFWS)
- Address all direct, indirect, and cumulative effects of the proposed project on biological resources. (USFWS)
- Describe anticipated impacts to terrestrial/marine habitats and species resulting from demolition and removal activities as well as develop minimization and mitigation measures.
- Address the impacts of once-through cooling throughout the life of the project on vegetation, crustaceans, and fish and both monitor and report on recovery after project shut-down.
- Consider planning and scheduling deconstruction activities accordingly to the migration of marine species including elephant seals, humpback whales, otters, porpoises, and seals that may be impacted by sounds and vibrations.
- Assess restoring the surrounding Diablo Canyon lands to a natural condition for wildlife, air, and peace.
- Mitigate the impacts to terrestrial and marine resources and coastal access involving the Greater than Class C Waste Storage Facility, Security Building, indoor firing range, heavy haul loading ramp and cofferdam construction.

Cultural Resources – Archaeology and Built Environment

- Evaluate cultural resource sites including sites numbered CA-SLO-81 and -832. (CPB)
- Identify cultural resources and impacts within the proximity of Pismo Beach rail yard. (CPB)
- Ensure robust review of cultural resource impacts and necessary mitigation measures. (CPUC)

Cultural Resources – Tribal Cultural Resources

- Ensure preservation of sites important to Indigenous Peoples.
- Address and acknowledge land ownership issues by local Indigenous Communities with the understanding that their intent is for conservation and managed use.
- Consider consulting with Indigenous Groups as Responsible Agencies.

Energy

- Address the loss of approximately 10% of the State's power by decommissioning the Diablo Canyon Power Plant.
- Address the impacts of electrical power import needs created by decommissioning the Diablo Canyon Power Plant including from Wyoming coal-fired generation.

- Assess the potential loss of the Diablo Canyon Power Plant in meeting California electrical energy demand, including as a clean energy source.
- Consider geothermal energy production as a replacement for the Diablo Canyon Power Plant.
- Consider what alternative energy system will be needed to generate power for 3 million California residents that currently rely on Diablo Canyon Power Plant and if geothermal energy systems have been considered as a replacement.
- Address DCPP's record of safe generation of electrical power.

Environmental Justice and Economics

- Describe environmental justice impacts on disadvantaged communities located along transportation routes used for disposing of dismantled and potentially hazardous materials.
- Assess the economic effect of the plant closure, direct and indirect, on the regional economy.
- Address environmental justice impacts involving transporting and storage of radioactive wastes.
- Describe environmental justice-related impacts involving disadvantaged communities associated with the final disposal of hazardous materials.

Geology, Soils, and Coastal Processes (includes Paleontology)

- Identify and assess any floodplain impacts due to the location of the Pismo Beach Materials Handling Facility in relation to Pismo Creek. (CPB)
- Assess retaining non-radioactive demolished materials on-site and mixing with on-site soils to minimize truck trips through Avila.
- Analyze the extent to which high-level wastes, pre-empted by the Nuclear Regulatory Commission, are to be treated in earthquake fault areas.
- Describe to what soil depth would contamination be monitored and addressed.
- Review engineering plans for the cofferdam and the restoration of the discharge structure, after demolition, as well as placement of riprap as potential erosion control.
- Include rigorous monitoring and testing of fill materials used on-site that is engineered from crushed clean concrete and soils.

Greenhouse Gas Emissions (GHG)

- For the marine portion of the project, quantify GHG and criteria pollutant emissions along the route, splitting them up by Air District zones, including travel in CA and federal waters. (SLOAPCD)
- Evaluate greenhouse gas (GHG) emissions per Assembly Bill (AB) 32, the California Global Warming Solution Act of 2006. In addition, Senate Bill 32 provided an update to the state's AB 32 2020 emission reduction target. The 2030 target from SB 32 is 40% below the 1990 levels. Although not legislatively set, a 2050 target was established by California Governor Schwarzenegger's Executive Order S-3-05. Since this project will likely continue past 2030, the evaluation should consider applicable GHG reduction targets for the project to be evaluated against. (SLOAPCD)

- Since San Luis Obispo County does not currently have a CAP that can be considered qualified with SB 32 or future GHG emission reduction requirements, on-site mitigation is first recommended. If the impacts still exceed no-net increase with the implementation of on-site mitigation, then local off-site mitigation should be considered. Any mitigation should be real, verifiable, and additional to regulatory requirements. If the impacts still exceed no-net increase after the implementation of on-site and local off-site mitigation, then carbon offsets should be purchased using guidance to reduce GHG emissions to no-net increase including purchasing offsets from California generated impacts and the potential for creating an individual offset program. (SLOAPCD)
- Address Greenhouse gas (GHG) emissions and global climate change impacts. (SBCAPCD)
- Quantify GHG emissions from all project sources (direct and indirect), present significance thresholds, and decide regarding the significance of impacts. (SBCAPCD)
- Mitigate climate change impacts to the extent reasonably possible, whether they are determined to be significant. (SBCAPCD)
- Design and operate the project to minimize GHG emissions including use of high efficiency equipment, reducing haul trips, using a truck fleet with the newest/cleanest possible vehicles including zero to near-zero emission vehicles, using locomotives and marine vessels with the cleanest available engine emissions technology including operational parameters to maximize fuel efficiency, and considering onsite renewable energy generation. (SBCAPCD)
- Evaluate air quality and greenhouse gas (GHG) impacts associated with truck trips through Pismo Beach and train hauling emissions from the Pismo Beach Materials Handling Facility. (CPB)
- Consider the project's effects on climate change including analysis of greenhouse-gas emissions.
- Investigate the project impacts on climate change.
- Analyze cumulative increases in California's electricity CO2 emissions by 2030.
- Address the global effects of greenhouse gas emissions and climate change in context of the decommissioning.

Hazardous and Radiological Materials

- Clarify if dry cask storage will be able to withstand the impacts of routine aging, seismic risks, threats of terrorism, and impacts from the ocean environment, and how will they be monitored and repaired.
- Consider the best transportation and storage methods for highly carcinogenic radioactive materials.
- Clarify the length that decommissioned materials would be stored at the Osburn site, the method of storage, the safety measures put in place to ensure that materials would be stored safely, the travel routes that would be used to transfer materials and the days and hours that this would occur, including at locations in proximity to residential areas. (CSM)
- Develop and describe monitoring plans for the newly designed canisters and casks used to store spent fuel rods at the new ISFSI.
- Develop plans to protect ISFSI from terrorist threats.
- Identify the disposition of materials that are chemically contaminated.

- Identify the disposition of radioactive materials below Class C and how workers and the public will be protected during transportation and dismantling of structures.
- Address effects of the Pismo Beach Materials Handling Facility on the surrounding residential homes and Judkins Middle School. (CPB)
- Assess the potential effect of the elements and sabotage to the existing dry casks if stored without containment at the Independent Spent Fuel Storage Installation (IFSI) on Parcel P.
- Continue to monitor for radiological contaminants in the surrounding lands and ocean.
- Inform the visiting public of any on-site radiological contamination and related health concerns.
- Address potential health risks from transporting hazardous and radiological materials due to accidental release and placement at destination.
- Assess the disposition of waste products associated with decommissioning of the desalination plant.
- Install monitoring stations on-site to detect airborne radiological particles, making data available for public review in real time.
- Address toxic risks associated with proposed concrete batch plants and other proposed site infrastructure modifications.
- Evaluate use of a climate-controlled containment area to protect existing dry casks at the ISFSI, including use of the containment domes for this purpose.
- Assess methods to increase safety of stored spent fuel in the dry casks.
- Continuously monitor and repair cask and/or canisters.
- Describe how adverse events would be handled after cessation of the plant while spent fuels are still in use.
- Describe how containers will be monitored and repaired if pools are dismantled.
- Describe if a hot cell or similar system will be installed.
- Assess use of a hardened on-site storage (HOSS) facility.
- Describe methods to monitor for and prevent contamination during facility dismantling, including contamination of land and sea and within food chains.
- Describe procedures to address unexpected events and emergencies.
- Describe how contaminated materials would be handled and contained, decontamination addressed and the location of any off-site disposal for the various levels of contaminated materials.
- Describe the criteria used to determine reuse vs disposal.
- Address if debris and contaminants would be released into the ocean.
- Ensure safety of stored decommissioned material at the rail site for extended periods of time and describe the methods of storage and security measures that will be utilized.
- Address if the proposed facility to store greater than Class C Wastewater would be within or outside the coastal zone.
- Analyze the IFSI dry cask storage site and determine its disposition.
- Address if there are any hazardous materials that would remain on site for recycling or reuse to avoid trucking or barging.

- Analyze best and most modern methods and designs to monitor stored wastes to detect hazards in the environment and to ensure safety.
- Address project related low-level radioactive waste.
- Evaluate the storage of spent fuel and the existing area where materials are stored to identify damage from sea air corrosion.
- Identify that DCPP is expected to continue to operate safely during and after the beyond-design basis events (including severe weather) according to a May 2020 NRC post-Fukushima review.

Hydrology and Water Quality

- Assess the impacts of wastewater treatment and ocean effluent discharges in absence of the current high volume water discharge. (PSLHD)
- Address impacts of continued discharge of hot water released into the marine ecosystems.
- Conduct regular water sampling in the waters off Diablo Canyon for the duration of the decommissioning project.
- Analyze water runoff impacts to ocean water quality during decommissioning including beyond the DCPP marina. (PSLHD)
- Assess wastewater treatment and ocean effluent discharges if desalination plant continues operation given absence of the current high volume water discharge from the existing plant. (PSLHD)
- Carefully site and monitor stockpile areas to ensure that soils and groundwater are not impacted, including by toxins associated with construction debris and contaminated soils.
- Address if the groundwater aquifer can produce required water supplies during peak decommissioning activities.
- Address the potential for toxins in groundwater used at the site for decommissioning activities.
- Consider seawater sampling on a regular basis to determine if any contamination comes from Fukushima or is locally derived and ensure that radioactive elements are not released into adjacent waters.
- Describe disposal of wastewater associated with the underwater dismantling and segmentation of radioactive components.

Land Use and Planning

- Address that the Osburn property site, City of Santa Maria, is located within the Area 9 Specific Plan and that any development on the site is subject to the development standards and requirements of this plan. (CSM)
- Address permitting issues associated with the existing rail spurs, constructed from 2017-2018, associated with establishment of the rail yard on the Osburn property. (CSM)
- Address any issues associated with potential land ownership issues resulting from the North Ranch and the Parcel P lands north of Diablo Creek being owned by PG&E and the rest of the Parcel P and South Ranch are owned by Eureka and leased to PG&E.
- Address any issues associated with the Wild Cherry Canyon (part of Diablo Canyon Lands) being owned by Eureka Energy and leased to HomeFed.

- Include discussion of Wild Cherry Canyon about public access and conservation in the analysis of the decommissioning process.
- Include PG&E's 1,200-acre deed restriction under the 2006 CDP E-06-011/A-3-SLO-06-017 as part of the analysis.
- Assess the disruption to customary functions and uses of Port San Luis and the Harbor District during decommissioning.
- Address impacts to the potential rail site located within the County of Santa Barbara's jurisdiction on the former Sugar Beet plant site (Assessor Parcel Number 113-210-001).
- Address that the Osburn property is located within a PD/M-1 (Planned Development/Light Industrial zoning district, with a Light Industrial (LI) General Plan Land Use designation, and that a suitable site would be in zoned in PD/M-2 (Planned Development/Heavy Industrial). (CSM)
- Assess the impact of using the Pismo Beach Materials Handling Facility for decommissioning activities on local community needs and given the residential nature of the area.
- Include measures to lessen impacts to the local area if the Pismo Beach Materials Handling Facility is used during decommissioning including no storage, transport, or handling of hazardous or radioactive materials, restrictions on hours of lighting use, and significant restrictions on the hours of operation.
- Review and mitigate ministerial permits, including grading, building and demolition permits as described in the project proposal.
- Ensure that any land transfers are compatible with California Public Utilities Commission's Public Utility Code 851. (CPUC)

Noise

- Address the impacts of noise to sensitive receptors. (CPB)
- If the Pismo Beach Materials Handling Facility is required to be operable during the decommissioning, ensure that noise activities are minimized to avoid disturbance to neighborhoods, potentially causing discomfort or annoyance, under the Pismo Beach General Noise Regulations.
- Restrict decommissioning activities that create excessive noise from 9am to 5pm, Monday through Friday.
- Address any noise impacts to local neighborhoods southeast of Price Canyon Road and to the City of Pismo Beach.

Public Services, Utilities, and Service Systems

- Assess public safety impacts around the Pismo Beach Police Department and Fire Station 64, located in the 1000 block of Bello Street, to emergency response activities given the high number of tourists visiting the area. (CPB)
- Address effects of closing the plant and preventing expansion of its existing desalination plant on water supplies.

Project Description

- Clarify whether the decommissioned material will be stored at the rail facility for an extended period or immediately loaded onto rail cars. Describe length of time onsite, method of storage, and security measures. (SBCP&D)
- Confirm direction of travel of the waste, south toward Los Angeles or north toward the Bay Area. EIR must evaluate risk of transporting waste through populated areas. (SBCP&D)
- Provide a more detailed description of the types of waste materials that will be transported to the locations in Santa Barbara County, including a description of whether the waste will include asbestos materials, hydrocarbons, or other toxic air contaminants, as well as fine particulates, or odor-containing materials. (SBCAPCD)
- Define when Once Through Cooling (OTC) is proposed to end (Phase 1 or 2) in relationship to coverage by either the EIR or Phase 2 programmatic EIR as well as permitting and mitigation requirements associated with either scenario.
- Include a review of the California Coastal Commission's Conditions of Approval.
- Incorporate the potential need for a new or amended Coastal Development Permit (CDP) for the ISFSI.
- Address the need for ongoing monitoring of both the ISFSI and the GTCC Waste Storage Facility including development of an inspection, monitoring and reporting program like that required for the SONGs decommissioning.
- Review the impacts of the project goals described in the proposed project involving retaining existing energy-infrastructure to meet customer needs and creation of marine/harbor opportunities through repurposing of the breakwater, Intake Structure, and associated harbor area.
- Clarify if infrastructure modifications will be required for roads, rails, and for barge loading.
- Clarify the travel routes that would be used to transfer materials and the days and hours that this would occur, including in locations in proximity to residential areas.
- Clarify if the intake structure would remain in place to help with barge operations.
- Clarify if the discharge intake would be removed.
- Clarify if the discharge intake would be used in the future to intake water or used as a barge platform.
- Clarify if the nuclear waste would be handled in the Santa Maria railyards or remain at the Pismo railyard.
- Consider retaining non-radioactive demolished materials on-site and mixed with soils to minimize truck trips through Avila.

Population and Housing

- Evaluate potential housing impacts of large numbers of workers that will be needed, short term and long term, for all stages of the decommissioning process. (CSLO)
- Evaluate potential cumulative effects to Population and Housing that could result from the decommissioning phases and on potential future uses of the site. (CSLO)

Recreation and Public Access

- Address impacts of decreased public access on the coast due to the existing structures including the 230 and 500 kV switchyards, raw water reservoirs, intake structure, roads, and the east and west breakwaters.
- Analyze impacts to the Pecho Coast Trail, Pt. Buchon Trail and the 1,200-acre conservation set aside at Point San Luis, all required by the Coastal Commission.
- Assess maintaining PG&E owned property around the Wild Cherry Canyon area for public access, boat storage, and harbor operations. (PSLHD)
- Consider permanent and irrevocable conservation and access easements of North Ranch, Wild Cherry Canyon, and South Ranch as mitigation for storage of radiological waste.
- Consider extending the Pecho Coast Trail along the coastal bluffs in South Ranch, Parcel P and North Ranch to connect to the Pt. Buchon Trail, completing an essential link in the California Coastal Trail.
- Include a more detailed analysis of why PG&E was required to open the Pecho Coast Trail as mitigation for the Training/Simulator Building, open the Buchon Trail as mitigation for the ISFI, and set aside 1,200 acres for conservation at Point San Luis as mitigation for the Steam Generator Replacement Project.
- Consider future historic landmarks along the Coastal Trail that would interpret the past land uses associated with the DCPP.
- Include guarantee of conservation and public access, in perpetuity, of Diablo Canyon Lands including use of conservation easements.
- Include the 2000 DREAM Initiative in the analysis that is supported by 75% of SLO County residents to conserve and provide public access to all the Diablo Canyon Lands upon the plant's closure.

Transportation

- Assess vehicle trips during decommissioning including the volume of truck traffic. (Caltrans Dist. 5)
- Consider limiting truck traffic during decommissioning to Monday-Thursday, during peak hours, to eliminate conflicts with Avila Beach's peak travel periods (Friday-Sunday). (Caltrans Dist. 5)
- Consider entering into a road maintenance agreement with Caltrans throughout and following decommissioning to alleviate impacts of increased truck traffic on roadway pavement quality and shoulders. (Caltrans Dist. 5)
- Fully assess hauling schedules, traffic on/off the state highway system, and safety precautions for pedestrians and bicyclists during decommissioning in the Construction Management Plan and provide to Caltrans for review. (Caltrans Dist. 5)
- Describe what roads will be used and what will be the impact to traffic.
- Describe any potential health impacts from hazardous and radiological materials due to accidental release during transportation.
- Assess transportation and pedestrian safety/access on Avila Beach Drive during the decommissioning project and future traffic loads for potential uses at the DCPP site.

- Assess use of roadways for heavy construction vehicles involving transportation of non-radioactive concrete and materials during any high traffic times.
- Complete a condition assessment of the Avila Beach Drive revetment to ensure an ability withstand loads, erosion, and sea level rise during the full duration of decommissioning. (PSLHD)
- Study traffic circulation in Pismo Beach including traffic signals or other traffic control devices necessary to accommodate potential increase in truck hauling during decommissioning. (CPB)
- Evaluate impacts to the sensitive areas along the locations of truck travel, at Price Street and Price Canyon, and at the Pismo Beach Materials Handling Facility, including Judkins Middle school and both single and multi-family residences on the southeast side of Price Canyon Road. (CPB)
- Address impacts to the northernmost portion of Pismo Beach, as well as the City's frontage roads, involving current public uses and events. (CPB)
- Complete a traffic study that involving Pierce Canyon Road including traffic associated with the Arroyo Grande Oilfield located at Price Canyon.
- Assess traffic related impacts on Highway 101 at the exit for Price Street.
- Assess traffic related impacts if trucks turn onto Five Cities Drive to get to James Way, then to Price Street that would lead to potential congestions at the two exits.
- Analyze the range of impacts involving transportation and pedestrian safety/access on Avila Beach Drive.
- Address traffic impacts on the community of Avila Beach and Harbor Terrace, especially during warm weather weekends and holidays.
- Identify what type of trucks will be transporting the materials and specify how many a day would travel to Pismo Beach.
- Address if the waste would be transported in a southerly direction to Los Angeles or northerly toward the Bay Area and evaluate the risk associated either route. (SBCP&D)
- Describe road maintenance to address impacts of decommissioning operations.
- Describe impacts and mitigation for traffic congestion and parking.
- Include an analysis of decontamination and demolition and transport of debris during decommissioning. Observe traffic in the City of Pismo Beach and specifically traffic leading to Bello Street and address the analysis in the EIR. (CPB)
- Address if there are considerations for Pismo Beach Fire Department, CalFire, police, ambulances, FedEx, UPS mail trucks, and bicyclists turning onto Lemoore Street.
- Consider reducing transportation requirements of demolished non-radioactive concrete and materials by mixing these materials with onsite fill and retaining this mix for reuse in site restoration.
- Address hazards associated with transporting and storing nuclear waste including potential benefits of barge transportation over rail or roads.

Wildfire and Environmental Hazards

- Address impacts to Avila's one-way in and out access in terms of potential earthquake, fires, tsunamis, and nuclear facility events.

Alternatives (Proposed Project)

- Ensure that the EIR process clarifies the cost estimates of mitigation measures and alternatives to allow the CPUC and stakeholders to compare the EIR proposals to PG&E's decommissioning cost estimates and funds available in the Nuclear Decommissioning Trust. (CPUC)
- Analyze all feasible alternatives as means of reducing effects to biological resources. (USFWS)
- Evaluate rail routes that that may reduce potential risk of exposure to populated areas. (SBCP&D)
- Consider alternative sites for waste disposal should the proposed sites become unavailable and if wastes are stored longer than planned.
- Address the No Project Alternative as a zero-emission alternative.
- Clarify if non-decommissioning alternatives would require new applications and undergo a new process.

Reuse Concepts

- Consider how the DREAM Initiative in 2000 was supported by over 75% of county voters to set aside all the surrounding Diablo Canyon Lands for habitat preservation, agriculture, and passive public access.
- Assess the following public uses: 1) full PSLHD control of access to the road and trails to the Point San Luis Lighthouse 2) expansion of PSLHD land ownership adjacent to the District's Harbor Terrace campground for expansion of the camping area and public access to a trail system 3) boat storage, commercial fishing gear storage, and harbor operations near the current entrance to DCPP along Avila Beach Drive 3) use of the current DCPP marina and adjacent land for harbor operations including commercial and recreational fishing, boating, and other public uses. (PSLHD)
- Analyze retaining existing substation and 500kV and 230kV transmission systems for future use such as offshore wind energy. (CPUC)
- Address making the lands safe for public uses such as habitat preservation, agriculture, and passive public use as well as establishment of clean, green, renewable energy sources, education, and research.
- Assess reuse of the desalination plant for future potable water requirements in the area. (PSLHD)
- Consider preserving the current breakwaters at the DCPP. (PSLHD)
- Consider making office buildings on Parcel P available for congregate housing including offering them to People's Self Help Housing and the Homeless Oversight Services Council.
- Ensure that restored lands deemed safe by NRC be utilized for the public good.
- Address repurposing non-contaminated facilities to create new local jobs, promote renewable energy sources including transmission lines, and preservation of the existing desalination plant, breakwaters, and associated harbor.
- Address potential enlargement of the plant's desalination plant to provide more water than the County and Central Coast currently receives from the State Water Project via a Central Coast Water Authority pipeline, a facility under potential threat from the San Andreas Fault.

- Address keeping the nuclear power plant and water desalination facility operable to provide water supplies for the Central Coast.
- Ensure that analysis of future use is not going to result in a development agreement now.
- Consider retaining the existing substation and transmission system that will offer offshore wind and other energy providers a tie-in to the grid.
- Ensure that any land transfers adhere to the State Public Utility Code Section 851.
- Clarify if some reuses of Parcel P will occur before 2040.
- Consider that any redevelopment of the site may cause create wildfire risks, requiring additional mitigation such as needs for additional ingress and egress.

General EIR Comments

- Describe NRC jurisdiction over project related high-level radioactive waste storage and decontamination standards.
- Involve the SBAPCD as a responsible agency under the California Environmental Quality Act (CEQA); the SBAPCD will rely on the EIR when evaluating any District permits for proposed equipment. (SBAPCD)
- Fully analyze effects of the project on local communities.
- Include the Strategic Vision of the Diablo Canyon Decommissioning Engagement Panel and the Conservation Framework adopted by the Friends of the Diablo Canyon Lands during project review. www.diablocanyonlands.org.
- Identify the length of time for implementation of all project mitigation including if it is either perpetual or temporary, including in reference to the potential for long-term storage of highly toxic radioactive materials within coastal locations.
- Consider an extension of the DEIR public review timeframe for at least 60 days. (CSLO)
- Ensure that CPUC approves any PG&E voluntary land transfers following decommissioning. (CPUC)
- Address permitting issues associated with the ISFSI and GTCC involving future uses prior to demolition.
- Address if a permit needs to be issued for development and installation of an SFPI, an independent spent fuel cooling system.
- Address permitting requirements for permanent on-site storage of GTCC waste material in appropriate casks.
- Analyze the effects on the entire 12,000-acre area (project site and surrounding 11,250 acres) involving the disposition of the 750-acre site. (USFWS)
- Ensure that the County and the applicant work with the USFWS to avoid and minimize effects to listed species.
- Analyze impacts to all PSLHD lands, facilities, and submerged tidelands.
- Follow CDFW specified environmental data and filing fee requirements during project. (CDFW)
- Consider additional time to submit scoping comments to address up to four proposed truck to rail transfer sites as well as rail transport to out of state waste facilities, including the Osborn Property, City Santa Maria. (CSM)
- Treat any license extension as a separate application with separate environmental review.
- Ensure that the EIR is approved before the start of decommissioning.

- Describe the required ministerial permits and discuss what impacts could occur.
- Consider including previous community and public engagement such as the Diablo Canyon Decommissioning Engagement panel in this process.
- Consider the project-related community-based activities that have taken place that can inform the decommissioning process and the future of this land including the Diablo Canyon Decommissioning Engagement panel, engaged now well over three years, discussing project decommissioning, offering many public meetings, and receiving many public comments.
- Elaborate more about project mitigation as previous mitigations were short and do not provide informative details.
- Do not decommission Diablo Canyon Power Plant as it has provided continuous clean energy for around 30 years and can continue to operate safely.
- Clarify if alternatives and reuse options are going to be analyzed and would these be treated separately.
- Consider a license-extension as a separate project requiring separate environmental review process; extending the site license is beyond the scope of this EIR.

Issues Not Related to EIR

- Address if Pismo Beach or PG&E will be responsible for Price Canyon.
- Describe what funding category is PG&E using to pay for environmental consulting services.
- Describe how resources will be procured if PG&E's financial and time budget for EIR development is not sufficient.
- Describe measures to protect ratepayers during completion of the proposed project.

NRC Related Comments

- Identify the extent that the EIR recommends additional mitigation measures above that required by the NRC.
- Determine a threshold of acceptable residual contamination that is consistent with the health and safety standards of the County.

Appendix B2

Notice of Preparation

Notice of Preparation and Notice of Scoping Meeting

Diablo Canyon Power Plant Decommissioning Project

ED2021-174 / DRC2021-00092

Date: October 28, 2021
To: Interested Agencies, Organizations, and Individuals
Lead Agency: San Luis Obispo County
Applicant: Pacific Gas and Electric Company

I. INTRODUCTION

This is a notice for solicitation of agency, organization, and public input and initiation of scoping for the preparation of an Environmental Impact Report (EIR) for the Diablo Canyon Power Plant Decommissioning Project (DCPP Decommissioning Project or Proposed Project).

San Luis Obispo County (County) is the Lead Agency under the California Environmental Quality Act (CEQA) for the preparation and review of the DCPP Decommissioning Project EIR. Pursuant to Section 15082 of the State CEQA Guidelines, the County is soliciting the views of responsible, trustee, and interested agencies, organizations, and individuals on the scope and content of the environmental analysis in the EIR. Agencies should comment on the elements of the scope and content of the EIR that are relevant to the agencies' statutory responsibilities, as provided under State CEQA Guidelines Section 15082(b). A summary of the Proposed Project, including alternatives under consideration, and environmental effects that may result from implementation are provided below. Additionally, information about the DCPP Decommissioning Project may be accessed via the County's website:

https://www.slocounty.ca.gov/Departments/Planning-Building/Grid-Items/Community-Engagement/Active-Planning-Projects/Diablo-Canyon-Nuclear-Power-Plant-Decommissioning.aspx

Comment Period: Written comments or questions regarding the scope and content of the EIR can be sent anytime during the Notice of Preparation (NOP) public review period. The review period begins **October 28, 2021 and ends December 6, 2021 (40 days).** Please include the name of the contact person for your agency or organization, if applicable. Please send all comments via US mail or email to:

Susan Strachan
Nuclear Power Plant Decommissioning Project Manager
San Luis Obispo County, Department of Planning and Building
976 Osos St #300, San Luis Obispo, CA 93408

Email: diablo@co.slo.ca.us

Subject Line: DCPP Decommissioning Project NOP Comments

Scoping Meetings: The County will hold 5 virtual scoping meetings using Zoom to give the agencies, organizations, and the public an opportunity to learn about the Proposed Project, to ask questions regarding the Proposed Project, and provide oral comments on the scope and content of the EIR. These meetings will be recorded and posted on the County's website (see link above) for later viewing. Each meeting will include the same presentation. Comments received at each meeting will become part of the public record for the Project.

The meeting times and login details are as follows:

Tuesday November 9, 2021 at 10:00 a.m.	**Tuesday November 9, 2021 at 6:00 p.m.**
Zoom link: https://us02web.zoom.us/j/88008559486 or by Phone: **(669) 900-6833** then enter Webinar ID: **880 0855 9486**	Zoom link: https://us02web.zoom.us/j/88344286664 or by Phone: **(669) 900-6833** then enter Webinar ID: **883 4428 6664**
Wednesday December 1, 2021 at 10:00 a.m.	**Wednesday December 1, 2021 at 6:00 p.m.**
Zoom link: https://us02web.zoom.us/j/82051282377 or by Phone: **(669) 900-6833** then enter Webinar ID: **820 5128 2377**	Zoom link: https://us02web.zoom.us/j/83781876105 or by Phone: **(669) 900-6833** then enter Webinar ID: **837 8187 6105**
Saturday December 4, 2021 at 2:00 p.m.	
Zoom link: https://us02web.zoom.us/j/81440062317 or by Phone: **(669) 900-6833** then enter Webinar ID: **814 4006 2317**	

II. DESCRIPTION OF PROPOSED PROJECT

The Pacific Gas and Electric Company (PG&E) proposes decommissioning of the Diablo Canyon Power Plant. The Proposed Project is located at 3890 Diablo Canyon Road in an unincorporated area of San Luis Obispo County. Approximately two-thirds of the DCPP site is located within the coastal zone and approximately one-third is located outside of the coastal zone.

The California Coastal Act (CCA) is the principal planning and regulatory program for the coastal zone of California. Section 23.01.031 of the County's Coastal Zone Land Use Ordinance (CZLUO) requires a Coastal Development Permit (CDP) for development projects, including decommissioning projects, in accordance with the CCA and the above-referenced section of the CZLUO. In addition, Section 23.02.034 of the CZLUO requires a CDP to enable public review of significant land use proposals and to ensure consistency with local ordinance and policy. The area of the site in the coastal zone is located within the California Coastal Commission (CCC) appeal jurisdiction, meaning that County decisions on the project may be appealed to the CCC. Section 22.62.060 of the County's Inland Land Use Ordinance requires a CUP for significant land use proposals outside the coastal zone to enable public review and ensure local ordinance and policy consistency.

The DCPP Is located within the jurisdiction of the CCC and State Lands Commission (DCPP features in tidelands and submerged lands) and a CDP and new lease amendment will be required from these agencies, respectively for plant decommissioning activities within the agencies' jurisdictions.

The DCPP is a two-unit nuclear-powered electrical generating station that began commercial operation in 1985 for Unit 1 and 1986 for Unit 2 and is the last nuclear power plant still operating in California. The two reactors are licensed by the U.S. Nuclear Regulatory Commission (NRC) to operate until November 2, 2024 (Unit 1) and August 26, 2025 (Unit 2). Between 2009 and 2016, PG&E pursued efforts to renew these licenses, which would have allowed for the continued operation of DCPP until 2044 (Unit 1) and 2045 (Unit 2). In 2016, PG&E decided to forego license renewal efforts and announced plans to close DCPP at the expiration of its current NRC operating licenses. This decision was confirmed by the California Public Utilities Commission in 2018. Upon final shutdown of the units and assuming all permit conditions are acceptable, PG&E intends to transition DCPP immediately from an operating status into a decommissioning status, meaning the facility will be shutdown and the process of dismantling and removing it will begin.

Project Summary. The Proposed Project involves four different sites: (1) the DCPP site, (2) the Pismo Beach Railyard (PBR), and (3) one of two potential Santa Maria Valley Railyard Facility (SMVR) sites (see figures provided at the end). The DCPP site is on the coast of San Luis Obispo County, California, approximately 7 miles northwest of Avila Beach. The DCPP facility comprises a 750-acre high-security zone surrounded by an approximately 12,000-acre area of land owned by either PG&E or Eureka Energy, a wholly owned subsidiary of PG&E.

The rail sites would be used to transfer decommissioning waste from trucks to rail cars, where the waste would then be transported by rail to out-of-state disposal facilities (Clive, Utah and/or Andrews, Texas). The PBR site is currently used by PG&E for equipment and material storage and transportation needs in support of DCPP operations. The site is located at 800 Price Canyon Road in the City of Pismo Beach in San Luis Obispo County, approximately 13 miles southeast of the DCPP site. This site would be used as a contingency for the transfer of non-radioactive and non-hazardous decommissioning waste. Two SMVR sites are being considered; however, only one would be used. One is within the City of Santa Maria at the Osburn Yard, located at 1599 A Street, and the other further west within the County of Santa Barbara at Betteravia Industrial Park located at 2820 W. Betteravia Road.

Facility decommissioning would occur in two phases:

- Phase 1 (2024 through 2031): Pre-planning and Decommissioning Project Activities, and
- Phase 2 (2032 through 2039): Completion of Soil Remediation, Final Status Surveys, and Final Site Restoration.

The main activities in Phase 1 include:

- Installation of electrical infrastructure for the decommissioning power supply
- Site security infrastructure and general modifications to existing structures to support decommissioning activities
- Removal of the nuclear reactor pressure vessels (RPVs), RPV internal components, and steam generators
- Decontamination and demolition of buildings
- Intake structure modifications to accommodate waste removal by barge
- Removal of the discharge structure and restoration of the area once removed
- Construction of waste storage facilities for Greater than Class C (GTCC) waste and non-radioactive waste
- Spent Fuel and GTCC waste transfer to Independent Spent Fuel Storage Installation (ISFSI) and new GTCC storage building
- Removal of firing range and construction of new firing range
- Site characterization to determine areas of contamination and soil remediation (soil clean up)
- Initial site restoration, soil remediation, and Final Status Surveys (surveys to ensure the site meets release criteria specified in the NRC required License Termination Plan)
- Modify and use of railyards for waste shipments (under separate permits from the Cities of Pismo Beach and Santa Maria and County of Santa Barbara)

The main activities in Phase 2, which would occur only at the DCPP site, include:

- Continue soil remediation
- Continue Final Status Surveys
- Remove infrastructure not supporting retained facilities (e.g., roads, parking areas)
- Final site restoration
- Site restoration monitoring (up to 5 years)
- Transition to ISFSI and GTCC storage facility operations
- Termination of NRC Part 50 DCPP operating licenses

Facilities that would remain in place for PG&E use in an "owner-controlled area" (see below) following completion of Phases 1 and 2 include:

- Primary and secondary access roads
- Internal roads
- 230 and 500 kV switchyards
- ISFSI
- Raw water reservoirs
- New security building, firing range, and GTCC waste storage facility (built in Phase 1)

In addition, PG&E proposes to retain the existing Eastern and Western Breakwaters and Intake Structure for potential future use by others.

The structures that would remain onsite would continue to be managed by PG&E within a designated owner-controlled area (see figure below). Activities would be limited to ISFSI and GTCC storage facility operations until an off-site interim storage facility or permanent repository is available. Identification of an off-site repository for long-term storage of spent nuclear fuel and

GTCC waste is a concern both for DCPP and for nuclear power facilities across the nation and awaits resolution by the federal government.

III. ALTERNATIVES TO THE PROPOSED PROJECT

The EIR will evaluate alternatives to the Proposed Project that have the potential to reduce environmental impacts. The alternatives identified below are under consideration.

- **No Project Alternatives.**
  - **SAFSTOR Alternative** – DCPP would be placed in a safe, stable storage condition referred to as SAFSTOR and DCPP decommissioning would be completed within 60 years as required under federal regulation.
  - **No CSLC Approval Alternative** – This alternative assumes no approval from California State Lands Commission (CSLC) is received for decommissioning infrastructure within the CSLC jurisdiction, which includes offshore areas including State (filled) tide and submerged lands. Under this alternative decommissioning of structures within the CSLC jurisdiction (e.g., discharge structure, boat dock, storage facility, office facilities, intake electrical room, intake maintenance shop, equipment storage pad, spare tri-bar storage) would not occur. Repurposing of other structures, such as the breakwater or intake structure, would not occur. Decontamination and radiological and chemical remediation would take place to achieve license termination.
- **Intake Structure Removal Alternative.** This alternative would include full removal of the intake structure back to the water tunnels, and tunnel entrances would be sealed with a concrete bulkhead.
- **Breakwater Removal Alternative.** This alternative would include full removal of the breakwaters around the Intake Cove and marine habitat restoration using imported rocks.
- **Minimum Demolition Alternative.** This alternative would leave buildings and supporting infrastructure in place to the maximum extent feasible. Decontamination and radiological and chemical remediation would take place to achieve license termination. Eventual dismantlement and offsite transportation could take place later, or buildings and supporting infrastructure could be reused by a third party.
- **Full Removal Alternative.** All DCPP infrastructure would be completely removed (beyond the standard three feet minimum below adjacent grade), including the intake structure and breakwaters. Only the owner-controlled area and associated support facilities, such as utilities and roads would remain.

IV. AREAS OF POTENTIAL IMPACT FOR THE PROPOSED PROJECT (2024 - 2039)

The County has determined that an EIR will be required to satisfy environmental review for the Proposed Project. Therefore, as allowed under CEQA Guidelines Section 15060(d), the County has not prepared an Initial Study and will instead begin work directly on the EIR. The EIR will focus on the potentially significant effects of the Proposed Project, discuss any effects found not to be significant (CEQA Guidelines Section 15128) and will assess the direct, indirect, and cumulative impacts, as well as growth-inducing effects.

The EIR will include an evaluation of the following environmental issues:

- Aesthetics
- Air Quality
- Biological Resources (Marine and Terrestrial)
- Cultural Resources – Archaeology and Built Environment
- Cultural Resources - Tribal Cultural Resources
- Energy
- Geology, Soils, and Coastal Processes (Paleontology)
- Greenhouse Gas Emissions
- Hazardous and Radiological Materials
- Hydrology and Water Quality
- Land Use and Planning (Agriculture)
- Mineral Resources
- Noise
- Population and Housing
- Public Services and Utilities
- Recreation and Public Access
- Transportation
- Wildfire

The EIR will also analyze:

- Climate Change and Sea-Level Rise
- Commercial Fishing
- Environmental Justice
- State Tide and Submerged Lands Possessing Significant Environmental Values

No determinations have been made as to the significance of these potential effects. Such determinations will be made in the EIR after the issues are thoroughly analyzed. The County invites interested parties, and all affected, responsible, and trustee agencies, to suggest specific areas of analysis to be addressed within these general categories, or other issues not included above, to be considered in the EIR.

V. FUTURE SITE REUSE POTENTIAL (2040 AND BEYOND)

Following Phases 1 and 2 of decommissioning and termination by the NRC of DCPP's Title 10 Code of Federal Regulations (CFR) Part 50 license (10 CFR Part 50, or Part 50), the DCPP site, excluding the owner-controlled area, would be available for development. Therefore, the EIR will evaluate possible reuse concepts for the DCPP site, which will be referred to in the EIR as Phase 3. Because these uses would be far in the future and would require separate land use and CEQA analysis for permitting, the reuse concepts will be evaluated at a program level. This evaluation will be provided to identify potential environmental impacts or issues associated with the possible reuse concepts.

The County is still developing ideas for future site reuse. However, the EIR may compare the possible environmental impacts of the following reuse concepts:

- University Campus
- Developed Recreation (car camping to glamping)
- Day Use Recreation (e.g., trails)
- Research Facility
- Renewable Energy Production and/or Storage
- Resort Hotel
- Mixed Use
- Offshore Wind Port/support facility

The possible environmental impacts of the different concepts will be identified based on the project site information developed for the Proposed Project and will consider the same issue areas as those identified above for the Proposed Project.

Figure 1. DCPP Decommissioning Project Sites

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Appendix B3

Public Notices

From:	PL_Diablo
To:	Susan Strachan; Cindy A. Chambers
Subject:	Notice of Upcoming EIR Scoping Meetings for Diablo Canyon Decommissioning DRC2021-00092
Date:	Monday, November 29, 2021 2:12:50 PM
Attachments:	Outlook-1483473689.png

County of San Luis Obispo to Host Meetings on Diablo Canyon Nuclear Power Plant Decommissioning

The County of San Luis Obispo will prepare an Environmental Impact Report (EIR) for the Diablo Canyon Nuclear Power Plant Decommissioning Project. An EIR Scoping Meeting is an opportunity for agencies and interested members of the public to obtain information about the project, ask questions, and provide oral comments on the scope and content of the EIR. The County will hold five (5) virtual scoping meetings. The first two meetings occurred on November 9. The meeting times and login details for the remaining meetings are as follows:

Wednesday December 1, 2021 at 10:00 a.m.	**Wednesday December 1, 2021 at 6:00 p.m.**
Zoom link: **https://us02web.zoom.us/j/82051282377** or by Phone: **(669) 900-6833** then enter Webinar ID: **820 5128 2377**	Zoom link: **https://us02web.zoom.us/j/83781876105** or by Phone: (669) 900-6833 then enter Webinar ID: 837 8187 6105
Saturday December 4, 2021 at 2:00 p.m.	
Zoom link: **https://us02web.zoom.us/j/81440062317** or by Phone: (669) 900-6833 then enter Webinar ID: 814 4006 2317	Note: Each meeting will include the same presentation.

The project's Notice of Preparation and PG&E's application, including a detailed Project Description, Map Exhibits, and studies can be accessed on the County's website at this link: https://www.slocounty.ca.gov/Departments/Planning-Building/Grid-Items/Community-Engagement/Active-Planning-Projects/Diablo-Canyon-Nuclear-Power-Plant-Decommissioning.aspx

Written Scoping comments are due by 5:00 p.m., December 6, 2021. Comments may be submitted via email to: diablo@co.slo.ca.us, or via USPS mail to: County of San Luis Obispo Planning & Building, Room 300, Attention: S. Strachan, 976 Osos Street, San Luis Obispo, CA 93408.

Please contact Susan Strachan at (805) 788-2129, or Cindy Chambers at (805) 781-5608, or via the project email above, for additional information.

Thank you,

Cindy Chambers
Senior Planner
Diablo Canyon Decommissioning Project
(p) 805-781-5608
cchambers@co.slo.ca.us

COUNTY OF SAN LUIS OBISPO
PLANNING & BUILDING

New Times

1010 Marsh St., San Luis Obispo, CA 93401
(805) 546-8208 • FAX (805) 546-8641

PROOF OF PUBLICATION
(2015.5 C.C.P.)

STATE OF CALIFORNIA,
County of San Luis Obispo,

I am a citizen of the United States and a resident of the county aforesaid; I am over the age of eighteen years, and not a party interested in the above entitled matter. I am the principal clerk of the printer of the *New Times*, a newspaper of general circulation, printed and published weekly in the City of San Luis Obispo, County of San Luis Obispo, and which has been adjudged a newspaper of general circulation by the Superior Court of the County of San Luis Obispo, State of California, under the date of February 5, 1993, Case number CV72789: that notice of which the annexed is a printed copy (set in type not smaller than nonpareil), has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to-wit:

October 28

in the year 2021.

I certify (or declare) under the the penalty of perjury that the foregoing is true and correct.

Dated at San Luis Obispo, California, this day 28 of October, 2021.

Patricia Horton

Patricia Horton, New Times Legals

Proof of Publication of

COUNTY OF SAN LUIS OBISPO
DEPARTMENT OF PLANNING & BUILDING
TREVOR KEITH, DIRECTOR

Environmental Impact Report - Notice of Preparation and Notice of EIR Scoping Meetings

Diablo Canyon Nuclear Power Plant Decommissioning Project
ED2021-174 / DRC2021-00092

The County of San Luis Obispo as Lead Agency will prepare an Environmental Impact Report (EIR) for the Diablo Canyon Nuclear Power Plant Decommissioning Project. The project is a request by Pacific Gas and Electric for a County Development Plan/Coastal Development Permit and Conditional Use Permit for both Coastal and Inland components of decommissioning and site restoration. Portions of the project site are in retained Coastal Commission jurisdiction as well.

An EIR Scoping Meeting is an opportunity for agencies and interested members of the public to obtain information about the project, ask questions, and provide oral comments on the scope and content of the EIR. The County will hold five virtual scoping meetings. The meeting times and login details are as follows:

Tuesday November 9, 2021 at 10:00 a.m.	**Tuesday November 9, 2021 at 6:00 p.m.**
Zoom link: https://us02web.zoom.us/j/88008559486 or by Phone: **(669) 900-6833** then enter Webinar ID: **880 0855 9486**	Zoom link: https://us02web.zoom.us/j/88344286664 or by Phone: **(669) 900-6833** then enter Webinar ID: **883 4428 6664**
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Zoom link: https://us02web.zoom.us/j/81440062317 then enter Webinar ID: **814 4006 2317** or by Phone: **(669) 900-6833**	

DESCRIPTION OF PROPOSED PROJECT

PG&E's proposed decommissioning activities include: decontamination and demolition of approximately 65,000 square feet of structures and facilities; grading cut and fill of approximately 524,000 cubic yards; site disturbance and restoration of approximately 71 acres; removal of hazardous and non-hazardous waste materials; and construction of new facilities, including a new security building, firing range, and Greater Than Class C Waste (GTCC) facility to be located in a PG&E Owner-Controlled Area. Existing structures would also remain within the PG&E Owner-Controlled Area, including the 500 kV and 230 kV electrical switchyards and the Independent Spent Nuclear Fuel Storage Installation (ISFSI) facility where spent nuclear fuel will continue to be stored until an interim storage facility or permanent repository is available. PG&E also proposes to retain the existing Eastern and Western Breakwaters and the Intake Structure for potential future use by others.

Decommissioning waste, including low-level nuclear waste, would be transported offsite for disposal via truck, rail, and barge. The project involves three additional locations for potential rail transfer that would require local-agency permitting approval: the Pismo Beach Materials Handling Facility located at 800 Price Canyon Road in Pismo Beach; a rail site located in Santa Barbara County (2820 W. Betteravia Road); and, a rail site within the City of Santa Maria (1599 A Street). Only one of the two sites outside of San Luis Obispo County would be used.

The project is proposed in two phases: Phase 1 (2024 through 2031) includes Pre-planning and Decommissioning activities; Phase 2 (2032 through 2039) includes completion of Soil Remediation, Final Status Surveys, and Site Restoration. The Diablo Canyon project site is located at 3890 Diablo Canyon Road, approximately seven miles east of Port San Luis. The proposed project is within the Public Facilities land use category in the San Luis Bay Coastal Planning area and within the San Luis Bay Inland Sub Area of the San Luis Obispo Planning Area.

All issue areas of potential impact as mandated by the CEQA Guidelines (Appendix G) including Alternatives, Cumulative Effects, and Growth Inducement, will be addressed in the Environmental Impact Report to be prepared for the project. No determinations have been made as to the significance of these potential effects. Such determinations will be made in the EIR after the issues are thoroughly analyzed. The County invites interested parties, and all affected, responsible, and trustee agencies, to suggest specific areas of analysis to be addressed within these general categories, or other issues not included above, to be considered in the EIR.

There are no Cortese listings or GeoTracker sites located on the Diablo Canyon or Pismo Beach railyard sites. At this time, there is no tentative hearing date for the project.

Future Site Re-use Potential
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FURTHER INFORMATION:

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October 28, 2021

New Times

1010 Marsh St., San Luis Obispo, CA 93401
(805) 546-8208 • FAX (805) 546-8641

PROOF OF PUBLICATION
(2015.5 C.C.P.)

STATE OF CALIFORNIA,
County of San Luis Obispo,
I am a citizen of the United States and a resident of the county aforesaid; I am over the age of eighteen years, and not a party interested in the above entitled matter. I am the principal clerk of the printer of the *New Times*, a newspaper of general circulation, printed and published weekly in the City of San Luis Obispo, County of San Luis Obispo, and which has been adjudged a newspaper of general circulation by the Superior Court of the County of San Luis Obispo, State of California, under the date of February 5, 1993, Case number CV72789: that notice of which the annexed is a printed copy (set in type not smaller than nonpareil), has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to-wit:

November 4

in the year 2021.

I certify (or declare) under the the penalty of perjury that the foregoing is true and correct.

Dated at San Luis Obispo, California, this day 4 of November, 2021.

Patricia Horton

Patricia Horton, New Times Legals

Admin & Personal/-NTMG Admin/NTMG Office/BUSINESS/Public Notices/Proof of Pub

Proof of Publication of

COUNTY OF SAN LUIS OBISPO
DEPARTMENT OF PLANNING & BUILDING
TREVOR KEITH, DIRECTOR

Environmental Impact Report - Notice of Preparation and Notice of EIR Scoping Meetings

Diablo Canyon Nuclear Power Plant Decommissioning Project
ED2021-174 / DRC2021-00092

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Zoom link: https://us02web.zoom.us/j/88008559486 or by Phone: **(669) 900-6833** then enter Webinar ID: **880 0855 9486**	Zoom link: https://us02web.zoom.us/j/88344286664 or by Phone: **(669) 900-6833** then enter Webinar ID: **883 4428 6664**
Wednesday December 1, 2021 at 10:00 a.m.	**Wednesday December 1, 2021 at 6:00 p.m.**
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Zoom link: https://us02web.zoom.us/j/81440062317 then enter Webinar ID: **814 4006 2317** or by Phone: **(669) 900-6833**	

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November 4, 2021

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976 OSOS STREET, ROOM 300
SAN LUIS OBISPO CA 93408

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4LGL 2.00 X 153.00 Words: 995
Total 4LGL 306.00
Class: S0986 LEGALS
Rate: LD Cost: 548.50
Affidavits: 1

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Phone: (805)788-2129
Fax#: (805)220-7038
Email: strachan@dcn,org
Agency:

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Environmental Impact Report - Notice of Preparation and Notice of EIR Scoping Meetings

Diablo Canyon Nuclear Power Plant Decommissioning Project
ED2021-174 / DRC2021-00092

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https://us02web.zoom.us/j/83781876105
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Legal #52234 Pub date: October 29, 2021

1010 Marsh St., San Luis Obispo, CA 93401
(805) 546-8208 • FAX (805) 546-8641

PROOF OF PUBLICATION
(2015.5 C.C.P.)

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November 25

in the year 2021.

I certify (or declare) under the the penalty of perjury that the foregoing is true and correct.

Dated at San Luis Obispo, California, this day 25 of November, 2021.

Patricia Horton

Patricia Horton, New Times Legals

Admin & Personal/•NTMG Admin/NTMG Office/BUSINESS/Public Notices/Proof of Pub

Proof of Publication of

COUNTY OF SAN LUIS OBISPO
DEPARTMENT OF PLANNING & BUILDING
TREVOR KEITH, *DIRECTOR*

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NOTE: Each meeting will include the same presentation of project information.

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976 Osos Street, Room 300 | San Luis Obispo, CA 93408 | (P) 805-781-5600 | 7-1-1 TTY/TRS Relay

planning@co.slo.ca.us | www.sloplanning.org

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November 25, 2021

New Times
1010 Marsh St., San Luis Obispo, CA 93401
(805) 546-8208 • FAX (805) 546-8641

PROOF OF PUBLICATION
(2015.5 C.C.P.)

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December 2

in the year 2021.

I certify (or declare) under the the penalty of perjury that the foregoing is true and correct.

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Patricia Horton

Patricia Horton, New Times Legals

Proof of Publication of

COUNTY OF SAN LUIS OBISPO
DEPARTMENT OF PLANNING & BUILDING
TREVOR KEITH, *DIRECTOR*

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or by Phone: (669) 900-6833

then enter Webinar ID: 814 4006 2317

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December 2, 2021

SANTA MARIA TIMES

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Joe Bailey (805) 739-2239
jbailey@santamariatimes.com

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Gina Frisby, chief of staff for Assemblyman Evan Low, packs boxes at Low's Capitol Annex office in Sacramento on Monday.

RICH PEDRONCELLI

Lawmakers relocate to make way for new building

ADAM BEAM
Associated Press

SACRAMENTO — California's Legislature will reconvene in about a month, but staff are busy this week building boxes instead of bills as they work to quickly vacate their offices ahead of the scheduled demolition of their nearly 70-year-old workspace.

California's Capitol was completed in 1874, and at the time it was big enough to hold most of state government, including the Legislature, the executive branch and the state Supreme Court.

But as California grew into the nation's most populous state following the Gold Rush and a pair of world wars, state government grew along with it. Agencies moved out as more buildings sprung up around the Capitol. In 1952, the Annex was connected to the Capitol, where it has housed lawmakers offices — including the governor — ever since.

That ends this year as part of a plan to demolish the Annex and replace it with a more modern structure that will comply with new rules designed to withstand earthquakes and fires all while making the building more accessible for people with disabilities.

In the meantime, the state built a $423.6 million office building about two blocks away from the Capitol to house lawmakers and their staff during construction. The Legislature will still meet in their respective chambers in the state Capitol. But their offices, instead of just a few floors away, will be about two blocks away until at least 2025.

That's if everything goes according to plan. Unforeseen construction delays could keep them there much longer. And some environmental and historical preservation groups have sued to block the project, worried about its impact on surrounding Capitol Park and some of the rare trees and plants that live there.

Lawmakers say Capitol Park's most prominent trees will be protected. That includes the "moon tree" — a Redwood that grew from a seed that went to the moon on Apollo 14 and is now about 120 feet (36.5 meters) tall — and a grove of trees planted in 1897 that were taken from famous Civil War battlefields at Gettysburg and Fredericksburg.

It was mostly quiet inside the doomed Annex on Monday as some offices have already relocated to the new office space. That includes the large bronze statue of a grizzly bear that stood in front of the governor's office. The bear, affectionately known as "bacteria bear" for its ability to attract schoolchildren's fingers, has been a fixture for tourists since former Gov. Arnold Schwarzenegger personally paid to install it more than a decade ago.

In Assemblyman Evan Low's office, chief of staff Gina Frisby worked alongside a mini-refrigerator that had been cleaned and unplugged. She packed up her bosses' office, famous for its wood-paneled walls that are widely loathed by lawmakers.

"I don't know how many times over the years he has complained bout wanting to get that removed," Frisby said.

Inside the office of Assemblyman Adrin Nazarian, Chief of Staff Dan Savage was a bit wistful as he recounted his 25 years in the building — nearly all of his adult working life.

"I can't tell you how many times I've slept on my desk and woke up with a crick in my neck," Savage said as cardboard boxes lined the walls and coffee cups mingled with cleaning supplies on a nearby desk.

Nazarian was chair of the legislative budget committee that vetted the proposal for replacing the Annex, so Savage knows all about the building's problems that he says makes the demolition necessary.

But closing down the Annex will likely be Savage's final act in state government as he plans to retire at the end of December.

"Not only is the building going, but I'm going," he said. "I'll never be able to come back to this building."

Father held after 4 California children, grandmother slain

STEFANIE DAZIO
Associated Press

LANCASTER — Four children, including an infant, and their grandmother were found shot to death in a Southern California home and the children's father was arrested on suspicion of killing them, the Los Angeles County Sheriff's Department said.

The victims were found Sunday night in a home in the city of Lancaster in the high desert Antelope Valley north of Los Angeles.

The children's mother discovered the bodies and called 911, Lt. Brandon Dean told The Associated Press in a telephone interview.

Three houses away, Grace Beltran and her son Gerard were awakened by first responders' flashing lights. Grace Beltran said a woman was running back and forth in their front yard, screaming, "My babies are gone! They're all dead!"

Within a few minutes of the mother arriving home, the children's father, Germarcus David, 29, turned himself in to deputies at the Lancaster sheriff's station, Dean said.

David was arrested after being interviewed by investigators and was held in lieu of $2 million bail.

It was not immediately known if David had a lawyer who could speak on his behalf. He was expected to make an initial appearance at the Antelope Valley Courthouse on Tuesday.

BUSINESS

YESTERDAY'S U.S. MARKETS

Dow Jones	Nasdaq	S&P 500	Gold
▲ 35,135.94 +236.60	▲ 15,782.83 +291.18	▲ 4,655.27 +60.65	▼ $1,782.90 -$2.60

GAS PRICES

	SB County		SLO County	
	Regular	Diesel	Regular	Diesel
Yesterday	$4.66	$4.79	$4.86	$5.02
Month ago	$4.51	$4.69	$4.78	$4.92
Year ago	$3.20	$3.42	$3.37	$3.60

Source: AAA Daily Fuel Gauge Report

Twitter CEO steps down, leaves company at a crossroads

ASSOCIATED PRESS

Jack Dorsey is out of his post as Twitter's chief executive for the second time in his career — this time, he says, by choice.

Dorsey, who co-founded the company, offered no specific reasons for his resignation Monday beyond an abstract argument that Twitter, where he's spent 16 years in various roles, should "break away from its founding and founders." Dependence on company founders, he wrote, is "severely limiting."

He will be succeeded by Twitter's current chief technology officer, Parag Agrawal, a choice Wall Street analysts seemed to welcome, seeing him as a safe choice who will usher the company into what's widely seen as the internet's next era — the metaverse. Investors were less sure, sending Twitter's stock 3% lower.

Dorsey was the social platform's first CEO in 2007 until he was forced out the following year, then returned to the role in 2015. He is known for his relaxed demeanor, for his sometimes massive beard that's the subject of several parody Twitter accounts and for Silicon Valley eccentricities that include dabbling in silent retreats, intermittent fasting, cryptocurrencies and blockchain.

He leaves Twitter at a crossroads. The service changed American politics, journalism and culture.

"But it also, it turns out, had a darker side and has been exploited for years by people who want to harass other people and spread falsehoods about other individuals, about groups of individuals, about the state of democracy," said Paul Barrett, deputy director at the New York University Stern Center for Business and Human Rights.

In a letter posted on his Twitter account, Dorsey said he was "really sad…yet really happy" about leaving the company and that it was his decision.

Dorsey sent the first tweet on March 21, 2006, that read "just setting up my twttr." Twitter went through a period of robust growth during its early years, but as its expansion slowed, the San Francisco company began tweaking its format in a bid to make it easier and more engaging to use. While it never rivaled Facebook in size, Twitter became a primary conduit for political discourse and journalism, for better and for worse.

He will remain on the board until his term expires in 2022. Agrawal joined Twitter in 2011 and has been CTO since 2017. Dorsey expressed confidence in Agrawal and new board Chairman Bret Taylor, who is president and chief operating officer of the business software company Salesforce.

Twitter was caught up in the heated political atmosphere leading up to the 2020 election, particularly when it banned former President Donald Trump following his incitement of the Jan. 6 riot at the U.S. Capitol. Dorsey defended the move, saying Trump's tweets after the event resulted in a risk to public safety and created an "extraordinary and untenable circumstance" for the company.

Trump sued the company, along with Facebook and YouTube, in July, alleging censorship.

Critics argued that Twitter took too long to address hate speech, harassment and other harmful activity on its platform, particularly during the presidential campaign.

Publicly, Dorsey has signaled that he understood Twitter's need to change. In a series of tweets in 2018, he said the company was committed to "collective health, openness, and civility of public conversation, and to hold ourselves publicly accountable towards progress."

"We have witnessed abuse, harassment, troll armies, manipulation through bots and human-coordination, misinformation campaigns, and increasingly divisive echo chambers. We aren't proud of how people have taken advantage of our service, or our inability to address it fast enough," he wrote.

MICHAEL REYNOLDS

Twitter CEO Jack Dorsey appears on a screen as he speaks remotely during an Oct. 28, 2020, hearing before the Senate Commerce Committee on Capitol Hill.

SANTA MARIA TIMES

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Corrections

The Times corrects errors of fact appearing in its news columns.
If you have a correction, please call (805) 739-2143

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Chris Courchaine carries a Christmas tree he bought at Crystal River Christmas Trees in Alameda on Nov. 26.

TERRY CHEA

Christmas tree buyers face reduced supplies, higher prices

TERENCE CHEA
Associated Press

ALAMEDA — Even Christmas trees aren't immune to the pandemic-induced shortages and inflation plaguing the economy.

Extreme weather and supply chain disruptions have reduced supplies of both real and artificial trees this season. American shoppers should expect to have fewer choices and pay up to 30% more for both types this Christmas, industry officials said.

"It's a double whammy — weather and supply chain problems are really hampering the industry," said Jami Warner, executive director of the American Christmas Tree Association, an industry trade group. "Growers have been hard hit by floods, fires, smoke, drought, extreme weather conditions."

Record-breaking heat and wildfires in late June took a heavy toll on Christmas tree farms in Oregon and Washington, two of the nation's largest growers.

Warner could not provide an estimate of how many fewer trees there will be this year but because it takes up to 10 years to grow, the crop loss will be felt for many seasons to come.

The shortage of truck drivers is making it harder and more expensive to transport live trees from farms to stores and tree lots.

Warner's advice: "Shop early. If you see something you like, buy it."

At Crystal River Christmas Trees, owner Dale Pine and his nephew Stacy Valenzuela struggled to get enough trees to sell at their tree lot in Alameda. Many of its suppliers in Oregon lost trees in the triple-digit heat wave.

"It was looking pretty grim for a while," Valenzuela said. "Every single day you're on the phone checking, 'Hey, you got anything? If you do, send it my way.' So a lot of work to get these trees on the ground this year."

Crystal River had to raise prices this year because the costs of trees, labor and truck delivery have all gone up, Valenzuela said.

Alameda resident Ian Steplowski came to Crystal River lot to buy a Silvertip tree with his wife and two young kids the day after Thanksgiving.

"We're having shortages of everything and of course it had to take Christmas trees," Steplowski said. "Definitely noticing everything's a bit more expensive this year already."

Teri Schaffert heard about the shortage of real trees this year, so she decided to buy an artificial tree for the first time. Almost a week before Thanksgiving, she went to shop at the Burlington showroom of Balsam Hill, which primarily sells its artificial trees online.

"I came in early because I heard in the news that there's not going to be enough fresh Christmas trees," said Schaffert, who lives in nearby San Mateo. Her husband isn't happy about the change. "What else can we do? I have to get ready for the future because I love Christmas. I love to decorate."

But the artificial tree industry is struggling with its own supply troubles as clogged ports and the lack of truckers delay shipments and raise costs, said Caroline Tuan, Balsam Hill's chief operating officer. The company's trees are about 20% more expensive this year and there is less variety.

"We have to bring our products over from our factories (in China), and that has been very challenging," Tuan said. "All of that has impacted us, which means that we have fewer trees to sell as an industry."

Worries about drought and drought led David Cruise and his wife to the Balsam Hill showroom to buy their first artificial tree this year.

"In the grand scheme of climate change here in California, this is really the way to go," said Cruise, who lives in Brentwood. "The sooner everybody gets on board with the artificial tree, the sooner everybody's going to enjoy it."

Man arrested in death of Jacqueline Avant, music icon's wife

ASSOCIATED PRESS

BEVERLY HILLS— A 29-year-old man has been arrested in the death of philanthropist Jacqueline Avant, who was fatally shot this week at the Beverly Hills home she shared with her husband, legendary music executive Clarence Avant, police said Thursday.

Aariel Maynor is currently on parole and was taken into custody early Wednesday by Los Angeles police at a separate residence after a burglary there, Beverly Hills Police Chief Mark Stainbrook said.

Police recovered an AR-15 rifle at that home that was believed to have been used in the shooting of Jacqueline Avant. Maynor accidentally shot himself in the foot with the gun, police said, and is being treated before he can be booked into jail.

Authorities do not believe there are any other suspects in the Avant case, and Stainbrook said there are no outstanding threats to public safety.

Police have not yet determined Maynor's motive or whether he targeted the Avant home or it was a random attack. It was not immediately known if he had an attorney.

BUSINESS

YESTERDAY'S U.S. MARKETS

Dow Jones	Nasdaq	S&P 500	Gold
▲ 34,639.79 +617.75	▲ 15,381.32 +127.27	▲ 4,577.10 +64.06	▼ $1,769.70 -$14.60

GAS PRICES

	SB County Regular	SB County Diesel	SLO County Regular	SLO County Diesel
Yesterday	$4.64	$4.84	$4.86	$5.03
Month ago	$4.51	$4.71	$4.79	$4.97
Year ago	$3.20	$3.44	$3.36	$3.60

Source: AAA Daily Fuel Gauge Report

US government sues to block $40 billion Nvidia-Arm chip deal

TALI ARBEL
AP Technology Writer

The Federal Trade Commission on Thursday sued to block graphics chip maker Nvidia's $40 billion purchase of chip designer Arm, saying the deal would create a powerful company that could hurt the growth of new technologies.

Nvidia Corp., based in Santa Clara, California, said in September 2020 that it was buying United Kingdom-based Arm Ltd. from Japanese technology giant Softbank to "create the world's premier computing company for the age of AI."

But the deal immediately raised concerns that Arm would abandon its business model of licensing chip designs to hundreds of tech companies, including many of Nvidia's competitors.

Many of the world's smartphones run on Arm's chip designs and it is a vital supplier for companies like Apple and Samsung. It's also an innovator in chip technology that can power artificial intelligence for connected devices like medical sensors. Nvidia's chips are essential to computers and data centers and the company says it has a wide range of competitors, from chip makers like AMD, Intel and Qualcomm, to computer networking provider Cisco and tech giants Google and Amazon.

"The FTC is suing to block the largest semiconductor chip merger in history to prevent a chip conglomerate from stifling the innovation pipeline for next-generation technologies," FTC Bureau of Competition Director Holly Vedova said in a news release. "This proposed deal would distort Arm's incentives in chip markets and allow the combined firm to unfairly undermine Nvidia's rivals."

The deal would give the combined company control over technology that rival firms need to develop their own chips, the FTC alleged. That would harm competition in markets where Nvidia uses Arm-based designs, the FTC says, including systems in cars that do things like automate lane changes and prevent collisions, and data centers critical to cloud computing.

Regulators in the U.K. and the European Union have also opened investigations into the deal, citing competition concerns.

Nvidia said it will "continue to work to demonstrate that this transaction will benefit the industry and promote competition." It said it will "vigorously contest" the FTC's lawsuit.

The company added that it is "committed to preserving Arm's open licensing model and ensuring that its IP is available to all interested licensees, current and future."

An Arm spokesperson referred questions to Nvidia. A Softbank spokesperson did not immediately reply to a request for comment.

MANU FERNANDEZ

People gather in the Nvidia booth at the Mobile World Congress mobile phone trade show on Feb. 27, 2014, in Barcelona, Spain.

00
01

Diablo Canyon Power Plant Decommissioning Project – Scoping Period

Information video regarding the EIR and December scoping meetings. Video sent to KSBY, KCOY, the SLO Tribune to include in e-edition videos, American General Radio stations, and Dimes media. The video was also posted to the County's Facebook page.

County of San Luis Obispo Department of Planning and Building

November 6 at 11:00 AM ·

The County of San Luis Obispo will prepare an Environmental Impact Report (EIR) for the Diablo Canyon Nuclear Power Plant Decommissioning Project. An EIR Scoping Meeting is an opportunity for agencies and interested members of the public to obtain information about the project, ask questions, and provide oral comments on the scope and content of the EIR. Written scoping comments are due by 5:00 p.m., December 6, 2021. For meeting details and comment opportunities, visit sloplanning.org or use the QR Code in the post.

El Condado de San Luis Obispo preparará un Informe de Impacto Ambiental (EIR) para el Proyecto de Desmantelamiento de la Planta de Energía Nuclear Diablo Canyon. Una reunión de alcance de EIR es una oportunidad para que las agencias y los miembros interesados del público obtengan información sobre el proyecto, hagan preguntas y proporcionen comentarios orales sobre el alcance y el contenido del EIR. Los comentarios de alcance por escrito deben presentarse antes de las 5:00 p.m. del 6 de diciembre de 2021. Para obtener detalles de la reunión y oportunidades de comentarios, visite sloplanning.org o use el código QR en la publicación.

3

Appendix B4

Scoping Meetings

Appendix B4.1

Meeting Attendees and Meeting Presentation

Attendees – Public Scoping Meetings (Virtual)

Diablo Canyon Power Plant Decommissioning Project

Tuesday, November 9, 2021, 10am

1. Stephen Delear* (BLM)
2. James Jennings
3. Peter von Langen (RWCQB)
4. Kara Woodruff
5. Michelle (last name not provided)
6. Pat Mullen
7. Cynthia Herzog (CSLC)
8. Rene Ferini* (Supervisor Bob Nelson, Santa Barbara County)
9. Eric Greening*
10. Sara Sanders
11. Eric Daniels
12. Garrett Veyna
13. Lucinda Calvo (CSLC)
14. Steve Black
15. Chuck Anders
16. Drew Simpkin (CSLC)
17. Molly Kern
18. Amanda Canepa* (CDFW)
19. Doug Barker
20. Nicole Ellis
21. Gordon Withers
22. Mark Elvin

Tuesday November 9, 2021, 6pm

1. Jill Zamek*
2. Lucinda Calvo (CSLC)
3. Carina Corral
4. Harrison Fugate*
5. Eric Daniels
6. June Maguire
7. Coleman Miller*
8. Jeff Wheelwright*
9. Chuck Anders
10. Benita Epstein*

Wednesday, December 1, 2021, 10 am and 6 pm**

1. Carl Wurtz* (am)
2. Jim Austin* (am) (Sta Maria Fire Marshal)
3. Kara Woodruff* (am)
4. Dan Eady* (am)
5. Susan Harvey* (am)
6. Jack Krasner* (am)
7. Mckayla* (am)
8. Bill Almas* (am)
9. Gene Nelson* (am)
10. Matt Downing* (am)
11. Mike Gatto* (am)
12. Chris Hamma
13. Doug Tait
14. Luke Moylan
15. Sam Roth
16. Kendall Steeves
17. Drake Mossman
18. Carina Corral
19. Lucinda Calvo (CSLC)
20. Aiden Smith)
21. Ken Thompson
22. Hannah Bielcik
23. Sofia Bryukhova
24. Bastiaan Weststrate
25. Jordan Skow
26. Owen Kaufman
27. Ryan Hudson
28. Glenn Martin
29. Chuck Anders
30. Carol (last name not provided)
31. Warren Hansen
32. Jesus Velasquez
33. June Maguire
34. Eric Daniels
35. Sherry Lewis

December 1 Meeting, Cont.

36. Sherry Danoff* (am/pm)
37. Kristina Spearman
38. Cole Cleminshaw
39. Coleman Miller* (pm)
40. Brandon Williams
41. Eric Greening* (pm)
42. Thomas Marre
43. Adam Cleary

Saturday, December 4, 2021, 2pm

1. Kenderick Kelly
2. Brandon Howell
3. August Hogen-esch
4. Sebastian Koran
5. Steve Benedict
6. Ken Thompson
7. Lucinda Calvo (CSLC)
8. Supervisor Ortiz-Legg
9. Sheila Baker
10. Chuck Anders
11. Claire Carlson
12. Louise Scott
13. Lauren Brown*
14. Tristan De Lemos
15. Mary Jo Borak* (CPUC)

Attendance - All Meetings: 90
Speakers - All Meetings: 25

*These individuals asked questions or provided oral comments at the meetings.

**For this series of meetings, Zoom generated a combined report for both meetings. However, for both the am and pm meetings, approximately 30 people participated in each meeting based on meeting notes. For all meetings, speakers were confirmed through meeting transcripts.

County of San Luis Obispo

Virtual Public Scoping Meetings

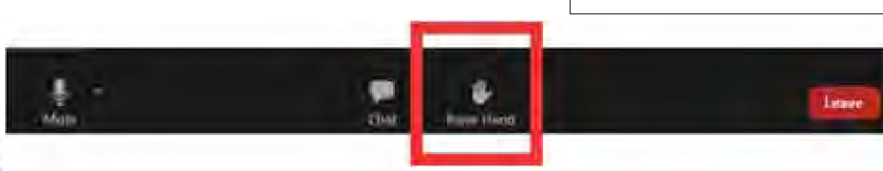
1

Meeting Participation via Zoom

- All attendees will be muted during the presentation
- **Q&A/Scoping Comments:** Use the **RAISE HAND** feature
  - We will call on you to speak during Q&A, and at end of presentation for scoping comments
- **Note**: This meeting is being recorded

If joining by PHONE:
- Press *9 to raise your hand

When called on:
- Press *6 to unmute



2

Meeting Agenda

- Introductions
- PG&E's Proposed Project: DCPP Decommissioning Project Description
  - Questions and Answers
- County-Driven Analysis: Future Site Re-Use Concepts
  - Questions and Answers
- EIR Process
  - Questions and Answers
- Scoping Comments

3

Meeting Participants

County of San Luis Obispo Planning and Building
- **Susan Strachan** – Nuclear Power Plant Decommissioning Manager
- **Cindy Chambers** – Senior Planner

Aspen Environmental Group – County Consultants
- **Sandra Alarcón-Lopez** – EIR Project Manager
- **Lisa Blewitt** – Deputy Project Manager

PG&E representatives are available to answer questions regarding their proposed project

4

Purpose of Meeting and Scoping

- CEQA requires 30-day scoping period
- Meeting required for project of Statewide, regional or areawide significance
- Opportunity for agencies and public to provide input and comment on the scope and content of the EIR
  - Provide oral comments at a scoping meeting or provide written comments by mail or email
- Opportunity to provide input on project alternatives, evaluation methods, and mitigation measures

5

Project Description

- Background
- Agency jurisdictions
- Power plant decommissioning
- Offsite locations for waste transportation

6

Land Use Application

- PG&E land use application filed March 29, 2021
  - Development Plan/Coastal Development Permit and Conditional Use Permit for both Coastal and Inland components
- County comment letter issued April 28, 2021
- PG&E application supplement filed July 8, 2021
- County comment letter issued August 9, 2021
- PG&E additional application information filed on October 6, 2021
- County accepted application on October 27, 2021

7

General Site Vicinity

8

Diablo Canyon Power Plant Site

Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

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Agency Jurisdictions

Boundaries shown are for illustrative purposes only.

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Agency Jurisdictions, cont.

- **County of San Luis Obispo** – CEQA Lead Agency, Development Plan/Coastal Development Permit and Conditional Use Permit for both Coastal and Inland components
- **California Coastal Commission –** Original jurisdiction Coastal Development Permit, appeal jurisdiction for County CDP permit
- **California State Lands Commission –** New lease or lease amendment
- **Nuclear Regulatory Commission –** Oversees decommissioning process – cleanup/removal radioactive structures and systems, transfer spent fuel; termination of Part 50 License

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DCPP Decommissioning

- Unit 1 NRC license termination: November 2, 2024
- Unit 2 NRC license termination: August 26, 2025
- 2016: PG&E stopped NRC license renewal effort
- 2018: CPUC approved retirement
- 2024: PG&E proposes to begin decommissioning and dismantling plant

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Project Description

Decommissioning will occur in two phases:

- Phase 1: 2024-2031 – Pre-Planning and Decommissioning Activities
- Phase 2: 2032-2039 – Completion of Soil Remediation, Final Status Surveys, and Final Site Restoration

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Project Description, cont.

- **Decommissioning Includes:**
  - Decontamination and demolition of infrastructure, buildings and structures
  - Retention of some structures
  - Construction of new buildings/structures in future PG&E Owner-Controlled Area
  - Installation of temporary infrastructure and buildings
  - Use of off-site rail loading sites

14

Project Description, cont.

15

Project Description, cont.

16

Project Description, cont.

17

Phase 1: Decommissioning (2024-2031)

- Temporary infrastructure and building modifications
- Decontamination and demolition of buildings
- New buildings/structures construction in future PG&E Owner-Controlled Area
- Spent fuel and GTCC waste transfer to ISFSI and new GTCC Storage Facility
- Removal and restoration of discharge structure

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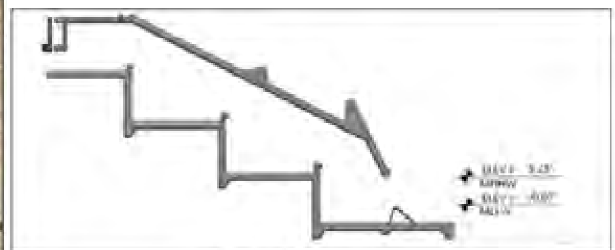
Phase 1: Decommissioning (2024-2031)

Ocean Side View of Discharge Structure During Construction



Profile View of Discharge Structure

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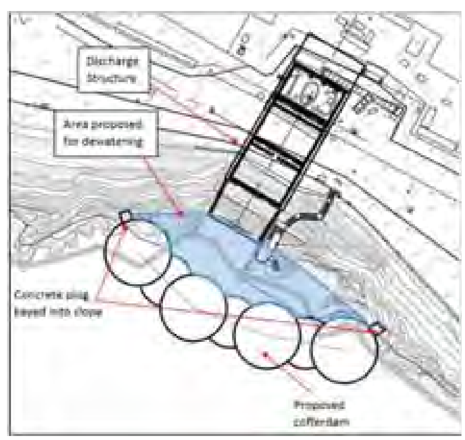
Phase 1: Decommissioning (2024-2031)

- Removal of nuclear reactor pressure vessels and internals, steam generators
- Site characterization to identify contaminated areas
- Soil remediation and Final Status Surveys
- Modification and utilization of off-site railyards



20

Phase 2: Restoration (2032-2039)

- Continue soil remediation and Final Status Surveys
- Remove infrastructure not needed for retained facilities
- Final site restoration
- Site restoration monitoring (up to 5 years)
- Termination of NRC Part 50 DCPP operating licenses
- Transition to ISFSI and GTCC storage operations

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Decommissioning Waste Transportation

Three transportation modes:

- Barge
- Truck
- Truck to Rail

22

Rail Loading Facilities

- City of Pismo Beach (contingency, non-radioactive/non-hazardous wastes)
- City of Santa Maria (Osburn Yard)
- County of Santa Barbara (Betteravia Industrial Park)

23

Rail Loading Facilities

24

Rail Loading Facilities

25

Questions on the Proposed Project?

26

Future Site Reuse Concepts (2040+)

- County-driven analysis
- Not part of PG&E's Proposed Project or proposed by PG&E
- Concepts will be compared to provide early high-level analysis of possible post-decommissioning uses

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Future Site Reuse Concepts (2040+)

Concepts under consideration by the County of San Luis Obispo:

- University Campus
- Developed Recreation
- Day Use Recreation
- Research Facility
- Renewable Energy Generation and/or Storage
- Resort Hotel
- Mixed Use
- Offshore Wind Port/Support Facility

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Questions on Analysis of Reuse Concepts?

29

California Environmental Quality Act (CEQA)

- CEQA applies to projects that require a discretionary approval from a State or local agency
- Preparation of an Environmental Impact Report (EIR) is required when evidence indicates that the proposed project would have a significant impact(s) on the environment
- CEQA allows lead agency to move forward with the analysis without an Initial Study if an EIR will be prepared

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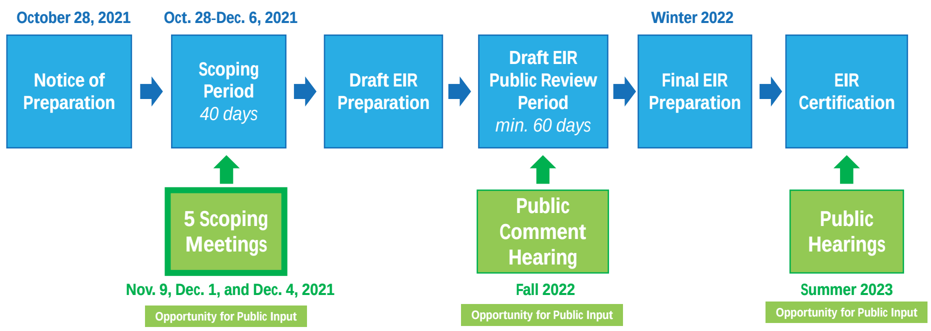
EIR Process and Schedule



31

Contents and Purpose of an EIR

Contents:

- Detailed description of PG&E's proposed project
- Describe the environmental and regulatory setting of the project area
- Disclose the potential environmental impacts of the proposed project
- Identify and evaluate alternatives that reduce significant impacts
- Propose measures to reduce/avoid significant environmental impacts
- Separate chapter for description and comparison of County-driven review of future reuse concepts

Purpose:

- Provide technically sound information for decision-makers to consider in evaluating the proposed project

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Environmental Issues to be Evaluated

- Aesthetics
- Air Quality
- Biological Res: Marine/Terrestrial
- Cultural Res: Archaeology/Built Envir.
- Cultural Res: Tribal Cultural Resources
- Energy
- Geology, Soils, and Coastal Processes
- Greenhouse Gas Emissions
- Hazardous and Radiological Materials
- Hydrology and Water Quality
- Land Use, Planning, and Agriculture
- Mineral Resources
- Noise
- Population and Housing
- Public Services and Utilities
- Recreation and Public Access
- Transportation
- Wildfire

The EIR will also evaluate:

- Climate Change and Sea-Level Rise
- Commercial Fishing
- Environmental Justice
- State Tide and Submerged Lands

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NRC Preemption and Radiological Hazards

- Preemptive authority over radiological safety
  - Radiological aspects of decommissioning
  - Handling, storage, transport, disposal, and monitoring of spent nuclear fuel and high-level radioactive waste
  - Storage design and shipping casks
  - Independent Spent Fuel Storage Installation/Greater Than Class C waste storage – design location, and operations
- EIR will present NRC requirements and required safety plans

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Impact Analysis

- Impacts are based on changes to the environment compared to existing conditions
  - Direct, indirect, cumulative, and growth-inducing effects
- CEQA requires the analysis to focus on "significant" impacts
- Mitigation measures are required to reduce or avoid significant impacts
- Social and economic impacts are not considered significant

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Alternatives

- Alternatives will be determined by CEQA requirements:
  - Consistency with most project objectives
  - Ability to reduce or avoid impacts of proposed project
  - Feasibility of proposed alternatives
- Alternatives may include changes to the proposed project
- CEQA requires evaluation of No Project Alternative
  - This project may include more than one No Project Alternative
- Evaluated in less detail than the proposed project

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Scoping Comments

- Environmental concerns that may result from PG&E's proposed project; suggested areas to comment on:
  - Scope and content of EIR
  - Local environmental knowledge
  - Issues that need evaluation or how issues are evaluated
  - Feasible alternatives to PG&E's Proposed Project
  - Mitigation measures to avoid or reduce impacts of the Proposed Project
- Other options the County should consider for future site reuse

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Scoping Comments via Zoom

- **Oral Scoping Comments:** Please use the **RAISE HAND** feature and we will unmute you and call on you to speak
- Speakers limited to 3 minutes

If joining by PHONE:

- Press *9 to raise your hand

When called on:

- Press *6 to unmute

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How to Provide Comments

Comments are due by December 6, 2021

You can also **email** or **mail** comments.

Mail Comment to:
Susan Strachan
Nuclear Power Plant Decommissioning Project Manager
San Luis Obispo County,
Department of Planning and Building
976 Osos St #300, San Luis Obispo, CA 93408

Email Comment to:
diablo@co.slo.ca.us
Subject Line: **DCPP Decommissioning Project NOP Comments**

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Appendix B4.2

Transcript – Scoping Meeting November 9, 2021 10:00 AM

DIABLO CANYON DECOMMISSIONING PROJECT

PUBLIC MEETING

WEB VIDEOCONFERENCE

TUESDAY, NOVEMBER 9, 2021, 10:00 A.M.

Reported by:

Michele Watson

CSR No. 8359

MS. STRACHAN: Good morning. I'm Susan Strachan. I'm the County's decommissioning manager overseeing the permitting for the decommissioning of the Diablo Canyon Nuclear Power Plant. I want to welcome all of you here today. This is, as you know, a virtual meeting.

If I could have the next slide, please. I just want to go over how people can participate in the meeting via Zoom. So first of all, all attendees will be muted during the presentation. We will have a few question-and-answer sessions and we'll have a scoping comment session.

If you're participating online, in order to speak during those time periods, use the raise-the-hand feature, which is located at the toolbar at the bottom of your screen, and then we will call on you to speak during the Q and A, or at the end of the presentation for the scoping meetings.

If you're participating by phone, you press star 9 to raise your hand, and when called upon, press star 9 to unmute. This meeting, as Sandra said, is being recorded and we'll repeat these instructions for how to participate before each of those time periods. So don't worry, you don't have to memorize all of this right now.

Next slide please. I want to go through the meeting agenda, so we will go through introductions. I'm then I'm going to provide a description of PG&E's proposed decommissioning project. Once we go through the project description, we'll have a question-and-answer session. We do have representatives from PG&E available to help with that portion of the program.

Next, we're going to get into a discussion of future site reuse concepts. So these are concepts for what could be on the site once the decommissioning activities are over. This is a County driven analysis. It's not part of PG&E's proposed project, but it is something that will be included in the environmental impact report.

We'll then have a second question-and-answer session to answer any questions with regard to this analysis. Followed by that, we will have a presentation on the environmental impact report process, and again, have a third question-and-answer period, followed by scoping comments, which again, is the opportunity for participants to provide comments on basically what they'd like to see covered in the environmental impact report. Next slide please.

So for introductions as I mentioned, I'm Susan

Strachan. I'm the nuclear power plant decommissioning manager for San Luis Obispo County. Cindy Chambers works with me, she's a senior planner with the County and then we have Aspen environmental group. Aspen are consultants to the County. They will be preparing the environmental impact report for the Diablo decommissioning.

I want to point out that Aspen Environmental Group also is the group that prepared the environmental impact report for the decommissioning of the San Onofre nuclear power plant in San Diego County. That decommissioning is going on right now.

Representing Aspen is Sandra Alarcon-Lopez, she's the EIR project manager, and Lisa Blewitt, who is the deputy project manager. And as I mentioned, we also have PG&E representatives who'll be available to answer questions and I will introduce them when we get to that portion of the meeting. Next slide, please.

Now, first let's talk about what the purpose of the meeting is, and scoping. So scoping is required under the California Environmental Quality act. It requires a 30-day scoping period where people can make comments on content of the environmental impact report. I have to say that for this project, we're actually taking a longer scoping period, because when we issued the notice of preparation, which is what kicks off that scoping period and counted out 30 days, that 30 days landed right around Thanksgiving. So we extended it to actually approximately 40 days to give more time due to the Thanksgiving holiday.

Scoping meetings are required for projects which are of statewide, regional or area-wide significance. And again, it's an opportunity for agencies in the public to provide input on the scope and content of the EIR.

Now, there's three different ways the comments can be provided. They can be provided through a scoping meeting like we're having today, where you can provide verbal comments or you can provide written comments by mail or by email, and we'll provide information on the mailing address and the email address when we get to the scoping comment portion of the meeting.

The scoping meeting or scoping also provides an opportunity for agencies in the public to provide input on project alternatives, EIR evaluation methods, and mitigation methods. Next slide, please.

So now I want to get into providing a description of the project that has been proposed by PG&E to the County, go into a little bit of background on the application, talk about the jurisdiction of some of the key agencies, discuss the power plant decommissioning activities, and then talk about some offsite locations for waste transportation that are proposed by PG&E. Next slide, please.

So to give some background on PG&E's land use application, they filed the application on March 29th, 2021 with the County. The application is for a development plan, coastal development permit, and a conditional use permit. The site actually has a portion in the coastal zone and then a portion in the inland part of the County, which is why you have the different permits or applications that were submitted.

Once the County receives the application, it then does a 30-day application review. It sends out letters to agencies and organizations asking for input on the application and then does its own review. So at the end of the 30 days, the County issued a comment letter on April 28th, 2021, listing additional information that we needed for the application.

PG&E responded with the filing of an application supplement on July 8th. County then did get another 30-day review, again, sent out referral letters to the agencies and organizations, and a second County comment letter was issued on August 9th.

PG&E then responded to that letter with a filing on October 6th. And on October 27th the County accepted PG&E's application. With that application accepted, we then issued the notice of preparation on October 28th. Next slide.

So this slide is a general site vicinity of the Diablo Canyon Power Plant. The power plant is marked, or the boundaries are marked in blue. The yellow area are Diablo Canyon lands that are owned by PG&E or Eureka Energy, which is a subsidiary of PG&E. Next slide, please.

So this shows the boundary of the power plant site marked in red and then actually in an aerial of the power plant site itself. Next slide.

So this slide shows the agency's jurisdiction. So the yellow line going through the middle marks the coastal zone. And so the area above the coastal zone in brown, that's the inland portion, portion of the site that is not in the coastal zone. The green part is that area which is in the coastal zone.

So from a County permitting standpoint, it covers both the inland and the green coastal zone portion. If you go then farther down toward where the water is, where Sandra has the cursor, that covers a jurisdiction that's under the California Coastal Commission and the State Lands Commission. Next slide, please.

Now, this slide talks about the different activities by these agencies. So County of San Louis Obispo, we are the lead agency under the California environment quality act. That means that we have the responsibility for preparing the environmental impact report. And again, the permits that would be issued, assuming the project is approved or listed below.

California Coastal Commission is a responsible agency under the California Environmental Quality Act. So we work closely with them to make sure that the environmental impact report is going to cover the things they need in order to do their permitting. That area down by the water on the previous slide is the original jurisdiction of the Coastal Commission.

So they'll be issuing a permit for activities in that area, but it's important to point out that the portion of the site within the coastal zone is in the appeal jurisdiction of the Coastal Commission. So any permit issued by the County within any Coastal Commission appealed jurisdiction can be appealed to the Coastal Commission.

California State Lands Commission is a trustee agency under California Environmental Quality Act. They will be issuing a new lease or a lease amendment for project features within their jurisdiction, which, again, is down in that water area that was in the previous slide. And the Nuclear Regulatory Commission is a federal agency which oversees decommissioning process. So they're specifically cleanup, removal of radioactive structures and systems, transfer spent fuel, and then termination of the licenses for the project.

With the involvement of the NRC, state and local agencies are preempted for issues dealing with radiological hazards and radiological safety. And we'll get in that in more detail when we're talking about the EIR process. Next slide, please.

Now, the Diablo Canyon Power Plant Decommissioning, there are two nuclear units on the site. Unit 1, the license terminates in November of 2024, and Unit 2, the license terminates in August of 2025. PG&E had been embarking on renewing the licenses for these projects, but in 2016, stopped that license renewal effort, and determined that it was going to retire the plant.

In 2018, the California Public Utilities Commission approved the retirement of the Diablo Canyon Power Plant. And then PG&E initiated its permitting for the decommissioning activities. The plan is that PG&E proposes to begin the decommissioning and dismantling of the plant in 2024. Next slide, please.

Now, the decommissioning will occur in two phases, two time periods. Phase 1, 2024 to 2031 is when preplanning and decommissioning activities will occur. In other words, this is a bulk of the decommissioning, a bulk of taking every thing down will occur during that phase 1 time period.

In phase two, which is 2032 to 2039, they'll be doing completion of soil remediation, final status surveys. These are surveys that are conducted as a requirement by the Nuclear Regulatory Commission to ensure that the site meets established radiological release criteria. And then they'll be doing the final site restoration of the site. Next slide, please.

Now, the project decommissioning, I think when people think of decommissioning, think about decontamination and demolition of infrastructure and buildings and structures, and that is a key component of it. But as proposed, it includes the retention of some structures and I'll go through those, the construction of new buildings and structures, which will be in a future PG&E owner-controlled area on the site. And I'll be going through that.

And then decommissioning also involves the installation of temporary infrastructure and buildings that are needed to accommodate the decommissioning effort. And then it's also going to include the use of some offsite rail loading sites. Next slide, please.

Now, this slide depicts areas that are not going to be removed, and those are denoted in black in terms of roads within the plant site and in red in terms of different structures. So down by the water, we have the two break waters. PG&E proposes to have those remain. And the intake structure, PG&E proposes to have that remain also. These are the structures that could be available for future reviews by others.

Then moving on up, this is what we're going to get into, what would be referred to as a future PG&E owner controlled area. You have the rectangle, which is the -- it says ISFSI, which stands for Independent Spent Fuel Storage Installation. That's where spent fuel is currently stored. And then once decommissioning begins spent fuel that's currently in, the reactors will be transported and stored up in that ISFSI. That is a site that has been previously permitted.

Next to it are the raw water reservoirs. Those will remain. There's a 230 KV switch yard which will remain, and a 500 KV switch yard, which will remain. Next slide, please.

Now, this slide covers the features which would be in the new PG&E owner-controlled area. Some of them, like ISFSI, for example, the switch yards, raw water reservoir that I pointed out in the previous slide, are existing structures that will remain and be in this owner-controlled area. The green boxes denote new construction. So given that the fuel will be up in this upper part of the site and the remaining part of the site will be decommissioned, a new security building will be built up in this area.

Also, a new indoor firing range will be built in this area. PG&E also proposes to build a Greater-than-Class-C waste facility, which will store reactor internals or process waste for which there is not a federal repository for it to be sent offsite similar to the spent fuel.

So that will stay on site also and be constructed as part of the decommission effort. Next slide.

Now, this slide, there's a lot going on here, but what I like about it is that it's a site layout for decommissioning for this lower portion of the site. And I think it depicts all that's involved in terms of decommissioning. So it identifies different lots. These are parking lots that will be used to accommodate decommissioning workers.

Parking lots are also converted to serve as lay-down for the decommissioning effort. It shows buildings that are existing buildings that will be converted to uses to support decommissioning. So, for example, the main warehouse, which is identified in orange will be modified to create a waste handling facility where waste will be segregated, stockpiled, packaged for offsite transport.

There's another building, a flex equipment building, which will be modified to create what's referred to as an environmental count room or a lab to be used for testing soil samples. So this just gives an idea of what will go where during the decommissioning effort, which is a lot of activity. Next slide, please.

So some of the activities that are going to happen during the phase 1 decommissioning again, 2024 to 2031, temporary infrastructure and building modifications like those ones I just mentioned will happen during this time period. Decontamination and demolition of buildings, again, the new buildings and structures to be constructed in the future PG&E owner-controlled area will occur.

During phase 1, the spent fuel and Greater-than-Class-C waste will be transferred to the independent spent fuel storage installation and the new

Greater-than-Class-C waste storage facility, and removal and restoration of the discharge structure will begin during this phase. Next slide, please.

So this is a picture of the discharge structure during decommissioning. So this is the structure that will be one of the structures that will be removed as a result of decommissioning. Next slide, please.

So going on from the discharge structure removal, the picture on the right shows the circles are tight with a proposed coffer dam, basically creating an area where the water can be pumped out, creating a dry space for the discharge structure to be removed.

Other activities during this phase are removal of the nuclear reactor pressure vessels and internals, steam generators, site characterization to identify contaminated areas. With those contaminated areas identified, soil remediation will recur, and again, the final status surveys that I mentioned previously.

Also during this phase, modification and utilization of the offsite railyards would occur. Next slide.

During phase 2 of the project, soil remediation and final status surveys would continue. Any infrastructure that is now not needed for retained facilities would be removed. Final site restoration would happen. So this is the grading of the site, the development with storm water management system, now that structures have been removed, will be developed and revegetation would happen.

There will be monitoring of that site restoration effort for up to five years and then PG&E will terminate its NRC license, part 50 license, which covers the current operation of the plant, and it will transition into a ISFSI, meaning the spent fuel and the Greater-than-Class-C waste storage operations. Next slide, please.

I wanted to talk for a moment about decommissioning waste transportation. PG&E is proposing a blended approach for waste transportation. It will consist of transporting waste by barge, transporting waste by truck, meaning directly on a truck to an offsite disposal facility, and then transporting by truck to an offsite rail facility that I mentioned previously.

What's helpful with this blended approach is that barge transportation can accommodate much more waste than a truck can. And so by using barge transportation for taking waste off site, it dramatically reduces the number of trucks that would otherwise be on the road transporting waste.

PG&E has used barge transportation before. That picture on that slide is steam generators that were transported on site in roughly 2006 time period. Next slide, please.

So I mentioned the railroading facilities. PG&E has proposed three different sites. This slide shows where they are in relation to the Diablo Canyon Power Plant. One site is in Pismo Beach. This site would be used as a contingency, and there would be no radiological or hazardous waste transported to this facility.

There are two other sites. One in the city of Santa Maria, one in Santa Barbara County. Both of these will be evaluated in the environmental impact report. However, ultimately only one of the sites will be used. Next slide, please.

Here's a depiction of the Pismo Beach railyard facility. This is on property owned by PG&E, and it's off of Price Canyon Road. And again, this is a site that would be used as a contingency site. Next slide.

And then this shows the two sites. This osburn yard is located in the City of Santa Maria, off of, close to Stowe Road, and then the second one is the Betteravia Industrial Park located in unincorporated Santa Barbara County.*

*Note: This sentence was revised to match the audio/video of the meeting.

And with that, we'd like to take questions on the proposed project. As I mentioned previously, if you are participating online, please use the raise-hand feature at the bottom of your screen and we'll call on you to speak during Q and A. And then if you're joining by phone, press star 9 to raise your hand. When called upon, press star 6 to mute.

And with this, I wanted to start answering questions. We have Tom Jones with PG&E and Kris Vardas from PG&E. Do we have any questions?

MS. BLEWITT: Here we go. I have Rene Ferini. I'm going to allow you to unmute yourself now.

MS. FERINI: Hi, everyone. My name is Rene Ferini. I work for supervisor Bob Nelson in Santa Barbara County. I just wanted to clarify, at the proposed Santa Maria railyards, would any nuclear waste be handled there, or would it be the same parameters as the Pismo railyard?

MS. STRACHAN: There would be nuclear waste transported there, and we can have PG&E go into detail in terms of how that will be done, but Pismo is the one where it would be nonradiological or hazardous waste.

Tom, do you want to go into more detail on that, please?

MR. JONES: Yeah. I wouldn't use the term nuclear waste. That's typically associated with the fuel. What we'd be talking about is low level radiological items similar to what you might have at a hospital or university or manufacturing facility. These are large components that are too large for long range truck, could be on barge, but that's the type of item that would be there. It's not associated with spent nuclear fuel.

MS. FERINI: Got it. And then also, how are you going to determine which railyard you are going to use? What are the parameters?

MR. JONES: We're still under evaluation. Each has pluses and minuses from a transportation perspective. So we're looking at those. The Pismo yard is terribly constrained for the length of the components, combined with the traffic in that area. It's more difficult than approaching any of these yards. And both of the yards in Santa Maria, one in the unincorporated, one in the incorporated portion of the city, are in active use today.

The one in the County stores rail cars for the railroads right now. And then the one in Santa Maria in the proper city limits in the Santa Maria transports agricultural weather equipment on a regular basis. So there's pluses and minuses to the infrastructure we need to build out on these locations. So that's still under evaluation.

MS. FERINI: Awesome. Thank you. That's all my questions.

MS. STRACHAN: Thank you.

MS. BLEWITT: We have an additional question coming in from Amanda. Please state your name and affiliation and unmute yourself.

MS. CANEPA: Hi, this is Amanda Canepa with the California Department of Fish & Wildlife. I was hoping either Tom or Kris, if you can elaborate a little bit on PG&E's decision to remove the discharge structure, but to leave the intake structure in place.

MR. JONES: Sure. So I'll start and I'll ask Kris to add anything that he'd like to. Our current conditions of our lease from the California State Lands Commission require that all tenant improvements be removed. And so in keeping with that, the discharge structure will no longer be useful to the project or the site after a certain period of time.

We seek to convert the intake to a barging platform and maintain the breakwaters to have a calm harbor in which to facilitate shipment through barge.

Moreover, the breakwater composes a nice marina, and it's been host now to federally major black abalone*, and that disturbance is something we wish to avoid. So the discharge structure is very small and we would restore that slope once it's removed. But again, it doesn't support the ongoing project or have further public utility like the breakwaters intake structure would have.

Kris, would you like to add anything to that?

MR. VARDAS: I think that's pretty good summary. I can answer any further questions that Amanda may have.

MS. CANEPA: Just to clarify. So the intake structure would not be used in the future to actually take in water, but as a barge platform or something similar?

MR. VARDAS: Both would be used for a certain period of time to circulate water. We have multiple alternative discharge points, but we have only the one intake. Those are all governed under our ISFIs permit, but we can convert to a discharge, an alternative discharge point, and flow rates drop.

Once the power plant is no longer operating, the volume of water we move drops by over 90 percent. So there were some other concerns and federal regulations that you take into account when you're not flowing water out. So those would require a change in

*Note: This word was revised to match the audio/video of the meeting.

how we handle the discharge. And just to add, during the latter part of decommissioning, we would in essence, seal off the discharge structure. So the intake portion under water within the structure, that would be sealed off, and then the pipes that connect from the intake structure to the plant would be filled in and would not allow for any withdrawal of sea water from within the intake.

MS. BLEWITT: Okay. Great. Thanks so much. I don't see any additional hands raised.

MS. STRACHAN: Okay. Thank you, Lisa.

MS. BLEWITT: Oh, wait. Stephen Delar, please unmute yourself.

MR. DELAR: Hi. Steve Delar with the BLM. Just a real quick question. What's going to be taken offsite via barge? Are we talking fuel or low level waste, or what's going to be involved with the barges?

MR. JONES: So fuel is not part of this project application or review. It's been separately addressed. We're talking low-level waste in general construction group. And so it's proposed to be our principal route of shipment. Each barge that we're looking at approximately equates to 250 trucks.

MS. BLEWITT: Any further questions? I'm not seeing any more raised hands.

MS. STRACHAN: Okay. Thank you, Lisa.

MS. BLEWITT: Thank you.

MS. STRACHAN: Then we move on to the next discussion topic. Next slide, please, Sandra. So for this next topic, these are the future reuse concepts. This is going out into the future. As you can see on the slide, it's 2040 and on after the site is decommissioned. I think it's important to point out that this is a County-driven analysis. This is not a part of PG&E's proposed project.

These reuse concepts are being proposed by PG&E. It's something that the County wanted to do, given that, we know from a community standpoint, there's a lot of interest here. And what this analysis will let us do is it will let us compare the concepts to provide an early high-level analysis of possible post decommissioning uses.

It'll help identify if there are potential impacts or issues with any of these potential uses. Next slide, please.

So this is a list of concepts that are currently under consideration by the County. One of them is a university campus. So, for example, could Cal Poly come in and do something at the site tied to its educational pursuits?

Developed recreation: So RV camping or glamping or tent camping.

Research facility: So private business coming in using a site for research purposes.

Renewable energy generation and/or storage: Is there a type of renewable energy that could be accommodated on the site or storage, for example, battery storage? Is that something that could be done there?

A resort hotel, mixed use, which could be a combination of different reuse concepts.

And then an offshore wind port or support facility given the Morro Bay Call Area that's under consideration right now for offshore wind.

So what we want to know is if there are any questions that anyone has, not on reuse concept on ideas, we'll get into that when we get to scoping, but any questions with regard to the analysis that we're going to be doing on these reuse concepts.

And again, it's the same manner for making comments on raising your hand if you're online or star 9, if you're on phone. Anyone with questions, Lisa?

MS. BLEWITT: I'm not seeing any raised hands.

MS. STRACHAN: Okay. Then why don't we continue on to the next part of our meeting, which is the overview of the California Environmental Quality Act, which will be done by Sandra Alcaron-Lopez.

MS. ALARCON-LOPEZ: Thank you, Susan. I'm going to give you a very high level overview of CEQA and the EIR. We're in the preliminary stages of working on the document, and you'll see that here shortly on the slide that shows the flow chart of the key steps in the environmental review process.

Just very quickly on this slide, to tell you that the County has made a decision based on what they consider the potential to be for significant impacts and the decommissioning of the site. And with that, they've decided to prepare an environmental impact report. And CEQA allows you to move forward with that analysis without preparing any preliminary study, such as the initial study, which is generally part of an EIR.

So we've started working on the environmental impact report, we're in the preliminary phases. And one of the key components of this particular meeting is to get your input on some of those issues.

On this next slide -- and I apologize, it does take a few seconds -- what this shows is the general process for the environmental document. And you'll see that we are in that first green square, which is the public scoping period. Susan mentioned earlier the timeframe of 40 days, CEQA requires a minimum of 30, and because of the complexity of the project, we're allowing more time to present comments and input on the project. But there'll be other opportunities for the public to get involved, because we are in the preliminary stages.

We haven't made any determinations other than we're going to prepare an environmental impact report. So there'll be an opportunity at the draft EIR stage to make some comments and provide input, and then also when the final EIR has been prepared and it goes to the decision hearings.

I wanted to generally talk about the content of the EIR. We know that there is, as Susan mentioned, there's PG&E's proposed project, and then there's also the reuse concepts that are going to be looked at and considered in the environmental document.

For PG&E's proposed project, we're going to include in the document, a very detailed description of their project. We're also going to look at the environmental and regulatory setting for the project area, and we're going to look at, for several different issue areas, what potential impacts could occur with that proposed project, with the decommissioning and the dismantling of the facility.

For the proposed project, we also, under CEQA, have to identify any project alternatives that could reduce impacts. If we identify a significant impact for a particular environmental issue area, we need to think about what alternatives we could implement or evaluate to reduce those impacts.

Also, a key component of that would be looking at any measures that could reduce significant impacts for the different issues that we're going to be evaluating. Key difference here too, is that we are going to have a separate chapter that talks about and compares the different reuse concepts.

It's not part of PG&E's project, but it is an analysis that the County would like to do to do that comparative planning, high level review at this stage to see what options are available. That's going to be included and presented in the EIR in a separate chapter.

The other thing is that when we're talking about the environmental document, we really are just presenting information for the decisionmakers. It's an information document that helps the decisionmakers make a decision when they come to that on the actual decommissioning project.

On this next slide, you can see it's kind of dense. These are all of the issues that we're going to look at and consider in the environmental document. The key here is that we are in the preliminary stages, we haven't made a determination on any of these issues.

We just want to try and show you that we are going to do a comprehensive evaluation of the issues, and we're going to look at all of the potential issues in the document. We've also included some of the issues the responsible agencies are going to be concerned with, such as the climate change and the sea level rise, commercial fishing. And some of the ones that you see on the right-hand corner there, those address some of the issues that responsible agencies are going to want to look at and use in their evaluation of the project.

One issue that has come up a number of times in some of the community meetings is this NRC preemption. And we wanted to just talk about it very quickly here, because one of the things that we need to do in the EIR is consider the whole of the action, and because we look at that complete project, even though the County has no jurisdiction over the radiological safety issue, because they're preempted by the Nuclear Regulatory Commission, we still have to take into consideration the requirements that NRC imposes on the facility, as well as any measures that are required by NRC to address the facility and the radiological components of the power plant.

So when we're talking about preemption, the NRC regulates anything related to the safety, to the decommissioning, to the handling, to the storage, that includes the storage design and the shipping class as well as the ISFSI, which we have spelled out there, and the Greater-than-Class-C waste storage issues. So those are all issues that are under the purview of the NRC.

So what are we going to do in terms of those issues in EIR? What we're going to do in this regard is look at and summarize for the public what those requirements are and any safety plans or procedures that are required to be implemented as part of the decommissioning process. And we feel that that is an important thing to present in the document. We've done it in the SONGS EIR and we feel that it's applicable for this particular effort as well.

In terms of the impact analysis, when we're doing the impact analysis in the EIR, the thing that we're looking for is the potential for the project to make any changes to the environment. We're looking at direct, indirect, cumulative, are there other construction projects that are going to be or occur at the same time as this one that are going to create any impacts, and then any growth-inducing effects that might occur as a result of the project.

CEQA requires that we focus on the significant impacts of the project. So when we're looking at alternatives, the alternatives have to address the significant impacts. The mitigation measures have to address the significant impacts. We have to look at and address those impacts and try to find measures that are going to reduce them.

We are going to incorporate in the environmental document, an environmental justice portion to address some of the issues that State Lands is going to take into consideration; but under CEQA, those cannot be considered significant, the social and economic potential impacts, but we are going to look at some of those issues through the environmental justice component, as well as population housing.

Alternatives. We have published in the NOP, some ideas of alternatives that could be considered for the proposed project. Those could change based on either comments that we get here or input that we get from the agencies. What we want to do when we're looking at and identifying alternatives that we're going to carry forward, we want to make sure that they meet the project objectives and that they have an ability to reduce any potential impacts from the proposed project.

We also have to look at the feasibility of the alternatives. Are they going to work from either a technology or feasibility basis? And we could consider any alternatives that will create changes to the project. We identified some of the NOP project alternatives. That's a requirement under CEQA that we consider that.

For this project, we may have more than one NOP project alternative. And then because it is a CEQA document, those alternatives are going to be evaluated in less detail than the proposed project. It's more of a comparison type of analysis.

Before we get into the official public comments, we'd like to take some questions, if you have them, on the EIR process.

MS. BLEWITT: We have one question from Eric Greening. Please unmute yourself. Allowed to talk is not available because Eric is using an older version of Zoom. Choose promote to panelists to allow Eric to talk. Shall I do that?

MS. STRACHAN: Yes. We did this at a meeting last week too. He needed to be promoted to panelists to communicate.

MR. JONES: But please, then you restrict that ability afterwards.

MS. ALARCON-LOPEZ: Yes.

MR. GREENING: Thank you. So, yeah, so I can be restored to the nonpanelist status after this, that helps me regain the raised-hand function.

Anyway, yes, I'm Eric Greening. I actually have two questions. The first question is: At the engagement panel meeting PG&E presented last week, PG&E presented a much tighter timeline, which greatly concerned me for the approval process at the County to be completed at the end of 2022, which would create undo haste in the EIR process, because it would have to get to the Planning Commission by October and a 60-day comment period on a draft.

I'm relieved that your proposed timeline looks about eight months longer. Can we be sure, given that PG&E is paying for this, that everyone will be agreeable to your taking this amount of time or whatever amount of time you need? That's my first question, because obviously with a project like this, thoroughness is far more important than haste.

My second question relates to the NRC preemption. Essentially, are you only essentially giving the news of NRC proposed mitigation measures, or given that your list of issues you consider includes radiation hazards, would you be able to propose and perhaps negotiate added mitigation measures, even given that the actual decisions are out of the County's control?

And an example of something beyond the County's control is earthquakes. Obviously, the County has no control over earthquake fault or when they rupture, but it is responsible for making health and safety findings based on its own evaluation of hazards and how to mitigate those. So those are my two questions. Thank you.

MS. STRACHAN: Thank you. Mr. Greening. I'll answer the schedule, That is the schedule for the project. So that is the schedule that we are working off toward. Aspen and I spend a lot of time going through those dates and that's the schedule that is proposed for the project. And in terms of the preemption and mitigation and whether we can propose mitigation, Sandra, why don't I turn that over to you in terms of, especially given your experience with SONGS.

MS. ALARCON-LOPEZ: I'm not sure I know how to answer this question, because we'd have to find the nexus for something that we cannot or that the County could impose within their jurisdiction. So I'm not sure that we could identify something which is in the NRC purview, because they have the exclusive jurisdiction over any of the radiological safety issues.

Would you agree with that, Lisa?

MS. BLEWITT: I would. Generally speaking, the County cannot impose mitigation measures for elements that are preempted by the NRC.

MR. GREENING: Thank you. So the County has to make its health and safety findings based on whether it evaluates the NRC's measures as being adequate or not, because the County does have to make health and safety findings. Anyway, that's obviously this is going to be a complicated thing we'll be discussing for some time.

If I remain as a panelist, since I don't have a raise-hand function, please put me in line for the scoping comments when you get to that point. Thank you.

MS. ALARCON-LOPEZ: Thank you.

MS. STRACHAN: Thank you. We will change your status. Any other questions?

MS. BLEWITT: If you need to raise your hand, please press star 9 if you're calling in; otherwise, I'm not seeing any other raised hands.

MS. STRACHAN: Okay. Let's go into the official scoping comment period where we'll take your oral comments on any of the topics that we have discussed in this presentation or in this meeting. We want to just give you a very quick overview so we can get to the comments here, that we're looking for anything that addresses scope or content of the EIR, any local environmental knowledge that you think might help us in preparing the environmental document, and also any issues that need evaluation or how we evaluate it, what methods we use to evaluate, any feasible alternatives that you think we ought to consider.

We identified some in the NOP, but maybe there's others that you think we haven't considered or that we should consider. And then any mitigation measures that you think we ought to address in the environmental document. We also mentioned the future site reuse concepts that are also going to be included in the environmental document.

So if there's any ideas that you have on future site use that you think we ought to identify or discuss, please include that in your comments. We want to just remind you very quickly that you can use your raise-hand function so that we know to call on you and unmute you.

We are going to limit your comments to three minutes just to make sure that we get everybody's comments in the record. We are transcribing the meeting. We have a court reporter who's transcribing the meeting, and we also will have an audio recording. So we are going to record and take note of everything that you comment or that you present today.

As Lisa mentioned, if you're calling by phone, press 9, so that you can raise your hand and then press 6 to unmute yourself. With that, we are going to start the public comments. If you could raise your hands and we'll just call you in the order that we see your hand come up.

MS. BLEWITT: Please be sure to state your name and your affiliation for the record as I call on you; but first we need some raised hands. Again, star 9 to raise your hand if you're calling in.

MR. GREENING: I would be raising my hand if I had a raise-hand function.

MS. BLEWITT: Go ahead and proceed, Eric.

MR. GREENING: All right. Thank you. Eric Greening. And, yes, one specific type of survey that I think needs to be done, included in this, the Mothers for Peace have been sampling ocean water and sending it to Woods Hole since the accident at Fukushima, and have detected spikes from there.

If there were some sort of leakage into the ocean from a local source, I presume it would also be identifiable. And so there should be seawater sampling on a regular basis to determine that to see if any comes from local, as well as cumulative impacts from Fukushima or whatever, and how they all play out, add up.

But beyond that, what is missing now is actual food chain impacts; in other words, what is in the water may be prevalent in far greater concentrations up a biological food chain. So I do believe that top of the food chain, marine life, should be periodically sampled to be sure that radiation or radioactive elements are not escaping from the site into the adjacent waters.

And then just one thought about reuse scenarios. As of today, the public comment period has opened with the National Oceanic and Atmospheric Administration on the proposed Chumash Heritage National Marine Sanctuary, and working with the Chumash, perhaps a proposal, if they were interested in using that site, which they might or might not be, for a headquarters or something that functions in connection with that sanctuary, might be on the table as one option.

Again, I wouldn't want to propose it unless the Chumash did, but I would want to include that as an option. Thank you.

MS. BLEWITT: Thank you, Eric. I'm not seeing any other raised hands at this point. Are there any other scoping comments? I'm not seeing any more at this time. Of course, as you can see on the screen, there are opportunities to mail in comments to Susan Strachan at the Department of Planning & Building in San Luis

Obispo, or to email comments to Diablo@co.slo.ca.us. Comments are due by December 6th, 2021.

MS. STRACHAN: Thank you, Lisa. We want to thank everyone for attending the meeting today. We will be posting a recording of the meeting on the County's Planning & Building website. There's a specific webpage for the Diablo Canyon Decommissioning, and we do have future scoping meetings. We have one tonight at 6:00. We have two on December 1st, one at 10:00 and one at 6:00, and then one on December 4th at 2:00. And information on accessing those meetings is also available on the County's website.

Thank you everyone for your attendance. We appreciate it.

CERTIFICATE

I, the undersigned, a Certified Shorthand Reporter of the State of California, do hereby certify:

That the foregoing proceedings were taken before me at the time and place herein set forth; that a verbatim record of the proceedings was made by me using machine shorthand which was thereafter transcribed under my direction; further, that the foregoing is an accurate transcription thereof.

I further certify that I am neither financially interested in the action nor a relative or employee of any attorney of any of the parties.

IN WITNESS WHEREOF, I have this date subscribed my name this 16th day of November, 2021.

michele watson

MICHELE WATSON

CSR No. 8359

Appendix B4.3

Transcript – Scoping Meeting November 9, 2021
6:00 PM

DIABLO CANYON DECOMMISSIONING PROJECT

PUBLIC MEETING

WEB VIDEOCONFERENCE

TUESDAY, NOVEMBER 9, 2021, 6:00 P.M.

Reported by:

Michele Watson

CSR No. 8359

MS. STRACHAN: Thank you, Sandra. Good evening, everyone. I want to thank you for taking the time to join us tonight for the Diablo Canyon Power Plant Decommissioning Project Scoping Meeting.

I just want to go over a few items in terms of participating in the meeting via Zoom. So we're starting off the meeting tonight with a presentation. During that time all attendees will be muted.

We will have a few question-and-answer sessions and we'll have a scoping comment session.

If you're participating online, in order to speak during those time periods, use the raise-hand feature, which is located at the toolbar at the bottom of your screen, and then we will call on you to speak during the Q and A, or at the end of the presentation for the scoping meetings.

If you're participating by phone, you press star 9 to raise your hand and when called upon press star 9 to unmute. This meeting, as Sandra said, is being recorded and we'll repeat these instructions for how to participate before each of those time periods. So don't worry, you don't have to memorize all of this right now. Next slide, please.

I want to go through the meeting agenda, so we will go through introductions. I'm then I'm going to provide a description of PG&E's proposed decommissioning project. Once we go through the project description, we'll have a question-and-answer session. We do have representatives from PG&E available to help with that portion of the program.

Next, we're going to get into a discussion of future site reuse concepts. So these are concepts for what could be on the site once the decommissioning activities are over. This is a County-driven analysis. It's not part of PG&E's proposed project, but it is something that will be included in the environmental impact report.

We'll then have a second question-and-answer session to answer any questions with regard to this analysis. Followed by that, we will have a presentation on the environmental impact report process, and again, have a third question-and-answer period, followed by scoping comments, which again, is the opportunity for participants to provide comments on basically what they'd like to see covered in the environmental impact report.

Next slide please. So for introductions, as I mentioned, I'm Susan Strachan. I'm the nuclear power plant decommissioning manager for San Luis Obisbo

County. Cindy Chambers works with me, she's a senior planner with the County. And then we have Aspen environmental group. Aspen are consultants to the County. They will be preparing the environmental impact report for the Diablo decommissioning.

I want to point out that Aspen Environmental Group also is the group that prepared the environmental impact report for the decommissioning of the San Onofre Nuclear Power Plant in San Diego County. That decommissioning is going on right now.

Representing Aspen is Sandra Alarcon-Lopez, she's the EIR project manager, and Lisa Blewitt, who is the deputy project manager. And as I mentioned, we also have PG&E representatives who'll be available to answer questions and I will introduce them when we get to that portion of the meeting.

Next slide, please. Now, first let's talk about what the purpose of the meeting is, and scoping. So scoping is required under the California Environmental Quality Act. It requires a 30-day scoping period where people can make comments on content of the environmental impact report. I have to say that for this project, we're actually taking a longer scoping period, because when we issued the notice of preparation, which is what kicks off that scoping period and counted out 30 days, that 30 days landed right around Thanksgiving. So we extended it to actually approximately 40 days to give more time due to the Thanksgiving holiday.

Scoping meetings are required for projects which are of statewide, regional- or area-wide significance. And again, it's an opportunity for agencies in the public to provide input on the scope and content of the EIR.

Now, there's three different ways the comments can be provided. They can be provided through a scoping meeting like we're having today, where you can provide verbal comments or you can provide written comments by mail or by email, and we'll provide information on the mailing address and the email address when we get to the scoping comment portion of the meeting.

The scoping meeting or scoping also provides an opportunity for agencies in the public to provide input on project alternatives, EIR evaluation methods, and mitigation methods.

Next slide, please. So now I want to get into providing a description of the project that has been proposed by PG&E to the County, go into a little bit of background on the application, talk about the jurisdiction of some of the key agencies, discuss the power plant decommissioning activities, and then talk about some offsite locations for waste transportation that are proposed by PG&E.

Next slide, please. So to give some background on PG&E's land use application, they filed the application on March 29th, 2021 with the County. The application is for a development plan, coastal development permit, and a conditional use permit. The site actually has a portion in the coastal zone and then a portion in the inland part of the County, which is why you have the different permits or applications that were submitted.

Once the County receives the application, it then does a 30-day application review. It sends out letters to agencies and organizations asking for input on the application and then does its own review. So at the end of the 30 days, the County issued a comment letter on April 28th, 2021, listing additional information that we needed for the application.

PG&E responded with the filing of an application supplement on July 8th. County then did get another 30-day review, again, sent out referral letters to the agencies and organizations, and a second County comment letter was issued on August 9th.

PG&E then responded to that letter with a filing on October 6th. And on October 27th the County accepted PG&E* application. With that application accepted, we then issued the notice of preparation on October 28th. Next slide.

So this slide is a general site vicinity of the Diablo Canyon Power Plant. The power plant is marked, or the boundaries are marked in blue. The yellow area are Diablo Canyon lands that are owned by PG&E or Eureka Energy, which is a subsidiary of PG&E. Next slide, please.

So this shows the boundary of the power plant site marked in red and then actually in an aerial of the power plant site itself. Next slide.

So this slide shows the agency's jurisdiction. So the yellow line going through the middle marks the coastal zone. And so the area above the coastal zone in brown, that's the inland portion, portion of the site that is not in the coastal zone. The green part is that area which is in the coastal zone.

So from a County permitting standpoint, it covers both the inland and the green coastal zone portion. If you go then farther down toward where the water is, where Sandra has the cursor, that covers a jurisdiction that's under the California Coastal Commission and the State Lands Commission. Next slide,

*Note: The text was changed from Page’s to PG&E.

please.

Now, this slide talks about the different activities by these agencies. So County of San Louis Obispo, we are the lead agency under the California environment quality act. That means that we have the responsibility for preparing the environmental impact report. And again, the permits that would be issued, assuming the project is approved or listed below.

California Coastal Commission is a responsible agency under the California Environmental Quality Act. So we work closely with them to make sure that the environmental impact report is going to cover the things they need in order to do their permitting. That area down by the water on the previous slide is the original jurisdiction of the Coastal Commission.

So they'll be issuing a permit for activities in that area, but it's important to point out that the portion of the site within the coastal zone is in the appeal jurisdiction of the Coastal Commission. So any permit issued by the County within any Coastal Commission appealed jurisdiction can be appealed to the Coastal Commission.

California State Lands Commission is a trustee agency under California Environmental Quality Act. They will be issuing a new lease or a lease amendment for project features within their jurisdiction, which, again, is down in that water area that was in the previous slide. And the Nuclear Regulatory Commission is a federal agency which oversees decommissioning process. So they're specifically cleanup, removal of radioactive structures and systems, transfer spent fuel, and then termination of the licenses for the project.

With the involvement of the NRC, state and local agencies are preempted for issues dealing with radiological hazards and radiological safety. And we'll get in that in more detail when we're talking about the EIR process. Next slide, please.

Now, the Diablo Canyon Power Plant Decommissioning, there are two nuclear units on the site. Unit 1, the license terminates in November of 2024, and Unit 2, the license terminates in August of 2025. PG&E had been embarking on renewing the licenses for these projects, but in 2016, stopped that license renewal effort, and determined that it was going to retire the plant.

In 2018, the California Public Utilities Commission approved the retirement of the Diablo Canyon Power Plant. And then PG&E initiated its permitting for the decommissioning activities. The plan is that PG&E proposes to begin the decommissioning and dismantling of the plant in 2024. Next slide, please.

Now, the decommissioning will occur in two phases, two time periods. Phase 1, 2024 to 2031 is when preplanning and decommissioning activities will occur. In other words, this is a bulk of the decommissioning, a bulk of taking every thing down will occur during that phase 1 time period.

In phase two, which is 2032 to 2039, they'll be doing completion of soil remediation, final status surveys. These are surveys that are conducted as a requirement by the Nuclear Regulatory Commission to ensure that the site meets established radiological release criteria. And then they'll be doing the final site restoration of the site. Next slide, please.

Now, the project decommissioning, I think when people think of decommissioning, think about decontamination and demolition of infrastructure and buildings and structures, and that is a key component of it. But as proposed, it includes the retention of some structures and I'll go through those, the construction of new buildings and structures, which will be in a future PG&E owner-controlled area on the site. And I'll be going through that.

And then decommissioning also involves the installation of temporary infrastructure and buildings that are needed to accommodate the decommissioning effort. And then it's also going to include the use of some offsite rail loading sites. Next slide, please.

Now, this slide depicts areas that are not going to be removed, and those are denoted in black in terms of roads within the plant site and in red in terms of different structures. So down by the water, we have the two break waters. PG&E proposes to have those remain. And the intake structure, PG&E proposes to have that remain also. These are the structures that could be available for future reviews by others.

Then moving on up, this is what we're going to get into, what would be referred to as a future PG&E owner controlled area. You have the rectangle, which is the -- it says ISFSI, which stands for Independent Spent Fuel Storage Installation. That's where spent fuel is currently stored. And then once decommissioning begins spent fuel that's currently in, the reactors will be transported and stored up in that ISFSI. That is a site that has been previously permitted.

Next to it are the raw water reservoirs. Those will remain. There's a 230 KV switch yard which will remain, and a 500 KV switch yard, which will remain. Next slide, please.

Now, this slide covers the features which would be in the new PG&E owner-controlled area. Some of them, like ISFSI, for example, the switch yards, raw water reservoir that I pointed out in the previous slide, are existing structures that will remain and be in this owner-controlled area. The green boxes denote new construction. So given that the fuel will be up in this upper part of the site and the remaining part of the site will be decommissioned, a new security building will be built up in this area.

Also, a new indoor firing range will be built in this area. PG&E also proposes to build a Greater-than-Class-C waste facility, which will store reactor internals or process waste for which there is not a federal repository for it to be sent offsite similar to the spent fuel.

So that will stay on site also and be constructed as part of the decommission effort. Next slide.

Now, this slide, there's a lot going on here, but what I like about it is that it's a site layout for decommissioning for this lower portion of the site. And I think it depicts all that's involved in terms of decommissioning. So it identifies different lots. These are parking lots that will be used to accommodate decommissioning workers.

Parking lots are also converted to serve as lay-down for the decommissioning effort. It shows buildings that are existing buildings that will be converted to uses to support decommissioning. So, for example, the main warehouse, which is identified in orange will be modified to create a waste handling facility where waste will be segregated, stockpiled, packaged for offsite transport.

There's another building, a flex equipment building, which will be modified to create what's referred to as an environmental count room or a lab to be used for testing soil samples. So this just gives an idea of what will go where during the decommissioning effort, which is a lot of activity. Next slide, please.

So some of the activities that are going to happen during the phase 1 decommissioning again, 2024 to 2031, temporary infrastructure and building modifications like those ones I just mentioned will happen during this time period. Decontamination and demolition of buildings, again, the new buildings and structures to be constructed in the future PG&E owner-controlled area will occur.

During phase 1, the spent fuel and Greater-than-Class-C waste will be transferred to the independent spent fuel storage installation and the new

Greater-than-Class-C waste storage facility, and removal and restoration of the discharge structure will begin during this phase. Next slide, please.

So this is a picture of the discharge structure during decommissioning. So this is the structure that will be one of the structures that will be removed as a result of decommissioning. Next slide, please.

So going on from the discharge structure removal, the picture on the right shows the circles are tight with a proposed coffer dam, basically creating an area where the water can be pumped out, creating a dry space for the discharge structure to be removed.

Other activities during this phase are removal of the nuclear reactor pressure vessels and internals, steam generators, site characterization to identify contaminated areas. With those contaminated areas identified, soil remediation will recur, and again, the final status surveys that I mentioned previously.

Also during this phase, modification and utilization of the offsite railyards would occur. Next slide.

During phase 2 of the project, soil remediation and final status surveys would continue. Any infrastructure that is now not needed for retained facilities would be removed. Final site restoration would happen. So this is the grading of the site, the development with storm water management system, now that structures have been removed, will be developed and revegetation would happen.

There will be monitoring of that site restoration effort for up to five years and then PG&E will terminate its NRC license, part 50 license, which covers the current operation of the plant, and it will transition into a ISFSI, meaning the spent fuel and the Greater-than-Class-C waste storage operations. Next slide, please.

I wanted to talk for a moment about decommissioning waste transportation. PG&E is proposing a blended approach for waste transportation. It will consist of transporting waste by barge, transporting waste by truck, meaning directly on a truck to an offsite disposal facility, and then transporting by truck to an offsite rail facility that I mentioned previously.

What's helpful with this blended approach is that barge transportation can accommodate much more waste than a truck can. And so by using barge transportation for taking waste off site, it dramatically reduces the number of trucks that would otherwise be on the road transporting waste.

PG&E has used barge transportation before. That picture on that slide is steam generators that were transported on site in roughly 2006 time period. Next slide, please.

So I mentioned the railroading facilities. PG&E has proposed three different sites. This slide shows where they are in relation to the Diablo Canyon Power Plant. One site is in Pismo Beach. This site would be used as a contingency, and there would be no radiological or hazardous waste transported to this facility.

There are two other sites. One in the city of Santa Maria, one in Santa Barbara County. Both of these will be evaluated in the environmental impact report. However, ultimately only one of the sites will be used. Next slide, please.

Here's a depiction of the Pismo Beach railyard facility. This is on property owned by PG&E, and it's off of Price Canyon Road. And again, this is a site that would be used as a contingency and it would accept non-radioactive, non-hazardous, waste.* Next slide.

And then this shows the two sites. This Osborne yard is the one located in the city of Santa Maria close to Stowe Road, and then the second one is And then the one in unincorporated Santa Barbara County is at the Betteravia Industrial Park off of Betteravia.

*Note: This sentence was revised to match the audio/video of the meeting.

And with that, we'd like to take questions on the proposed project. As I mentioned previously, if you are participating online, please use the raise-hand feature at the bottom of your screen and we'll call on you to speak during Q and A. And then if you're joining by phone, press star 9 to raise your hand. When called upon, press star 6 to mute. Do we have any questions?

MS. BLEWITT: We do. Our first comes from Jeff Wheelwright. You'll need to click to unmute yourself.

MR. WHEELWRIGHT: Hi. Good evening. Thank you. I'm a science writer in Morro Bay, and I've written about Diablo for probably 25 years, off and on, for local and national publications. I set it aside until your work began, and I appreciate your work, which I'm just catching up on.

And the short question is, and I'm sure you're all aware of this new report from MIT trying to, not deny the course that you're on, which is too close the plant, but just to tweak it, slow it down, extend the generation of power for maybe another 10 years beyond 25, and maybe repurpose the plant for things like desalination, hydrogen generation.

And this is just one example, as you know, of an increasing demand that the train that you're on be turned around a little bit or bend in another direction.

And you said earlier there's going to be a point for talking about alternatives.

I wish you would acknowledge the reality that this is not 2016. This is 2021, and the world has changed in terms of the appreciation of the climate crisis. California's problems with water and wildfire demand a review of how we generate electricity. And I really found myself smiling when you were very earnestly looking at how, for example, nuclear waste will be there for 10,000 years at that the present look right in the middle of this site, which you proposed to purpose for some other purpose.

So, again, please, you can't stop what you're doing, you're all committed in good faith and you're following your orders; but acknowledge to the public that the world has changed and that very well, in another year or two, when the deadline approaches, California might wake up and keep Diablo going. Thank you very much.

MS. STRACHAN: Thank you, Mr. Wheelwright.

MS. BLEWITT: Thank you. I don't see any other hands being raised at this point. Again, if you're calling in, you can press star 9 to raise your hand. We have another one from Benita Epstein.

MS. EPSTEIN: I just have a question about the trucks. What kind of trucks are they, diesel trucks? And how many a day would go to Pismo Beach?

MS. STRACHAN: Tom, do you want to answer that one?

MR. JONES: Right now that answer is zero. Our chief principal method for shipment is barging. The identified rail sites that are in the plant have 99 trucks over 10 years going to the greater Santa Maria area. And Pismo is an alternate site, but we have no plans to use it. It's a backup in case something else happens. The vast majority, in the high 90 percent, is barging.

MR. VARDAS: This is Kris. Just to add to that, the trucks would be diesel trucks, and a portion of those trucks would go directly out of state to truck waste to an out-of-state disposal facility. So it's barging, direct trucking out of state, and then truck to rail at one of the two Santa Maria facility sites.

MS. EPSTEIN: Thank you.

MS. BLEWITT: Thank you. Any other questions regarding the proposed project and the description before we move on? I do not see anymore.

MS. STRACHAN: Thank you, Lisa. We'll continue. Okay. So this next discussion is on future reuse concepts. So this is going out into the future, as it says on the slide, 2040 and beyond. This is a County-driven analysis that'll be in the EIR. This is not part of PG&E's proposed project.

Its concepts aren't proposed by PG&E, but the concepts will be evaluated and prepared to provide an early high-level analysis of possible postdecommissioning uses. And we're including it just because site reuse has been such a important topic talked about quite a bit in the community. Next slide, please.

So these are the concepts currently under consideration by the County of San Luis Obispo. One would be university campus. This something where Cal Poly, for example, could use the area for its studies.

Developed recreation: So RV camping, glamping, tent camping, day use recreation, hiking, kayaking. Research facility? Somebody coming in and doing research there.

Renewable energy generation and/or storage: So is there a type of renewable energy that would fit in this location or storage, such as battery storage?

Resort hotel: Mixed use would be a combination of any of these.

And then lastly, offshore wind port or support facility, and this has come up in light of the Morro Bay

Call Area for offshore wind. There's a lot of discussion about needing a location onshore to support any wind development in that Call Area.

So what we're looking for here is to see if anyone has comments, not on additional concepts, we'll get to that during the scoping period, but any questions with regard to the analysis that the County is going to be doing on these for future reuse concepts.

MS. BLEWITT: Please raise your hand if you have any questions regarding the analysis to be done on these future reuse concepts, and use the raise-hand feature or press star 9 if you're calling in. We have one raised hand. Two.

First, Jill Zamek, followed by Coleman Miller. Okay.

MS. STRACHAN: Hi, Jill.

MS. ZAMEK: Hi. Does PG&E have any plans for that? You said this is all coming from the community. Has PG&E submitted any of its proposals for the land use?

MS. STRACHAN: PG&E has done evaluation of looking at it, but is not proposing it, but we're piggybacking on work that has been already done; but it's not done as a proposal. The County has made the decision to go ahead and do this analysis. Does that answer your question?

MS. ZAMEK: Well, not exactly, because I know I was in a meeting where they were presenting a lot of information about real estate and proposed resorts there. And I'm wondering, is that going to be analyzed as well in this report?

MS. STRACHAN: That's what we're looking at, is we're making a decision and we're seeking input on what are the types of things people do want to have evaluated. So PG&E has done some work tied to other processes where they've looked at options. To the extent we can borrow that to aid us in that evaluation, we'll do that. But in terms of what are the concepts, that's why we're here. We want to get public's input in terms of what they want to see.

MS. ZAMEK: Thank you.

MS. BLEWITT: Next up is Coleman Miller.

MR. MILLER: Good evening. So you mentioned electrical energy storage and specifically batteries. If battery storage is considered in large scale, I think it's really important that the fire hazard be looked at. If these battery packs go up, there's just containment. They just let them burn down.

And with that aspect, I think it would be very important for the County to advocate that an alternate type of electro-energy storage that would not have the hazardous waste implications of battery storage or fire potential would be to use molten salt coupled with steam turbines.

Molten salt storage is being used at large solar thermo plants. There's one in Nevada, hundreds of megawatts scale, and should advocate to CEC and CPUC to think about diversifying electro-energy storage, not putting all the bets on batteries, and having a more robust and more sustainable electro-energy storage, if that is selected. Thank you.

MS. STRACHAN: Thank you.

MS. BLEWITT: Thank you, Coleman. I do not see any other -- oh, Harrison Fugate raised his hand.

MR. FUGATE: Yeah, I just have a question about, are these reuse concepts with the assumption that the federal government is going to give us some place to ship the Greater-Than-Class-C waste, or is that being factored in when it could be on the site for a very, very long time?

MS. STRACHAN: I mean, we haven't started any evaluation yet, but I do want to point out that, for example, PG&E has a facility up at Humboldt Bay that has fuel stored on site and a hiking trail, a walking trail, right along the shore, close to it.

Similarly with the San Onofre plant, it's right there on the beach with the fuel store on site and a beach walking trail right near there.

So I understand what you're saying in terms of the concern. That would be something we'd have to look at, but I'm also saying that there are situations where there is public close by while there is still fuel stored on site. And that's all been allowed by the Nuclear Regulatory Commission. Did that answer your question?

MR. FUGATE: Yeah. It was more or less of a concern. I'm aware of the hiking trail. It was just more of a planning aspect of probably wouldn't be doing major resort construction, I would be assuming.

MS. STRACHAN: I understand what you're saying. Thank you.

MR. FUGATE: Thanks.

MS. BLEWITT: Any other questions? Please raise your hand. I do not see any more questions so we can proceed, Susan.

MS. STRACHAN: Okay. Thank you, Lisa. So our next section we're going to talk about, Sandra Alarcon-Lopez with Aspen is going to go through the EIR process. When she's done, we'll have another Q and A session in case anyone has questions on that process.

And then we'll get into the scoping part of the meeting.

MS. ALARCON-LOPEZ: Thank you, Susan. As Susan mentioned, my name is Sandra Alarcon-Lopez. I'm with Aspen Environmental Group and we are a consultant to the County of San Luis Obispo. We're supporting the County with the preparation of the environmental impact report.

So I'm going to give you a very high level of discussion of the process associated with preparing the environmental document. One of the first steps that the County had to do was decide what type of document they were going to prepare for this project, and the County decided that an environmental impact report was necessary to move forward and evaluate the potential impacts of the project.

Under the California Environmental Quality Act, or CEQA, the County is allowed to move forward with that environmental document without preparing any type of initial study or preliminary study to justify that decision, because they've already decided the highest level document is necessary.

This flow chart gives you an idea of the different steps associated with the preparation of the environmental document. We're currently in the preliminary step, which is here, the scoping comments.

And as mentioned earlier, scoping allows us to get your input on the content and scope of the environmental issues that we consider and evaluate in the document.

This is the first step in jumping into the analysis of the EIR. But also, once we get your comments, we will summarize them, give them to the technical staff, and then work on the preparation of the draft document. At the draft document there will be another opportunity for public comment. And then once we get comments on the draft document, we'll prepare a final document that will be taken to the decisionmakers at the County for decision.

This particular hearing here would be a comment hearing, not a decision hearing, but it will give you another opportunity to provide comments on the document. So I think this kind of gives you an idea of the general key milestones that we'll work on in preparing the EIR.

Susan talked a little bit about the different components of the project. We're evaluating, primarily, PG&E's proposed projects. So the first five bullets that you see under contents directly relate to the proposed project. And we're going to include in the EIR a detailed description of that project. We're going to evaluate on an issue-by-issue basis, the environmental and regulatory setting associated with that particular issue area.

We're going to look at the potential environmental impacts associated with PG&E's project. And then we're also going to look at and identify any project alternatives that could reduce any significant impacts that we identify associated with the proposed project.

For both the alternatives, as well as the proposed project that we look at, we're going to identify mitigation measures that could potentially reduce any of those significant impacts, so that's all documented for the proposed project. But another component of this particular EIR is going to be the separate chapter where we look at and evaluate the different future reuse concepts.

We anticipate that it's going to be more of a comparative, high level analysis, but it is going to allow you to look at some of the site constraints and other environmental considerations that need to be considered as part of the analysis of the document.

One key aspect of the EIR is that it definitely gives the County a third-party review of the project and allows them to have information about environmental issues, environmental impacts associated with the project, and is really an informational document that they use as part of their decision.

This slide is very dense, but I think what it shows you is all of the different issues that are going to be covered in the environmental document. I mentioned earlier that this is the start of us writing and looking at and evaluating some of these issues. So we haven't made any determinations of significance for any of these issues.

We're just starting the process, and we want your input on what you think are issues that we either need to consider or things that you think are important that we ought to evaluate.

What you'll notice in here is that there are also other issues that address some of the concerns that the responsible agencies have, such as the California Coastal Commission and State Lands Commission. We're looking at some different issues, such as climate change, commercial fishing, environmental justice, and then the State Tideland issue. These are not typically in an EIR, but we are going to include them because they address some of the concerns that the responsible agencies have.

One issue that has come up in some of the past community meetings is the issue of the NRC's jurisdiction. And Susan mentioned it earlier in the presentation, that they have exclusive jurisdiction over any of the radiological hazards and radiological safety issues. So they have, in essence, preempted local and state involvement in any of the radiological hazards or radiological materials, radiological waste.

So if you look at the slide, it basically covers everything related to handling, storage, transport, disposal, and monitoring. So they have that jurisdiction, that the state and local agencies cannot -- we can address it, but we have no jurisdiction over it.

So what would the EIR then look at? Because the County has to look at the whole of the action, they have to look at the entire project, we are going to incorporate in the environmental document the NRC requirements, as well as the measures, the plans, the procedures that PG&E is putting in place to address some of the requirements that the NRC has imposed or that's required under current regulations. This is an approach that we took on the SONGS EIR, and we think it's applicable in this particular project, too, and we'd like to apply that here as well.

I mentioned one, the radiological hazards, but for all of the environmental issues that you saw on that prior slide, we're going to look at how the proposed project, the decommissioning project, changes the environment compared to current conditions.

We're going to look at direct, indirect, cumulative and growth-inducing effects for that proposed project. We're going to focus on significant impacts, because that's a requirement under CEQUA, that we focus on those significant impacts and we find a way to mitigate them.

We're going to identify any mitigation measures that can be applied to reduce or avoid significant impacts. We are going to, as part of environmental justice and population housing, look at some social and economic issues, because they're part of some of the issues that are concerned on a project like this. But under CEQA, those issues cannot have a significant impact because the EIR is focused on environmental issues and not social or economic.

Alternatives is going to be a key component of the EIR. We have identified some preliminary alternatives in the notice of preparation. Some of the alternatives have been identified by PG&E, and then we have some that have been identified by some of the responsible agencies.

Under CEQA, we're required to look at a NOP project alternative. And for this particular project that could include more than one variation of a NOP project. We also, under CEQA, because it is a CEQA focused or state focused document, we need to look at consistency with project objectives when we identify alternatives.

We need to identify alternatives that reduce impact, and we need to look at the feasibility of the different alternatives. The alternatives are not going to be evaluated at the same level as the project, but they are going to be compared to the project so that there's a comparative evaluation of the different environmental impacts. And that was a very high level, because we want to get to your scoping comments. But if there's any questions on the EIR process, we can take them now.

MS. BLEWITT: Please raise your hand as before if you have any questions on the EIR process. If you're calling in, you can use the star 9 to raise your hand. Does anyone have any questions regarding the EIR process? I'm not seeing any.

MS. STRACHAN: So we'd like to open it up for your formal scoping comments and any comments that you made during the Q and A we are recording those and transcribing them, so they will be taken into account.

Comments that would be helpful to us would address either the scope or content of the EIR, any local environmental knowledge that you have that you think we need to be aware of, any issues that you think we need to evaluate or you feel like we need to evaluate an issue in a certain way, that would be helpful, any feasible alternatives that you think we ought consider to PG&E's proposed project, and then any mitigation measures that you think are important for us to consider regarding PG&E's project.

We also, at this time during the scoping comments, are open to hear any of your ideas for other future site-use concepts that we should consider in the environmental document.

Just to remind you, if you'd like to make a comment, just please raise your hand. We're not going to limit the speakers to three minutes, because we don't have that many attendees today. If you're calling by phone and you need to raise your hand, just use star 9 and use star 6 to unmute yourself.

Before we open it up, we just wanted to make sure everybody understood that you can present your comments at any of the five scoping meetings that we're having, or you can email or mail your comments. We're going to leave this slide up during the comment period in case you need to write down any of this information.

So we do have one hand?

MS. BLEWITT: Yes, we do. Coleman Miller. Please state your name for the record and any organization or agency you're affiliated with.

MR. MILLER: Good evening. Can you hear me?

MS. BLEWITT: Yes.

MR. MILLER: My name is Coleman Miller. Tonight I'm calling as a citizen of Pismo Beach. In the long-term vision along this coastal property, when we think 20 years, 50 years out, could be a desire to connect the coastal trail to this land, and I think a consideration should be made for historic landmarks possibly along that future trail.

I believe Chumash has plans to convert the information center by 101 into some kind of information center more to the Chumash area, but if the coastal trail is connected, I would think north of the creek, that the Chumash could do their thing, but south of the creek, I would think a kiosk, perhaps, with the history of Diablo Canyon would be a good public service.

Many of the federal laboratories, the Department of Energy are doing this, like at Oak Ridge and other things where there's a kiosk along a trail showing the history of what was conducted at those sites.

Diablo Canyon was, of course, the poster child for the controversy of nuclear power. It's siting siting of the Sierra Club and a group that actually said to put the plant where it is versus the dunes down south in Pismo, and the other half of the Sierra Club said that they never wanted the plant to come about. So I think planning along that future coastal trail and having historic landmarks along that would be of value.

I did have question about what the NOP project alternative would be to that extent.

And I think the last thing I wanted to bring up is, I am an advocate for the barging, but if for some reason, barging is halted and they do have to do a lot of truck traffic from the Diablo site to the railyards, I would really think that the environmental impact thing would have to look at going to the electric tractors, as Tesla has put out, to reduce the CO_2 generation from that truck transport that would be become local to the local railyards.

I understand that we need a diesel truck, really, to haul the shipments directly to one of the waste disposal sites out of state. Thank you.

MS. BLEWITT: Thank you. Are there any other questions, or comments, I should say, scoping comments pertaining to the EIR, the environmental impact report?

Please raise your hand. I'm not seeing any additional commenters.

MS. STRACHAN: Okay. Thank you, Lisa. If there aren't any more comments, then that concludes our meeting for tonight. We'd like to thank you for taking the time to attend. We recognize this is your private time, after probably a long day at work, and we sincerely appreciate you taking the time to attend.

We will be posting a recording of the meeting to the County's website. It will be able to be viewed there.

We do have additional scoping meetings. The same material will be discussed at each meeting; but if interested, we have one scheduled for December 1st at 10:00 a.m. and at 6:00 p.m., and then one on December 4th at 2:00 p.m. And the instructions on how to access those meetings, because they will be virtual again, is on the County Planning & Building webpage. There's a link specifically for Diablo Canyon Decommissioning.

Thank you again for joining us. We appreciate it.

MS. BLEWITT: Thank you. I'm going to stop the recording.

MS. STRACHAN: We'll end the meeting. Thank you very much everyone.

CERTIFICATE

I, the undersigned, a Certified Shorthand Reporter of the State of California, do hereby certify:

That the foregoing proceedings were taken before me at the time and place herein set forth; that a verbatim record of the proceedings was made by me using machine shorthand which was thereafter transcribed under my direction; further, that the foregoing is an accurate transcription thereof.

I further certify that I am neither financially interested in the action nor a relative or employee of any attorney of any of the parties.

IN WITNESS WHEREOF, I have this date subscribed my name this 16th day of November, 2021.

michele watson

MICHELE WATSON

CSR No. 8359

Appendix B4.4

Transcript – Scoping Meeting December 1, 2021
10:00 AM

DIABLO CANYON DECOMMISSIONING PROJECT

PUBLIC MEETING

WEB VIDEOCONFERENCE

WEDNESDAY, DECEMBER 1, 2021, 10:00 A.M.

Michele Watson

CSR No. 8359

Job No. 24704B

WEDNESDAY, DECEMBER 1, 2021, 10:00 A.M.

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MS. STRACHAN: Good morning, everyone. I want to thank you for taking the time to join us for the Diablo Canyon Power Plant Decommissioning Project Scoping Meeting.

I just want to go over a few items in terms of participating in the meeting via Zoom. So we're starting off the meeting tonight with a presentation. During that time all attendees will be muted.

We will have a few question-and-answer sessions and we'll have a scoping comment session.

If you're participating online, in order to speak during those time periods, use the raise-hand feature, which is located at the toolbar at the bottom of your screen, and then we will call on you to speak during the Q and A, or at the end of the presentation for the scoping meetings.

If you're participating by phone, you press star 9 to raise your hand and when called upon press star 9 to unmute. This meeting, as Sandra said, is being recorded and we'll repeat these instructions for how to participate before each of those time periods. So don't worry, you don't have to memorize all of this right now. Next slide, please.

I want to go through the meeting agenda, so we will go through introductions. I'm then I'm going to provide a description of PG&E's proposed decommissioning project. Once we go through the project description, we'll have a question-and-answer session. We do have representatives from PG&E available to help with that portion of the program.

Next, we're going to get into a discussion of future site reuse concepts. So these are concepts for what could be on the site once the decommissioning activities are over. This is a County-driven analysis. It's not part of PG&E's proposed project, but it is something that will be included in the environmental impact report.

We'll then have a second question-and-answer session to answer any questions with regard to this analysis. Followed by that, we will have a presentation on the environmental impact report process, and again, have a third question-and-answer period, followed by scoping comments, which again, is the opportunity for participants to provide comments on basically what they'd like to see covered in the environmental impact report.

Next slide please. So for introductions, as I mentioned, I'm Susan Strachan. I'm the nuclear power plant decommissioning manager for San Luis Obisbo County. Cindy Chambers works with me, she's a senior planner with the County. And then we have Aspen environmental group. Aspen are consultants to the County. They will be preparing the environmental impact report for the Diablo decommissioning.

I want to point out that Aspen Environmental Group also is the group that prepared the environmental impact report for the decommissioning of the San Onofre Nuclear Power Plant in San Diego County. That decommissioning is going on right now.

Representing Aspen is Sandra Alarcon-Lopez, she's the EIR project manager, and Lisa Blewitt, who is the deputy project manager. And as I mentioned, we also have PG&E representatives who'll be available to answer questions and I will introduce them when we get to that portion of the meeting.

Next slide, please. Now, first let's talk about what the purpose of the meeting is, and scoping. So scoping is required under the California Environmental Quality Act. It requires a 30-day scoping period where people can make comments on content of the environmental impact report. I have to say that for this project, we're actually taking a longer scoping period, because when we issued the notice of preparation, which is what kicks off that scoping period and counted out 30 days, that 30 days landed right around Thanksgiving. So we extended it to actually approximately 40 days to give more time due to the Thanksgiving holiday.

Scoping meetings are required for projects which are of statewide, regional- or area-wide significance. And again, it's an opportunity for agencies in the public to provide input on the scope and content of the EIR.

Now, there's three different ways the comments can be provided. They can be provided through a scoping meeting like we're having today, where you can provide verbal comments or you can provide written comments by mail or by email, and we'll provide information on the mailing address and the email address when we get to the scoping comment portion of the meeting.

The scoping meeting or scoping also provides an opportunity for agencies in the public to provide input on project alternatives, EIR evaluation methods, and mitigation methods.

Next slide, please. So now I want to get into providing a description of the project that has been proposed by PG&E to the County, go into a little bit of background on the application, talk about the jurisdiction of some of the key agencies, discuss the power plant decommissioning activities, and then talk about some offsite locations for waste transportation that are proposed by PG&E.

Next slide, please. So to give some background on PG&E's land use application, they filed the application on March 29th, 2021 with the County. The application is for a development plan, coastal development permit, and a conditional use permit. The site actually has a portion in the coastal zone and then a portion in the inland part of the County, which is why you have the different permits or applications that were submitted.

Once the County receives the application, it then does a 30-day application review. It sends out letters to agencies and organizations asking for input on the application and then does its own review. So at the end of the 30 days, the County issued a comment letter on April 28th, 2021, listing additional information that we needed for the application.

PG&E responded with the filing of an application supplement on July 8th. County then did get another 30-day review, again, sent out referral letters to the agencies and organizations, and a second County comment letter was issued on August 9th.

PG&E then responded to that letter with a filing on October 6th. And on October 27th the County accepted PG&E's* application. With that application accepted, we then issued the notice of preparation on October 28th. Next slide.

So this slide is a general site vicinity of the Diablo Canyon Power Plant. The power plant is marked, or the boundaries are marked in blue. The yellow area are Diablo Canyon Lands that are owned by PG&E or Eureka Energy, which is a subsidiary of PG&E. Next slide, please.

So this shows the boundary of the power plant site marked in red and then actually in an aerial of the power plant site itself. Next slide.

So this slide shows the agency's jurisdiction. So the yellow line going through the middle marks the coastal zone. And so the area above the coastal zone in brown, that's the inland portion, portion of the site that is not in the coastal zone. The green part is that area which is in the coastal zone.

So from a County permitting standpoint, it covers both the inland and the green coastal zone portion. If you go then farther down toward where the water is, where Sandra has the cursor, that covers a jurisdiction that's under the California Coastal

*Note: The text was changed from Page's to PG&E.

Commission and the State Lands Commission. Next slide, please.

Now, this slide talks about the different activities by these agencies. So County of San Luis Obispo, we are the lead agency under the California Environment Quality Act. That means that we have the responsibility for preparing the environmental impact report. And again, the permits that would be issued, assuming the project is approved or listed below.

California Coastal Commission is a responsible agency under the California Environmental Quality Act. So we work closely with them to make sure that the environmental impact report is going to cover the things they need in order to do their permitting. That area down by the water on the previous slide is the original jurisdiction of the Coastal Commission.

So they'll be issuing a permit for activities in that area, but it's important to point out that the portion of the site within the coastal zone is in the appeal jurisdiction of the Coastal Commission. So any permit issued by the County within any Coastal Commission appealed jurisdiction can be appealed to the Coastal Commission.

California State Lands Commission is a trustee agency under California Environmental Quality Act. They will be issuing a new lease or a lease amendment for project features within their jurisdiction, which, again, is down in that water area that was in the previous slide. And the Nuclear Regulatory Commission is a federal agency which oversees decommissioning process. So they're specifically cleanup, removal of radioactive structures and systems, transfer spent fuel, and then termination of the licenses for the project.

With the involvement of the NRC, state and local agencies are preempted for issues dealing with radiological hazards and radiological safety. And we'll get in that in more detail when we're talking about the EIR process. Next slide, please.

Now, the Diablo Canyon Power Plant Decommissioning, there are two nuclear units on the site. Unit 1, the license terminates in November of 2024, and Unit 2, the license terminates in August of 2025. PG&E had been embarking on renewing the licenses for these projects, but in 2016, stopped that license renewal effort, and determined that it was going to retire the plant.

In 2018, the California Public Utilities Commission approved the retirement of the Diablo Canyon Power Plant. And then PG&E initiated its permitting for the decommissioning activities. The plan is that PG&E

proposes to begin the decommissioning and dismantling of the plant in 2024. Next slide, please.

Now, the decommissioning will occur in two phases, two time periods. Phase 1, 2024 to 2031 is when preplanning and decommissioning activities will occur. In other words, this is a bulk of the decommissioning, a bulk of taking every thing down will occur during that phase 1 time period.

In phase two, which is 2032 to 2039, they'll be doing completion of soil remediation, final status surveys. These are surveys that are conducted as a requirement by the Nuclear Regulatory Commission to ensure that the site meets established radiological release criteria. And then they'll be doing the final site restoration of the site. Next slide, please.

Now, the project decommissioning, I think when people think of decommissioning, think about decontamination and demolition of infrastructure and buildings and structures, and that is a key component of it. But as proposed, it includes the retention of some structures and I'll go through those, the construction of new buildings and structures, which will be in a future PG&E owner-controlled area on the site. And I'll be going through that.

And then decommissioning also involves the installation of temporary infrastructure and buildings that are needed to accommodate the decommissioning effort. And then it's also going to include the use of some offsite rail loading sites. Next slide, please.

Now, this slide depicts areas that are not going to be removed, and those are denoted in black in terms of roads within the plant site and in red in terms of different structures. So down by the water, we have the two break waters. PG&E proposes to have those remain. And the intake structure, PG&E proposes to have that remain also. These are the structures that could be available for future reviews by others.

Then moving on up, this is what we're going to get into, what would be referred to as a future PG&E owner-controlled area. You have the rectangle, which is the -- it says ISFSI, which stands for Independent Spent Fuel Storage Installation. That's where spent fuel is currently stored. And then once decommissioning begins spent fuel that's currently in, the reactors will be transported and stored up in that ISFSI. That is a site that has been previously permitted.

Next to it are the raw water reservoirs. Those will remain. There's a 230 KV switch yard which will remain, and a 500 KV switch yard, which will remain. Next slide, please.

Now, this slide covers the features which would be in the new PG&E owner-controlled area. Some of them, like ISFSI, for example, the switch yards, raw water reservoir that I pointed out in the previous slide, are existing structures that will remain and be in this owner-controlled area. The green boxes denote new construction. So given that the fuel will be up in this upper part of the site and the remaining part of the site will be decommissioned, a new security building will be built up in this area.

Also, a new indoor firing range will be built in this area. PG&E also proposes to build a Greater-than-Class-C waste facility, which will store reactor internals or process waste for which there is not a federal repository for it to be sent offsite similar to the spent fuel.

So that will stay on site also and be constructed as part of the decommission effort. Next slide.

Now, this slide, there's a lot going on here, but what I like about it is that it's a site layout for decommissioning for this lower portion of the site. And I think it depicts all that's involved in terms of decommissioning. So it identifies different lots. These are parking lots that will be used to accommodate decommissioning workers.

Parking lots are also converted to serve as lay-down for the decommissioning effort. It shows buildings that are existing buildings that will be converted to uses to support decommissioning. So, for example, the main warehouse, which is identified in orange will be modified to create a waste handling facility where waste will be segregated, stockpiled, packaged for offsite transport.

There's another building, a flex equipment building, which will be modified to create what's referred to as an environmental count room or a lab to be used for testing soil samples. So this just gives an idea of what will go where during the decommissioning effort, which is a lot of activity. Next slide, please.

So some of the activities that are going to happen during the phase 1 decommissioning again, 2024 to 2031, temporary infrastructure and building modifications like those ones I just mentioned will happen during this time period. Decontamination and demolition of buildings, again, the new buildings and structures to be constructed in the future PG&E owner-controlled area will occur.

During phase 1, the spent fuel and Greater-than-Class-C waste will be transferred to the independent spent fuel storage installation and the new Greater-than-Class-C waste storage facility, and removal and restoration of the discharge structure will begin during this phase. Next slide, please.

So this is a picture of the discharge structure during decommissioning. So this is the structure that will be one of the structures that will be removed as a result of decommissioning. Next slide, please.

So going on from the discharge structure removal, the picture on the right shows the circles are tight with a proposed coffer dam, basically creating an area where the water can be pumped out, creating a dry space for the discharge structure to be removed.

Other activities during this phase are removal of the nuclear reactor pressure vessels and internals, steam generators, site characterization to identify contaminated areas. With those contaminated areas identified, soil remediation will recur, and again, the final status surveys that I mentioned previously.

Also during this phase, modification and utilization of the offsite rail yards would occur. Next slide.

During phase 2 of the project, soil remediation and final status surveys would continue. Any infrastructure that is now not needed for retained facilities would be removed. Final site restoration would happen. So this is the grading of the site, the development with storm water management system, now that structures have been removed, will be developed and revegetation would happen.

There will be monitoring of that site restoration effort for up to five years and then PG&E will terminate its NRC license, part 50 license, which covers the current operation of the plant, and it will transition into a ISFSI, meaning the spent fuel and the Greater-than-Class-C waste storage operations. Next slide, please.

I wanted to talk for a moment about decommissioning waste transportation. PG&E is proposing a blended approach for waste transportation. It will consist of transporting waste by barge, transporting waste by truck, meaning directly on a truck to an offsite disposal facility, and then transporting by truck to an offsite rail facility that I mentioned previously.

What's helpful with this blended approach is that barge transportation can accommodate much more waste than a truck can. And so by using barge transportation for taking waste off site, it dramatically reduces the number of trucks that would otherwise be on the road transporting waste.

PG&E has used barge transportation before. That picture on that slide is steam generators that were transported on site in roughly 2006 time period. Next slide, please.

So I mentioned the railroading facilities. PG&E has proposed three different sites. This slide shows where they are in relation to the Diablo Canyon Power Plant. One site is in Pismo Beach. This site would be used as a contingency, and there would be no radiological or hazardous waste transported to this facility.

There are two other sites. One in the city of Santa Maria, one in Santa Barbara County. Both of these will be evaluated in the environmental impact report. However, ultimately only one of the sites will be used. Next slide, please.

Here's a depiction of the Pismo Beach rail yard facility. This is on property owned by PG&E, and it's off of Price Canyon Road. And again, this is a site that would be used as a contingency site. Next slide.

And then this shows the two sites. This Osborn yard is the one located in the city of Santa Maria close to Stowell Road. And then the second one is And then the one in unincorporated Santa Barbara County is at the

Betteravia Industrial Park off of Betteravia.

And with that, we'd like to take questions on the proposed project. As I mentioned previously, if you are participating online, please use the raise-hand feature at the bottom of your screen and we'll call on you to speak during Q and A. And then if you're joining by phone, press star 9 to raise your hand. When called upon, press star 6 to mute.

MS. BLEWITT: We have one person with a raised hand. Carl Wurtz followed by Jim Austin. Carl, please go ahead and ask your question.

CARL WURTZ: Thank you. This question is related to the EIR. At no time during these proceedings has any California agency considered the effect permanent shutdown of Diablo Canyon will have on climate change. Estimates predictable raise California's electricity CO2 emissions by 15.5 million times by 2030.

There's no indication it can possibly be replaced by renewable energy in 2025 or anytime in the future to comply with section 15126.6E1, of the California Environmental Quality Act. The environmental impact reviewer must always evaluate a no-project alternative or MPA.

The MPA compares impacts of the proposed project with impacts that would occur if a proposed project were not approved and implemented. We hope and expect San Luis Obispo will undertake the responsibility with all due diligence and we wish to avoid litigation; but if necessary to ensure compliance, we plan to litigate the matter aggressively.

We will show lending scope to only impacts directly linked to the commissioning activities is inconsistent with the purpose and intent of CEQA and has precedent case law. So what I'm asking today is will San Luis Obispo County commit to thoroughly investigating the impact Diablo Canyon's closure will have on climate change?

MS. STRACHAN: I want to address the first. When you started your comment, you made the comment that no agency has looked at this. This actually was before the California Public Utilities Commission. And when I had that slide about approving the retirement of Diablo Canyon, that's where that issue came up, and climate change was addressed. That's where the question of closure of the plant was asked in a regulatory environment. So that was that proceeding.

The project before us is the decommissioning of the plant since the decision of closure has already been made. We will get into the no-project alternative as required by CEQA, but in terms of the greenhouse gas and energy supply, that's a California Public Utilities Commission matter.

CARL WURTZITE: I would disagree. The environmental impact report applies to all aspects of the plant and decommissioning is permanent. And there's no doubt that CEQA would require you to investigate the impact on climate change. That's what the purpose of the California Environmental Quality Act was.

MR. JONES: Susan, if I might, from a licensing standpoint, the licensing is going to be expired. So the no-project alternative can't compel a federal agency to issue a license to continue to operate the plant. That's outside the scope the CEQA proceeding.

CARL WURTZ: We're not talking about licensing. We're talking about the impact on the environment of closing the plant.

MS. STRACHAN: I understand your comment. And this is something that we'll have that, I'm assuming, concluding that with scoping comments, but I do understand and appreciate your comment.

MS. BLEWITT: Just to reiterate there will be multiple opportunities to ask questions. At this point in the presentation, the focus is questions on the proposed project and the project description itself. We'll then be going through the EIR process and answering questions at that time. And then we will be doing the scoping comments. And that's the more formal portion of the presentation.

The next person is Jim Austin.

JIM AUSTIN: Thank you. I'm the fire marshal for the San Maria Fire Department. And the two proposed sites -- I've done a site visit of both, and I realized this is going to be evaluated in the EIR. So I'm not sure if I'm jumping ahead or what, but we have a concern about the Osborn Yard. It's adjacent to a dense residential neighborhood. So it would be our preference that the Betteravia site be the transfer site. It's not that we're trying to punt the operation to somebody else's jurisdiction because we are actually through automatic aid and mutual aid.

Our engine too is the first in that area, so we would still be responding to it. But that area is very rural, very little, there's no residential really. And we just think it's a more appropriate site. So, I don't know if we'll be involved in the EIR or we'll be reached out to, but I just wanted to raise that concern. Thank you.

MS. BLEWITT: Thank you. Thank you, Jim. Next person with raised hand is Kara Woodruff.

KARA WOODRUFF: Can you hear me okay?

MS. BLEWITT: Yes.

KARA WOODRUFF: Thanks for the presentation. Quick question. Is the proposed Greater-than-Class-C waste storage facility, the new facility being proposed inside or outside of the coastal zone?

MS. STRACHAN: It's outside of the coastal zone.

KARA WOODRUFF: Thank you.

MS. BLEWITT: Thank you. The next person with the raised hand is Sherri Danoff. Please unmute yourself.

SHERRY DANOFF: Thank you. Yes, I've just unmuted. I'm recalling in PG&E's initial application there was a section on reuse on site of demolished materials that are nonradioactive, basically, a feasibility study. And it suggested that a great deal of material could remain on site and mixed with soils that were also on site. And I'm wondering if there's any quantification as to how much material would remain on site and, therefore, not have to be either trucked or barged off site.

MS. STRACHAN: So I think you're referring to the clean concrete that they're proposing to use as fill. And that is part of the project.

Tom, in terms of volume do you know? Off the top of my head, I don't remember those numbers in terms of what that volume is.

SHERRY DANOFF. Okay, thanks.

MR. JONES: Susan, I have it more in percentages, but we do have a graphic. So I'm asking staff to pull that and mail it to you so we can share the concepts and how it reduces waste and then reusing the items for fill.

KRIS VARDIS: This is Kris Vardis I'm getting that graphic and sending it to you, Susan.

MS. STRACHAN: Actually if you can send it to Sandra, that would be great since.

KRIS VARDIS: Yeah. And in regards specifically to recycling of concrete, about 265,000 cubic yards of clean concrete would be recycled and reused on site.

SHERRY DANOFF: That's very helpful. Thank you.

MS. BLEWITT: Thank you, Sherri. We have one additional person with a raised hand. Dana Eady, please unmute yourself.

DANA EADY: Hi. Can you hear me okay?

MS. BLEWITT: Yes.

DANA EADY: Hi. Thank you. So my name is Dana Eady. I'm the Planning Division Manager with the City of Santa Maria. And I have been in contact with Susan regarding the Osborn site in the past few months. I did want to just mention that the City is going to be sending a letter requesting that the scoping period be extended so that we have additional time to review this.

And we also have not received any contact from PG&E yet regarding the Osborn site and we have some concerns as well about the proximity of existing residences to the site as Jim mentioned, our fire marshal mentioned, and just need more information from PG&E about the proposal.

So I just wanted to mention that we are going to send that letter in prior to the deadline, which I think is the 6th. So thank you. That was just the comments I had at this point.

MS. BLEWITT: Thank you, Dana. There are no other raised hands at this time for questions regarding the proposed project.

MS. STRACHAN: Okay. Why don't we move on then to the next segment. So briefly I want to talk about a component of the EIR, appendix to the EIR that the County is going to be doing with Osborn. And this is looking at future site reuse concepts. So this is going out into the future, as it shows on the slide.

We're looking at beyond 2040. So, once

decommissioning, These would be activities or potential activities after decommissioning is completed. This is a County driven analysis. This is not part of PG&E's proposed project. It is not proposed by PG&E. It'll be looking at reuse concepts to provide an early high level analysis of possible post-decommissioning uses.

This would give an idea of what could be potential issues or impacts with some reuse concepts. Next slide please.

So some of the concepts that are under consideration by the County would be a university campus, developed recreation such as camping, day use recreation, hiking, kayaking, research facility, renewable energy generation or storage, a resort hotel, mixed use, which could be a combination of different concepts or an offshore wind port support facility. So, we know that reuse is an important aspect of this project for people.

We did want people to know that we are going to be doing this high-level evaluation. Next slide, Sandra. And so, we just want to know if there's any questions on the analysis side of the reuse concepts. If there's other concepts that people are interested in pursuing, that could be brought up, if you can, during scoping. Just looking if there's any questions on the analysis that will be done.

MS. BLEWITT: We have one raised hand at this time for Kara Woodruff Please unmute yourself.

KARA WOODRUFF: Hi. Another quick question. I noticed on your slide it talks about future uses after 2040. As you know, there's a lot of activity and discussion about reusing Parcel P at the Diablo Canyon area. And I think there's an assumption that some reuses could occur before 2040, in the midst of decommissioning.

And so, I guess I'm just trying to get clarity. When you talk about the reuse of Parcel P, are you saying nothing like this is going to happen until 2040 at a minimum?

MS. STRACHAN: Thank you Kara. That's a good question. Not necessarily. It was just trying to put it in perspective that generally speaking these uses are post-decommissioning; but you're right. If there's something that could potentially occur sooner than that, this wouldn't preclude that from happening.

KARA WOODRUFF: Okay. Thank you.

MS. BLEWITT: We have an additional raised hand. Sherri Danoff. Please unmute yourself.

SHERRY DANOFF: Yes. Thank you. I'm wondering if the analysis of future uses and specific to resort hotel would include access. And I bring that up because access through Avila Beach on weekends and particularly during warm weather seasons is already over capacity and a resort hotel would have access through Avila. So would that be considered?

MS. STRACHAN: It would need to, again, at a high level, assume a certain amount of traffic. So, that would need to be part of the analysis.

SHERRY DANOFF: Okay. Thank you.

MS. BLEWITT: Are there any other questions regarding the reuse concepts?

Susan Harvey. Please unmute yourself.

Susan Harvey: Hi, thank you. Are you anticipating that this analysis of future use is going to lead to a development agreement now? It seems a little premature.

MS. STRACHAN: No, it's not. It's literally just to do an evaluation, again, at a very high level to give an indication of what could be potential issues or impacts associated with any of these concepts.

SUSAN HARVEY: Okay. Thank you.

MS. STRACHAN: So it's for information purposes. That is probably the best way to say it.

SUSAN HARVEY: Thank you.

MS. BLEWITT: Are there any other questions related to the reuse concepts? I see none.

MS. STRACHAN: Thank you, Sandra.

MS. BLEWITT: Wait. There was a hand, but then it went away. You can move on. Sorry.

MS. STRACHAN: Maybe we should ask Matt because he had a question at the very beginning.

MS. BLEWITT: I think that's who raised their hand and then took it away. Matt, if you want to raise your hand again. Perhaps later.

MS. ALARCON-LOPEZ: Okay. Thank you. What I'm going to do is give you just a very quick overview of the environmental impact review process. As Susan mentioned, I'm Sandra Alarcon-Lopez. I'm with Aspen Environmental Group. And we are working with the County on the preparation of the environmental impact report. In terms of the actual document, there were just a couple of things that we wanted to bring up and they're listed here on this slide.

Number one, the County recognizes that this is a discretionary approval and it is one that has the potential to cause impacts. And for that reason as the lead agency for the environmental document and for CEQA review, they've decided to move forward with an environmental impact report.

As allowed under the California Environmental Quality Act or CEQA, the lead agency can move forward with the preparation of the document even without the initial study. And that's what we're doing in order to move forward in the process.

This next slide gives you an idea of the different steps. And this is only the environmental review process. And one thing that we would like to do is just to let you know is that we're at the early stages of the process. As you see here, we're at the public scoping period. We.

Have five scoping meetings that we're putting forth. This is the third one in the series. We're presenting the same content, same information at all three meetings. There will be other opportunities for the public to participate in the environmental document. We're only at the early stages.

Once we get everybody's input and comments on the document, any ideas or information that you have for us, we'll prepare a draft environmental impact report. When that document is released, it'll give the public another opportunity to look at the project potential impacts and those type of issues.

In addition, there will be public hearings associated with the project. And that's after we've had an opportunity to take comments on the public document, the draft environmental document and then prepare a final environmental impact report. When we prepare this final document, we will respond to all of the written comments and all the comments that we receive on the draft document. So that will include both the draft EIR and any issues or comments that are presented.

This generally gives you information about the content that is going to be included in the environmental document. We're going to have a detailed description of PG&E's proposed project. And for all of the environmental issue areas that we're going to evaluate and discuss in the document, we're going to provide an environmental and regulatory section for each of those issues.

We're also going to look at impacts, what impacts to air, water, other issues are going to result from the proposed project. And when we're talking about the proposed project, we're talking about PG&E's project as described in their application to the County. We're also going to identify and evaluate any alternatives.

As part of CEQA, we have to look at what alternatives could easily be implemented to reduce significant impacts of PG&E's project. We also talked a little bit earlier about future use concepts. That's something that the County would like to include in the environmental document. And we're going to look at those issues in a separate chapter in the EIR because they are done, as Susan mentioned earlier, for information purposes.

There are a number of different issues that are being evaluated in the environmental document. They're listed on this particular slide. And I think that the key issue here is that we haven't made any decisions on any of these issues yet. We're in the preliminary stages of the environmental document.

We've been evaluating and looking at a number of different technical reports for the project site. And then we've also been coordinating with responsible agencies. So some of the issues that you see here like these right here are issues that are also going to apply to some of the responsible agencies, like the State Lands Commission and Coastal Commission that we'll evaluate and look at in the environmental document.

One of the issues that we wanted to specifically just mention, because it's come up several times in some of the community meetings, is NRC or Nuclear Regulatory Emission Preemption and the discussion of the radiological hazards.

The NRC has exclusive authority over that issue, meaning that they regulate how the material is handled, stored, transported, all components of managing that particular material and waste. And so when we're talking about how that's going to be looked at and presented in the environmental document, we will discuss it because the County has to look at the whole of the action.

What is the entire project and how is that going to be addressed in the document? So we will present the NRC requirements and we'll also identify some of the safety plans that are in place to meet some of those NRC requirements. We had the one slide that included all of the different issues that are being considered in the environmental document.

And one thing we wanted to just relay is that when we're looking at these different issue areas, we need to be comprehensive and we're going to look any direct, indirect, cumulative or growth-inducing effects of those issue areas. We're going to look and evaluate significant impacts that we think could potentially result from the proposed project.

Where we can, we're going to look at mitigation measures to reduce impact and we're going to look at social and economic issues; but they're not considered significant under CEQA. They're just for information purposes.

One thing that I did want to point out that I forgot to mention in the previous slide is that when we are looking at radiological hazards, we're going to use a very similar approach to one that we used on the SONGS EIR, and that is to look at and document what NRC requires and what is actually being implemented by PG&E at the site.

One of the key issues that we're looking at and that's required in the evaluation is the evaluation of alternatives. When we're looking at and identifying alternatives, we look at what are the objectives of the project, how could we find an alternative to the project that meets those objectives but also reduces potential impacts, and we also look at the feasibility of an alternative. Is it really a viable alternative to replace the project?

We also have to look at under CEQA the no-project alternative. For this project that's a little bit tricky because they've already moved forward with decommission, so to speak. And there is really no action alternative. So one of the alternatives of PG&E is pushing forward the safe store, which allows them to decommission over extended period of time, which is roughly about 60 years.

The alternatives in the CEQA document are evaluated and less detailed than the proposed project and that's in general. But we may find, depending on the different alternatives that we look at, that some may need additional evaluation. And this is one area where if you have any input, we'd like your input on those alternatives.

With that, we'll open it up for any questions on the EIR process.

MS. BLEWITT: We have several raised hands. We'll start with Carl Wurtz.

CARL WURTZ: Hi. Thank you. Ms. Alarcon-Lopez said that the evaluation of an EIR is a little tricky because, I believe she said that, decommissioning process has already begun. That can't happen because the environmental impact report needs to be approved before decommissioning can begin, even though formally the process, the legal process has begun. Decommissioning has not.

Let's get that straight right now because we cannot begin decommissioning until the EIR has been approved.

MS. ALARCON-LOPEZ: Right. And you're correct on that. I should have said that it's the licensing portion of it, not the decommissioning. The decommissioning is what we're evaluating in the environmental document. So I misspoke on that. So I apologize.

CARL WURTZ: I just wanted to mention too that I was encouraged to see that Aspen plans to examine the effects on climate change of this project because that's essential. Thank you.

MS. ALARCON-LOPEZ: Lisa, are there any other comments? Tom has his hand up.

MR. JONES: Yeah, I just wanted to clarify quickly, when Sandra was going over some items, she referenced safe store and just the language I want to be clear that we've put that in as a request for the alternatives analysis, but that is not something we are seeking.

Our goal is to go directly into decommissioning discretionary permits between now and 2024. So while it's part of the alternative analysis and should be responsible to do, but that's not the company's preference. I just don't want there to be confusion of that.

MS. ALARCON-LOPEZ: Thank you for clarifying that. That's true. And I did mention it under the alternatives, so I apologize if it was unclear, it was in a proposed alternative.

MS. STRACHAN: Sandra, I think we may have lost Lisa.

MS. ALARCON-LOPEZ: Yes, we did. We're fine. I do see that Carl has his hand up.

CARL WURTZ: I just lowered it. I think my question was answered. Thanks.

MS. ALARCON-LOPEZ: Okay. Susan Harvey, I'm going to unmute you.

SUSAN HARVEY: Hi. Excuse me. Thank you. I noticed in the description, project description, there was a reference to ministerial permits that would be issued. And I'm wondering if you will describe what those are going to be and also what potential impacts there might be from ministerial permits, because there's no indication of what that might encompass in the project description.

MS. ALARCON-LOPEZ: Ministerial permits would typically be building permits, demolition permits when we speak of ministerial permits tied with an effort like this.

SUSAN HARVEY: So I'd like to see an analysis done of what those impacts might be and what those ministerial permits might be in the EIR. Thank you.

MS. ALARCON-LOPEZ: Thank you. One second here. Jack Krasner, I'm going to unmute you if you could give us your comment.

JACK KRASNER: Thank you very much. My

question is regarding the waste storage. So this presumes that the decommissioning will go forward as cautious as I am about that. Will the EIR include comments on monitoring the ongoing materials to assure that if there's any escape or any hazards to the environment, that there'll be the most modern techniques to detect such issues?

MS. ALARCON-LOPEZ: Sorry we had somebody that lost connection. But yes, we will look at monitoring from the sense of potential mitigation measures and evaluate it in that regard if we find a particular impact that could potentially be one of the mitigation measures that are looked at and evaluated in the environmental document.

JACK KRASNER: Thank you.

SUSAN STRACHAN: I just want make sure I'm clear, because you mentioned waste storage, any waste storage tied to the spent fuel or the greater than Class C waste and monitoring requirements associated with that are under the purview of the Nuclear Regulatory Commission. And again, as Sandra said, there's preemption issues there the EIR will nevertheless identify those federal requirements, but again that's under the monitorings of NRC requirement.

JACK KRASNER: Got it. Thank you.

MS. BLEWITT: So I also have a question from McKayla. Sandra, you'll have to unmute her.

MCKAYLA: Hello. I had a question regarding how alternatives versus reuse options are going to be analyzed and if they'll be completely separate or would there be opportunities for those to overlap and how that would be approached?

MS. STRACHAN: Want me to tackle that one, Sandra?

MS. ALARCON-LOPEZ: Sure.

MS. STRACHAN: They're separate. So the reuse concept is a completely separate section of the document. Again, looking at a high level what reuse possibilities there are and what could be potential impacts associated with those, the decommissioning alternatives would be in a separate sequel, required alternative section of the EIR that would speak directly to alternatives to the decommissioning effort.

MCKAYLA: Okay. So if a reuse option provided a less environmentally impactful option because of reuse of infrastructure, what have you, that would be within the reuse plan?

MS. ALARCON-LOPEZ: Yes, correct, and completely separate from the decommissioning alternative section.

MCKAYLA: Okay. Thank you.

MS. BLEWITT: Thank you, McKayla. We also have a raised hand from Sherri Danoff.

SHERRI DANOFF: Okay. Am I unmuted?

MS. BLEWITT: Yes.

SHERRI DANOFF: Okay. I have concern about storage of spent fuel, storage and casks and the existing area where it's stored. Is there any possibility of evaluating containment for at least the existing casks, which as I understand it are subject to sea air corrosion?

Also, I've read a recent report that has a lot of concern about safety and vulnerability of the current location because it's not under containment. So this is an NRC issue, but how might this be handled in the EIR?

MS. STRACHAN: I appreciate the question that what we need to keep in mind is that the ISFSI has already been permitted. So it's more included under baseline, because it's already there and it's already been permitted as a previous project. The EIR would not get into discussing existing issues with regard to THE ISFSI. Any safety concerns, et cetera, like you're raising, would need to be raised with the NRC.

SHERRI DANOFF: Susan, I'm not sure where it is in the process, but PG&E very recently was applying for a new permit for the ISFSI. If I'm remembering correctly, the earlier one is expiring. Tom is available to clarify that for me.

MS. STRACHAN: Tom, why don't clarify the NRC license issue.

MR. JONES: Yeah, thanks. So there's a nuance here. So we also completed this activity at Humboldt Bay. There's no impact or change to the coastal resource.

The permits from a land-use perspective from both the County and Coastal Commission were looked at in perpetuity. The NRC, however, gives you license for specific durations, originally 20, and then up to a removal of 40 years. So that licensing activity will result in a referral to the Coastal Commission; but, for instance, in the Humboldt Bay project because there was no impact or change of use to the coastal resource and it was a continuation of the current use, there was no permit issued.

It's called CZMA, a Coastal Zone Management Act. And the Federal Government will refer to a state jurisdiction, but it did not require a coastal development permit. It's strictly a licensing activity.

SHERRI DANOFF: Okay. Thank you, Tom and Susan.

MS. BLEWITT: Thank you, Sherri. We also have question from Will Almas.

WILL ALMAS: Hello.

MS. BLEWITT: Yes.

WILL ALMAS: I'm unmuted?

MS. BLEWITT: Yes.

WILL ALMAS: Yes. This question pertains to nonradiological and nonhazardous waste generated by the decommissioning activities. It's my understanding that there is some mandate letter, some governmental directive that at nuclear plants waste of that nature that is nonhazardous and nonradiological will not be left on site.

I'd like to see an analysis of the carbon footprint and the necessity really getting down the necessity and alternative of disposal of particularly clean concrete on the site to reduce the carbon footprint of the decommissioning activities. So that would be a concern of mine and I hope you can look into that.

And I'd be interested if you can give some background or if you are aware of a mandate by the State of California that would prohibit you from going through that during the CEQA process.

MS. BLEWITT: Thank you, Will. We also have a

question from Gene Nelson.
GENE NELSON: Yeah. I just wanted to make sure that my public comments had been registered. I emailed them to Susan earlier this morning, so I just wanted to confirm they're being received and that they will become part of the record.
MS. STRACHAN: Gene, I'm checking now. You just sent?
GENE NELSON: They were sent earlier this morning.
MS. STRACHAN: Okay. We'll double check. Did you send them to me or to --
GENE NELSON: I sent them to the general --
MS. STRACHAN: Okay. I'm sure we have them. I can't check right now because you sent to that before.
GENE NELSON: Right. Good deal. In other words, we do anticipate that we will be litigating this issue. I'm the legal assistant for Californians for Green Nuclear Power, Incorporated, and the entire problem is that you folks are doing the same thing they did at SONGS, which is to improperly exclude from the scope cessation of plant operation and adverse environmental consequences.
And today I talked about some adverse consequences related to public welfare and safety. So I

appreciate your acknowledgement at least that I've sent to this email address at a prior time.

MS. BLEWITT: Thank you, Gene. And just as a reminder, if you need to raise your hand and you're on the phone, you should press star 9 to raise your hand, if you have any questions regarding the EIR process. I see no more raised hands with respect to the EIR process at this time.

MS. STRACHAN: Go ahead, Sandra. You want to cover it?

MS. ALARCON-LOPEZ: So what we want to do now is actually open it up for official comments. We had some Q and A, and I hope that didn't get too confusing in terms of the Q and A versus the actual comments, but we're now going to open it up for actual scoping comments.

We want to get your input on the scope and content of EIR. Any local environmental knowledge that you think we ought to be aware of or consider, any issues that you think need evaluation or are issues that you think are not being addressed, any alternatives that you think we ought to consider with regard to PG&E's proposed project and any mitigation measures that you think we ought to take into consideration to avoid or reduce impacts of the proposed project.

We also had mentioned earlier the reuse concepts. If you have any comments on those, we'd be happy to take them during this period as well. We wanted to specifically remind you that now when we get into this formal process, we're literally just going to take one comment after another.

When you raise your hand, it'll come into a certain order. We'll call your name and if you could state your name and affiliation for the record we would appreciate that. We're going to limit any comments to three minutes if we get a lot of commentaries. If you're joining by phone, we do see that one person joined by phone. If you could raise your hand by pressing star 9 and you can unmute yourself by pressing star 6.

The raise-hand feature that you see here on the slide, if you just put your cursor to the bottom of your screen, you'll see all the tools associated with Zoom.

We will go ahead and open it up now for comments. If you could raise your hand and let us know your comments and just as for your information, as we noted earlier, we are recording this particular meeting and we will take into account all of the questions and comments that we've gotten this far.

If you have any other questions, please present them at this time. And we're going to leave this slide up during the comment period so that you can see the information regarding where you can email a comment or mail a comment on this particular project. With that, I'll turn it over to Lisa.

MS. BLEWITT: Thank you, Sandra. We have our first commenter, Matt Downing. Please state your name and affiliation, for the record, and then provide your comment.

MATT DOWNING: Certainly thank you. Hopefully you can all hear me. My name is Matt Downing. I'm the Community Development Director for the City of Pismo Beach. The City is a responsible agency for this project and we are very grateful for the partnership with the County up to this point, specifically to Susan and to Cindy for reaching out to us.

Similar to Santa Maria, we will be requesting that the scoping period be extended. We've been requesting to meet with PG&E representatives to better understand the work that's proposed in the City. And while that hasn't happened yet, we do look forward to that occurring.

The EIR should take a look at the traffic circulation in the city including any necessary signals or other traffic control devices that are necessary.

Additionally, we need to know the potential impacts to our public safety with our police and fire stations being on Bellow Street. The EIR should study air quality impacts associated with truck trips and additional train hauling trips through the city. And then connected to these impacts, our impacts to sensitive receptors in the area.

So the Pismo Beach rail yard is located in close proximity to Judkins Middle School and multifamily and single family residences to the southeast of Price Canyon Road. And so, we need to know the impacts to those folks, and included air quality, GHG noise impact to these sensitive receptors as well.

We also know that this area is very culturally significant and next to known cultural sites. And so, we need to determine any improvements at the rail yard should identify any cultural impacts through those resources as well. Tied to that, it's in close proximity to Pismo Creek. So any improvements need to be looked at in relation to the flood plain in that area.

And then lastly, we want to commend the County for taking a look at future uses of the site as the decommissioning occurs. And really, we need to understand the access to the area is one way in, one way out, and can have significant impacts to the city circulation at the north end of town and along our frontage road.

So, I have other comments on the user potential uses, but those aren't related. So I'll just leave those for a later days. So, thank you all very much for your time and for this opportunity.

MS. BLEWITT: Thank you, Matt.

KRIS VARDIS: All right. Excuse me. This is Kris Vardis. Can I interject? I just wanted to provide a couple items. First is that we will be meeting with the City of Pismo Beach today. We have a meeting scheduled at this afternoon. We will be meeting with representatives from the City of Santa Maria on the 16th. So, I just wanted to make that clear.

MS. BLEWITT: Thank you, Kris and Matt. We also have raised hand from Kara Woodruff. Please state your name and affiliation for the record.

KARA WOODRUFF: I'm Kara Woodruff and I'm a member of the Diablo Canyon Decommissioning Engagement Panel. But my comments here today are just as an individual. I'm going to be submitting written comments on the scoping documents, but I wanted to just briefly state the four points that I was hoping to provide into the record.

The first, when you take a look at the project description, it's Section 3.3.4, the environmental analysis paragraph. It says that the EIR process will really look at two activities. Number one, decontamination and demolition and, Number 2, the transportation of debris. But really, there's two other items that have to be included.

KARA WOODRUFF: And I see there's a lot of language elsewhere that suggests you're going to make this discussion broader, but this particular paragraph only lists those two. And clearly you also need to take a look at the impacts related to the new facilities that will be constructed. Number 4 related to the retention of certain facilities that were initially intended when they built to be removed upon decommissioning.

So really your environmental analysis has to have really all four of these activities squarely addressed, not just the two that are mentioned in the document.

Second point is, under the project setting there is some discussion about the context or the decommissioning, et cetera, but you really don't go into hardly any detail about the significant community-based activities that will inform decommissioning and the future of this land.

So, for example, the Diablo Canyon Decommissioning Engagement panel has been engaged now well over three years, talking about decommissioning, offered many public meetings with people for an opportunity to make comment. And a lot of those comments were contained in the strategic vision document, which is available on our website. I don't see really any real reference to that in your analysis and I'm hoping to conclude it.

Also, there has been a lot of discussion and community activity centered around the future of the Diablo Canyon Lands. There's a document called the Conservation Framework, which is at the website, diablocanyonlands.org. It contains a lot of information about the land and the future of it and I really think that your document should reflect that history, as well.

And finally, in the year 2000 the County voters voted for the Dream Initiative, which called for the conservation of the land post-decommissioning. I think that also should be referenced.

My third point is regarding project mitigation. You do very briefly discuss the prior coastal development permits for Parcel P projects, but you really don't give it enough attention. And I think it's incredibly important knowing what the past is regarding the mitigation and figuring out what you're going to do in the future.

And so, I would suggest that you go into greater detail about what permits were issued and what was a legal basis for those mitigation measures, which include the Pecho Coast Trail or the Sean Trail and the 1200 acres at Point San Louis. I think that's really important to understand the concept of mitigation. And without it, you're really not providing sufficient analysis for the decision-makers on this issue.

And then my final point is regarding the ISFSI, dry cast storage site. I know there is debate about whether the mitigation for that site was intended to be mitigation to ask in perpetuity or whether it was just for a shorter period of time.

I think this is something that the County should take a close look at. Things have changed since that permit was issued. And I think we now have a much better idea that it's likely that those dry cast storage sites will stay on site for a lot longer than anybody anticipated. And I don't think it's accurate to simply say that that mitigation was done in perpetuity.

It's a very complex record with the Coastal Commission and I encourage you to look at it, because there's a lot of conflicting language at those different directions.

Again, I'll be submitting more formal detail comments by email, but that's a summary of what I'll be talking about. Thanks for your time.

MS. BLEWITT: Thank you, Kara. We also have a commenter, Mike. Please state your full name and affiliation for the record.

MIKE GATTO: Thank you everybody. This is Mike Gatto. I'm an attorney for Californians for Green Nuclear Power, which is a local-based environmental nonprofit. We have several concerns, but I'm going to focus today on the most CEQA-related one.

As many of you know, CEQA is a very comprehensive statute and it's very difficult to deal with. And as somebody who, like myself, has been on your end of the table, I understand that it is daunting when you have to go it through all the various CEQA considerations. But CEQA was revised in 2018 and it added to the list of things that you must consider when reviewing a project like this.

And the main ones that we have a concern with are the global effects for greenhouse gas emissions in the context of decommissioning the global effects on climate change, what could happen to the state as a whole with respect to greenhouse gas emissions that result from taking 9.9 percent of GHG-free power off the table here in California?

The County is going to be responsible for taking that analysis or making that analysis. It must consider what the alternatives are going to be. And I realize this is difficult for a County to take this on, because obviously the County is not involved in planning power for the state as a whole and it's not responsible for -- it has no jurisdiction over worldwide climate change concerns.

But the 2018 amendments to CEQA do require the County in the context of this project to consider what will happen for greenhouse gas emissions if and when Diablo Canyon is taken offline. That means making sure that there is accurate data in the record as to where the State purports to get the alternative power.

This is a very important part of your task and it's part of your impacts analysis and it should be something that should be prioritized in these documents.

The other thing we want to highlight is that with respect to offering adequate CEQA alternatives, we believe that a no-project alternative should be something that is considered very thoroughly; that, of course, is because we are concerned that this proposed decommissioning would have dire effects on greenhouse gas emissions in the state of California as a whole and for the globe.

So, that's a summary of our concerns. We too will be submitting them in writing and making sure that we follow the process closely, but we respect that you have a very tough project ahead of you, a very tough task ahead of you. It's very thorough and it's a lot of work. We don't mean to add to it, but it is the law. It has been the law since January 1st, 2019 that these considerations must be part of your analysis. Thank you very much.

MS. BLEWITT: Thank you, Mike. And just for the record, can you spell your last name?

MIKE GATTO: Yes. It's G as in George, A as in apple, two Ts like Tom, O as in Oscar. And we submitted a letter with some of these themes in July of 2021 relatively soon after the submissions process opened. And we'll make sure that we get this letter in the official record to the extent that it's not already with some additional comments very shortly.

MS. BLEWITT: Great. Thank you so much.

MIKE GATTO: Thank you.

MS. BLEWITT: Are there any other scoping comments at this time? Again, if you're dialing in through your phone, please press star 9 to raise your hand. I do not see any other raised hands at this time.

MS. STRACHAN: Okay. Thank you, Lisa. We'll put up the last slide. So I want to thank all of you for participating in the meeting, your questions, your comments. As I mentioned at the beginning, a recording of the meeting will be added to the Diablo Decommissioning webpage. That is a page within the Planning and Building County webpage.

In addition, the PowerPoint is actually already on that webpage right in the same vicinity as the recordings of our previous two meetings. So, once again, I want to thank you for your participation. We really appreciate it and that will conclude today's meeting. Thank you. I'm going to go ahead and stop the recording. Thank you everyone for your participation. Thank you.

CERTIFICATE

I, the undersigned, a Certified Shorthand Reporter of the State of California, do hereby certify:

That the foregoing proceedings were taken before me at the time and place herein set forth; that a verbatim record of the proceedings was made by me using machine shorthand which was thereafter transcribed under my direction; further, that the foregoing is an accurate transcription thereof.

I further certify that I am neither financially interested in the action nor a relative or employee of any attorney of any of the parties.

IN WITNESS WHEREOF, I have this date subscribed my name this 13th day of December, 2021.

michele watson

MICHELE WATSON, CSR
CSR No. 8359

Appendix B4.5

Transcript – Scoping Meeting December 1, 2021
6:00 PM

DIABLO CANYON DECOMMISSIONING PROJECT

PUBLIC MEETING

WEB VIDEOCONFERENCE

WEDNESDAY, DECEMBER 1, 2021, 6:00 P.M.

Michele Watson

CSR No. 8359

Job No. 24704B

WEDNESDAY, DECEMBER 1, 2021, 6:00 P.M

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MS. ALARCON-LOPEZ: This is the public scoping meeting for the Diablo Canyon Decommissioning Project at 6:00 p.m. and we're going to go ahead and start the meeting and I'll turn it over to Susan Strachan of the County of San Luis Obispo.

MS. STRACHAN: Thank you, Sandra. Hi, everyone. I'm Susan Strachan and I'm with San Luis Obispo County. I'm overseeing the permitting effort for the Diablo decommissioning for the County. And I want to thank you all for joining us tonight for the scoping meeting.

Sandra, could I have the first slide, please. I just want to go through how you participate via zoom. First of all, all attendees will be muted during the presentation. We will have some question and answer periods and then a period at the end to receive scoping comments. If you're participating via zoom, you use the raise hand feature and we will call on you to speak during the Q&A and at the end of the presentation for the scoping meetings or scoping comments. If you're participating by phone, you'll press zero star 9 to raise your hand and then when called on press star 6 to unmute.

I do want to point out the meeting is being recorded and that the recording of this and all the scoping meetings that we're holding will be posted to the County Planning and Building webpage specifically on the Diablo Decommissioning page. And we'll repeat these instructions as we get to the point of making comments. Next slide please.

So I want to start by going through the agenda for today or tonight. We'll do some introductions and then we'll give an overview of PG&E's proposed decommissioning project. And then we'll have a period of question and answers on that project description. We'll then get into what is an analysis that'll be included in the environmental impact report. It's something that the County is doing on feature site reuse concepts. And again, after that we'll have a question and answer period. Sandra will then get into a description of the EIR process, followed by a question-and-answer period. And then lastly, we will open it up to take scoping comments.

Next slide, please. So for introductions again, I'm Susan Strachan, I'm Nuclear Power Plant Decommissioning Manager. With us also is Cindy Chambers, who's a senior planner with the County helping out on the decommissioning effort. And then we have

Aspen Environmental Group. Aspen is the environmental consulting firm who will be preparing the environmental impact report.

I want to point out that Aspen also prepared the environmental impact report for the San Onofre Nuclear Power Plant Decommissioning. So we're thrilled to have them working on this project also. With us is Sandra Alarcon-Lopez who's the EIR project manager, and then also Lisa Blewitt, who is the deputy project manager with Aspen.

And then we also have representatives from PG&E who will be available to answer questions when we get to that phase of the presentation.

Next slide, please. So the purpose of the meeting and scoping, first of all, the California Environmental Quality Act requires that there be a 30-day scoping period. For this project, the scoping period is actually 40 days because the 30th day fell the day after Thanksgiving. So we went ahead and extended it for another week.

So the comment period began on October 28th and ends at 5:00 on December 6th. The scoping meetings are required for when there's a project of statewide, regional or area wide significance. And the meetings provide an opportunity for the agencies and public to provide input and comment on the scope and content of the EIR.

Three ways that comments can be provided. They can be provided orally at a scoping meeting, such as this one, or they can be provided in writing either by U.S. mail or email. And when we get to the scoping part of the meeting, we'll have that information available in case you're interested in making comments via U.S. mail or email.

The scoping meeting also provides an opportunity to provide input on project alternatives, evaluation methods, and mitigation measures. Next slide please, Sandra.

So I'm going to talk about the project description. I'll get into some background, jurisdiction of different agencies, talk about the power plant decommissioning, and then speak to some proposed offsite locations for waste transportation. Next slide.

MS. STRACHAN: So PG&E submitted its land use application to the County on March 29th. There's a portion of the site in the coastal zone and then a portion outside of the coastal zone, so they applied for permits that cover both, meaning a development plan, coastal development permit for that portion in the coastal zone and a conditional use permit for the portion that's outside of the coastal zone.

So when the County receives an application, it sends out referrals to different agencies to get their input. And then we undergo a 30-day review of the application. At the close of the 30 days, we submitted a letter to PG&E requesting additional information that we needed in the application in order to accept it.

And then PG&E filed an application supplement, addressing those comments and then also making some project description modifications on July 8th, 2021. We then again went through that 30-day review where we submitted referral letters to the agencies and issued a County comment letter on August 9th.

Again, PG&E responded on October 6th and then the County accepted PG&E's application on October 27th. We then issued the notice of preparation on October 28th, which is when the scoping period was initiated. Next slide, please.

So this is a general vicinity site slide. The yellow shows PG&E Diablo, or I should say Diablo Canyon Lands, owned by either PG&E or Eureka Energy, which is a subsidiary PG&E. And then the blue is the Diablo Canyon power plant site boundary. So it is in between, we have Morro Bay to the north and then Pismo and Avila to the south. Next slide.

And this is an aerial of the power plant. The red boundary is plant boundary based on NRC jurisdiction. And this is gives you a good view of the project features and I'll get into more specifics of the decommissioning effort associated with the site. Next slide, Sandra.

So as I mentioned, there's a portion of the site in the coastal zone and a portion outside. The yellow line is the demarcation of the coastal zone. So the area in green below it is that portion of the site in the coastal zone. The area in brown above it, is the area outside of the coastal zone.

When you head over to the water, there's an area a little bit difficult to see because it's in blue, but this is where you have Coastal Commission jurisdiction, original jurisdiction and the State Land's Commission jurisdiction. And again, the red boundary is tied to the Nuclear Regulatory Commission's jurisdiction. Next slide.

As I mentioned the County as the lead agency has the responsibility for preparing the environmental impact report. California Coastal Commission will issue a coastal development permit or consider issuing a coastal development permit. They're also in the appeal jurisdiction for the County's coastal development permit, meaning that any permit approved by the County can then be appealed to the Coastal Commission.

For the State Lands Commission, either a new lease or lease amendment will be applied for, and then the Nuclear Regulatory Commission oversees the decommissioning process, clean up and removal of radioactive structures and systems, the transfer of spent fuel and the termination of the Part 50 license. Next slide.

So some dates associated with decommissioning, the unit 1 Nuclear Regulatory license terminates on November 2nd, 2024, and then unit two license expires in August of 2025. PG&E has started a license renewal effort to extend the terms of these licenses, but in 2016 stopped that effort.

In 2018, the California Public Utilities Commission approved the retirement of the Diablo Canyon power plant. And at that point, then PG&E started doing work on studies, et cetera that were necessary for the various permit applications. PG&E proposes to begin the decommissioning and dismantling effort in beginning in 2024. Next slide.

PG&E has established two phases for the decommissioning effort. Phase 1 is 2024 to 2031. The bulk of the decommissioning activities will occur during this phase. It begins with pre-planning activities and then includes the removal of structures, the decontamination, et cetera, that'll happen again the bulk of that in phase 1.

Phase 2 is from 2032 to 2039. During that phase they'll complete soil remediation activities, do final status surveys. These are NRC required surveys to ensure that the site meets the established radiological release criteria, and then do the final restoration of the site. Next slide.

Now, the decommissioning effort does include the decontamination and demolition of infrastructure, buildings and structures, but it does also propose to retain some of the structures on site. PG&E also intends to construct some new buildings and structures and what would be a future PG&E owner-controlled area.

And then as part of the decommissioning area or effort, installation of temporary infrastructure and buildings has to occur. And again, there will be the use of some offsite rail loading facilities tied to the transportation of waste materials. Next slide.

So in this slide, the roads marked in black are proposed to stay post decommissioning. And then the areas identified in red are also features that are proposed to stay. So down by the water, you have the two breakwaters and then the smaller rectangle is where the intake structure is.

So the intake structure would be sealed so no water can come in there and the equipment, et cetera, would be removed from the top of it, but the actual concrete structure would remain. And then heading up on the site, the rectangle there, on the ISFSI, that's the Independent Spent Fuel Storage Installation, that's where the spent fuel is stored.

This was a previously permitted facility. There's spent fuel stored there now. The spent fuel that is in the reactors now, in the spent fuel pool now, will be transferred up to that. This has been stored there, since there's not a federal disposal repository, that fuel needs to stay until there is a place where it can be removed and disposed of offsite.

The two raw water reservoirs would stay. There's a 230KV switch yard which would remain and then a 500KV switch yard, which is proposed to remain. Next slide.

As I mentioned, there's also some new construction that's in plan for this owner-controlled area. And the owner-controlled area basically covers these features that are in this particular slide. The green shows new buildings that would be constructed.

One of these is referred to as a Greater-than-Class-C waste facility, where it says waste storage facility on the slide.

This will store reactor internals and process waste. And again, similar to the spent fuel, there's no federal repository to take this fuel, so it will remain on site until there is some place where it can be disposed of offsite. PG&E also proposes to build a new security building and a new indoor firing range. Next slide.

So this slide represents basically a site layout for decontamination effort at the lower portion of the site. Over on the left, you can see the reactors and the turbine building, which will come out. But the decommissioning effort involves use of existing buildings for decommissioning workers, construction trailers, again for offices for decommissioning workers, and then also in it involves the modification to existing buildings to accommodate the decommissioning efforts.

So for example, that big orange rectangle is the main warehouse for the power plant, and that would be modified to create a waste handling facility to segregate, stockpile and package contaminated soil for transport. Next to it, that yellow building is the Flex equipment storage building. That building is supposed to be modified to be a lab for testing soil samples.

So this slide, again, just gives an indication of what is involved in decommissioning in terms of making use of existing structures or modifying existing structures to accommodate the decommissioning effort. Next slide.

So just to list some of the details tied with the decommissioning effort during phase 1, again, there'd be temporary infrastructure, building modifications, decontamination and demolition of buildings, construction of the new buildings and structures in that future PG&E owner controlled area.

The spent fuel and the Greater-than-Class-C waste would be transferred to the existing ISFSI and the new Greater-than-Class-C waste storage facility. And the discharge structure would also be removed and restored. The next slide has a visual of that. Next slide, please.

So this is a picture of the discharge structure during construction. This structure is located on the edge of the water and it will be removed as part of the decommissioning effort. The slide next to it is a profile view of that structure. Next slide.

The picture to the right there shows that to actually remove it, a cofferdam has to be installed. That's represented by those circular circles down there. And it creates basically a barrier for water so the water can be taken out of that area so that the workers are working in a dry environment to remove the discharge structure.

So in addition to the removal of that structure and restoration of that area, also in phase 1, there would be the removal of the nuclear reactor, pressure vessels, internal steam generators. Site characterization would be done to identify contaminated areas.

Of those areas identified, remediation would occur. And again, the NRC required final status surveys would happen. And then for the offsite rail yards, modifications to those rail yards would occur during this time period and they would be utilized during the same period. Next slide.

So for phase 2 efforts, and this is from the 2032 to 2039 timeframe, soil remediation would continue to happen, final status surveys would continue, remaining infrastructure would be removed and then the restoration of the site would happen. So this includes revegetation of the site, installation of a storm water management system to handle the runoff.

Once the vegetation is put in, then there's ongoing monitoring to make sure that it's taking place and growing appropriately. The NRC license covering the site would be terminated and PG&E would then transition to an ISFSI and Greater-than-Class-C storage facility in that owner-controlled area.

Now, I want to talk a few minutes about decommissioning waste transportation. So there are three transportation modes that have been identified. One is by barge. And the reason the barge transportation is part of the project is, because of you can take a large volume and a lot of weight and transport it by barge. It then reduces the number of trucks that would otherwise transport the waste.

PG&E has used barge transportation before. The picture is of steam generators that were brought on site when PG&E did its steam generator replacement project. Another mode of transportation is truck. Trucking materials directly from the site to a disposal facility and then also truck to rail. So this is taking it by truck to one of the proposed offsite rail facilities that we'll talk about next. Next slide, please.

So there's three facilities listed. This slide shows where they are in relation to the Diablo Canyon power plant. One of the sites is the in the City of

Pismo Beach. It would be used as a contingency and it would only take nonradioactive, nonhazardous waste.

Second facility is within the City of Santa Maria referred to as the Osborne yard. And then the third is in the unincorporated County in the Northern part of the incorporated County of Santa Barbara, known as the Betteravia Industrial Park. Next slide.

So this is an aerial of the Pismo Beach rail yard site. It's property owned and used by PG&E. It's right off of Price Canyon road. And again, the site would be used as a contingency for nonhazardous and nonradioactive waste.

Again, on any of these sites, trucks would come in, they would offload the material from the truck onto rail cars, and then it would be transported by rail to a disposal facility. Next slide.

And these show the locations of the two rail sites. Again, Osborn site is in the city of Santa Maria, close to Stowell Road. And then the other is off of Betteravia, the Betteravia Industrial Park. Both of these sites are being evaluated in the environmental impact report, however, only one of them will be selected and used.

So that concludes the project description presentation. And we'll take questions. And again, if you're participating via zoom, use the raise hand feature and we'll call on you to speak. If you're joining by phone, press star 9, to raise your hand and when called on press star 6 to unmute.

MS. BLEWITT: Again, I'd like to reiterate that this portion of the presentation is associated with questions on the proposed project itself. Later on, we will take comment for scoping. We have one person right now with a raised hand, Eric Greening. I need to promote him to panelists since he's using an older version of Zoom.

ERIC GREENING: Thank you. Hello. I'm Eric Greening. Can you hear me?

MS. BLEWITT: Yes.

ERIC GREENING: Okay. Thank you. And of course, I appreciate it. I attended an earlier scoping session as well, and I appreciate your sharing of the information and willingness to answer questions.

During the last few weeks of the scoping period, there have been some surprising developments outside the universe of the scoping period at every level from local officials, a State assembly member, Terry Prosper, a spokesperson for the PUC, and even Jennifer Granholm seeming to encourage a sort of a rising tide -- of seeming to encourage not closing the plant at the proposed time.

My question then, I'm assuming that it is still completely PG&E's intention to decommission and that they are planning to go forward with the decommissioning project. And my question for Aspen is, obviously the budget you now have and the timeline you now have, would be completely inadequate for an analysis of anything to do with extending rather than decommissioning.

So could you please assure me that no matter what happens outside the universe of this decommissioning plan, the intention of Aspen and of PG&E is to go forward with decommissioning and that the scope of this proposed project is going to continue to be decommissioning, unless some external event essentially creates the need for a completely new process? Can I be assured of that?

MS. STRACHAN: Well, let me introduce, we have Tom Jones and Chris Vardas with PG&E to assist with answering questions. Tom, do you want to cover that first question?

TOM JONES: Sure. This is an active permit for PG&E and we're pursuing decommissioning.

ERIC GREENING: Thank you. Yeah, that's my understanding. And so if at some level of government, a change of plan was adopted, I would assume an entirely new applicant, an entirely new process, et cetera, et cetera would happen and that it wouldn't in any way be shoehorned into this process; can I be assured of that?

MS. STRACHAN: Yeah. I mean, I understand. This process is for decommissioning. So if there's something else other than that, it wouldn't be decommissioning. It would have to be dealt with separately, if I understand the question.

ERIC GREENING: That's what I always hoping to hear. There seemed to be some advocates out there with somewhat unrealistic expectations about this process, but I'm glad to hear that assurance, and we will go forward in good faith, assuming that that's where we're headed. Thank you.

MS. BLEWITT: Thank you, Eric. We have an additional raised hand. Sherri, can you unmute yourself?

SHERRI DANOFF: Can you hear me?

MS. BLEWITT: Yes.

SHERRI DANOFF: Okay, good. When you were talking about the breakwaters and the intake structure, why is it that the intake structure would remain? I'm curious as to why that would be left. Could you hear me, Mr. Jones?

TOM JONES: I was waiting for Aspen to direct the question to me. It's not my meeting.

SHERRI DANOFF: Oh, okay.

MS. BLEWITT: Yes, Tom, please respond.

TOM JONES: Okay. So the base structure for the intake will be filled and that'll become the key piece of infrastructure for our barging operations. So it's a little over 200 feet long, so that robust platform will have the crane operations, the fendering and the attachments so that the barges can come in and attach and can load the equipment from there. That saves us roughly 30,000 truck trips.

SHERRI DANOFF: Okay. So the intake structure itself would remain to help with the barge stuff, right?

TOM JONES: That's correct.

SHERRI DANOFF: Okay. Thank you.

MR. VARDAS: This is Chris Vardas with PG&E. I also want to add that by retaining the intake structure, you avoid potentially significant marine biological resource impacts associated with the decommissioning and removal of the intake structure.

TOM JONES: What Mr. Vardas is referring to is that some surveys have found federally endangered black abalone among structures and the adjacent structures.

SHERRI DANOFF: Thank you.

MS. STRACHAN: And I wanted to apologize for that pause. I went into no man's land and couldn't talk. So I apologize for that. Thank you, Tom, for taking the lead on answering that.

MS. BLEWITT: Yes. Thank you, Tom and Chris.

TOM JONES: You're welcome.

MS. BLEWITT: I am not seeing any additional raised hands at this time. I do see one person on the phone. If you do have a question, you can hit star 9 to raise your hand. Doesn't look like we have any additional raised hands regarding the project description.

MS. STRACHAN: Okay. Let's move on to future site reuse concepts. So this is part of the EIR being an appendix, it's something that the County is doing. Again, County-driven analysis. It is not part of PG&E's proposed project or proposed by PG&E.

The County will be evaluating in the part of EIR, different reuse concepts that will be compared to provide a high level analysis of potential post decommissioning uses. Next slide please.

MS. STRACHAN: So some of the concepts under consideration by the County are a university campus, developed recreation, which is camping, day use, hiking, kayaking, research facility, renewable energy generation or storage, resort hotel, mixed use, which could be a combination of any of these, or an offshore wind port or support facility. Next slide.

And so the question is, is that we don't have a lot on this. This is just a head's-up that this is something that we'll be evaluating at a high level. So this part, I am just wanting to know if anyone has any questions on the analysis that the County will be doing under the reuse concepts. If you have ideas of additional concepts, we'll cover that during scoping, but this is just on the analysis.

MS. BLEWITT: At this time. I do not see any raised hands to indicate questions.

MS. STRACHAN: Okay. We'll move on to the next portion, which is the EIR process overview by Sandra.

MS. ALARCON-LOPEZ: Thank you, Susan. As Susan mentioned, Aspen Environmental Group is supporting the County with the preparation of the environmental impact report. And before we get into the formal public comment portion of this, we wanted to give you a very high level description of the process for the environmental impact report and to give you an initial look at some of the content. And this is very high level, because we're just at the start of the process.

First and foremost, as the lead agency, the County has decided to prepare an environmental impact report. They have determined that there is potential for significant impacts, and so we're moving forward with that analysis. As allowed by CEQA, they can move forward without the preparation of an initial study. So we are moving forward with the document, but we are in the preliminary stages.

So this next slide shows you a very high-level timeline. We are at the beginning right here. We have a total of five scoping meetings. This is the fourth meeting that we're holding for this particular project, but there will be other opportunities for you to comment on the analysis in the environmental document. And when the draft EIR is prepared, there will be an additional opportunity to provide comments on that draft document.

Once we get comments on the draft document, we're going to respond to those comments and prepare a final environmental impact report. The County decision-makers will look at the EIR, which is an information document as well as other plans and documents to make their decision on this decommissioning project. So the key point here on this flow chart is really that we are at the start of this process.

So there are specific contents that we need to consider within the environmental document. We are going to prepare and have been preparing a detailed description of PG&E's project, and it's based on their application to the County.

We're going to look at and evaluate a number of different environmental issue areas. And for those issue areas, we're going to look at the environmental and regulatory setting of the project area. We're going to look at what type of environmental impacts the proposed project could result.

We're going to identify any potential alternatives that should be considered to reduce those significant environmental impacts. And then the EIR will also include any measures to reduce potential environmental impacts of the project.

As Susan mentioned, there is also a going to be an evaluation of reuse concepts. We're going to put that as a separate chapter in the EIR, mainly because it's not part of PG&E's proposed project. It's more of information that the County is going to use to look at what potential options are available for future site reuse.

We have a number of technical experts that are involved in the evaluation in the EIR, and a large portion of them have worked on other decommissioning projects, including SONGS.

This slide gives you an idea of the different issue areas that are going to be covered. It is going to be comprehensive. We're going to look at all these issue areas, because we are at the beginning of the development of the environmental document.

We haven't made a decision on the significant issues yet, but we do know that there are a number of issues that are outside of the typical EIR format that we need to consider. As an example, we are including issues that some of the responsible agencies need to consider. And those are the issues that you see right here regarding climate change, commercial fishing, environmental justice.

And then one thing that we wanted to cover was the one on hazardous and radiological materials. We wanted to cover that one, because the radiological hazards are really within the purview of NRC and they have exclusive jurisdiction over the handling, storage, transport, anything associated with radioactive waste, radioactive materials.

So what we're going to do in the environmental document is we're going to present some of those requirements and we're going to look at some of the safety plans that PG&E has in place right now for its operation, but will also be part of the decommissioning for this particular project.

For all of the issue areas that we're going to look at in the environmental document, we're really going to look at what are the potential changes that could occur to the environment based on implementing the proposed project. So we're going to look at direct impacts, indirect impacts, cumulative impacts and growth-inducing ones that could combine to have an impact if we have multiple projects in the same area. That would be cumulative analysis.

We're also going to focus the analysis on significant impacts, because the significant impacts are going to drive the type of alternatives that we're going to evaluate in the environmental document. For the significant impacts that we do identify, we need to look at any potential alternatives that could reduce those impacts.

We're also going to look at mitigation measures we need to include any that would reduce or avoid potential impacts. We will consider some social and economic issues, but those are not considered significant under CEQA. They are more for information purposes.

Alternatives. This is an area that we're currently developing. PG&E, in their application, has provided some recommendations on alternatives. We've gotten some input from our responsible agencies on the type of alternatives that could be evaluated in the environmental document.

Some of those were in that NOP that hopefully you've had an opportunity to look at. The key thing here is that when we're looking at alternatives, we want to look at whether or not the alternative has the potential to meet the project objectives and we need to look at its ability to reduce or avoid any impacts, and then we also look at whether or not it's a feasible alternative.

When we're talking about the no-project alternative, under CEQA we are required to look at and evaluate a no project alternative. However, in this particular project, because the NRC license will be terminated, the no-project alternative may result in an alternative that requires some type of action. In other words, the no-project alternative may not mean no action or no activities.

Before we get into the comment period, we wanted to see if you had any questions on the EIR process. We recognize that this is a high-level description of the process, but we're hoping that it gave you some background on the next steps. So if you could raise your hand, if you have any questions on the process, and then after this, we'll get into the formal public comments.

MS. BLEWITT: Again, if you're calling in press star 9 to raise your hand. We have one question. Coleman Miller.

COLEMAN MILLER: Good evening. Can you hear me?

SANDRA ALARCON: Yes.

COLEMAN MILLER: Just a question on your slide identifying the radiological aspects that are the sole purview of the Nuclear Regulatory Commission. I didn't see a low-level radioactive waste listed. I believe that's an oversight. Can you comment on that? Thank you.

MS. STRACHAN: We have radiological experts on our team. They will also work on the SONGS decommissioning project as well. And so they will be discussing radiological waste, low level, Greater-than-Class-C in their analysis of the impacts associated with the project; but at the same time, it will be couched with the concept that all of that is under the purview of the Nuclear Regulatory Commission.

Hopefully that answers your question.

COLEMAN MILLER: Yes. Thank you.

MS. BLEWITT: Looks like we have an additional question from Eric Greening.

ERIC GREENING: Thank you. Yeah, actually, I have a follow-up question to that question, because my understanding is that part of what needs to happen in terms of determining what is safe, is essentially to determine a threshold of acceptable residual contamination consistent with the health and safety findings the County needs to make.

Are you saying that even that determination is preempted by the NRC, or can the County, based on its own need to make health and safety findings, determine its own threshold for what degree of residual contamination will allow the site to be used?

MS. ALARCON-LOPEZ: It's my understanding, and again, I think this is tied back to the final status surveys in terms of that release criteria that that's governed by the Nuclear Regulatory Commission.

ERIC GREENING: Are you saying that the County couldn't set a higher standard if it chose to?

MS. ALARCON-LOPEZ: My understanding is that it's an NRC requirement. PG&E, I don't know if you know further on that, but that's my understanding is that NRC because it's radiologically oriented and tied to safety, that that purview is all under the NRC.

TOM JONES: That's correct. And there's a cleanup criteria called MARSSIM, the Multiple Agency Radiological Remediation Inventory, that'll be used by other agencies that participate, whether it's the County of San Francisco Health Department or the DTSC from the State of California, but that ensures the uniform criteria that all agencies will evaluate the effectiveness of the mediation or remediation.

ERIC GREENING: Thank you. I think this is an issue that will come up and get more discussion and to better understand just what is the boundary of the County is ability to act in such a way that it can genuinely make health and safety findings, which are required.

MS. ALARCON-LOPEZ: Thank you, Eric.

MS. BLEWITT: Thank you. Are there any other questions related to the EIR process at this time? I don't believe we have any more.

MS. ALARCON-LOPEZ: So now what we want to do is we want to get into the formal scoping comments and we wanted to just go over a few items to help us in this assessment with your comments. We'd like to get your input on the scope and content of the EIR. And we will take into consideration some of the questions that we've received before this formal scoping period, but we also want to get any information on local environmental knowledge that you think we ought to be aware of, any issues that you think we ought to evaluate, any alternative you think we ought to consider and then mitigation measures. And although it's not part of PG&E's proposed project, we will also take any comments that you have on future site reuse.

One thing I do want to say, before we listen to the comment period, is that we are going to give all of this information to our technical authors. So we will address all of the issues that we hear in the environmental document.

So if you want to make a comment, we ask that they are similar to the questions that you've been asking. We ask you to raise your hand. We're going to take you in the order that we see those raised hands.

If we get a lot of speakers, we will limit the comment to three minutes, but if we don't, we won't use the timer. If you're calling by phone and you want to make a comment, please press star 9 to raise your hand and star 6 to unmute yourself.

We will go ahead and open it up for comments, and we'll leave the information here on where you can email or mail your comments if you feel that you'd rather do that instead of provide an oral comment today.

So let's go ahead and open it up, Lisa.

MS. BLEWITT: We have our first speaker, Eric Greening. Please be sure to state your full name and any affiliation you have to an organization or agency for the record.

ERIC GREENING: Thank you. I am Eric Greening. Can you hear me?

MS. BLEWITT: Yes.

ERIC GREENING: Thank you. And I've already taken the opportunity to make oral comments previously and I'm working on some written comments, but I just wanted to share a thought relative to the future reuse scenarios.

One thing that we need to recognize is that sometimes mitigation measures have impacts of their own, and I just want to be sure not to miss that; for example, some development scenarios. If the site is redeveloped in any kind of an intensive way, it might require, as a mitigation from wildfire hazards, all sorts of secondary egress options.

Those secondary egresses or ingresses and egresses or circulation infrastructures would themselves have very significant environmental impacts, not only on the site, but beyond in the surrounding lands and potentially in such places as Montaña de Oro.

So I just wanted to affirm the importance of essentially going second- and third-order impacts when a mitigation measure is necessary, that itself has impacts, that those impacts also be analyzed and fully mitigated. And I'll be sharing more thoughts in writing. Thank you.

MS. BLEWITT: Thank you, Eric. Are there any other questions? Please raise your hand. If you're calling in by phone press star 9 to raise your hand. I know we covered a lot of material, but you may want to submit comments. I'm not seeing any additional raised hands.

So please take note to mail in your comments to Susan Strachan at the San Luis Obispo County Department of Planning and Building or email your comments to Diablo@co.slo.ca.us. Susan?

MS. STRACHAN: Hi, I fell into no man's land again. I think something happens when Eric is taken away from being a panelist that I turn into an attendee. So I apologize. There are no further comments, Lisa?

MS. BLEWITT: There are no additional raised hands. So it does not appear as though there are any additional comments. Yes.

MS. STRACHAN: Okay. Well, we want to thank everyone for participating today and taking the time to participate. The comment period ends December 6th at

5:00, and Lisa had provided the address. There's also information on the County is website under planning and building. And then there's a specific tab for Diablo Decommissioning.

As I mentioned, the recording of this meeting, as well as all five of the virtual scoping meetings that we're having, will be on the website. And the PowerPoint presentation is the website, if people are interested.

So with that, I don't think that's the end of the meeting and we thank you all for attending.

CERTIFICATE

I, the undersigned, a Certified Shorthand Reporter of the State of California, do hereby certify:

That the foregoing proceedings were taken before me at the time and place herein set forth; that a verbatim record of the proceedings was made by me using machine shorthand which was thereafter transcribed under my direction; further, that the foregoing is an accurate transcription thereof.

I further certify that I am neither financially interested in the action nor a relative or employee of any attorney of any of the parties.

IN WITNESS WHEREOF, I have this date subscribed my name this 14th day of December, 2021.

michele watson

MICHELE WATSON, CSR
CSR No. 8359

Appendix B4.6

Transcript – Scoping Meeting December 4, 2021
2:00 PM

DIABLO CANYON DECOMMISSIONING PROJECT

PUBLIC MEETING

WEB VIDEOCONFERENCE

SATURDAY, DECEMBER 4, 2021, 2:00 P.M

Reported by:

Michele Watson

CSR No. 8359

SATURDAY, DECEMBER 4, 2021, 2:00 P.M

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MS. ALARCON-LOPEZ: This is the public scoping meeting for Diablo County Power Plant Decommissioning Project, and Susan Strachan from the County of San Luis Obispo will start us off. Thank you.

MS. STRACHAN: Hey everyone. I'm Susan Strachan. I'm with, as Sandra said, San Luis Obispo County. I'm overseeing the permitting of the Diablo Decommissioning for the County. We really want to welcome all of you spending your Saturday afternoon with us for the scoping meeting on the Diablo Decommissioning Project.

Before we begin, I just want to through how to participate on a virtual meeting or in a virtual meeting. We will have a few areas where we'll be doing questions and answers and scoping comments. And if you're participating virtually, if you're wanting to speak, you use the raise-hand feature and we will call on you when it's your turn. If you're joining by phone, then you press 09 to raise your hand, and then when called on press 06 to unmute.

We are, as Sandra said, recording this meeting and the recording will be posted, as well as the recordings of all of the previous four meetings that we've had on the County's Planning and Building Diablo Decommissioning webpage, and our PowerPoint presentation is also available on that page.

We will go through these how to participate in terms of raising your hand and pressing 09, if by phone, again, when we get to the question and answer and scoping part of the meeting. Next slide, please, Sandra.

So in terms of our agenda today, we will do some introductions. I'll then give an overview of the decommissioning project description. After that we will have our first question and answer session on the project description. Then we'll move into a discussion on what is a County-driven analysis on future site reuse concepts. And then we'll have another question and answer period.

Then Sandra will provide an overview on the Environmental Impact Report process, followed again by question and answer session. And then lastly, we'll open it up to scoping comments. Next slide please.

Now, for introductions, as I said, I'm Susan Strachan, I'm the County's nuclear power plant decommissioning manager. With me is Cindy Chambers, a senior planner with the County. And then Aspen Environmental Group is the environmental consulting firm who's preparing the Environmental Impact Report.

I want to point out they are also the environmental firm that prepared the Environmental Impact Report for the San Onofre Nuclear Power Plant. So we're very fortunate to have a firm that has done a project like this before.

With us from Aspen is Sandra Alarcon-Lopez. She's the EIR project manager, and then Lisa Blewitt, who is the deputy project manager. We also have representatives from PG&E who will be available to answer questions regarding the project and we'll introduce them at that time. Next slide, please.

So briefly, I want to talk about the purpose of this meeting and scoping. So under the California Environmental Quality Act, we're required to have a 30-day scoping period. For this project it's actually a 40-day scoping period, because when we issued the notice of preparation, the 30th day fell, I think, on the Friday after Thanksgiving. We didn't want to do that, so we extended it out another several days after that.

The meeting is required, the scoping meeting, for projects of statewide, regional, and area-wide significance. The meetings then provide an opportunity for agencies in the public to provide input and comment on the scope and content of the EIR.

And now the comments can be provided verbally at a scoping meeting like this one, or they can be provided in writing by U.S. Mail or email. And when we get to the scoping comment portion of the meeting, we'll have the mailing address and email address for making comments in that manner. And scoping also provides an opportunity to provide input on project alternatives, evaluation methods and project mitigation methods. Next slide please.

So in terms of project description, I'm going to get into a little bit of background, talk about the jurisdictions of different agencies that are involved. I'll discuss the power plant decommissioning and then talk about some offsite locations for waste transportation. Next slide.

So the County received PG&E's land use application on March 29th, 2021. Since a portion of the site is in the coastal zone and a portion of the site is outside of the coastal zone. They applied for both a development plan/coastal development permit for the coastal zone portion of the site and a conditional use permit for that portion of the site outside of the coastal zone.

When the County receives applications, it then sends out referrals to different agencies and organizations to get their input on the application. And then county has 30 days to review the application and determine whether all the information it needs to proceed is included in the application.

After our 30-day review, we issued a letter to PG&E on April 28th, asking for additional information in your application. PG&E then responded on July 8th, providing the information we requested, plus they made some modifications to the project in that filing. We then, again, went through that 30-day review, sent referrals out to agencies and organizations and sent a second letter on August 9th.

PG&E responded with answers to our information that we requested on October 6th. And after reviewing that information on October 27th, the County accepted PG&E's application. We then issued the notice of preparation, which initiated the scoping period on October 28th, 2021. Next slide please.

So this is a slide of the general site vicinity. The yellow comprises the Diablo Canyon Lands that are owned, some by PG&E, some by Eureka Energy. And then the blue in the middle is the actual Diablo Canyon Power Plant boundary. Next slide.

And then this is an aerial of the site with the red outlining the NRC, Nuclear Regulatory Commission boundary, but it shows from an aerial perspective features of the power plant site. Next slide.

So this figure shows the agency jurisdictions and in the yellow line, that's going through it, that is the coastal zone boundary. So I mentioned that part of the plant is in the coastal zone, part is outside.

The portion in the green area, that is all within the coastal zone. The brown on the other side of the yellow line is the portion that's outside of the coastal zone. If you go down toward the water, and there's area where Sandra has the cursor in blue, that's where you get into State Lands and Coastal Commission jurisdiction. So they also have a role in the decommissioning of the project. Next slide.

So more details in terms of agency roles in the County of San Luis Obispo, we are the lead agency under the California Environmental Quality Act, which means that we have the role in preparing with Aspen the Environmental Impact Report, and then the processing of the permits that we're filled out for the decommissioning.

California Coastal Commission, that area down by the water, is within the Coastal Commission's original jurisdiction, and they'll receive a Coastal Development Permit Application. That part in green in the coastal zone is also the appeal jurisdiction for the County Coastal Development Permit. So a permit that the County issues that's in the coastal zone could ultimately be appealed to the California Coastal Commission.

California State Lands Commission, again, for that area down by the water that we showed on the previous slide, they will issue a new lease or lease amendment. And at the Federal level, the Nuclear Regulatory Commission is involved, and they oversee the decommissioning process specifically tied to the cleanup and removal of radioactive structures and systems, the transfer of the spent fuel. That will go to a previously permitted, what's referred to as, an ISFSI or Independent Spent Fuel Storage Installation. And then they're involved in the termination of the Part 50 license over the site. Next slide.

Just a quick kind of a short chronology tied to the decommissioning. Unit 1 of the power plant, the Nuclear Regulatory License for that unit terminates on November 2nd, 2024.

The Unit 2 license terminates on August 26th, 2025. PG&E had been in the process with the NRC to renew those licenses, but in 2016 stopped that license renewal effort to then move forward with a closure of the plant.

In 2018 CPC approved the retirement of the plant, and then PG&E started working on all of the various studies, et cetera, for submitting its applications, and intends, once permits are received, to begin decommissioning in 2024. Next slide.

Now, the decommissioning is going to occur in two phases. Phase 1, which is 2024 to 2030, that is when the bulk of the decommissioning activities will happen in terms of actual removal of structures and infrastructures and buildings from the plant site.

Phase 2, 2032 to 2039, is when completion of soil remediation activities will happen, final status surveys, which are surveys required by the NRC to ensure that the site meets the established radiological release criteria. Those will happen in Phase 2. And then final site restoration will occur at that time period. Next slide.

So when we look at the decommissioning effort, besides just decontamination and demolition of infrastructure, buildings and structures, PG&E is proposing to retain some structures and we'll go through that in just a minute. They also intend to construct new buildings and structures that would be located in what's referred to as a future PG&E owner-controlled area. And we'll show you a slide of where that is and what would take place there.

And then to accommodate the decommissioning, the removal of building structures and infrastructures, it requires the installation of temporary infrastructure and buildings to allow the demolition to occur. We'll talk about that. And then lastly, we're going to talk about the use of offsite rail loading facilities. Next slide.

So in terms of features to remain, the black that's shown in the slide are roads that are existing now that PG&E proposes to keep. They would not be removed as part of decommissioning. The red that is shown are plant features that PG&E is proposing to remain.

So if you go down by the water, those two more thin features are the breakwater that creates sort of a marina area where the intake structure is. The intake structure is that small, more rectangular feature. For decommissioning, the intake structure, that's where the cooling water comes in, that would be closed off so no water could enter. Equipment on top of the intake structure would be removed, but the concrete structure itself is proposed to remain.

Then moving farther up on the site, that rectangular that Sandra is pointing to right now is the ISFSI or Independent Spent Fuel Storage Installation. That's where spent fuel from the power plant is currently stored. It's where the spent fuel that's currently in the reactor spent fuel pool will be transferred upon decommissioning. That is a previously permitted facility. So that storage of the fuel, the transfer of this fuel is accommodated under that previous permit.

The two blue dots are raw water reservoirs, which will remain. And then there's a 230 switch yard that will remain and a 500 switch yard that they're proposing to remain. Next slide.

And so for new construction. That would occur up in this area where we showed the 500 KV switch yard, the 230 KV switch yard, and the Independent Spent Fuel Storage Installation. This would be what would constitute that new PG&E owner-controlled area.

In this area PG&E is proposing to build what's referred to as a Greater-than-Class-C waste storage facility. This is a radioactive waste, it's from the reactor internals and process waste, but similar to the spent fuel, there is currently not an offsite Federal repository where that fuel could be sent. So it needs to remain onsite until there is somewhere that it can be disposed of offsite or stored offsite.

They're also proposing to build a new security building and a new indoor firing range. And again, this area from roughly where the red rectangle is of the ISFSI on up would be the future PG&E owner-controlled area. Next slide.

Now this slide is of the lower portion of the site, and it's essentially a site layout for decommissioning. It shows existing buildings that would be used to accommodate decommissioning workers, it's offices. You see purple boxes around that constitutes construction trailers. That, again, would be used by employees associated with, workers associated with decommissioning.

It also shows existing structures that would be modified to accommodate decommissioning. So, for example, the big orange rectangle in the center of the figure, that is currently the main warehouse for the power plant. That warehouse is proposed to be modified to create a waste-handling facility where they would segregate, stockpile, and package up contaminated soil for transport.

To the right of that is a yellow square, that's their Flex equipment storage building. And that would be modified to create a lab for testing soil samples.

So this slide just gives an indication in a sense of what's involved in the decommissioning, in that you're taking out structures, but yet you have to bring in or use existing structures to accommodate that decommissioning effort. Next slide.

So just listing some of the activities that are going to happen during Phase 1, temporary infrastructure and building modifications, the decontamination and demolition of buildings, new construction within the PG&E future owner-controlled area.

The spent fuel and Greater-than-Class-C waste will be transferred to existing ISFSI and the new Greater-than-Class-C waste storage facility during this time. And a removal and restoration of the discharge structure would begin during Phase 1. Next slide, please.

So this is a picture of the discharge structure during construction. So this is the structure that will be one of the structures that will be removed as a result of decommissioning effort. Next slide, please.

The figure on the right shows, it's looking down on the discharge structure in black. Those circular figures, that would be what is referred to as a coffer dam, and it would be put in in front of the discharge structure creating an area where the water can be pumped out, creating a working environment to allow the discharge structure to be removed.

Other activities during this phase, the removal of the nuclear reactor, pressure vessels and steam generators, site characterization to identify contaminated areas. With those contaminated areas identified, soil remediation will recur, and again, the final status surveys that I mentioned previously.

Also during this phase, modification and utilization of the offsite rail yards would occur. Next slide.

So some of the activities that are going to happen during the Phase 1 decommissioning again, 2024 to 2031, temporary infrastructure and building modifications like those ones I just mentioned will happen during this time period. Decontamination and demolition of buildings, again, the new buildings and structures to be constructed in the future PG&E owner-controlled area will occur.

During Phase 1, the spent fuel and Greater-than-Class-C waste will be transferred to the independent spent fuel storage installation and the new Greater-than-Class-C waste storage facility, and removal and restoration of the discharge structure will begin during this phase. Next slide, please.

So this is a picture of the discharge structure during decommissioning. So this is the structure that will be one of the structures that will be removed as a result of decommissioning. Next slide, please.

So going on from the discharge structure removal, the picture on the right shows the circles are tight with a proposed coffer dam, basically creating an area where the water can be pumped out, creating a dry space for the discharge structure to be removed.

Other activities during this phase are removal of the nuclear reactor pressure vessels and internals, steam generators, site characterization to identify contaminated areas. With those contaminated areas identified, soil remediation will recur, and again, the final status surveys that I mentioned previously.

Also during this phase, modification and utilization of the offsite rail yards would occur. Next slide.

During Phase 2 of the project, soil remediation and final status surveys would continue. Any infrastructure that is now not needed for retained facilities would be removed. Final site restoration would happen. So this is the grading of the site, the development with storm water management system, now that structures have been removed, will be developed and revegetation would happen.

There will be monitoring of that site restoration effort for up to five years and then PG&E will terminate its NRC license, part 50 license, which covers the current operation of the plant, and it will transition into a ISFSI, meaning the spent fuel and the Greater-than-Class-C waste storage operations. Next slide, please.

I wanted to talk for a moment about decommissioning waste transportation. PG&E is proposing a blended approach for waste transportation. It will consist of transporting waste by barge, transporting waste by truck, meaning directly on a truck to an offsite disposal facility, and then transporting by truck to an offsite rail facility that I mentioned previously.

What's helpful with this blended approach is that barge transportation can accommodate much more waste than a truck can. And so by using barge transportation for taking waste off site, it dramatically reduces the number of trucks that would otherwise be on the road transporting waste.

PG&E has used barge transportation before. That picture on that slide is steam generators that were transported on site in roughly 2006 time period. Next slide, please.

So I mentioned the railroading facilities. PG&E has proposed three different sites. This slide shows where they are in relation to the Diablo Canyon Power Plant. One site is in Pismo Beach. This site would be used as a contingency, and there would be no radiological or hazardous waste transported to this facility.

There are two other sites. One in the city of Santa Maria, one in Santa Barbara County. Both of these will be evaluated in the Environmental Impact Report. However, ultimately only one of the sites will be used. Next slide, please.

Here's a depiction of the Pismo Beach railyard facility. This is on property owned by PG&E, and it's off of Price Canyon Road. And again, this is a site that would be used as a contingency site. Next slide.

And then this shows the two sites. This Osborne yard is the one located in the city of Santa Maria close to Stowe Road, and then the second one is And then the one in unincorporated Santa Barbara County is at the Betteravia Industrial Park off of Betteravia.

Both of these sites will be evaluated in the Environmental Impact Report for the project; however, only one of the sites will ultimately be used.

Now that concludes the overview of the project description. And with that, we'd like to take questions on the proposed project. As I mentioned previously, if you are participating online, please use the raise-hand feature at the bottom of your screen and we'll call on you to speak during Q and A. If you're joining by phone, press star 9 to raise your hand.

Lisa, do we have any questions?

MS. BLEWITT: Thank you, Susan. I just want to reiterate at this time, we're just looking for questions regarding the description of the proposed project to help with understanding. If anyone has questions, again, please raise your hand. If you're calling in, star 9 to raise your hand. We have one hand raised right now, Lauren Brown.

LAUREN BROWN: Yes. I saw that they proposed to remove the discharge shoot. What about the intake? I've heard that, that might be utilized by some of the tower cables coming from Offshore Wind.

MS. STRACHAN: The intake structures, PG&E is proposing to have that remain. And again, it would be closed, so no water could come in. The equipment would be taken off the top, but the actual concrete structure would remain. In terms of cables coming in for Offshore Wind, I haven't heard about that.

In relation to the intake structure, there is a 230 KV switch yard that's on site that I've heard of subsea transmission lines potentially interconnecting to that as a way of getting that power into the grid.

Tom, do you have anything to add on that?

MR. JONES: Yeah, that would be a separate and distinct project. The structure will remain and it could be utilized, but that would require a new subsurface transmission cable would require the right-of-way from the California State Lands Commission. It would be its own Coastal Land and CEQA application. We're not including anything like that in this project at this time.

MS. STRACHAN: Thank you, Tom. Yeah, we're going to get into that in a minute on these future reuse options or concepts. This is County driven, not PG&E. PG&E's proposal to us is basically what I went over. It's the decommissioning, the removal of the site, not post-decommissioning uses of the site. They have not proposed anything to that.

LAUREN BROWN: All right, thank you.

MS. BLEWITT: Thank you, Lauren. Does anyone else have questions regarding the proposed project? I do not see any more raised hands at this time.

MS. STRACHAN: Okay. Thank you, Lisa.

So as I mentioned, the County is part of the EIR. This will be a completely separate chapter, the EIR is going to look at future site re-use concept. So this is going out into the future post-decommissioning.

Again, this is a County-driven analysis. It is not part of PG&E's proposed project or proposed by PG&E. These are concepts that will be compared to to provide an early high-level analysis of possible post-decommissioning uses. Next slide.

So in terms of the concepts that are currently under consideration, they're listed here. One is university campus, one is developed recreation like camping, day-use recreation, hiking, kayaking, research facility, renewable energy generation and storage, resort hotel, mixed use, which could be a combination of any of these, or an Offshore Wind port or support facility. Next slide, please.

So for this we're not looking at -- we have a scoping portion of the program, of the meeting. So people who have other ideas of re-use concepts, that's the time to put that forward. But here we want to know if there's any questions on the specific County-driven analysis that we'll be doing on the reuse concepts.

MS. BLEWITT: Again, if you have any questions, please raise your hand. If you're calling in by phone, please press star 9 to raise your hand. There are no raised hands, Susan.

MS. STRACHAN: Okay. Thank you, Lisa. Sandra, you want to take over?

MS. ALARCON-LOPEZ: As Susan mentioned, my name is Sandra Alarcon-Lopez. I'm with Aspen environmental group, and we're working directly with the County on the preparation of the environmental document. So I'm going to give you a very quick overview of the CEQA process and then take comments or excuse me, then take questions after the discussion, before we get into the official scoping comments.

As the lead agency, the County decided to prepare an Environmental Impact Report. And as part of that, the County has moved forward with beginning the preparation of the document. We're right at the initial phases of the environmental document. One of the things that the County does is look at the potential for significant impacts, and they've decided that based on the type of project that it is, that there is the potential for that, and decided to move forward with an environmental report. As part of that, CEQA does allow the County to move forward without preparation of an initial study.

This next slide is a quick snapshot of the process, and basically there are key things here on this slide. Number one is the scoping period that we're in right now. This is the beginning of the environmental process. It's the opportunity for us to take your comments, get your initial input on the scoping content of the environmental document.

There will be other opportunities for you to comment. Once we get all these comments, we're going to prepare a draft environmental document, and we're going to take into consideration all of the comments that we receive during the scoping period, those that we received in the public meetings, as well as any written or email comments that are received during the scoping period.

Once the draft EIR has been prepared and finalized, it will be released for another public review. It's going to be released for a public review period, and there will be an additional opportunity for the public to comment on that document. When we receive your comments on the draft EIR, we're going to take those comments, respond to all the comments that we receive on that draft document and prepare a final Environmental Impact Report.

That final EIR is the document that the decision-makers at the County will use to review and make a decision on the project. The EIR is an information document and it provides information on potential environmental impacts associated with the project.

I want to quickly just go through the content of the environmental document. We are going to cover and evaluate a number of different environmental issues that I will present in the subsequent slide. We're going to look at the environmental setting and regulatory setting for those issues. And then we're going to look at how PG&E's proposed project could impact those environmental resource.

We're also required to look at alternatives and alternatives we'll need to focus on looking at reducing any significant impacts that are associated with the project. If we identify significant impacts, then we also identify and work towards identifying or recommending mitigation measures for the County to adopt for the proposed project.

One other component of the EIR is going to be to look at the reuse alternatives. As Susan mentioned earlier, this is a County-driven analysis. It's going to be high level, and it's also going to look at and compare the different environmental impacts associated with a number of different reuse concepts.

Here's the range of environmental issues that are going to be covered in the environmental document. I think the key here is really that we're going to look at all of the different potential environmental issues associated with the project. We're going to evaluate them and look at whether or not there's a potential for a significant impact. We haven't made that decision yet. We're at the preliminary evaluation stage of those issues.

And then the other key issue here is that we are going to work with a number of different resource and regulatory agencies. And so you see here, these four issue areas that are associated with some of the issues that some of the responsible agencies are going to need to take into considerations, such as the State Lands Commission and the Coastal Commission.

One of the things we wanted to just highlight, because it's come up in some of the community meetings is the NRC, Nuclear Regulatory Commission, a federal agency that has jurisdiction over the handling and management of radiological materials and waste. They have exclusive jurisdiction over that.

So in the EIR we're going to present the requirements that NRC has on this power plant and any plans for safety measures associated with those requirements. We're looking at this issue because as a County agency, they have to look at the whole of the action, but the Federal agency does have that exclusive jurisdiction.

For all of the issue areas that we look at and consider in the environmental document, we're going to look at all potential impacts. We're going to look at direct, indirect cumulative, and growth-inducing effects. For any significant impacts that we identify, we're going to also identify potential litigation measures that can be adopted to reduce those impacts.

We are going to look at environmental justice issues, but a lot of the social and economic impact issues are not considered significant under CEQA. One of the key components of the environmental report will be the consideration of alternatives. In the CEQA document, we don't need to look at alternatives at an equal level of detail, but we do need to identify alternatives that have the potential to reduce significant impacts.

We also have to look at the alternative in terms of meeting project objectives and the feasibility of those alternatives. One of the key considerations in this report, like other environmental reports, is that CEQA requires a consideration of a no-project alternative.

With this particular project, because there is a license termination and process, we will not have a true no-project or no-action alternative. And the NLP provided some examples of some alternatives that we're currently considering.

Are there any questions? At this time, I'll take questions on the EIR process.

MS. BLEWITT: Please raise your hand using the Zoom function, or if you're calling in, star 9 to raise your hand. Again, we're looking for questions on the EIR process before we open it up for the formal scoping comments. There do not appear to be any questions at this time.

MS. ALARCON-LOPEZ: So we are going to go ahead and open it up for formal scoping comments. We wanted to just kind of give you an idea of what we consider to be helpful. As I mentioned earlier, any comments that we receive here or in writing regarding the environmental report are all going to be taken into consideration in the draft document.

We're looking for any input that you have on the scope and comment of the environmental document, any information that you think we ought to know based on your local environmental knowledge of the area, any issues that you think we ought to evaluate, any alternatives that you think we ought to consider, and any mitigation measures that you would recommend, because the EIR will also look at future reuse options.

We'll also take any comments regarding concepts that you think we ought to take into consideration. We want to just remind you before we open it up, if you would like to make a comment, if you could raise your hand and those hands will come in a certain order, and we will call your name and ask you to state your name and affiliation.

If we get a lot of speakers, we will limit the comment to three minutes. If you're calling by phone and you want to make a comment, please press star 9 to raise your hand and star 6 to unmute yourself. Once Lisa calls your name. We're going to go ahead and open it up for comments and we will leave this email address and the mailing address up in case you want to submit a written comment, instead of providing an oral comment.

MS. BLEWITT: We have one raised hand at this time. It is a call-in person. Last four digits are 7270. Please press star 6 to unmute yourself and then state your name and affiliation for the record.

MARY JO BORAK: Good afternoon. Hi, everybody. My name is Mary Jo Borak, and I work for the California

Public Utilities Commission. I thank you very much for your presentation. I found it very helpful. We hopefully will submit some written comments to you by Monday afternoon, but I just wanted to tell you hopefully that our comments will fall into three main areas. And we hope that you can incorporate this into your scoping thoughts and consider these as you move forward with your draft EIR.

First issue that the CPUC is interested in is the cost associated with decommissioning. Your EIR will include mitigation measures to reduce environmental impact, which could have cost implications for PG&E and California rate payers.

We hope that the EIR process will take cost into consideration and look at more than one mitigation option whenever feasible. The EIR process should make clear the cost considerations of mitigation measures and alternatives to allow the CPUC and stakeholders compared to EIR proposals to PG&E's Decommissioning cost estimates and funds available in the Nuclear Decommissioning Trust.

Secondly, we are, of course, interested in continued use and access to the existing electric infrastructure at the site. The existing substation and transmission systems are robust and will be underutilized once the Diablo Canyon stops generating. Offshore Wind and other energy providers are ready to looking to tie in to grid at this location.

And finally, the third area we're interested in, which is not exactly associated with your EIR preparation, but there's a State Public Utility Code Section 851, which deals with land transfer for public utilities. And so we're, of course, interested in making sure that whatever alternatives that are looked at in your documents will be compatible with the needs we will have with any future PG&E filings on Public Utilities Code Section 851. So thank you.

MS. BLEWITT: Thank you, Mary Jo. Are there any other scoping comments at this time? Please, raise your hand. Again, if you're calling in press star 9 to raise your hand. I'm not seeing any other raised hands at this time.

MS. ALARCON-LOPEZ: Okay. Thank you, Lisa. That's going to conclude our meeting then for today. We want to thank all of you for taking the time, particularly out of your Saturday, for participating in today's scoping meeting. The scoping period ends or the time period for submitting comments ends December 6th at 5:00 p.m., that's this Monday at 5:00 p.m. The address Lisa had up on the previous slide, but it can also be found on the County's Planning and Building webpage, specifically a webpage for Diablo Decommissioning.

Again, the recording of this meeting as well as the previous four scoping meetings we have will be up on that webpage. This PowerPoint presentation is also available on the webpage right now. So once again, thank you so much for taking the time for participating. We really appreciate it.

CERTIFICATE

I, the undersigned, a Certified Shorthand Reporter of the State of California, do hereby certify:

That the foregoing proceedings were taken before me at the time and place herein set forth; that a verbatim record of the proceedings was made by me using machine shorthand which was thereafter transcribed under my direction; further, that the foregoing is an accurate transcription thereof.

I further certify that I am neither financially interested in the action nor a relative or employee of any attorney of any of the parties.

IN WITNESS WHEREOF, I have this date subscribed my name this 16th day of December, 2021.

michele watson

MICHELE WATSON, CSR

CSR No. 8359

Appendix B5

Scoping Comment Letters/Emails

Scoping Comment Letters/Emails

NO.	DATE	FROM
A: Agencies		
A001	11/24/21	Santa Barbara County Energy Minerals Compliance Division
A002	12/2/21	City of Santa Maria
A003	12/1/21	City of Pismo Beach
A004	12/6/21	Santa Barbara County Air Pollution Control District
A005	12/6/21	City of San Luis Obispo
A006	12/6/21	Port San Luis Harbor District
A007	12/6/21	San Luis Obispo County Air Pollution Control District
A008	12/6/21	California Public Utilities Commission
A009	12/6/21	California Department of Transportation
A010	12/6/21	U.S. Fish and Wildlife Service
A011	12/6/21	California Department of Fish and Wildlife
B: Organizations		
B001	10/29/21	Californians for Green Nuclear Energy #1
B002	11/16/21	Californians for Green Nuclear Energy #2
B003	11/29/21	San Luis Obispo Mothers for Peace
B004	12/1/21	Californians for Green Nuclear Power 3
B005	12/1/21	Californians for Green Nuclear Power 4
B006	12/6/21	Santa Lucia Sierra Club and Surfrider Foundation
B007	12/6/21	Californians for Green Nuclear Power 5
B008	12/6/21	Californians for Green Nuclear Power 6
B009	12/6/21	Californians for Green Nuclear Power 7
B010	11/9/21	Avila Valley Advisory Council
C: Tribal Governments		
No comment letters/emails received during scoping		
D: Individuals		
D001	11/1/21	Coleman Miller
D002	11/10/21	Peggy Sharpe
D003	12/6/21	Maia Petrovic
D004	12/6/21	Melinda Forbes

D: Individuals, *continued*		
D005	12/6/21	Sybil Jacobs
D006	12/1/21	Kara Woodruff
D007	12/4/21	L. Jane Swanson
D008	12/4/21	Guy Sharp
D009	12/4/21	Sherri Danoff
D010	12/5/21	Eric Greening
D011	12/5/21	Steven and Zoe Zawalick
D012	12/5/21	Benita Epstein
D013	12/6/21	Sheila Baker
D014	12/6/21	Jill ZamEk
D015	12/6/21	Doug Tait
D016	12/6/21	Melissa Boggs
D017	12/6/21	Sam Blakeslee
D018	12/5/21	Kathi DiPeri

County of Santa Barbara
Planning and Development

Lisa Plowman, Director
Jeff Wilson, Assistant Director

November 24, 2021

Susan Strachan
Nuclear Power Plant Decommissioning Project Manager
San Luis Obispo County, Department of Planning and Building
976 Osos St. #300
San Luis Obispo, CA 93498

RE: DCPP Decommissioning Project NOP Comments

Dear Ms. Strachan,

The Santa Barbara County Planning & Development Department (P&D) appreciates the opportunity to provide comments regarding the Diablo Canyon Power Plant Decommissioning Project (DCPP). The project description states that the applicant is considering three potential rail sites to be used to transfer decommissioned waste from trucks to rail cars. One of the potential rail sites is located within the County of Santa Barbara's jurisdiction on the former Sugar Beet plant site (Assessor Parcel Number 113-210-001). Earlier this year we informed you via email that use of this transfer site will require discretionary permitting action from the County. Pursuant to Section 15103 of the CEQA Guidelines, we request additional time to submit scoping comments as we have yet to receive a formal application from PG&E for development and use of this site as a rail loading spur.

In addition to our request for more time we are submitting the following list of project description/scoping comments related to the proposed project description.

1. Please clarify whether the decommissioned material would be stored at the rail transfer site for an extended period of time or immediately loaded onto rail cars. If the waste material is to be stored onsite, please describe the extent of the time period for which it would be stored, the method of storage and the security measures that will be in place to ensure the material is safely stored.

2. The travel routed for how the decommissioned waste would arrive at its final out-of-state destination is unclear. Please clarify whether the waste would be transported in a southerly direction toward Los Angeles or northerly toward the Bay Area. After the rail route is identified, the EIR must evaluate the risk associated with transporting the hazardous waste through populated areas to its final destination. We note that the NOP includes a list of five

123 E. Anapamu Street, Santa Barbara, CA 93101 · Phone: (805) 568-2000 · FAX: (805) 568-2030
624 W. Foster Road, Santa Maria, CA 93455 · Phone: (805) 934-6250 · FAX: (805) 934-6258
www.sbcountyplanning.org

project alternatives. We recommend that the EIR alternatives analysis be expanded to identify and analyze alternative rail routes which may reduce the potential risk of exposure to populated areas.

We appreciate the opportunity to provide comments on the DCCCP. We look forward to reviewing the draft document to understand how our comments are addressed. If you have any questions, please feel free to contact me (805) 568-2519.

Sincerely,

John Zorovich
Deputy Director
Energy Minerals & Compliance Division
Planning & Development Department

Cc: Lisa Plowman

Santa Maria
All-America City

CITY OF SANTA MARIA
COMMUNITY DEVELOPMENT
DEPARTMENT

110 S. PINE STREET #101 (ON HERITAGE WALK) • SANTA MARIA, CALIFORNIA [illegible]

December 2, 2021

Susan Strachan
Nuclear Power Plant Decommissioning Project Manager
County of San Luis Obispo, Planning & Building
976 Osos Street, Room 200
San Luis Obispo, CA 93408

SUBJECT: Diablo Canyon Power Plant Decommissioning Project Notice of Preparation

Dear Ms. Strachan,

The City of Santa Maria Community Development Department appreciates the opportunity to provide comments regarding the Diablo Canyon Power Plant Decommissioning Project. The project description included in the Notice of Preparation dated October 28, 2021, states that there are four different sites being considered to transfer decommissioning waste from trucks to rail cars, where the waste would then be transported by rail to out-of-state disposal facilities. One of the sites being considered is located within the City of Santa Maria (Osburn property located at 1599 A Street). Pursuant to Section 15103 of the California Environmental Quality Act (CEQA) Guidelines, we request additional time to submit scoping comments as we have yet to receive a formal application from PG&E for development and use of this site as a rail loading spur.

Additionally, after reviewing the project description and researching this site, we have the following comments/concerns.

1. The site is located within the Area 9 Specific Plan. Any development on the site is subject to the development standards and requirements of this plan.

2. In our research of the existing uses on the site, the existing rail spurs appeared to be constructed in 2017-2018. We could not locate permits (entitlements or building permits) to establish the rail yard use on this property.

3. According to the Area 9 Specific Plan, the site is located within a PD/M-1 (Planned Development/Light Industrial) zoning district, with a Light Industrial (LI) General Plan Land Use designation. The purpose of the underlying LI land use designation is "To accommodate industrial uses which contain the process primarily within the building, do not generate negative environmental impacts and which are most

compatible with adjacent nonindustrial uses." Types of uses planned for this land use include research facilities, light assembly plants, non-public oriented offices, industrial support offices and those industrial uses with processing entirely contained within a building. The proposed trucking/loading-centered use is more intensive than allowed by the land use designation and would be better suited to a more intensive industrial/manufacturing land use. The use would be more suitably located on a site that is zoned PD/M-2 (Planned Development / Heavy Industrial).

4. An existing single family residential subdivision is located within 400 feet of the project site. The City of Santa Maria has concerns regarding the impacts of this project to nearby residents. Please clarify in the project description the length of time decommissioned materials would be stored on the site, the method of storage, and safety measures put in place to ensure that materials would be stored safely. Please also clarify the travel routes that waste would be transferred to and from the site, and the days/hours that this would occur.

We appreciate the opportunity to provide comments on the project. If you have any questions, please feel free to contact me at 805-925-0951 ext. 2444 or by email at deady@cityofsantamaria.org.

Sincerely,

Dana Eady
Digitally signed by Dana Eady
Date: 2021.12.02 12:21:03 -08'00'

Dana Eady, Planning Division Manager
Community Development Department

Cc: Chuen Ng, Director of Community Development
James Austin, Fire Marshal

760 Mattie Road, Pismo Beach, CA 93449
(805) 773-4658 | PismoBeach.org

December 1, 2021

Susan Strachan
San Luis Obispo County, Department of Planning and Building
976 Osos Street, #300
San Luis Obispo, CA 93408

RE: Diablo Canyon Power Plant Decommissioning Project Notice of Preparation Comments

Dear Ms. Strachan:

Thank you for including the City of Pismo Beach (City) in the environmental impact report (EIR) process for the Diablo Canyon Power Plant Decommissioning Project (the "Project"). The Project is located at 3890 Diablo Canyon Road in an unincorporated area of San Luis Obispo County. The City is a Responsible Agency for the Project as a result of the potential use of the Pismo Beach Materials Handling Facility (PBMHF) facility to support the project. As you are aware, the City has been requesting to meet with Pacific Gas & Electric (PG&E) representatives to better understand the impact of the project on the Pismo Beach community. The City looks forward to a meaningful discussion with PG&E representatives.

Please be aware that due to lingering questions on specifics of what activities are proposed in Pismo Beach and at the PBMHF, the City's following comments are preliminary. In accordance with CEQA Guidelines Section 15103, the City will need additional time to provide complete scoping comments until an application is submitted to the City for specific project components or, at minimum, a meeting with PG&E representatives is conducted to clarify these questions. At this time, the City offers the following comments:

1. The EIR should study traffic circulation in Pismo Beach, including traffic signals or other traffic control devices necessary to accommodate a potential increase in truck hauling traffic through the City. The City commends PG&E for listening to our previous comments regarding the importance of removing site waste by barge, as this drastically reduces truck trips through Pismo Beach.

2. The City's Police Department and Fire Station 64 are located in the 1000 block of Bello Street. With a high amount of tourist visits throughout the year, Bello Street and the intersection with Price Canyon Road are active in emergency response. The EIR should study potential impacts to public safety because of the project.

3. The EIR should evaluate air quality and greenhouse gas (GHG) impacts associated with truck trips through Pismo Beach and train hauling emissions from the PBMHF.

4. The locations of the truck travel path and the PBMHF are near Judkins Middle School, as well as multifamily and single-family residences on the southeast side of Price Canyon Road. The EIR needs to

evaluate impacts to these sensitive receptors resulting from the project components affecting Pismo Beach.

5. The PBMHF is near known cultural sites CA-SLO-81 and -832. Even in previously disturbed areas, the EIR needs to evaluate and fully understand impacts to cultural resources.

6. Due to the location of the PBMHF in relation to Pismo Creek, the EIR should floodplain impacts to any proposed improvements or operation expansion at the PBMHF.

7. In addition to air quality and GHG impacts to sensitive receptors, impacts to sensitive receptors related to noise also needs to be addressed.

8. We commend the County of San Luis Obispo for considering future uses of the plant area this early in the process. Due to the limited access to the project site, homes or other high intensity uses will be disruptive to local traffic patterns. The City sees impacts to the northernmost portion of Pismo Beach, as well as the City's frontage roads, with current uses and events and this will be potentially exacerbated by future uses of the Project site.

Thank you again for the opportunity to comment. Should you have any questions please feel free to contact me at mdowning@pismobeach.org or by phone at (805) 773-4658.

Sincerely,

Matthew Downing, AICP
Community Development Director

cc: City Manager
City Attorney
Assistant City Manager

December 6, 2021

Susan Strachan
San Luis Obispo County
Department of Planning and Building
976 Oso Street, #300
San Luis Obispo, CA 93408

Email Only: diablo@co.slo.ca.us

Re: Air Pollution Control District Response to Notice of Preparation of an Environmental Impact Report for Diablo Canyon Power Plant Decommissioning Project, ED2021-174/DRC2021-00092

Dear Susan Strachan:

The Santa Barbara County Air Pollution Control District (District) appreciates the opportunity to provide comments on the Notice of Preparation (NOP) of a Draft Environmental Impact Report (EIR) for the Diablo Canyon Power Plant Decommissioning Project.

Project Description

Pacific Gas and Electric Company (PG&E) proposes to decommission the power-generating facility, appurtenant structures, and infrastructure of the Diablo Canyon Power Plant (DCPP). Work is to take place in two phases. Phase 1, from 2024 till 2031, consists of pre-planning and decommissioning activities. Phase 2, from 2032 till 2039, consists of completion of soil remediation, final status surveys, and final site restoration. Various decommissioning and remediation activities will take place in San Luis Obispo County.

In Santa Barbara County, regulated waste material may be hauled by truck from the DCPP to one of two Santa Maria Valley Railroad (SMVR) facilities for transport out-of-state by rail for disposal. The SMVR-SB Facility (also known as Betteravia Industrial Park) is located approximately 1.6 miles west of the City of Santa Maria in the jurisdiction of the County of Santa Barbara. The SMVR-SM site (Osburn Yard) is located east of the intersection of A Street and La Brea Avenue in the City of Santa Maria. Infrastructure modifications at either of the two SMVR facilities would include refurbishment of existing rail spurs (SMVR-SB) or installation of a new rail spur (SMVR-SM), use of steel road plates or installation of engineered fill, equipment for loading material from trucks to railcars, and power supplies or installation of high voltage power capable of supporting the equipment listed above. Operations at the site include the use of diesel engines as well as a railcar mover. Waste transportation by rail is planned to occur between 2024 and 2029. Waste may also be hauled by barge directly from the DCPP to offsite waste disposal facilities in locations along the West Coast of the US.

Information Requests

The District reviewed initial application materials for the project and provided an *Initial Feedback* letter and an *Updated Initial Feedback* letter on August 31, 2021 and October 21, 2021, respectively. The

District's *Updated Initial Feedback* Letter requested responses to the following items to determine potential air quality impacts, appropriate permit conditions, and applicability of District permit requirements and prohibitory rules. Please ensure that the Draft EIR provides the following information:

1. **Description of Waste.** The District requests a more detailed description of the types of waste material that will be transported to the locations in Santa Barbara County, including a description of whether the waste will include asbestos materials, hydrocarbons or other toxic air contaminants, fine particulates, or odor-containing materials.

2. **Specifications of Proposed Equipment at the Santa Maria Valley Railyard (SMVR) Facilities.** For the temporary 400-ton gantry crane and the two truck-mounted cranes, please provide the number and function of engines (e.g., what crane operational mode they will power), engine size in brake horsepower (bhp), and fuel type. Please also specify how long they will be operating on the site. For emissions quantification, the applicant should also specify the bhp for the proposed diesel-powered scissor lifts, reach lifts, and forklifts.

District Comments on Scope of Environmental Review

District staff reviewed the NOP and concurs that air quality and global climate change impacts should be addressed in the EIR. The proposed project includes equipment and operations that are subject to District permit requirements and prohibitory rules. Therefore, **the District will be a responsible agency under the California Environmental Quality Act (CEQA) and will rely on the EIR when evaluating any District permits for proposed equipment**. Potential air quality and climate change impacts should be fully evaluated and disclosed in the EIR. Impacts should be avoided as much as feasible through project design features, efficiencies, mitigation, and monitoring. To avoid additional CEQA documentation related to District permit issuance, the EIR should include the air pollutant emissions for all proposed operations and equipment in the project's air quality and greenhouse gas impact analysis and include mitigation as appropriate to reduce the impacts. The District's guidance document, entitled *Scope and Content of Air Quality Sections in Environmental Documents*, is available online at www.ourair.org/land-use. This document should be referenced for general guidance in assessing air quality impacts in Santa Barbara County. The District should be contacted directly for specific guidance as needed.

The EIR should evaluate the following potential impacts related to the Diablo Canyon Power Plant Decommissioning Project:

1. **Attainment Status and Consistency with the District's Ozone Plan.** Attainment status for Santa Barbara County is posted on the District website at www.ourair.org/air-quality-standards. The most recent Ozone Plan (previously known as the Clean Air Plan) was adopted in December 2019 and is available at www.ourair.org/clean-air-plans. The District website should be consulted for the most up-to-date air quality information prior to the release of the public Draft EIR.

Consistency with local and regional plans, including the District's 2019 Ozone Plan, is required under CEQA for all projects. Consistency with the Ozone Plan should be evaluated on a case-by-case basis, and the EIR should include an assessment of whether operations within Santa Barbara County will be consistent with the Ozone Plan. The Ozone Plan relies primarily on land use, population, and on-road emissions projections provided by the California Air Resources Board (CARB) as a basis for vehicle emission forecasting. All development projects should be evaluated to determine whether direct and indirect emissions associated with the project are accounted for in the Ozone Plan's emissions growth assumptions, and whether the project is consistent with policies adopted in the Ozone Plan.

Industrial stationary source projects will generally be considered consistent with the Ozone Plan if they are consistent with District rules and regulations. Large industrial stationary sources may be found inconsistent if their emissions are not considered in the Plan's stationary source emission inventory.

2. Impacts to Sensitive Receptors. The District is concerned with land use incompatibilities and potential air quality and health impacts associated with changing and intensifying activities at the SMVR locations in Santa Barbara County. Both proposed locations are proximate to other land uses including agricultural and residential land uses. The proposed project would increase air pollutants emitted from the rail yards including emissions from diesel-fired locomotives, off-road equipment, heavy duty trucks, and generators. Project activities at the rail yards may expose nearby receptors to increased toxic air contaminants and/or objectionable odors.

The California Air Resources Board (CARB)'s Air Quality and Land Use Handbook[1] includes recommendations and siting criteria for development projects and encourages land use agencies to use their planning processes to ensure the appropriate separation between air pollution sources and sensitive land uses. The handbook includes a discussion of rail spurs on pages 15 to 18. CARB recommends avoiding siting major service and maintenance rail yards within 1,000 feet of a sensitive land use. The two proposed locations in Santa Barbara County are close to either residential receptors or workplace receptors and the potential for health risk should be evaluated.

The potential health risk impacts associated with the utilization of any and all potential rail yard locations, and all potential sources of toxic air contaminants, should be evaluated under California Environmental Quality Act (CEQA) in the form of a Health Risk Assessment (HRA). As part of District permit issuance, the proposed project will require that a refined HRA be performed to demonstrate that the operation of project-related equipment does not cause a significant risk to the surrounding community and nearby sensitive receptors. For the purposes of the CEQA analysis, the equipment evaluated should include, but is not limited to: locomotive engines, off-road/construction equipment, on-road equipment (on-road heavy-duty trucks, light-duty trucks, and passenger vehicles), marine vessel/barging activities, and all stationary and portable diesel engines.

If an HRA shows that the project would present a significant health risk to the surrounding community at a proposed location, mitigation measures should be applied to reduce the health risk to a less than significant level. Alternatively, another location(s) could be identified and evaluated. In order to minimize public exposure to air pollution, the District recommends the use of cleaner and low emission equipment, including equipment meeting Tier 4 or better engine emission standards and zero and near-zero emission technology.

We recommend that the results of the HRA are incorporated into the EIR for the project. Please conduct the refined HRA in accordance with the District *Modeling Guidelines for Health Risk Assessments*, Form-15i, available at www.ourair.org/permit-applications. Please contact William Sarraf, Supervisor of the

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[1] www.arb.ca.gov/ch/handbook.pdf

District's Engineering Division, at SarrafW@sbcapcd.org or (805) 961-8888 if you have any questions on performing the HRA.

3. Increase in Criteria Pollutant Emissions from Proposed Project. San Luis Obispo County in its role as the CEQA lead agency should identify any potential adverse air quality impacts and all air pollutant sources that could occur from all phases of the proposed project. Air quality impacts occurring in Santa Barbara County and offshore of Santa Barbara County, from both construction and operations, should be discussed and quantified as feasible.

The proposed project will involve air quality impacts associated with locomotive engines, truck trips and other mobile travel, off-road equipment, diesel generators, and marine vessel/barging activities. Air quality impacts should be based on project-specific information and should be supported by technical studies, such as an air quality technical report and/or traffic study whenever possible.

Stationary and area source emissions should be added to transportation source emissions prior to applying the project-specific thresholds of significance. If the proposed project exceeds the significance thresholds for air quality, mitigation should be applied to reduce those emissions as appropriate under CEQA. Section 6 of the District's *Scope and Content* document offers ideas for air quality mitigation. However, project-specific measures should be developed that are pertinent to the specific project. Mitigation measures should be enforceable through permit conditions, agreements, or other legally binding instruments. The EIR should include a Mitigation Monitoring and Reporting Plan that explicitly states the required mitigations and establishes a mechanism for enforcement.

4. Global Climate Change/Greenhouse Gas Impacts. Greenhouse gas (GHG) emissions and global climate change impacts should be addressed in the CEQA document. Global climate change is a cumulative impact; a project participates in this potential impact through its incremental contribution combined with the cumulative increase of all other sources of GHGs. The EIR should include a quantification of GHG emissions from all project sources (direct and indirect), present significance thresholds, and make a determination regarding the significance of impacts. In addition, we recommend that climate change impacts be mitigated to the extent reasonably possible, whether or not they are determined to be significant.

At a minimum, the project should be designed and operated to minimize GHG emissions. Some potential measures include, but are not limited to:

a. Incorporate high efficiency process equipment
b. Reduction in vehicle trips from haul vehicles
c. Utilization of a truck fleet with the newest/cleanest possible vehicles including zero to near-zero emission vehicles
d. Utilize locomotives and marine vessels with the cleanest available engine emissions technology and include operational parameters to maximize fuel efficiency
e. Consideration of onsite renewable energy generation

For guidance regarding greenhouse gas analysis for CEQA environmental documents, please refer to the *CAPCOA CEQA & Climate Change* document. CAPCOA has also published *Quantifying Greenhouse Gas Mitigation Measures*, an extensive sector-by-sector compendium of project-specific mitigation measures, including quantification methods to calculate GHG emission reductions. Both of these documents are available online at www.capcoa.org. The District has identified some potential strategies for local GHG mitigation that could be implemented in Santa Barbara County; these strategies are summarized and posted on the District's website at www.ourair.org/ghgmitigation-sbc.

We hope you find our comments useful. We look forward to reviewing the Draft EIR. If you have any questions please contact Emily Waddington, Air Quality Specialist, at (805) 961-8878 or WaddingtonE@sbcapcd.org, or contact Molly Pearson, Planning Division Manager, at (805) 961-8838 or PearsonM@sbcapcd.org.

Sincerely,

Molly Pearson

Molly Pearson
Manager, Planning Division

cc: David Harris, Manager, District Engineering Division [email only]
William Sarraf, Supervisor, District Engineering Division [email only]
Planning Chron File

Community Development
919 Palm Street, San Luis Obispo, CA 93401-3249
805.781.7170
slocity.org

December 6, 2021

Susan Strachan
Nuclear Power Plant Decommissioning Project
County of San Luis Obispo
976 Osos St., Rm. 300
San Luis Obispo, CA 93408

SUBJECT: City comments for the Diablo Canyon Power Plan (DCPP) Decommissioning project EIR Notice of Preparation

Thank you for providing the Notice of Preparation for the DCPP Decommissioning Project Environmental Impact Report. As indicated in the NOP, City staff anticipates the DEIR will include a comprehensive study of the potential impacts of the project with various alternatives and all CEQA issue areas to be studied in the EIR. Therefore, at this time, staff offers a request regarding the public review time once the DEIR is publicly available and has only the following comment to ensure the DEIR adequately evaluates the Population and Housing issue area in the DEIR.

Population and Housing – The DEIR should evaluate the potential housing impacts of large numbers of workers that will be needed for short and long terms at various components of the decommissioning process. Housing affordability is a significant issue in San Luis Obispo and in the surrounding unincorporated county and in other incorporated cities in the County. Even if significant numbers of workers aren't expected to reside in the City of San Luis Obispo, there could be pressure on housing availability in other areas that have a "spillover" effect on the City's housing stock. The DEIR should include a detailed review of the potential cumulative effects to Population and Housing that could result from the decommissioning phases, and the programmatic level analysis to be conducted on potential future uses of the site should also study the potential effects of this issue area.

Public Review Time Frame – Given the complexity and comprehensive study of issue areas that will be in the DEIR, please consider extending the DEIR public review timeframe to at least 60 days.

The City of San Luis Obispo requests to be notified of any hearings, or significant project updates related to this project, and availability of the DEIR for public review. Thank you for considering City Community Development Department NOP comments on the DCPP Decommissioning EIR.

Please feel free to contact me with any questions. I can be contacted by phone at 805-781-7166, or by e-mail: bleveille@slocity.org

Sincerely,

Brian Leveille, AICP
Senior Planner
City of San Luis Obispo, Community Development Department

CC: Michael Codron, Community Development Director
Tyler Corey, Deputy Director
Teresa McClish, Housing Policy and Programs Manager

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JOHN D'ORNELLAS Interim Harbor Manager
JEFFREY A. MINNERY Legal Counsel
PHILLIP J. SEXTON, CPA Treasurer

December 6, 2021

Project Number & Name: ED2021-174 / DRC2021-00092
DCPP Decommissioning Project NOP Comments

To: Ms. Susan Strachan, Nuclear Power Plant Decommissioning Project Manager
San Luis Obispo County, Department of Planning and Building
sstrachan@co.slo.us, diablo@co.slo.us

This letter contains the Port San Luis Harbor District's (District) comments on the scope of the Diablo Canyon Power Plant (DCPP) Decommissioning Project Environmental Impact Report (EIR) and the District's overall concerns with the Project. The District's comments are focused on the DCPP site and adjacent land.

1. **Harbor District land, facilities, and submerged tidelands**: The environmental impact of all potential utilization planned during the decommissioning project of any land, facilities, and submerged tidelands owned and managed by the District should be reviewed. These could include, but are not limited to, the old barge landing adjacent to entrance of the DCPP access road, parking lots, piers, and moorage areas.
2. **Road Transportation**: Transportation and pedestrian safety/access on Avila Beach Drive to support the decommissioning project and future traffic loads for potential uses at the DCPP site should be reviewed in the EIR. The District's areas of concern include use of roadways for heavy construction vehicles during any high traffic times, vehicle staging, and all transportation of demolished non-radioactive concrete and materials. A condition assessment of the Avila Beach Drive revetment should be performed to ensure ability to withstand loads, erosion, and sea level rise during the full duration of decommissioning.
3. **Water Quality**: Water runoff during decommissioning and its impacts to the ocean water quality and fish habitats should be fully reviewed during the project. This water quality impact and environmental review should extend well beyond the DCPP marina.
4. **Desalination / Brine Water Quality**: Review what will occur to the existing desalination plant and resulting waste products during the decommissioning project and after the project for the future potential uses of the land and their potable water requirements. Assess wastewater treatment and ocean effluent discharges in absence of the current high volume water discharge.

5. **Future Site Reuse Potential**: The District has previously submitted its ideas for future uses of PG&E owned land in and around the DCPP. The District requests review of the environmental impact of these public uses in the EIR. These uses include:

   - Full District control of the access to the road and trails to the Point San Luis Lighthouse.
   - Expansion of District land ownership adjacent to the District's Harbor Terrace campground for expansion of the camping area and public access to a trail system.
   - Boat storage, commercial fishing gear storage, and harbor operations material storage near the current entrance to the DCPP along Avila Beach Drive.
   - Use of the current DCPP marina and adjacent land for harbor operations including commercial fishing, recreational fishing and boating, and other coastal dependent and coastal related public uses. The District supports preserving the current breakwaters at the DCPP.
   - PG&E owned property around the Wild Cherry Canyon area for public access, boat storage, and harbor operations.

Thank you for consideration of our comments for this project.

John D'Ornellas
Interim Harbor Manager
Port San Luis Harbor District

C: PSLHD Harbor Commission
Dawn Ortiz-Legg, 3rd District Supervisor

Email: Diablo Canyon Decommissioning Project

From: Andrew Mutziger <amutziger@co.slo.ca.us>
Sent: Monday, December 6, 2021 8:00 AM
To: PL_Diablo <PL_Diablo@co.slo.ca.us>; Susan Strachan <sstrachan@co.slo.ca.us>; Cindy A. Chambers <cchambers@co.slo.ca.us>
Cc: Dora Drexler <ddrexler@co.slo.ca.us>; Molly Pearson <pearsonm@sbcapcd.org>; WaddingtonE@sbcapcd.org <WaddingtonE@sbcapcd.org>
Subject: SLO County APCD DCNPP NOP Input: EIR NOTICE OF PREPARATION AND SCOPING MEETINGS for DRC2021-00092/ED2021-174 - Diablo Canyon Nuclear Power Plant Decommissioning Project

Hi Susan and Cindy,

Prior to the issuance of the Notice of Preparation for an Env. Impact Report for the Diablo Canyon Nuclear Power Plant Decommissioning Project, SLO County APCD provided input on preliminary project information – see attached files 4208-1Final_signed.pdf, 4208-3_signed.pdf, 20210727_4208-4_signed.pdf, and 20210924EmailsOnDiabloGHGmitigation.pdf. We also participated in meetings on 19 Aug 2021 and 22 Sep 2021 with yourselves and SLO County's EIR consultant, Aspen, where we discussed our previous comments, draft air quality and GHG impact and mitigation information, and items from my conversation with the California Air Resources Board's Local Planning Section. Subsequent to the NOP issuance, SLO County APCD provided additional input (see attached files 20211112-APCD-OKwPGEresponseTo9Aug2021infoHoldLtrFromCounty.pdf and 20211115-APCDrequestForDAMP&GHGupdate.pdf) and we have participated in collaborative discussions about Air District comments with Santa Barbara County APCD.

The attached documents holistically reflect SLO County APCD's input to date for the project's NOP and our agency will be looking for our comments to be adequately addressed in the Draft EIR.

In addition, SLO County APCD has the following NOP comments for implementation by PG&E based on our recent collaborative discussions with SB County APCD:

1. For the marine aspect of the project, quantify the GHG and criteria pollutant emissions along the route, splitting them up by Air District zones, including travel in CA and Federal waters.

2. Mitigate/minimize marine vessel emissions by specifying the required operational parameters that maximize fuel efficiency and minimize air pollutant emissions (e.g., vessel speed, load factor, fuel type, engine characteristics/tier level) in the EIR and include them as project conditions of approval. This is another good strategy for minimizing GHG and criteria pollutant impacts.

Thank you and please let me know if you or your consultant have any questions.

Sincerely,

Andy Mutziger | Division Manager
Planning, Monitoring & Grants
SLO County Air Pollution Control District
(805) 781-5956 VM • amutziger@co.slo.ca.us • SLOCleanAir.org

Via Email

June 12, 2020

Kris Vardas
DCPP Decommissioning
P.O. Box 56
Avila Beach, CA 93424
KAV6@pge.com

SUBJECT: APCD Comments regarding the Diablo Canyon Power Plant Decommissioning - Statement of Work

To Kris Vardas:

Thank you for including the San Luis Obispo County Air Pollution Control District (APCD) in the environmental review process. We have completed our review of the April 28, 2020 Diablo Canyon Power Plant (DCPP) Decommissioning Statement of Work (SOW) air quality and transportation sections.

Background

Pacific Gas and Electric Company (PG&E) announced plans in 2016 to retire the two reactors at DCPP. This is proposed to begin at the end of the plant's current Nuclear Regulatory Commission operating licenses in 2024 and 2025.

The consultant, Environmental Resources Management (ERM) prepared the SOW which outlines aspects of the decommissioning project, including air quality aspects. Based on the SOW and APCD's input on the SOW, ERM would prepare an air quality impact assessment report for the decommissioning. This report would be provided in draft for review by the APCD, PG&E, and the County of San Luis Obispo (proposed lead agency for the project's future Environmental Impact Report).

The following are APCD's input for the SOW.

General comments

- APCD recommends the consultant quantify the impacts from the project. This includes criteria pollutants, greenhouse gases, and toxics (health risk assessment) inside and outside of SLO County.

- APCD recommends using HARP2 for the air quality risk assessment. The model not only evaluates inhalation risk, but also multi-pathway toxic risks. For within SLO County, the APCD recommends isopleth plots for the project impacts with increments of 1 in a million, 5, 10, etc. For outside of SLO County, the APCD recommends a plot of risk relative to distance from the rail line, truck route, and receiving port.

- Project schedule and phasing may change over time and the air quality impact analyses will need to be reassessed relative to these changes.

This section addresses comments related to individual sections of the SOW.

Section 2.4.2 Air Quality Impact Assessment Report

Criteria Pollutants
An air quality impact assessment of the project needs to be completed that quantifies the impacts, and incorporates mitigation if impacts are above the APCD's significance threshold values identified in Table 2-1 of the *CEQA Air Quality Handbook* (ROG+NOx, DPM and PM10 only). Impacts in excess of the threshold values will need to be mitigated as outlined on Page 2-2 of the APCD's CEQA Handbook.

Greenhouse Gases
Evaluation of greenhouse gas (GHG) emissions are required per Assembly Bill (AB) 32, the California Global Warming Solution Act of 2006. Senate Bill 32 provided an update to the state's AB 32 2020 emission reduction target. The 2030 target from SB 32 is 40% below the 1990 levels. Although not legislatively set, a 2050 target was established by California Governor Schwarzenegger's Executive Order S-3-05. Since this project will likely continue past 2030, the evaluation should consider applicable GHG reduction targets for the project to be evaluated against.

It should be noted that Table 3-2 in the APCD *CEQA Air Quality Handbook (2012)* includes a GHG bright line threshold of significance, but threshold is no longer valid because it was based on the AB 32 target. The APCD plans to issue guidance on how projects can address their GHG impacts through available mitigation approaches. In the meantime, an informational document from the Sacramento Metropolitan Air Quality Management District states:

> If a jurisdiction does not have a qualified CAP [Climate Action Plan], development projects may have to mitigate GHG emissions from their projects to no-net increase level, which has already been done for larger development projects[1] and is the most defensible alternative to compliance with a qualified CAP [Climate Action Plan][2].

San Luis Obispo County does not currently have a CAP that can be considered qualified with SB 32 or future GHG emission reduction requirements. In terms of mitigating a project's total GHG impacts, the APCD first recommends on-site mitigation. If the impacts still exceed no-net increase

[1] Newhall Ranch Resource Management and Development Plan and Spineflower Conservation Plan: Final Additional Environmental Analysis. California Department of Fish and Wildlife SCH No. 2000011025, 12 June 2017.
[2] "Final White Paper Beyond 2020 And Newhall: A Field Guide To New CEQA Greenhouse Gas Thresholds And Climate Action Plan Targets For California." Association of Environmental Professionals, 18 October 2016, https://califaep.org/docs/AEP-2016_Final_White_Paper.pdf.

with the implementation of on-site mitigation, then local off-site mitigation should be considered. Any mitigation should be real, verifiable, and additional to regulatory requirements. If the impacts still exceed no-net increase after the implementation of on-site and local off-site mitigation, then carbon offsets should be purchased using the following guidance to reduce GHG emissions to no-net increase:

- Any offset purchased for the project's California impacts should come from California generated GHG reductions. Impacts outside of California could be mitigated with non-California generated GHG reductions.
- While the APCD does not endorse individual offset programs, the following are some examples of California offset programs. Others may exist:
    - California Air Resources Board (CARB): https://ww3.arb.ca.gov/cc/capandtrade/offsets/offsets.htm#protocols
    - California American Carbon Registry: https://americancarbonregistry.org/california-offsets/california-offset-program
    - Climate Action Reserve: https://www.climateactionreserve.org/how/california-compliance-projects/
    - Climate Forward: https://climateforward.org/how-it-works/

Section 2.2.2.2.6. Risk assessment and Section 2.4.2.8 (determining proximity of sensitive receptors for toxic impact analysis). The risk assessment should compare the risk for the different material transport options (e.g. trucking/rail versus barge). The engine emission standards for the trucking fleet, rail, and marine vessels that the project could use for the different decommissioning scenarios need to be factored into the risk assessment. The project should determine the engine standards the project proponents are willing to commit to use prior to conducting the risk assessment. Routes to minimize toxic risk to sensitive receptors should also be determined and is discussed later in this letter.

This section addresses comments related to demolition and decommissioning activities.

Permit Requirements
Based on the information provided, we are unsure of the types of equipment that may be present during the project. Portable equipment, 50 horsepower (hp) or greater, used during project activities may require California statewide portable equipment registration (issued by the California Air Resources Board) or an APCD permit. The following list is provided as a guide to equipment and operations that may have permitting requirements but should not be viewed as exclusive. For a more detailed listing, refer to the Technical Appendices, page 4-4, in the *CEQA Air Quality Handbook* (April 2012).

- Power screens, conveyors, diesel engines, and/or crushers;
- Portable generators and equipment with engines that are 50 hp or greater;
- Electrical generation plants or the use of standby generators;
- Internal combustion engines;
- Rock and pavement crushing;
- Unconfined abrasive blasting operations;
- Tub grinders;
- Trommel screens; and
- Portable plants (e.g. aggregate plant, asphalt batch plant, concrete batch plant, etc).

If you have any questions regarding APCD permitting requirements, contact the APCD Engineering and Compliance Division at 805 781-5912.

Hydrocarbon Contaminated Soil

Should hydrocarbon contaminated soil be encountered during project activities, the APCD must be notified as soon as possible and no later than 48 hours after affected material is discovered to determine if an APCD Permit will be required. In addition, the following measures shall be implemented immediately after contaminated soil is discovered:

- Covers on storage piles shall be maintained in place at all times in areas not actively involved in soil addition or removal;
- Contaminated soil shall be covered with at least six inches of packed uncontaminated soil or a non-permeable hydrocarbon barrier. No headspace shall be allowed where vapors could accumulate;
- Covered piles shall be designed in such a way to eliminate erosion due to wind or water. No openings in the covers are permitted;
- The air quality impacts from the excavation and haul trips associated with removing the contaminated soil must be evaluated and mitigated if total emissions exceed the APCD's construction phase thresholds;
- During soil excavation, odors shall not be evident to such a degree as to cause a public nuisance; and
- Clean soil must be segregated from contaminated soil.

The notification and permitting determination requirements shall be directed to the APCD Engineering & Compliance Division at 805-781-5912.

Developmental Burning

APCD Rule 501 prohibits developmental burning of vegetative material within San Luis Obispo County.

Proper Abatement of Asbestos-Containing Material

Demolition activities can have potential negative air quality impacts, including issues surrounding proper handling, abatement, and disposal of asbestos-containing material (ACM). ACM could be encountered during the demolition or remodeling of existing structures or the disturbance, demolition, or relocation of above or below ground utility pipes/pipelines (e.g., transite pipes or insulation on pipes). If this project will include any of these activities, then it may be subject to various regulatory jurisdictions, including the requirements stipulated in the National Emission Standard for Hazardous Air Pollutants (40CFR61, Subpart M - asbestos NESHAP).

NESHAP requirements include but are not limited to:

1) Written notification to the APCD, within at least 10 business days of activities commencing.
2) Asbestos survey report conducted by a Certified Asbestos Consultant.
3) Written work plan addressing asbestos handling procedures in order to prevent visible emissions.

Go to slocleanair.org/rules-regulations/asbestos.php for further information.

Proper Abatement of Lead-Based Coated Structures

Demolition, remodeling, sandblasting, or removal with a heat gun can result in the release of lead-containing particles from the site. Proper abatement of lead-based paint must be performed to prevent the release of lead particles from the site. An APCD permit is required for sandblasting operations. For additional information regarding lead abatement, contact the San Luis Obispo County Environmental Health Department at 805-781-5544 or Cal-OSHA at 818-901-5403. Additional information can also be found online at epa.gov/lead.

Limits of Idling

State law prohibits idling diesel engines for more than 5 minutes. All projects with diesel-powered construction activity shall comply with Section 2485 of Title 13 of the California Code of Regulations and the 5-minute idling restriction identified in Section 2449(d)(2) of the California Air Resources Board's In-Use Off-Road Diesel regulation to minimize toxic air pollution impacts from idling diesel engines. The specific requirements and exceptions for the on-road and off-road regulations can be reviewed at the following web sites: arb.ca.gov/msprog/truck-idling/factsheet.pdf and arb.ca.gov/regact/2007/ordiesl07/frooal.pdf.

Material Routing

Proposed routes to move the material should be evaluated and selected to ensure routing patterns have the least impact to residential dwellings and other sensitive receptors, such as schools, parks, day care centers, nursing homes, and hospitals.

Fugitive Dust Mitigation Measures: Long List

Construction activities can generate fugitive dust, which could be a nuisance to residents and businesses in close proximity to the proposed construction site. Projects with grading areas more than 4 acres and/or within 1,000 feet of any sensitive receptor shall implement the following mitigation measures to manage fugitive dust emissions such that they do not exceed the APCD 20% opacity limit (APCD Rule 401) and minimize nuisance impacts:

a. Reduce the amount of the disturbed area where possible;
b. Use of water trucks or sprinkler systems in sufficient quantities to prevent airborne dust from leaving the site and from exceeding the APCD's limit of 20% opacity for greater than 3 minutes in any 60-minute period. Increased watering frequency would be required whenever wind speeds exceed 15 mph. Reclaimed (non-potable) water should be used whenever possible. When drought conditions exist and water use is a concern, the contractor or builder should consider the use of an APCD-approved dust suppressant where feasible to reduce the amount of water used for dust control. Please refer to the following link from the San Joaquin Valley Air District for a list of potential dust suppressants: Products Available for Controlling Dust;
c. All dirt stockpile areas should be sprayed daily and covered with tarps or other dust barriers as needed;
d. Permanent dust control measures identified in the approved project revegetation and landscape plans should be implemented as soon as possible, following completion of any soil disturbing activities;
e. Exposed ground areas that are planned to be reworked at dates greater than one month after initial grading should be sown with a fast germinating, non-invasive grass seed and watered until vegetation is established;

f. All disturbed soil areas not subject to revegetation should be stabilized using approved chemical soil binders, jute netting, or other methods approved in advance by the APCD;
g. All roadways, driveways, sidewalks, etc. to be paved should be completed as soon as possible. In addition, building pads should be laid as soon as possible after grading unless seeding or soil binders are used;
h. Vehicle speed for all construction vehicles shall not exceed 15 mph on any unpaved surface at the construction site;
i. All trucks hauling dirt, sand, soil, or other loose materials are to be covered or should maintain at least two feet of freeboard (minimum vertical distance between top of load and top of trailer) in accordance with California Vehicle Code (CVC) Section 23114;
j. "Track-Out" is defined as sand or soil that adheres to and/or agglomerates on the exterior surfaces of motor vehicles and/or equipment (including tires) that may then fall onto any highway or street as described in CVC Section 23113 and California Water Code 13304. To prevent 'track out', designate access points and require all employees, subcontractors, and others to use them. Install and operate a 'track-out prevention device' where vehicles enter and exit unpaved roads onto paved streets. The 'track-out prevention device' can be any device or combination of devices that are effective at preventing track out, located at the point of intersection of an unpaved area and a paved road. Rumble strips or steel plate devices need periodic cleaning to be effective. If paved roadways accumulate tracked out soils, the track-out prevention device may need to be modified;
k. Sweep streets at the end of each day if visible soil material is carried onto adjacent paved roads. Water sweepers shall be used with reclaimed water where feasible. Roads shall be pre-wetted prior to sweeping when feasible;
l. All PM_{10} mitigation measures required should be shown on grading and building plans; and
m. The contractor or builder shall designate a person or persons whose responsibility is to ensure any fugitive dust emissions do not result in a nuisance and to enhance the implementation of the mitigation measures as necessary to minimize dust complaints and reduce visible emissions below the APCD's limit of 20% opacity for greater than 3 minutes in any 60-minute period. Their duties shall include holidays and weekend periods when work may not be in progress (for example, wind-blown dust could be generated on an open dirt lot). The name and telephone number of such persons shall be provided to the APCD Compliance Division prior to the start of any grading, earthwork, or demolition (Contact Tim Fuhs at 805-781-5912).

<u>Pipeline Purging Operations</u>
The applicant must submit a Pipeline Purging Plan and permit application to the APCD. If the Pipeline Purging Plan includes the use of APCD permitted degassing systems, the APCD may issue a permit exemption for the project. A permit or permit exemption must be issued by the APCD prior to the start of any pipeline degassing and/or removal activities. Please allow 6 weeks for the permit processing. Information and downloadable application forms are available under the Library section of our website at slocleanair.org. For more information on these requirements, contact the APCD Engineering & Compliance Division at 805-781-5912.

All pipeline purging operations shall be conducted in accordance with the following APCD pipeline purging policy.

1. Petroleum material transportation pipelines shall not be purged or degassed without

prior APCO approval.

2. The operator shall submit a Pipeline Purging Plan, designed to minimize nuisance odors, at least thirty (30) calendar days prior to the purging of any petroleum material transportation pipeline. That plan shall:
    a. Include pipeline internal diameter, designation, material normally conveyed, a large scale map of the upstream and downstream locations between which the purge is to occur, the distance in feet between those two points, and a small scale map of the pipeline's route;
    b. Address all phases of the process including the estimated length of time over which the purge will occur, the starting date and time, and the method of odor control;
    c. The location, size, anticipated length of stay, and Rule 425, that addresses petroleum storage tanks, compliance status of any temporary storage vessels;
    d. The location, anticipated length of operation, and the following operating parameters for any odor or emission control device:
        1) Thermal oxidizers: flow rate of pipeline vapors to the control equipment, control efficiency and capacity, operating temperature, auxiliary fuel requirements and consumption rate, expected operating characteristics, and auxiliary equipment requirements, e.g. motor-generators;
        2) Carbon absorbers: flow rate of pipeline vapors to the control equipment, control efficiency and capacity, breakthrough detection method, and actions to be taken upon breakthrough discovery.
3. An estimate of the composition of the pipeline vapors to include hydrogen sulfide, benzene, and total petroleum hydrocarbon in volume percent or ppmv; and
    a. Include emission estimates for all phases of work and equipment involved, with the exception of engines used for welders or air compressors, or as the motive power for mobile equipment.
4. Multiple or sequential pipeline purges that will occur within a single ninety (90) day period may be consolidated into the same plan. The APCO reserves the right to require a permit or portable equipment registration for any equipment proposed for use in the pipeline purging if that equipment is not exempt under APCD Rule 201, Equipment Not Requiring a Permit.
5. After the initial submittal of a Pipeline Purging Plan, any changes to that plan must be submitted as soon as possible to the APCO. Any change submitted with a lead-time of less than one (1) working day may result in disapproval for the lack of time available to assess the effects of the change.

The APCO shall be notified no later than two (2) working days prior to any pipeline purging event.

Thank you for the opportunity to comment on this SOW. If you have any questions or comments, feel free to contact Gary Arcemont at 781-5912.

Sincerely,

Andy Mutziger
Manager - Planning, Outreach & Grant Division

AJM/JNM/GJA/jjh

cc: Dora Drexler, APCD Manager – Engineering & Compliance Division
Lacey Minnick, County Planning and Building

SLO COUNTY apcd | Air Pollution Control District San Luis Obispo County

Via Email

April 14, 2021

Susan Strachan
County of San Luis Obispo Planning and Building
976 Osos Street, Room 300
San Luis Obispo, CA 93408
sstrachan@co.slo.ca.us

SUBJECT: DRC2021-00092 PG&E Diablo Canyon Power Plant Decommissioning

To Susan Strachan:

Thank you for including the San Luis Obispo County Air Pollution Control District (APCD) in the environmental review process. We have completed our review of the Diablo Canyon Power Plant Decommissioning documentation.

The Diablo Canyon Power Plant (DCPP) Decommissioning Project (Project) proposed by Pacific Gas and Electric Company (PG&E) will include activities at the DCPP site located approximately seven miles northwest of Avila Beach, within the County of San Luis Obispo, California. Project activities will also take place at the Pismo Beach Materials Handling Facility located within the City of Pismo Beach and at one of two Santa Maria Valley Railyard Facility sites located in Santa Barbara County or the City of Santa Maria, California. PG&E announced plans in 2016 to retire Diablo Canyons two reactors – the only remaining nuclear power plant in California. This will occur at the end of the current operating licenses in 2024 and 2025. Work at the project site will occur over decades.

This Development Plan/Coastal Development Permit (CDP) and Conditional Use Permit (CUP) Application Package is being submitted by PG&E to proceed with the decommissioning of the DCPP. PG&E's CDP application package includes an Environmental Impact Assessment (EIA) and several technical reports to support the application and to assist the County of San Luis Obispo (County) and its consultant in preparation of an Environmental Impact Report (EIR). The EIA is intended to assist the County in its preparation of an EIR for the Project and provides the environmental setting, existing conditions, regulatory framework, proposed avoidance and minimization measures, significance thresholds, environmental analysis, recommended mitigation measures and impact conclusions.

The APCD has the following comments.

General comments
As a commenting agency in the California Environmental Quality Act (CEQA) review process for a project, the APCD assesses air pollution impacts of a project. **Please address the action items contained in this letter that are highlighted by bold and underlined text**.

Since work at the project site will not start for several years and will extend over decades, project activities, schedule and phasing may change over time and may need to be re-assessed relative to the submitted air quality impact analyses. The APCD's *CEQA Air Quality Handbook* (April 2012) and Land Use & CEQA webpage provides current guidance. In addition, the APCD recently issued CEQA greenhouse gas guidance. APCD guidance will likely be updated over time. Therefore, an updated assessment should be provided at the commencement of the project based on then current APCD guidance. The following APCD comments discuss what the APCD is expecting for these future impact evaluations and reports.

Decommissioning Activity Management Plan
Appendix I of the decommissioning project's referral packet includes an air quality impact assessment for the project based on preliminary estimates of project activity. This assessment indicates that decommissioning activities could exceed the APCD's daily and quarterly construction thresholds as shown the CEQA Air Quality Handbook.

Section 6.4.3 of the project referral does not include all applicable construction equipment mitigation measures from Section 2.3 of the *CEQA Air Quality Handbook* (April 2012). **An activity management plan and offsite mitigation are additional mitigation measures that are needed because of the potential exceedance of APCD's Tier 2 construction threshold.** The current APCD construction mitigation measures can be found in the Quick Guide for SLO County APCD Construction Mitigation Measures.

The APCD recommends the project implement a Decommissioning Activity Management Plan (DAMP) that includes all APCD mitigation in Section 2.3 of the CEQA Air Quality Handbook and submit reports to APCD at the end of each quarter that present actual air quality impacts during the quarter. The applicant will compare the impacts to APCD's daily and quarterly construction thresholds, and if necessary, identify updated air quality mitigation measures to mitigate impacts in excess of APCD thresholds.

The DAMP should be submitted to the APCD for review to determine whether APCD standards have been met. Guidelines can be found in the APCD's CEQA Air Quality Handbook – Technical Appendix 4.5. The DAMP will be approved by the lead agency prior to the start of construction and should include, but not be limited to, the following elements:

- A Dust Control Management Plan that describes all dust control measures;
- List of on and off-road construction equipment (equipment type, gross vehicle weight rating, engine model year, horsepower and miles or hours of operation);
- Scheduling of construction truck trips during non-peak hours to reduce peak hour emissions;
- Limits to the length of the construction workday, if necessary; and
- Phasing of construction activities, if appropriate.

The follow APCD comments addresses individual sections of the Air Quality and GHG Assessment document.

Section 6.2.1.1 paragraph 4. At Diablo Canyon, winds from the southeast (SE) are not offshore. Northwest and SE winds generally parallel the coast near Diablo Canyon. **Please modify this paragraph.**

Section 6.2.2. Truck and rail transport will impact air quality outside of California, as materials are transported to Arizona, Utah, Nevada and Texas. **APCD recommends that this section state that there will be air quality impacts from truck and rail transport in Arizona, Utah, Nevada, New Mexico and Texas.** (Section 3.3.1.1.2 of the project referral also has this information – please make edits to this section as well). **Please revise this section.**

Section 7.3. This section incorrectly concludes that the decommissioning project would be subject to the APCD's stationary source industrial GHG threshold of 10,000 MT CO_2e/yr. Our June 12, 2020 letter (attached) and our 2021 CEQA GHG Guidance provide guidance for how to address GHG impacts when there is no applicable threshold. **APCD recommends that Section 7.3 be revised to apply this guidance to the project.**

The following APCD comments are related to individual sections of the Transportation document and the Health Risk Assessment document

Section 3. Page 448 of 473. This section discusses barge traffic and transport of materials by barge.

Previous staff discussions related to the Health Risk Assessment indicated there would not be any transport of materials by marine vessels. Omission of marine vessel emissions will impact the results of the health risk assessment. **This inconsistency must be addressed.**

The following APCD comments are related to APCD permits, notifications and trucking requirements. Action items related to APCD permits are listed in the project referral documentation. The following discussion provides more detail.

Permit Requirements
Portable equipment, 50 horsepower (hp) or greater, used during project activities may require California statewide portable equipment registration (issued by the California Air Resources Board) or an APCD permit. The following list is provided as a guide to equipment and operations that may have permitting requirements but should not be viewed as exclusive. For a more detailed listing, refer to the Technical Appendices, page 4-4, in the *CEQA Air Quality Handbook* (April 2012).

- Power screens, conveyors, diesel engines, and/or crushers;
- Portable generators and equipment with engines that are 50 hp or greater;
- Electrical generation plants or the use of standby generators;
- Internal combustion engines;
- Rock and pavement crushing;
- Unconfined abrasive blasting operations;
- Tub grinders;
- Trommel screens; and
- Portable plants (e.g., aggregate plant, asphalt batch plant, concrete batch plant, etc.).

If you have any questions regarding APCD permitting requirements, contact the APCD Engineering and Compliance Division at 805 781-5912.

Hydrocarbon Contaminated Soil

Should hydrocarbon contaminated soil be encountered during project activities, the APCD must be notified as soon as possible and no later than 48 hours after affected material is discovered to determine if an APCD Permit will be required. In addition, the following measures shall be implemented immediately after contaminated soil is discovered:

- Covers on storage piles shall be maintained in place at all times in areas not actively involved in soil addition or removal;
- Contaminated soil shall be covered with at least six inches of packed uncontaminated soil or a non-permeable hydrocarbon barrier. No headspace shall be allowed where vapors could accumulate;
- Covered piles shall be designed in such a way to eliminate erosion due to wind or water. No openings in the covers are permitted;
- The air quality impacts from the excavation and haul trips associated with removing the contaminated soil must be evaluated and mitigated if total emissions exceed the APCD's construction phase thresholds;
- During soil excavation, odors shall not be evident to such a degree as to cause a public nuisance; and,
- Clean soil must be segregated from contaminated soil.

The notification and permitting determination requirements shall be directed to the APCD Engineering & Compliance Division at 805-781-5912.

Proper Abatement of Asbestos-Containing Material (ACM)

Demolition activities can have potential negative air quality impacts, including issues surrounding proper handling, abatement, and disposal of asbestos-containing material (ACM). ACM could be encountered during the demolition existing structures. If this project will likely be subject to various regulatory jurisdictions, including the requirements stipulated in the National Emission Standard for Hazardous Air Pollutants (40CFR61, Subpart M - asbestos NESHAP).

NESHAP requirements include but are not limited to:

1) Written notification to the APCD, within at least 10 business days of activities commencing.
2) Asbestos survey report conducted by a Certified Asbestos Consultant.
3) Written work plan addressing asbestos handling procedures in order to prevent visible emissions.

Go to slocleanair.org/rules-regulations/asbestos for further information.

Proper Abatement of Lead-Based Coated Structures

Demolition, remodeling, sandblasting, or removal with a heat gun can result in the release of lead-containing particles from the site. Proper abatement of lead-based paint must be performed to prevent the release of lead particles from the site. An APCD permit is required for sandblasting operations. For additional information regarding lead abatement, contact the San Luis Obispo County Environmental Health Department at 805-781-5544 or Cal-OSHA at 818-901-5403. Additional information can also be found online at epa.gov/lead.

Limits of Idling
State law prohibits idling diesel engines for more than 5 minutes. All projects with diesel-powered construction activity shall comply with Section 2485 of Title 13 of the California Code of Regulations and the 5-minute idling restriction identified in Section 2449(d)(2) of the California Air Resources Board's In-Use Off-Road Diesel regulation to minimize toxic air pollution impacts from idling diesel engines. Regulations can be reviewed at: Final Regulation Order Article 4.8.

Truck Routing
Proposed truck routes may need to be re-evaluated at times to ensure routing patterns have the least impact to residential dwellings and other sensitive receptors, such as schools, parks, day care centers, nursing homes, and hospitals.

Thank you for the opportunity to comment on this project. If you have any questions or comments, feel free to contact me at (805) 781-5912.

Sincerely,

GARY ARCEMONT
Air Quality Specialist

GJA/jjh

Enclosure: CEQA Letter 4208-1

cc: Dora Drexler, APCD
Lacey Minnick, County Planning and Building

SLO COUNTY apcd | Air Pollution Control District San Luis Obispo County

Via Email

June 12, 2020

Kris Vardas
DCPP Decommissioning
P.O. Box 56
Avila Beach, CA 93424
KAV6@pge.com

SUBJECT: APCD Comments regarding the Diablo Canyon Power Plant Decommissioning - Statement of Work

To Kris Vardas:

Thank you for including the San Luis Obispo County Air Pollution Control District (APCD) in the environmental review process. We have completed our review of the April 28, 2020 Diablo Canyon Power Plant (DCPP) Decommissioning Statement of Work (SOW) air quality and transportation sections.

Background

Pacific Gas and Electric Company (PG&E) announced plans in 2016 to retire the two reactors at DCPP. This is proposed to begin at the end of the plant's current Nuclear Regulatory Commission operating licenses in 2024 and 2025.

The consultant, Environmental Resources Management (ERM) prepared the SOW which outlines aspects of the decommissioning project, including air quality aspects. Based on the SOW and APCD's input on the SOW, ERM would prepare an air quality impact assessment report for the decommissioning. This report would be provided in draft for review by the APCD, PG&E, and the County of San Luis Obispo (proposed lead agency for the project's future Environmental Impact Report).

The following are APCD's input for the SOW.

General comments

- APCD recommends the consultant quantify the impacts from the project. This includes criteria pollutants, greenhouse gases, and toxics (health risk assessment) inside and outside of SLO County.

- APCD recommends using HARP2 for the air quality risk assessment. The model not only evaluates inhalation risk, but also multi-pathway toxic risks. For within SLO County, the APCD recommends isopleth plots for the project impacts with increments of 1 in a million, 5, 10, etc. For outside of SLO County, the APCD recommends a plot of risk relative to distance from the rail line, truck route, and receiving port.

- Project schedule and phasing may change over time and the air quality impact analyses will need to be reassessed relative to these changes.

This section addresses comments related to individual sections of the SOW.

Section 2.4.2 Air Quality Impact Assessment Report

Criteria Pollutants
An air quality impact assessment of the project needs to be completed that quantifies the impacts, and incorporates mitigation if impacts are above the APCD's significance threshold values identified in Table 2-1 of the *CEQA Air Quality Handbook* (ROG+NOx, DPM and PM10 only). Impacts in excess of the threshold values will need to be mitigated as outlined on Page 2-2 of the APCD's CEQA Handbook.

Greenhouse Gases
Evaluation of greenhouse gas (GHG) emissions are required per Assembly Bill (AB) 32, the California Global Warming Solution Act of 2006. Senate Bill 32 provided an update to the state's AB 32 2020 emission reduction target. The 2030 target from SB 32 is 40% below the 1990 levels. Although not legislatively set, a 2050 target was established by California Governor Schwarzenegger's Executive Order S-3-05. Since this project will likely continue past 2030, the evaluation should consider applicable GHG reduction targets for the project to be evaluated against.

It should be noted that Table 3-2 in the APCD *CEQA Air Quality Handbook (2012)* includes a GHG bright line threshold of significance, but threshold is no longer valid because it was based on the AB 32 target. The APCD plans to issue guidance on how projects can address their GHG impacts through available mitigation approaches. In the meantime, an informational document from the Sacramento Metropolitan Air Quality Management District states:

> If a jurisdiction does not have a qualified CAP [Climate Action Plan], development projects may have to mitigate GHG emissions from their projects to no-net increase level, which has already been done for larger development projects[1] and is the most defensible alternative to compliance with a qualified CAP [Climate Action Plan][2].

San Luis Obispo County does not currently have a CAP that can be considered qualified with SB 32 or future GHG emission reduction requirements. In terms of mitigating a project's total GHG impacts, the APCD first recommends on-site mitigation. If the impacts still exceed no-net increase

[1] Newhall Ranch Resource Management and Development Plan and Spineflower Conservation Plan: Final Additional Environmental Analysis. California Department of Fish and Wildlife SCH No. 2000011025, 12 June 2017.
[2] "Final White Paper Beyond 2020 And Newhall: A Field Guide To New CEQA Greenhouse Gas Thresholds And Climate Action Plan Targets For California." Association of Environmental Professionals, 18 October 2016, https://califaep.org/docs/AEP-2016_Final_White_Paper.pdf.

with the implementation of on-site mitigation, then local off-site mitigation should be considered. Any mitigation should be real, verifiable, and additional to regulatory requirements. If the impacts still exceed no-net increase after the implementation of on-site and local off-site mitigation, then carbon offsets should be purchased using the following guidance to reduce GHG emissions to no-net increase:

- Any offset purchased for the project's California impacts should come from California generated GHG reductions. Impacts outside of California could be mitigated with non-California generated GHG reductions.
- While the APCD does not endorse individual offset programs, the following are some examples of California offset programs. Others may exist:
    - California Air Resources Board (CARB): https://ww3.arb.ca.gov/cc/capandtrade/offsets/offsets.htm#protocols
    - California American Carbon Registry: https://americancarbonregistry.org/california-offsets/california-offset-program
    - Climate Action Reserve: https://www.climateactionreserve.org/how/california-compliance-projects/
    - Climate Forward: https://climateforward.org/how-it-works/

Section 2.2.2.2.6. Risk assessment and Section 2.4.2.8 (determining proximity of sensitive receptors for toxic impact analysis). The risk assessment should compare the risk for the different material transport options (e.g. trucking/rail versus barge). The engine emission standards for the trucking fleet, rail, and marine vessels that the project could use for the different decommissioning scenarios need to be factored into the risk assessment. The project should determine the engine standards the project proponents are willing to commit to use prior to conducting the risk assessment. Routes to minimize toxic risk to sensitive receptors should also be determined and is discussed later in this letter.

This section addresses comments related to demolition and decommissioning activities.

Permit Requirements
Based on the information provided, we are unsure of the types of equipment that may be present during the project. Portable equipment, 50 horsepower (hp) or greater, used during project activities may require California statewide portable equipment registration (issued by the California Air Resources Board) or an APCD permit. The following list is provided as a guide to equipment and operations that may have permitting requirements but should not be viewed as exclusive. For a more detailed listing, refer to the Technical Appendices, page 4-4, in the *CEQA Air Quality Handbook* (April 2012).

- Power screens, conveyors, diesel engines, and/or crushers;
- Portable generators and equipment with engines that are 50 hp or greater;
- Electrical generation plants or the use of standby generators;
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- Rock and pavement crushing;
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If you have any questions regarding APCD permitting requirements, contact the APCD Engineering and Compliance Division at 805 781-5912.

Hydrocarbon Contaminated Soil

Should hydrocarbon contaminated soil be encountered during project activities, the APCD must be notified as soon as possible and no later than 48 hours after affected material is discovered to determine if an APCD Permit will be required. In addition, the following measures shall be implemented immediately after contaminated soil is discovered:

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- Covered piles shall be designed in such a way to eliminate erosion due to wind or water. No openings in the covers are permitted;
- The air quality impacts from the excavation and haul trips associated with removing the contaminated soil must be evaluated and mitigated if total emissions exceed the APCD's construction phase thresholds;
- During soil excavation, odors shall not be evident to such a degree as to cause a public nuisance; and
- Clean soil must be segregated from contaminated soil.

The notification and permitting determination requirements shall be directed to the APCD Engineering & Compliance Division at 805-781-5912.

Developmental Burning

APCD Rule 501 prohibits developmental burning of vegetative material within San Luis Obispo County.

Proper Abatement of Asbestos-Containing Material

Demolition activities can have potential negative air quality impacts, including issues surrounding proper handling, abatement, and disposal of asbestos-containing material (ACM). ACM could be encountered during the demolition or remodeling of existing structures or the disturbance, demolition, or relocation of above or below ground utility pipes/pipelines (e.g., transite pipes or insulation on pipes). If this project will include any of these activities, then it may be subject to various regulatory jurisdictions, including the requirements stipulated in the National Emission Standard for Hazardous Air Pollutants (40CFR61, Subpart M - asbestos NESHAP).

NESHAP requirements include but are not limited to:

1) Written notification to the APCD, within at least 10 business days of activities commencing.
2) Asbestos survey report conducted by a Certified Asbestos Consultant.
3) Written work plan addressing asbestos handling procedures in order to prevent visible emissions.

Go to slocleanair.org/rules-regulations/asbestos.php for further information.

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Demolition, remodeling, sandblasting, or removal with a heat gun can result in the release of lead-containing particles from the site. Proper abatement of lead-based paint must be performed to prevent the release of lead particles from the site. An APCD permit is required for sandblasting operations. For additional information regarding lead abatement, contact the San Luis Obispo County Environmental Health Department at 805-781-5544 or Cal-OSHA at 818-901-5403. Additional information can also be found online at epa.gov/lead.

Limits of Idling

State law prohibits idling diesel engines for more than 5 minutes. All projects with diesel-powered construction activity shall comply with Section 2485 of Title 13 of the California Code of Regulations and the 5-minute idling restriction identified in Section 2449(d)(2) of the California Air Resources Board's In-Use Off-Road Diesel regulation to minimize toxic air pollution impacts from idling diesel engines. The specific requirements and exceptions for the on-road and off-road regulations can be reviewed at the following web sites: arb.ca.gov/msprog/truck-idling/factsheet.pdf and arb.ca.gov/regact/2007/ordiesl07/frooal.pdf.

Material Routing

Proposed routes to move the material should be evaluated and selected to ensure routing patterns have the least impact to residential dwellings and other sensitive receptors, such as schools, parks, day care centers, nursing homes, and hospitals.

Fugitive Dust Mitigation Measures: Long List

Construction activities can generate fugitive dust, which could be a nuisance to residents and businesses in close proximity to the proposed construction site. Projects with grading areas more than 4 acres and/or within 1,000 feet of any sensitive receptor shall implement the following mitigation measures to manage fugitive dust emissions such that they do not exceed the APCD 20% opacity limit (APCD Rule 401) and minimize nuisance impacts:

a. Reduce the amount of the disturbed area where possible;
b. Use of water trucks or sprinkler systems in sufficient quantities to prevent airborne dust from leaving the site and from exceeding the APCD's limit of 20% opacity for greater than 3 minutes in any 60-minute period. Increased watering frequency would be required whenever wind speeds exceed 15 mph. Reclaimed (non-potable) water should be used whenever possible. When drought conditions exist and water use is a concern, the contractor or builder should consider the use of an APCD-approved dust suppressant where feasible to reduce the amount of water used for dust control. Please refer to the following link from the San Joaquin Valley Air District for a list of potential dust suppressants: Products Available for Controlling Dust;
c. All dirt stockpile areas should be sprayed daily and covered with tarps or other dust barriers as needed;
d. Permanent dust control measures identified in the approved project revegetation and landscape plans should be implemented as soon as possible, following completion of any soil disturbing activities;
e. Exposed ground areas that are planned to be reworked at dates greater than one month after initial grading should be sown with a fast germinating, non-invasive grass seed and watered until vegetation is established;

f. All disturbed soil areas not subject to revegetation should be stabilized using approved chemical soil binders, jute netting, or other methods approved in advance by the APCD;
g. All roadways, driveways, sidewalks, etc. to be paved should be completed as soon as possible. In addition, building pads should be laid as soon as possible after grading unless seeding or soil binders are used;
h. Vehicle speed for all construction vehicles shall not exceed 15 mph on any unpaved surface at the construction site;
i. All trucks hauling dirt, sand, soil, or other loose materials are to be covered or should maintain at least two feet of freeboard (minimum vertical distance between top of load and top of trailer) in accordance with California Vehicle Code (CVC) Section 23114;
j. "Track-Out" is defined as sand or soil that adheres to and/or agglomerates on the exterior surfaces of motor vehicles and/or equipment (including tires) that may then fall onto any highway or street as described in CVC Section 23113 and California Water Code 13304. To prevent 'track out', designate access points and require all employees, subcontractors, and others to use them. Install and operate a 'track-out prevention device' where vehicles enter and exit unpaved roads onto paved streets. The 'track-out prevention device' can be any device or combination of devices that are effective at preventing track out, located at the point of intersection of an unpaved area and a paved road. Rumble strips or steel plate devices need periodic cleaning to be effective. If paved roadways accumulate tracked out soils, the track-out prevention device may need to be modified;
k. Sweep streets at the end of each day if visible soil material is carried onto adjacent paved roads. Water sweepers shall be used with reclaimed water where feasible. Roads shall be pre-wetted prior to sweeping when feasible;
l. All PM_{10} mitigation measures required should be shown on grading and building plans; and
m. The contractor or builder shall designate a person or persons whose responsibility is to ensure any fugitive dust emissions do not result in a nuisance and to enhance the implementation of the mitigation measures as necessary to minimize dust complaints and reduce visible emissions below the APCD's limit of 20% opacity for greater than 3 minutes in any 60-minute period. Their duties shall include holidays and weekend periods when work may not be in progress (for example, wind-blown dust could be generated on an open dirt lot). The name and telephone number of such persons shall be provided to the APCD Compliance Division prior to the start of any grading, earthwork, or demolition (Contact Tim Fuhs at 805-781-5912).

Pipeline Purging Operations

The applicant must submit a Pipeline Purging Plan and permit application to the APCD. If the Pipeline Purging Plan includes the use of APCD permitted degassing systems, the APCD may issue a permit exemption for the project. A permit or permit exemption must be issued by the APCD prior to the start of any pipeline degassing and/or removal activities. Please allow 6 weeks for the permit processing. Information and downloadable application forms are available under the Library section of our website at slocleanair.org. For more information on these requirements, contact the APCD Engineering & Compliance Division at 805-781-5912.

All pipeline purging operations shall be conducted in accordance with the following APCD pipeline purging policy.

1. Petroleum material transportation pipelines shall not be purged or degassed without

prior APCO approval.

2. The operator shall submit a Pipeline Purging Plan, designed to minimize nuisance odors, at least thirty (30) calendar days prior to the purging of any petroleum material transportation pipeline. That plan shall:
   a. Include pipeline internal diameter, designation, material normally conveyed, a large scale map of the upstream and downstream locations between which the purge is to occur, the distance in feet between those two points, and a small scale map of the pipeline's route;
   b. Address all phases of the process including the estimated length of time over which the purge will occur, the starting date and time, and the method of odor control;
   c. The location, size, anticipated length of stay, and Rule 425, that addresses petroleum storage tanks, compliance status of any temporary storage vessels;
   d. The location, anticipated length of operation, and the following operating parameters for any odor or emission control device:
      1) Thermal oxidizers: flow rate of pipeline vapors to the control equipment, control efficiency and capacity, operating temperature, auxiliary fuel requirements and consumption rate, expected operating characteristics, and auxiliary equipment requirements, e.g. motor-generators;
      2) Carbon absorbers: flow rate of pipeline vapors to the control equipment, control efficiency and capacity, breakthrough detection method, and actions to be taken upon breakthrough discovery.
3. An estimate of the composition of the pipeline vapors to include hydrogen sulfide, benzene, and total petroleum hydrocarbon in volume percent or ppmv; and
   a. Include emission estimates for all phases of work and equipment involved, with the exception of engines used for welders or air compressors, or as the motive power for mobile equipment.
4. Multiple or sequential pipeline purges that will occur within a single ninety (90) day period may be consolidated into the same plan. The APCO reserves the right to require a permit or portable equipment registration for any equipment proposed for use in the pipeline purging if that equipment is not exempt under APCD Rule 201, Equipment Not Requiring a Permit.
5. After the initial submittal of a Pipeline Purging Plan, any changes to that plan must be submitted as soon as possible to the APCO. Any change submitted with a lead-time of less than one (1) working day may result in disapproval for the lack of time available to assess the effects of the change.

The APCO shall be notified no later than two (2) working days prior to any pipeline purging event.

Thank you for the opportunity to comment on this SOW. If you have any questions or comments, feel free to contact Gary Arcemont at 781-5912.

Sincerely,

Andy Mutziger
Manager - Planning, Outreach & Grant Division

AJM/JNM/GJA/jjh

cc: Dora Drexler, APCD Manager – Engineering & Compliance Division
Lacey Minnick, County Planning and Building

VIA EMAIL ONLY

July 27, 2021

Susan Strachan
County of San Luis Obispo Department of Planning and Building
976 Osos Street, Room 300
San Luis Obispo, CA 93408
sstrachan@co.slo.ca.us

SUBJECT: APCD Comments Regarding the PG&E Diablo Canyon Nuclear Power Plant Decommissioning Project

Dear Susan Strachan:

Thank you for including the San Luis Obispo County Air Pollution Control District (APCD) in the environmental review process. We have completed our review of the proposed project located at the PG&E Diablo Canyon Nuclear Power Plant (DCPP), approximately seven miles northwest of Avila Beach. PG&E preformed an initial evaluation of the air quality and greenhouse gas impacts described in Appendix Q – Traffic Impact Assessment. The Appendix analyzes activities associated with decommissioning of the nuclear-powered electrical generating station. These activities can be broken down into two distinct parts for the context of the analysis: 1) Deconstruction and demolition activities occurring onsite at DCPP and 2) Transportation of waste from structure demolition at DCPP. As the site of the power plant will be returned primarily to natural conditions with retention of a few existing facilities, there are no operation and maintenance activities to be considered after decommissioning.

The following comments are formatted into 3 sections. The **(1) General Comments** section states information pertinent to the applicant, lead agency, and/or public. The **(2) Air Quality** and **(3) Greenhouse Gas Emissions** sections may state mitigation measures and/or rules and requirements which the APCD recommends be set as conditions of approval for the project. The **lead agency** may contact the APCD Planning Division for questions and comments related to the content in this letter at 805-781-5912.

Please Note: The APCD recently updated the Land Use and CEQA Webpage on the slocleanair.org website. The information on the webpage displays the most up-to-date guidance from the SLO County APCD, including the 2021 Interim CEQA Greenhouse Gas Guidance, Quick Guide for Construction Mitigation Measures and Quick Guide for Operational Mitigation Measures.

(1) General Comments

APCD comments regarding *Appendix Q – Traffic Impact Assessment*
6.4.3 Potential Impacts – Question (c)
The proposed project has changed to include activities at the Santa Maria Valley Railroad. Because of this, the Santa Barbara Air Pollution Control District should be notified of future referrals and studies related to this project especially since "residences are located appropriately 300 feet from the Osburn railyard [AND] emission sources at the Osburn railyard include the operational of a railcar mover and diesel-fired generators, in addition to incoming and outgoing trucks and locomotives" (Page 27 of Appendix Q).

(2) Air Quality

APCD comments regarding *PG&E Responses to Information Hold Letter*
PG&E Response to AQ-1:
As stated in this section "a list of equipment for barging of waste is in development and not included in this attachment [attachment 7]." A conceptual list of ocean-going and loading equipment is provided; however, the APCD is concerned that if the barging equipment list is not known, then the emission calculations stated in Table 6.4.3-3 may not be the most accurate estimate for barging of waste by marine vessel. The APCD recommends updating Attachment 7 to include a list of barging equipment and updating the Harbor Craft emission estimates stated in Appendix 1 (Page 438 and 439) in Appendix Q. Additionally, please clarify why the Port of Long Beach Harbor Craft Emissions by Vessel and Engine Type was the most appropriate option to derive emission factors from for this project as stated in Appendix 1.3 – Barge/Tug Emission Factors.

PG&E Response to AQ-6:
Although emission estimates in Appendix Q are below APCD Tier 2 thresholds thus indicating a Decommissioning Activity Management Plan (DAMP) is not needed, the APCD still supports the inclusion of a DAMP as a mitigation measure to ensure actual emissions with actual equipment used are below APCD Tier 2 thresholds. A DAMP would also provide a formal mechanism over the decommissioning process to evaluate actual daily and quarterly emissions relative to APCD thresholds and specify applicable on and off-site mitigation measures if needed.

APCD comments regarding *Appendix Q – Traffic Impact Assessment*
6.4.3 Potential Impacts – Question (b)
Along with calculating *quarterly* emission impacts of ROG+NOx and DPM, the EIR should also calculate *daily* impacts from ROG+NOx and DPM and compare them to the APCD's *daily* ROG+NOx and DPM thresholds displayed on the APCD's CEQA and Land Use Website under the drop-down title "Comparing Construction Emissions to Thresholds and Applying Mitigation."

6.4.3 Potential Impacts – Question (c)
On page 40 in Appendix I1 naturally occurring asbestos (NOA) impacts are discussed. Appendix Q does not address asbestos impacts in section 6.4.3. The EIR should address NOA and proper abatement of asbestos-containing material (ACM) as it relates to all locations and phases of the project. The following mitigation measures/special conditions to meet state or federal rules & regulations should be included in the EIR:

Proper Abatement of ACM
Demolition activities can have potential negative air quality impacts, including issues surrounding proper handling, abatement, and disposal of ACM. ACM could be encountered during the demolition or remodeling of existing structures or the disturbance, demolition, or relocation of above or below ground utility pipes/pipelines (e.g., transite pipes or insulation on pipes). If this project will include any of these activities, then it may be subject to various regulatory jurisdictions, including the requirements stipulated in the National Emission Standard for Hazardous Air Pollutants (40CFR61, Subpart M - asbestos NESHAP).

NESHAP requirements include but are not limited to:

1) Written notification to the APCD, within at least 10 business days of activities commencing.
2) Asbestos survey report conducted by a Certified Asbestos Consultant.
3) Written work plan addressing asbestos handling procedures in order to prevent visible emissions.

Go to slocleanair.org/rules-regulations/asbestos.php for more information.

Naturally Occurring Asbestos on Site
NOA has been identified by the California Air Resources Board as a toxic air contaminant. Serpentine and ultramafic rocks are very common throughout California and may contain NOA. The APCD has identified areas throughout the county where NOA may be present (NOA Map). The following requirements apply because the project site is in a candidate area for NOA. The applicant shall ensure that a geologic evaluation is conducted to determine if the area disturbed is or is not exempt from the CARB Asbestos Air Toxics Control Measure (Asbestos ATCM) for Construction, Grading, Quarrying, and Surface Mining Operations (Title 17 CCR Section 93105) regulation.

a. If the site is not exempt from the requirements of the regulation, the applicant must comply with all requirements outlined in the Asbestos ATCM. This may include development of an Asbestos Dust Mitigation Plan and an Asbestos Health and Safety Program for approval by the APCD; or
b. If the site is exempt, an exemption request must be filed with the APCD.

More information on NOA can be found at slocleanair.org/rules-regulations/asbestos/noa.

(3) Greenhouse Gas Emissions

APCD comments regarding *PG&E Responses to Information Hold Letter*
PG&E Response to AQ-10:

The Golden Door Properties v. County of San Diego decision ruled:

> That a mitigation measure in the SEIR that permitted the purchase of carbon offsets from projects outside the County, including international projects, violated the California Environmental Quality Act (CEQA) because the mitigation measure did not require that offsets meet AB 32 requirements, that greenhouse gas emission reductions be additional, and that the offsets originating outside California have greenhouse emissions programs

> equivalent to or stricter than California's program. In addition, the appellate court found that the mitigation measure violated CEQA because 100% of greenhouse gas emissions could be offset by projects originating outside California and there were no objective criteria for County officials to use to determine whether a particular offset program was appropriate. (Summary)

The no-net increase threshold does not necessarily mean that emissions need to be entirely mitigated by offsets, or that offsets used by PG&E will not meet AB 32, be additional, or appropriate. On January 28th, 2021 the SLO County APCD staff released the 2021 Interim CEQA GHG Guidance document to provide administrative clarification on the SLO County APCD Handbook's thresholds of significance for GHG emissions and to provide information on current trends, best practices, and legislation. In the document it describes a hierarchy of mitigation options to reduce GHG emissions. **The APCD recommends reviewing the document in its entirety and revising the GHG impact analyses accordingly.**

Further, on page 101 of the 2017 Climate Change Scoping Plan (2017 Scoping Plan) it states, "achieving no net additional increase in GHG emissions, resulting in no contribution to GHG impacts, is an appropriate overall objective for new development." Since the DCPP decommissioning project is not a "new" development project, this threshold may not be appropriate. However, **the APCD does not agree that the 10,000 MT CO2e is an appropriate threshold for this project.**

In the APCD Board approved *Greenhouse Gas Emission Thresholds Board Staff Report (2012)*, it describes the 10,000 MT CO2e industrial or stationary source threshold as follows:

> The Industrial Threshold (also called Stationary Source Threshold) applies to new or modified stationary source projects that will need to be analyzed under CEQA and mitigated to the maximum extent feasible. Both the South Coast Air Quality Management District (AQMD) and Bay Area AQMD have adopted a 10,000 MT C02e/yr threshold for stationary sources based on a goal of capturing and mitigating 90 to 95% of new stationary source GHG emissions. The APCD's proposed 10,000 MT C02e threshold accounts for 94% of all combustion related CO2 emissions in the APCD's 2009 GHG emissions inventory for combustion sources from all permitted facilities. Stationary source projects below the 10,000 MT CO2e/yr threshold account for only a small portion of SLO County's total GHG emissions from stationary sources. Such small sources will not significantly add to global climate change and will not hinder SLO County's ability to reach the AB 32 goal, even when considered cumulatively. (Page 4)

The Industrial or Stationary Source Threshold was based on the APCD's 2009 GHG emissions inventory for combustion sources from all permitted facilities with a goal of capturing and mitigating 90 to 95% of *new or modified* stationary source GHG emissions. Since the DCPP decommissioning activities would not be considered a "new stationary source" the 10,000 MT CO2e/yr threshold does not apply to this project. Additionally, "modified" as defined by Rule 105, Definitions, section A.49 states a "modified emission unit" is "any emission unit which will increase emissions of any air contaminant from an existing emission unit." The emission units for the DCPP facility are all currently permitted equipment/processes, which will not experience an increase of emissions through the decommissioning project. Furthermore, if permitted equipment/processes will decrease or cease operation during the decommissioning process, the actual GHG emissions associated with the decreased or ceased operated permitted equipment/processes can be subtracted from the decommissioning GHG emission totals if the baseline for this project is DCPP's current operation status.

Section 15064.7 (b) of the 2021 CEQA Statue and Guidelines states "lead agencies may also use thresholds on a case-by-case basis as provided in Section 15064 (b)(2)." The APCD recommends that if a no-net increase threshold will not be used for the decommissioning project, the lead agency could propose an appropriate threshold for this project, so the significant GHG emission impacts are properly mitigated. An SB 32 based GHG inventory should be used to develop an appropriate threshold. If the lead agency does not have their own SB 32 based GHG inventory, SLO County APCD has components of the County's inventory that could be used. Please contact the SLO County APCD Planning Division for more information.

APCD comments regarding *Appendix Q – Traffic Impact Assessment*
<u>Section 7.4.3 Potential Impacts – Table 7.4.3-1</u>

As indicated in the 2021 Interim CEQA Greenhouse Gas Guidance document, the 25-year project life amortization method is appropriate for commercial only projects. The DCPP decommissioning project is not a commercial project and thus the 25-year project life is not appropriate. The most appropriate project life for this project would be the duration of Phase 1 of decommissioning activities – 2024 through 2035 (12 years).

Again, thank you for the opportunity to comment on this proposal. If you have any questions or comments, feel free to contact me at 805-781-5912.

Sincerely,

JACKIE MANSOOR
Air Quality Specialist

JNM/jjr

Andrew Mutziger

From: Andrew Mutziger
Sent: Friday, September 24, 2021 12:36 PM
To: Sandra Alarcon-Lopez; Susan Strachan; Lisa Blewitt; Brewster Birdsall; Rachael Dal Porto; Jon Ansolabehere; Vince Kirkhuff
Cc: Cindy A. Chambers; Karl Tupper
Subject: Local GHG mitigation RE: Diablo GHG Threshold Meeting

Hi Susan – Thank you for the CPUC resource links for the Diablo closure.

All,
Thank you for the productive meeting on Wed. Beyond to information I provided during the meeting on local GHG mitigation, here are some additional prospects.

APCD has investigated APCD permits for high volume fuel users which could potentially be electrified, although it would be important to determine what electric infrastructure improvements each would need; PG&E has the expertise to make that determination. Some companies may be interested in a cost sharing the project with PG&E if the cost share makes sense for their future operations. Some projects could include solar to help offset the grid draw.

There are 2 diesel engines:

- 7,670 gal/yr (2020) and 6,000 gal/yr (2019)
- 3,400 gal/yr (2020) and 3,600 gal/yr (2019)

There are several wineries and other private facilities w/ natural gas boilers (mmcf = million cf) or LPG or propane boilers:

- 43.0 mmcf/yr (2020) and 45.2 mmcf/yr (2019)
- 28.21 mmcf/yr (2020) and 20.5 mmcf/yr (2019)
- 7.0 mmcf/yr (2020) and 9 mmcf/yr (2019)
- 6.6 mmcf/yr (2020)
- 6.2 mmcf/yr (2020) and 7 mmcf/yr (2019)

- 7,750 gal/yr (2020) – LPG boiler
- 11,500 gal/yr (2020) 17,500 gal/yr (2019) – Propane boiler
- Three – 8,000 gal/yr (2020) – Propane boilers

There are two major facilities that have many emission sources, some of which could be electrified:

- Cal Poly – They have a strong interest in sustainability – Talk with Dennis Elliot
- CA Men's Colony

Within our grant program, stationary irrigation engines can be electrified and controlled by variable frequency drives. We have had little interest from the growers as of late, but dealers might be able to find some with current interest. We have electrified many in the past running 1000 to 2000 hrs/yr. There are some large natural gas and diesel ag engines in Cuayma.

Please let us know if you have any questions or need additional information.
Sincerely,

Andy Mutziger | Division Manager
Planning, Monitoring & Grants

SLO County Air Pollution Control District
(805) 781-5956 VM • amutziger@co.slo.ca.us • SLOCleanAir.org

From: Sandra Alarcon-Lopez <Salopez@aspeneg.com>
Sent: Wednesday, September 22, 2021 4:55 PM
To: Susan Strachan <sstrachan@co.slo.ca.us>; Andrew Mutziger <amutziger@co.slo.ca.us>; Jackie Mansoor <JMansoor@co.slo.ca.us>; Lisa Blewitt <lblewitt@aspeneg.com>; Brewster Birdsall <Bbirdsall@aspeneg.com>; Rachael Dal Porto <RDPorto@aspeneg.com>; Jon Ansolabehere <jansolabehere@co.slo.ca.us>; Vince Kirkhuff <vkirkhuff@co.slo.ca.us>
Cc: Cindy A. Chambers <cchambers@co.slo.ca.us>
Subject: [EXT]RE: Diablo GHG Threshold Meeting

Thank you.

Sandra Alarcón-Lopez
Executive Vice President

5020 Chesebro Road, Suite 200, Agoura Hills, CA 91301
Office: (562) 947-5259 Cell: (562) 715-1138
salopez@aspeneg.com
www.aspeneg.com

Aspen is pleased to continue providing responsive service to our clients remotely and in compliance with COVID-19 regulations during this time. You may reach us by email or business phone, which is connected to our home offices.

From: Susan Strachan <sstrachan@co.slo.ca.us>
Sent: Wednesday, September 22, 2021 3:54 PM
To: Andrew Mutziger <amutziger@co.slo.ca.us>; Jackie Mansoor <JMansoor@co.slo.ca.us>; Sandra Alarcon-Lopez <Salopez@aspeneg.com>; Lisa Blewitt <lblewitt@aspeneg.com>; Brewster Birdsall <Bbirdsall@aspeneg.com>; Rachael Dal Porto <RDPorto@aspeneg.com>; Jon Ansolabehere <jansolabehere@co.slo.ca.us>; Vince Kirkhuff <vkirkhuff@co.slo.ca.us>
Cc: Cindy A. Chambers <cchambers@co.slo.ca.us>
Subject: RE: Diablo GHG Threshold Meeting

Hi Everyone –

Below is the link to the CPUC document approving the shutdown of Diablo Canyon.

https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M205/K423/205423920.PDF

Thanks,

Susan Strachan
Nuclear Power Plant Decommissioning Manager
Direct: (805) 788-2129
Email: sstrachan@co.slo.ca.us

COUNTY OF SAN LUIS OBISPO
PLANNING & BUILDING

From: Susan Strachan
Sent: Wednesday, September 22, 2021 2:16 PM
To: Andrew Mutziger <amutziger@co.slo.ca.us>; Jackie Mansoor <JMansoor@co.slo.ca.us>; Salopez@aspeneg.com; Lisa Blewitt <lblewitt@aspeneg.com>; Brewster Birdsall <Bbirdsall@aspeneg.com>; rdporto@aspeneg.com; Jon Ansolabehere <jansolabehere@co.slo.ca.us>; Vince Kirkhuff <vkirkhuff@co.slo.ca.us>
Cc: Cindy A. Chambers <cchambers@co.slo.ca.us>
Subject: RE: Diablo GHG Threshold Meeting

Hi Everyone -

Below are links to documents on the CPUC decision regarding procurement of additional power to cover for the Diablo closure as well as some gas-fire once through cooling plants. The original CPUC proposal included procurement of natural gas-fired plant capacity. However, the decision requires 100% clean energy.

Revised Proposed Decision: https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M389/K155/389155856.PDF
Redline: https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M389/K243/389243715.pdf
CPUC Press Release: http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M389/K478/389478892.PDF

Please let me know if you have any questions.

Thanks,

Susan Strachan

Nuclear Power Plant Decommissioning Manager
Direct: (805) 788-2129
Email: sstrachan@co.slo.ca.us

COUNTY OF SAN LUIS OBISPO
PLANNING & BUILDING

From: Andrew Mutziger <amutziger@co.slo.ca.us>
Sent: Wednesday, September 22, 2021 12:18 PM
To: Susan Strachan <sstrachan@co.slo.ca.us>; Jackie Mansoor <JMansoor@co.slo.ca.us>; Salopez@aspeneg.com; Lisa Blewitt <lblewitt@aspeneg.com>; Brewster Birdsall <Bbirdsall@aspeneg.com>; rdporto@aspeneg.com; Jon Ansolabehere <jansolabehere@co.slo.ca.us>; Vince Kirkhuff <vkirkhuff@co.slo.ca.us>
Cc: Cindy A. Chambers <cchambers@co.slo.ca.us>
Subject: RE: Diablo GHG Threshold Meeting

Hi All,
In preparation for our 1pm meeting today, I wanted to provide you with a quick summary of my discussion with CARB regarding the GHG side of the evaluation:

1. Threshold: I expressed our last meeting discussion on threshold concepts for the closure. They had no additional thoughts but had thoughts on baseline.
2. Baseline: CEQA allows for a future baseline that more adequately characterizes the project. When the plant closes, there will be impacts as the electricity load shifts from nuclear to a more emission intensive load. It is likely that PCUC, Energy Commission, etc. already have ideas about this.
3. State Renewable Goals: How does the plant closure and load shift fit into the state's renewable goals, recognizing that the impact at closure will not be the same in the future as renewables ramp up.
4. AB 900 – Judicial CEQA Streamlining example: While this streamlining provision is not directly applicable to the closure, the GHG mitigation tools may be helpful to consider: Charging stations, tree planting, city fleet replacement with EVs, think outside of the box. For example, from APCD's background with our GHG Stakeholder Group - Jurisdictions have limited resources, so potentially fund qualified Climate Action Plans or other efforts to help jurisdictions implement measures that reduce their GHG inventories in a science-based way to meet the state's 2030, 2050, and carbon neutrality targets.
5. Case Law's 50% Offset Limit: It is either the Golden Door case or the Newhall Ranch case that spoke about no more than 50% of needed reductions coming from offsets. It sounds like CARB staff were not sure if case law acknowledges the challenge of this. It does not sound like it has been tested. On-site or local mitigation may be tough to meet the 50% of the reductions.
6. Recommended a Push for Local Mitigation Project: CARB indicated that local mitigation does not necessarily need to meet strict CARB offset standards and yet count for mitigation. An example might be funding a local retrofit program of the built environment. 3C-REN has an existing retrofit program that has limited scope based on need. Perhaps there is a way to scale or duplicate.

7. Offsets or Forecast Mitigation Units: For the hierarchy of GHG mitigation/offset recommendations from SLO County APCD, please see our 2021 Interim GHG Guidance. CARB approved GHG offset project registries may host offsets based on voluntary protocols which can work for CEQA. Climate Action Reserve also offers the Climate Forward concept which funds known emission reduction programs/projects that have yet to happen. Our understanding is that there is a prospect of moving CAR1487 Project from their registry to FMUs which could also work for CEQA compliance. This specific project is from RenewWest. We understand that the project could provide 1 million California generated FMU (tons) available for purchase. There may be other California FMU or offsets available.

Looking forward to a productive meeting.
Sincerely,
Andy Mutziger | Division Manager
Planning, Monitoring & Grants
SLO County Air Pollution Control District
(805) 781-5956 VM • amutziger@co.slo.ca.us • SLOCleanAir.org

-----Original Appointment-----
From: Susan Strachan <sstrachan@co.slo.ca.us>
Sent: Friday, August 20, 2021 8:54 AM
To: Susan Strachan; Andrew Mutziger; Jackie Mansoor; Salopez@aspeneg.com; Lisa Blewitt; Brewster Birdsall; rdporto@aspeneg.com; Jon Ansolabehere; Vince Kirkhuff
Cc: Cindy A. Chambers
Subject: Diablo GHG Threshold Meeting
When: Wednesday, September 22, 2021 1:00 PM-2:00 PM (UTC-08:00) Pacific Time (US & Canada).
Where: Microsoft Teams Meeting

Microsoft Teams meeting

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Andrew Mutziger

From:	Andrew Mutziger
Sent:	Friday, November 12, 2021 4:11 PM
To:	Cindy A. Chambers
Cc:	Susan Strachan
Subject:	RE: REVISED REFERRAL - Response to Information-Hold For DRC2021-00092 - Diablo Canyon Nuclear Power Plant Decommissioning Project

Hi Cindy,
I'm following up with you on PG&E's 17 Sep responses to AQ-1 to AQ-4 from the County's 9 Aug Information Hold Letter. SLO County APCD accepts the PG&E responses.
Sincerely,

Andy Mutziger | Division Manager
Planning, Monitoring & Grants
SLO County Air Pollution Control District
(805) 781-5956 VM • amutziger@co.slo.ca.us • SLOCleanAir.org

From: Cindy A. Chambers <cchambers@co.slo.ca.us>
Sent: Friday, October 8, 2021 1:28 PM
To: Karen White <xolon.salinan.heritage@gmail.com>; info@salinantribe.com; olivas.mona_gmail.com <olivas.mona@gmail.com>; chumashtribe_sbcglobal.net <chumashtribe@sbcglobal.net>; cbcntribalchair@gmail.com; jtumamait@hotmail.com; neil.peyron@tulerivertribe-nsn.gov; Alyssa Roslan <aroslan@co.slo.ca.us>; Andrew Mutziger <amutziger@co.slo.ca.us>; bruce.a.henderson@usace.army.mil; avilacsd_gmail.com <avilacsd@gmail.com>; hagemann.associates_gmail.com <hagemann.associates@gmail.com>; Cheryl Journey <cjourney@co.slo.ca.us>; Don C. Moore <dcmoore@co.slo.ca.us>; Lauren Burrus <lburrus@co.slo.ca.us>; Michael Stoker <mstoker@co.slo.ca.us>; Michelle Freeman <mfreeman@co.slo.ca.us>; Sylvia Aldana <saldana@co.slo.ca.us>; ccastellon@blm.gov; R4CEQA@wildlife.ca.gov; Bailey, Craig@Wildlife <Craig.Bailey@wildlife.ca.gov>; sarah.paulson@wildlife.ca.gov; Merideth.Sterkel@cpuc.ca.gov; Kevin.McLean_fire.ca.gov <Kevin.McLean@fire.ca.gov>; Wells, Dell@CALFIRE <Dell.Wells@fire.ca.gov>; Veyna, Garrett@CALFIRE <Garrett.Veyna@fire.ca.gov>; McRoberts, Loree <Loree.McRoberts@fire.ca.gov>; Dennis Byrnes <dennis.byrnes@fire.ca.gov>; Schudson, Jenna@DOT <Jenna.Schudson@dot.ca.gov>; agcity_arroyogrande.org <agcity@arroyogrande.org>; bpedrotti@arroyogrande.org; bbuckingham_grover.org <bbuckingham@grover.org>; Steven Graham <sgraham@morrobayca.gov>; Matt Downing <mdowning@pismobeach.org>; Rebecca Cox <rcox@slocity.org>; c ng <cng@cityofsantamaria.org>; deady@cityofsantamaria.org; brian.o'neill@coastal.ca.gov; Luster, Tom@Coastal <tom.luster@coastal.ca.gov>; jybarra@co.santa-barbara.ca.us; howen@co.santa-barbara.ca.us; jzoro@countyofsb.org; pearson@sbcapcd.org; gavin.mccreary@dtsc.ca.gov; Leslie Terry <lterry@co.slo.ca.us>; Kayla M Rutland <krutland@co.slo.ca.us>; Kathleen Goble <kgoble@co.slo.ca.us>; Caleb Mott <cmott@co.slo.ca.us>; Vicki Janssen <vjanssen@co.slo.ca.us>; Blake Fixler <bfixler@co.slo.ca.us>; Sarah Sartain <ssartain@co.slo.ca.us>; duane.whittemore@lmusd.org; jdyer@waterboards.ca.gov; Elizabeth Kavanaugh <ekavanaugh@co.slo.ca.us>; admin@portsanluis.com; AndreaL_portsanluis.com <AndreaL@portsanluis.com>; David Grim <dgrim@co.slo.ca.us>; Edward Reading <ereading@co.slo.ca.us>; JR Beard <rbeard@co.slo.ca.us>; Peter Moreci <PMoreci@co.slo.ca.us>; Rene Brill <rbrill@co.slo.ca.us>; Wendell Wilkes <wwilkes@co.slo.ca.us>; Brendan Clark <BClark@co.slo.ca.us>; Genaro Diaz <gdiaz@co.slo.ca.us>; Lucas Sharkey <Lucas.Sharkey@Waterboards.ca.gov>; phammer@waterboards.ca.gov; Tamara Presser <TPresser@waterboards.ca.gov>; mdawson_slcusd.org <mdawson@slcusd.org>; SSanders_SLOCOG

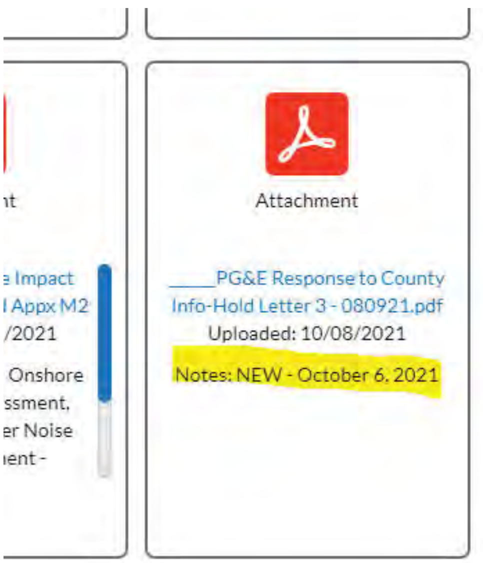
<SSanders@slocog.org>; TGillham_slocog.org <TGillham@slocog.org>; shanamaikai_slocog.org <shanamaikai@slocog.org>; SH_COMMANDERS <sh-commanders@co.slo.ca.us>; Simpkin, Drew@SLC <drew.simpkin@slc.ca.gov>; Anthony Schuetze <aschuetze@co.slo.ca.us>; glen_knowles@fws.gov; Leilani Takano <leilani_takano@fws.gov>; roger_root@fws.gov; christopher_diel@fws.gov; apease_slocity.org <apease@slocity.org>; fcollins_northernchumash.org <fcollins@northernchumash.org>; brooke.gutierrez_parks.ca.gov <brooke.gutierrez@parks.ca.gov>; avilavalleyac@gmail.com; tom.swanson@fire.ca.gov
Cc: Susan Strachan <sstrachan@co.slo.ca.us>; Cindy A. Chambers <cchambers@co.slo.ca.us>
Subject: REVISED REFERRAL - Response to Information-Hold For DRC2021-00092 - Diablo Canyon Nuclear Power Plant Decommissioning Project

Hello,

We are requesting your review of this **REVISED RESPONSE TO PREVIOUS SUBMITTAL,** as the proposed project may be of interest or concern to your department/agency. Please click the direct hyperlink below titled "Project Summary / Referral*" for an overview of the project, and the response to comments dated October 6, 2021:

Project Summary / Referral*: PG&E Diablo Canyon Nuclear Power Plant Decommissioning DRC2021-00092
APN(s): 076-011-018, 076-011-032

The Revised Submittal is found at the end of the previous attachments, with the document name and notes as shown below:



:

Direct comments or questions on this application to the project manager(s):
Susan Strachan, 805) 788-2129, sstrachan@co.slo.ca.us
Cindy Chambers, 805 781- 5608, cchambers@co.slo.ca.us

Please comment within 14 days of receiving this e-mail (Community Advisory Groups: please respond within 60 days)

Referral Response:
As part of your response to this referral, please consider the following questions:

- Are there significant concerns, problems or impacts in your area of review?

- If Yes, please describe the impacts along with any recommendations to reduce the impacts in your response.
- If your community has a "vision" statement in the Area Plan - does the community feel this project helps to achieve that vision? If No, please describe.
- What does the community like or dislike about the project or proposal?
- Is the project compatible with surrounding development, does it fit in well with its surroundings? If No, are there changes in the project that would make it fit in better?
- Does the community believe the road(s) that provide access to the site is(are) already overcrowded?
- Does the community wish to have a trail in this location?
- If the proposal is a General Plan Amendment, does the community feel the proposed change would encourage other surrounding properties to intensify, or establish intense uses that would not otherwise occur?
- Please feel free to include information or questions other than those listed above. You may also choose to respond that you have no comments regarding the proposal.

**All information and/or material provided in the linked Referral Package is valid for 90 days after this correspondence. If current or additional information is needed, please contact the Project Manager for the most updated information*

Cindy Chambers
Senior Planner
(p) 805-781-5608
cchambers@co.slo.ca.us

COUNTY OF SAN LUIS OBISPO
PLANNING & BUILDING

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I work in-office on Monday, Wednesday, and Friday each week. When I work remotely on Tuesdays and Thursdays, the best way to reach me is by email, although I am able to retrieve phone messages at (805) 781-5608. Please note that when working remotely, I will return your call via a private line.

For updates on COVID-19 in SLO County: Visit ReadySLO.org or call the recorded Public Health Information Line at (805) 788-2903. A staffed phone assistance center at (805) 543-2444 is available seven (7) days a week from 8 a.m. to 5 p.m. for questions related to COVID-19.

Andrew Mutziger

From:	Andrew Mutziger
Sent:	Monday, November 15, 2021 10:58 AM
To:	Susan Strachan; Cindy A. Chambers
Subject:	DAMP & GHG
Attachments:	20210924EmailsOnDiabloGHGmitigation.pdf; 4208-4_signed.pdf

Hi Susan and Cindy,

Thank you for sending the info hold letter which helped fill in the blanks in our files for the project.

As I noted in my 12 Nov 2021 email SLO County APCD accepts PG&E's responses to AQ-1 to AQ-4 from the Aug 9, 2021 letter. That's the criteria air pollutant side and we look forward to working with PG&E on a Decommissioning Activity Management Plan (DAMP) that ensures air quality impacts from the actual equipment and actions during the decommissioning are properly mitigated.

As a reminder, PG&E's response to AQ-6 in the Apr 28, 2021 info hold letter indicated they felt a DAMP was not necessary. Our July 27, 2021 letter (attached) reaffirmed that a DAMP is necessary and provided APCD's reasoning. We have not heard concerns about this from PG&E, so is it correct to assume that the DAMP requirement will be in the conditions of approval for the project?

I also wanted to follow up with you on the greenhouse gas portion of our July 27, 2021 letter and the related attached emails. During our Aug 19, 2021 Teams meeting, it sounded like Aspen was going to recommend a no net increase threshold and mitigation would need to be identified. APCD provided mitigation input in the attached email chain (20210924EmailsOnDiabloGHGmitigation.pdf). Is there a status update that can provided prior to the scoping meetings that are about 2 weeks from now?

Thank you very much,

Andy Mutziger | Division Manager
Planning, Monitoring & Grants
SLO County Air Pollution Control District
(805) 781-5956 VM • amutziger@co.slo.ca.us • SLOCleanAir.org

From: Susan Strachan <sstrachan@co.slo.ca.us>
Sent: Monday, November 15, 2021 8:30 AM
To: Andrew Mutziger <amutziger@co.slo.ca.us>; Cindy A. Chambers <cchambers@co.slo.ca.us>
Subject: RE: 9 Aug Information Hold letter?

Hi Andy –

Here is the County's August 9, 2021 Information Hold letter. We are working on the Diablo EnerGov site to make it easier to find documents. There are a lot of them which had made finding them difficult.

Thanks,

Susan Strachan
Nuclear Power Plant Decommissioning Manager
Direct: (805) 788-2129
Email: sstrachan@co.slo.ca.us

COUNTY OF SAN LUIS OBISPO
PLANNING & BUILDING

From: Andrew Mutziger <amutziger@co.slo.ca.us>
Sent: Friday, November 12, 2021 3:57 PM
To: Cindy A. Chambers <cchambers@co.slo.ca.us>; Susan Strachan <sstrachan@co.slo.ca.us>
Subject: 9 Aug Information Hold letter?

Hi Cindy and Susan,
I'm reviewing our Diablo records and I'm not finding the 9 Aug Information hold letter to PG&E from the county and I didn't see it on the EnerGov website either. When you have a moment, could you please forward it to me?
Thank you very much,

Andy Mutziger | Division Manager
Planning, Monitoring & Grants
SLO County Air Pollution Control District
(805) 781-5956 VM • amutziger@co.slo.ca.us • SLOCleanAir.org

Email: Diablo Canyon Decommissioning Project

From: Borak, Mary Jo <maryjo.borak@cpuc.ca.gov>
Sent: Monday, December 6, 2021 4:33 PM
To: PL_Diablo <PL_Diablo@co.slo.ca.us>
Cc: Kito, Michele <michele.kito@cpuc.ca.gov>; Reiger, J. Jason <Jonathan.Reiger@cpuc.ca.gov>
Subject: [EXT]CPUC comments on Diablo Canyon Decommissioning Scoping for EIR

Dear Ms. Strachan

As a state agency that has broad and robust regulations over PG&E and state-wide interests related to Diablo Canyon we thank you for the opportunity to provide scoping comments on your EIR. The California Public Utilities Commission (CPUC) has been involved in the decommissioning of Diablo Canyon to ensure that ratepayers interests are considered, utility facilities and operations are safe and reliable, and that local and state-wide interests are considered in the decommissioning of Diablo Canyon including its possible future uses and interconnections with the statewide electrical grid and/or power generating facilities. We note that imposed mitigation measures may have ratepayer impacts and may limit, or expand, potential future uses and ownership of the site. These are all issues that may come before the CPUC in the future and we offer these high level comments today in that light.

Costs associated with decommissioning. The EIR document will include mitigation measures to reduce environmental impacts which could have cost implications for PG&E and California ratepayers.

- The EIR process should take costs into consideration and look at more than one mitigation option whenever feasible.
- The EIR process should make clear the cost estimates of mitigation measures and alternatives to allow the CPUC and stakeholders to compare the EIR proposals to PG&E's decommissioning cost estimates and funds available in the Nuclear Decommissioning Trust.

Continued use of and access to existing electric infrastructure at the site. The existing substation and 500 kV and 230 kV transmission systems are robust and will be underutilized once Diablo Canyon stops generating. Off shore wind and other energy providers are already looking to tie into the California electric grid at this location. Future access to the grid via both land and sea should be a consideration in the EIR.

Public Utility Code Section 851 land transfers. PG&E will need to receive approval from the CPUC for any PG&E voluntary land transfers that occur following the closure of Diablo Canyon and decommissioning efforts. While this is not a specific issue related to CEQA requirements, the EIR should be cognizant of this requirement as it studies possible future uses of the Diablo Canyon site.

Cultural Impacts. It is the CPUC understanding that the land in and around Diablo Canyon is of significant cultural value. We support your robust review of any and all cultural impacts and necessary mitigation measures.

Thank you for the opportunity to comment on this project.
Sincerely,
Mary Jo Borak

Mary Jo Borak (she)
Program and Project Supervisor
Infrastructure Permitting and CEQA
Energy Division
California Public Utilities Commission
415 703-1333
MaryJo.Borak@cpuc.ca.gov

DEPARTMENT OF TRANSPORTATION
CALTRANS DISTRICT 5
50 HIGUERA STREET
SAN LUIS OBISPO, CA 93401-5415
PHONE (805) 549-3101
FAX (805) 549-3329
TTY 711
www.dot.ca.gov/dist05/

Making Conservation a California Way of Life.

December 6, 2021

SLO US101 PM 21.12
SCH# 2021100559

Susan Strachan
Diablo Decommissioning Project Manager
Planning and Building Department
County of San Luis Obispo
976 Osos Street, Room 300
San Luis Obispo, CA 93408

COMMENTS FOR THE NOTICE OF PREPARATION (NOP) OF AN ENVIRONMENTAL IMPACT REPORT (EIR) FOR THE DIABLO CANYON NUCLEAR POWER PLANT DECOMMISSIONING PROJECT

Dear Ms. Strachan:

The California Department of Transportation (Caltrans) appreciates the opportunity to review the NOP for the Diablo Canyon Power Plant Decommissioning Project. At this time, we offer the following comments in response to the NOP:

Caltrans supports development that is consistent with State planning priorities intended to promote equity, strengthen the economy, protect the environment, and promote public health and safety. We accomplish this by working with local and state jurisdictions to achieve a shared vision of how the transportation system should and can accommodate interregional and local travel and development. Projects that support smart growth principles which include improvements to pedestrian, bicycle, and transit infrastructure (or other key Transportation Demand Strategies) are supported by Caltrans and are consistent with our mission, vision, and goals.

While the decommissioning project might produce fewer overall vehicle trips then the site is currently, we do have concerns about the volume of new truck trip that this project will generate. Due to the estimated high truck trip volumes we agree with the projects proposal to limit truck trips to Monday through Thursday, eliminating trips during Avila Beach's peak visitor travel periods of Friday through

Sunday. We recommend limiting trucking activities during weekday peak hours as well.

Additionally, we are concerned with the potential impact to shoulder and roadway pavement quality with the project's high volume of truck trips. It might be appropriate to enter into a maintenance agreement that brings pavement conditions back to existing conditions throughout and following the decommissioning of the power plant.

The draft Transportation Assessment (Appendix N) mentions the development of a Construction Management Plan (CMP). We are interested in reviewing the CMP once completed, especially sections pertaining to hauling schedules, traffic on/off the state highway system, and safety precautions for pedestrians and bicyclists.

Caltrans requests to be included in any future public noticing regarding this project to allow us to prepare for and participate in the public process.

We look forward to continued coordination with the County on this project. If you have any questions, or need further clarification on items discussed above, please contact me at (805) 835-6432 or Jenna.Schudson@dot.ca.gov.

Sincerely,

Jenna Schudson

Jenna Schudson
Development Review Coordinator
Caltrans District 5, LD-IGR South Branch

United States Department of the Interior
U.S. FISH AND WILDLIFE SERVICE
Ecological Services
Ventura Fish and Wildlife Office
2493 Portola Road, Suite B
Ventura, California 93003

IN REPLY REFER TO:
08EVEN00-2022-CPA-0015

December 6, 2021

Susan Strachan
Nuclear Power Plant Decommissioning Project Manager
San Luis Obispo County, Department of Planning and Building
976 Osos Street #300
San Luis Obispo, California 93408

Subject: Notice of Preparation of an Environmental Impact Report for the Diablo Canyon Power Plant Decommissioning, San Luis Obispo County, California

Dear Susan Strachan:

The U.S. Fish and Wildlife Service (Service) has reviewed the County of San Luis Obispo's October 28, 2021, Notice of Preparation (NOP) of a draft Environmental Impact Report (DEIR) for the Diablo Canyon Power Plant (DCPP) Decommissioning. The main DCPP project site is located at 3890 Diablo Canyon Road in an unincorporated area of San Luis Obispo County, California, and consists of a 750-acre high-security zone surrounded by an approximately 12,000-acre area of land owned by either PG&E or one of its subsidiaries. The entire 12,000-acre project site extends along the coast for approximately 10 miles between the community of Avila Beach and Montaña de Oro State Park approximately 7 miles northwest of Avila Beach. Three satellite sites for the project are identified as occurring in the cities of Pismo Beach and Santa Maria and at a location southwest of the City of Santa Maria.

This letter provides our comments on the NOP for the proposed decommissioning of the Diablo Canyon Power Plant that would occur in two phases: (1) Phase 1: Pre-planning and Decommissioning Project Activities (2025-2034); (2) Phase 2: Final Site Restoration (2035 through 2042) and Independent Spent Fuel Storage Installation (ISFSI) Only Operations.

The Service's mission is working with others to conserve, protect, and enhance fish, wildlife, plants, and their habitats for the continuing benefit of the American people. To assist in meeting this mandate, the Service provides comments on public notices issued for projects that may have an effect on those resources, particularly federally listed plants and wildlife. The Service's responsibilities also include administering the Endangered Species Act of 1973, as amended (Act). The Act prohibits the unpermitted "take" of listed species [16 U.S.C. 1538(a)(1)(B)]. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Such taking may be authorized by the Service in two ways: through interagency consultation for projects with Federal involvement pursuant to section 7, or through the issuance of an incidental take permit under section 10(a)(1)(B) of the Act.

As it is not our primary responsibility to comment on documents prepared pursuant to the California Environmental Quality Act, our comments on the NOP do not constitute a full review of project impacts. We are providing our comments based upon past biological surveys, project activities that have the potential to affect federally listed species, and our concerns for listed species within our jurisdiction related to our mandates under the Act. Based upon our review of the NOP, its associated documents, and our knowledge of the resources in the vicinity of the project, we have the following comments and recommendations:

Project Extent

We believe that the entire 12,000 acres discussed at the outset of the NOP comprise the project site and the surrounding 11,250 acres are inextricably linked to the 750 acres immediately surrounding the power plant and its associated structures. Therefore, the entire 12,000 acres should be addressed in the DEIR specifically including a discussion of the disposition of and effects to the surrounding 11,250 acres of the project site.

Alternatives Analyses

We recommend that PG&E discuss all feasible alternatives in the DEIR. The alternatives analysis is important to the Service's evaluation of the project and feasible alternatives often reduce effects to biological resources. We believe the Full Removal alternative identified in the NOP, as per the original agreement, would result in the fewest long-term adverse effects to listed and sensitive species.

Biological Resource Assessments

The DEIR should contain a thorough discussion of all terrestrial and marine biological resources that are present onsite including species abundance, distribution, and status. The DEIR should also discuss the potential effects the proposed project would have on sensitive biological resources. This would require surveys to be conducted for sensitive and federally listed species at the appropriate times of year and during appropriate conditions. Protocol level surveys should be conducted for all sensitive and federally listed species that have survey protocols.

California Red-legged Frog

Based on the observation of the California red-legged frog (*Rana draytonii*) onsite (Terra Verde Environmental Consulting 2020, Appendix K, pp. 44 and 57 of 86), we recommend that protocol level surveys be conducted in all suitable habitat areas on the project site so the full effects of the proposed project on California red-legged frogs can be analyzed. Please include a more thorough discussion of the abundance and distribution of California red-legged frogs onsite in the DEIR. We are available to discuss project effects to the California red-legged frog and measures that can be taken to avoid or minimize impacts.

Botanical Resources

The botanical surveys were conducted during one of the driest years in recorded history for California and may not accurately represent the natural resources present. In order to be able to accurately determine which species are present and how they may be affected by the proposed project, we recommend that botanical surveys be conducted before completion of the DEIR during a year with average or above average precipitation and during the appropriate time.

Additionally, the botanical surveys were done late in the blooming season (May to July) (Terra Verde Environmental Consulting 2020, Appendix K, p. 20 of 86), thus missing early season blooming plants, such as Diablo Canyon bluegrass (*Poa diaboli*), an early blooming narrow endemic only known from the immediate vicinity of the DCPP. Additional botanical surveys should be completed before completion of the DEIR to capture the plants that bloom early in the season. Some surveys should be conducted between March and April, depending on the climate.

We detected multiple anomalies and errors in Appendix K regarding the botanical surveys that draw into question its completeness and recommend that this document be revisited and revised, as necessary. For example:

- San Diego viguiera (*Bahiopsis* [*Viguiera*] *laciniata*) is listed as occurring on the DCPP site. This species is native to the San Diego/Baja region with the northern-most documented occurrence in southeastern Ventura County. There is no discussion to explain this anomalous report.

- The discussion of the Diablo Canyon bluegrass (and possibly other sensitive species) in the Regionally Occurring Special-status Species appendix appears in error and should be revised. For this species, it states: "Suitable habitat is present at the DCPP site; species not observed <u>during appropriately timed surveys"</u> [emphasis added]. The botanical surveys were conducted between May and July, outside of the blooming period for this species; therefore, surveys were not conducted during the appropriate time.

- Pismo Clarkia (*Clarkia speciosa* subsp. *immaculata*) has been documented within approximately 5 miles of the DCPP in habitat consistent with that on the DCPP, yet Appendix K declares that there is no suitable habitat on the DCPP for this species.

Marine Resources

We recommend that you coordinate with us at your earliest convenience regarding the decommissioning operations for the cooling water discharge structure, water intake structure, breakwaters, boat dock, and harbor because southern sea otters (*Enhydra lutris nereis*) regularly use this area (Tenera Environmental Inc. and ERM 2020, Appendix J, p. 58). Any modifications or demolition to these structures may affect southern sea otters and may require a permit under the Marine Mammal Protection Act and consultation under the Act.

Based on the identification of a larval tidewater goby (*Eucyclogobius newberryi*) that was collected onsite between 1996 and 1999 (Tenera Environmental Inc. and ERM 2020, Appendix

J, p. 72), we recommend you conduct protocol level surveys in all locations in the project area that contain suitable habitat.

Effects Analysis

Please include a full discussion and analysis in the DEIR of all aspects of the effects of the proposed project on all biological resources, including effects that are direct, indirect, and cumulative.

We recommend that the County and the applicant work with the Service to avoid and minimize effects to listed species. We also recommend that the County and the applicant conduct focused surveys for all listed species with suitable habitat onsite as soon as possible. Surveys should be conducted in the appropriate season and follow accepted protocols to inform your environmental analysis of impacts to federally listed species in the DEIR. You should contact us soon to help determine what measures may be appropriate to conserve the listed species and their habitats that occur onsite. We can also provide guidance on the steps that may be needed to comply with the Act.

The Service appreciates the opportunity to provide comments on the NOP of the DEIR for the Diablo Canyon Power Plant Decommissioning project. If you have any questions, please contact Mark A. Elvin of our staff at (805) 677-3317, or by electronic mail at mark_elvin@fws.gov.

Sincerely,

JENNY MAREK Digitally signed by JENNY MAREK Date: 2021.12.06 16:25:23 -08'00'

Jenny Marek
Deputy Field Supervisor

LITURATURE CITED

Tenera Environmental Inc. and ERM. 2020. Diablo Canyon Decommissioning, Marine Biological Resources Assessment. August 2020. 108 pp. + appendices.

Terra Verde Environmental Consulting. 2020. Diablo Canyon Decommissioning, Terrestrial Biological Resources Assessment. August 2020. 86 pp. + appendices.

State of California – Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
Central Region
1234 East Shaw Ave
Fresno, California 93710
www.wildlife.ca.gov

GAVIN NEWSOM, Governor
CHARLTON H. BONHAM, Director

December 6, 2021

Susan Strachan
Diablo Canyon Power Plant Decommissioning Project Manager
County of San Luis Obispo, Department of Planning and Building
976 Osos Street #300
San Luis Obispo, California 93408

**Subject: Diablo Canyon Nuclear Power Plant Decommissioning Project - ED2021-174 / DRC2021-00092 (PROJECT)
Notice of Preparation (NOP)
SCH No.: 2021100559**

Dear Ms. Strachan:

The California Department of Fish and Wildlife (CDFW) received a Notice of Preparation (NOP) from County of San Luis Obispo for the Project pursuant the California Environmental Quality Act (CEQA) and CEQA Guidelines.[1]

Thank you for the opportunity to provide comments and recommendations regarding those activities involved in the Project that may affect California fish and wildlife. Likewise, we appreciate the opportunity to provide comments regarding those aspects of the Project that CDFW, by law, may be required to carry out or approve through the exercise of its own regulatory authority under the Fish and Game Code.

CDFW ROLE

CDFW is California's **Trustee Agency** for fish and wildlife resources and holds those resources in trust by statute for all the people of the State (Fish & G. Code, §§ 711.7, subd. (a) & 1802; Pub. Resources Code, § 21070; CEQA Guidelines § 15386, subd. (a)). CDFW, in its trustee capacity, has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and habitat necessary for biologically sustainable populations of those species (*Id.*, § 1802). Similarly, for purposes of CEQA, CDFW is charged by law to provide, as available, biological expertise during public agency environmental review efforts, focusing specifically on

[1] CEQA is codified in the California Public Resources Code in section 21000 et seq. The "CEQA Guidelines" are found in Title 14 of the California Code of Regulations, commencing with section 15000.

projects and related activities that have the potential to adversely affect fish and wildlife resources.

CDFW is also submitting comments as a **Responsible Agency** under CEQA (Pub. Resources Code, § 21069; CEQA Guidelines, § 15381). CDFW expects that it may need to exercise regulatory authority as provided by the Fish and Game Code. As proposed, for example, the Project may be subject to CDFW's lake and streambed alteration regulatory authority (Fish & G. Code, § 1600 et seq.). Likewise, to the extent implementation of the Project as proposed may result in "take" as defined by State law of any species protected under the California Endangered Species Act (CESA) (Fish & G. Code, § 2050 et seq.), related authorization as provided by the Fish and Game Code may be required.

Nesting Birds: CDFW has jurisdiction over actions with potential to result in the disturbance or destruction of active nest sites or the unauthorized take of birds. Fish and Game Code sections that protect birds, their eggs and nests include, §§ 3503 (regarding unlawful take, possession or needless destruction of the nest or eggs of any bird), 3503.5 (regarding the take, possession or destruction of any birds-of-prey or their nests or eggs), and 3513 (regarding unlawful take of any migratory nongame bird).

Water Pollution: Pursuant to Fish and Game Code section 5650, it is unlawful to deposit in, permit to pass into, or place where it can pass into "Waters of the State" any substance or material deleterious to fish, plant life, or bird life, including non-native species. It is possible that without mitigation measures, activities associated with the Project could result in pollution of Waters of the State from storm water runoff or construction-related erosion. Potential impacts to the wildlife resources that utilize these watercourses include the following: increased sediment input from road or structure runoff; toxic runoff associated with development activities and implementation; and/or impairment of wildlife movement along riparian corridors. The Regional Water Quality Control Board and United States Army Corps of Engineers also has jurisdiction regarding discharge and pollution to Waters of the State.

Fully Protected Species: CDFW has jurisdiction over fully protected species of birds, mammals, amphibians, reptiles, and fish, pursuant to Fish and Game Code sections 3511, 4700, 5050, and 5515. CDFW prohibits and cannot authorize take of any fully protected species.

PROJECT DESCRIPTION SUMMARY

Proponent: Pacific Gas and Electric Company (PG&E)

Objective: The objective of the Project is to decommission Diablo Canyon Nuclear Power Plant (DCPP). The DCPP facility is 750-acre property owned by PG&E and is surrounded by 12,000-acres of mixed grazed annual grasslands, coastal live oak and riparian woodland, chaparral, and scrub habitats. Diablo Creek flows west along the northern edge of the DCPP with a half mile of the creek culverted and has switchyard pads. The Pismo Beach facility is an approximately 25.5-acre property. The site is surrounded by developed land, a Union Pacific Railroad line, undeveloped land, and Pismo Creek.

Primary Project activities includes two different phases. Phase one will install electrical infrastructure for the decommission, construct of a new security building, remove the nuclear reactors, remove the discharge structure, construct of waste storage facilities, construct of a new firing range, and conduct initial site restoration, soil remediation, and final status surveys. Modification of the rail yards to transfer non-radioactive waste via rail cars and transported out of state will also occur. Phase two consists of continuation of the soil remediation and final status surveys, removal of infrastructure that does not support the retained facilities, and site restoration monitoring.

Primary marine-related Project activities will occur in Phase one and includes discharge structure removal and restoration, which will involve installation of a circular cell steel sheet pile cofferdam and dewatering of the work area prior to demolition. Before installation, the footprint of the cofferdam will be scraped/dredged by a barge-mounted excavator to remove large objects or debris that could interfere with the structure. Sheet piles will be installed from shore using a crane-mounted vibratory hammer and filled with granular soils. Once the work area is dewatered, the discharge structure will be removed completely back to the water tunnels, which will be sealed with a concrete bulkhead. After demolition, the shoreline will be restored while the cofferdam is still in place. The void left by removal of the structure will be filled with quarry rock. After site restoration, the area behind the cofferdam will be flooded, and then the cofferdam will be removed.

The NOP/Application Package also presents two alternatives to the Project that would involve a considerable amount of construction in the marine environment. The Intake Structure Removal Alternative would occur in Phase one and would result in complete removal of the intake structure back to the water tunnels. The removal and restoration process and methods would be similar to that of the discharge structure; however, the cofferdam would likely be installed and removed using a barge. The Removal of Breakwaters Alternative would occur in Phase two and include full removal of both breakwaters that enclose the Intake Cove using either a marine or land-based approach. The seafloor under the existing breakwater footprint would then be restored.

Location: The Project has two established sites and two potential sites:

1. Diablo Canyon Power Plant, 3890 Diablo Canyon Road, Avila Beach, CA 93424.
    a. All marine components of the Project will be located here.
2. Pismo Beach Railyard, 800 Price Canyon Road, City of Pismo Beach, CA 93449
3. Two potential sites, only one of which will be used:
    a. Santa Maria Valley Railyard Facility, 1599 A Street, Santa Maria, CA 93455
    Betteravia Industrial Park, 2820 W. Betteravia Road, Santa Maria CA 93455

Timeframe: Phase 1 (2024-2031): Pre-planning and decommissioning Project activities

Phase 2 (2031-2039): Completion of soil remediation, final status surveys, and final site restoration.

COMMENTS AND RECOMMENDATIONS

CDFW offers the comments and recommendations below to assist San Luis Obispo County in adequately identifying and/or mitigating the Project's significant, or potentially significant, direct, and indirect impacts on fish and wildlife (biological) resources. Editorial comments or other suggestions may also be included to improve the document.

There are many special-status resources present in and adjacent to the Project area. These resources need to be evaluated and addressed prior to any approvals that would allow ground-disturbing activities or land use changes. The NOP indicates there is potentially significant impact unless mitigation measures are taken but no measures are listed to reduce impacts to less than significant. CDFW is concerned regarding potential impacts to special-status species including, but not limited to: the federally endangered black abalone (*Haliotis cracherodii*), the federally threatened Steelhead (*Oncorhynchus mykiss irideus*), the federally threatened and State fully protected Southern sea otters (*Enhydra lutris nereis*), the federally and State threatened California tiger salamander (*Ambystoma californiense*), the federally threatened and State species of special concern California red-legged frog (*Rana draytonii*), the federally candidate species monarch Butterfly (*Danaus plexippus*), the State fully protected peregrine falcon (*Falco peregrinus anatum*), white-tailed kite (Elanus leucurus), and golden eagle (*Aquila chrysaetos*), and the State species of special concern American badger (*Taxidea taxus*), burrowing owl (*Athene cunicularia*), California legless lizard (*Anniella pulchra*), coastal range newt (*Taricha torosa*), coast horned lizard (*Phrynosoma blainvillii*), San Diego desert woodrat (*Neotoma lepida intermedia*), two-striped garter snake (*Thamnophis hammondii*), western pond turtle (*Emys marmorata*), special-status bats, and special-status plants. In order to adequately assess any potential impacts to biological resources, focused biological surveys should be conducted by a qualified wildlife biologist/botanist during the appropriate survey period(s) in order to determine whether any special-status species and/or suitable habitat features may be present within the Project area. Properly conducted biological surveys, and the information assembled from them, are essential to identify any mitigation, minimization, and avoidance measures and/or the need for additional or protocol-level surveys, especially in the areas not in irrigated agriculture, and to identify any Project-related impacts under CESA and other species of concern.

Additionally, when an EIR is prepared, mitigation measures must be specific and clearly defined and cannot be deferred to a future time. The specifics of mitigation measures may be deferred, provided the lead agency commits to mitigation and establishes performance standards for implementation, when an EIR is prepared. The Final CEQA document must provide quantifiable and enforceable measures as needed that will reduce impacts to less than significant levels. CDFW recommends the EIR include the mitigation measures found in the Terrestrial Biological Resource Assessment and Marine Biological Resources Assessment (collectively, Biological Assessments) prepared by Terra Verde Environmental Consulting for all the proposed Project sites in addition to our comments below.

I. Environmental Setting and Related Impact

Would the Project have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by CDFW, United States Fish and Wildlife Service (USFWS), or National Oceanic and Atmospheric Administration (NOAA) Fisheries?

COMMENT 1: Black Abalone

Issue: Black abalone and their habitat occur in the marine environment at the Project site (PG&E 2020), and Project activities have the potential to impact black abalone. CDFW recommends that the Final CEQA document include an impact analysis for black abalone as well as mitigation measures to avoid or minimize impacts to this protected species. These measures may also be used to reduce impacts to other important marine species, such as fish, red abalone (*Haliotis rufescens*), and other sensitive invertebrates.

Specific impact: In-water Project activities, such as scraping/dredging, cofferdam installation, and dewatering, may directly impact black abalone (and other marine species) by entraining, crushing, or desiccating them. These activities may also impact black abalone indirectly via habitat exclusion, destruction, and/or degradation.

Evidence impact is potentially significant: The black abalone is listed as an endangered species under the Federal Endangered Species Act (FESA). According to the Project's Marine Biological Resources Assessment (Appendix J; PG&E 2020b), an established population of black abalone occurs at the Project site. As stated in this assessment, limited larval dispersal and low population density make black abalone particularly vulnerable to extinction. Adverse effects to even a small proportion of the DCPP black abalone population may significantly impact this species.

Recommended Potentially Feasible Mitigation Measure(s):
To avoid and minimize potential impacts of the Project to black abalone, CDFW recommends including the following mitigation measures and requiring them as conditions of approval in the Project's Final EIR. CDFW recommends consulting with NOAA Fisheries on the Draft EIR's impact analysis and all proposed mitigation measures for black abalone.

Recommended Mitigation Measure 1: CDFW agrees with the recommendations made in Appendix J and the Project's Conceptual Intake & Discharge Structure Demolition Plan (Appendix C; PG&E 2020a) to complete biological and bathymetric surveys of the discharge plume area after discharge stops and before dredging and cofferdam installation. Cofferdam installation should avoid sensitive habitats, such as rocky reef habitat, to the greatest extent feasible.

Recommended Mitigation Measure 2: For all marine areas that will be dewatered, installed with a cofferdam, or have structure removed (i.e., riprap removal, Removal of Breakwaters Alternative), CDFW recommends the salvage/relocation of all black abalone and as many other marine organisms as possible by marine biologists. Of particular concern for CDFW are fish, red abalone, and sea stars. A CDFW-issued Scientific Collecting Permit will be needed for relocation of species (see 'Scientific Collecting Permit' section below). CDFW recommends that a marine biologist perform biological inspections prior to dewatering of cofferdam(s) to ensure no salvageable animals remain in the dry work area.

Recommended Mitigation Measure 3: If the Intake Structure Removal Alternative is incorporated into the Project, CDFW recommends that the Project avoid dewatering the area adjacent to the natural rock face to the west of the intake structure if possible. While no black abalone were documented here, this natural structure provides habitat for red abalone, other invertebrates, and multiple algal species. Sedentary species in this area would perish as a result of dewatering. If the Project must dewater this portion of the Intake Cove, the Draft EIR should fully explain why this is the preferred alternative.

COMMENT 2: California Tiger Salamander (CTS)

Issue: The Biological Assessments did not consider CTS in their impact analysis. CTS have the potential to occur in the following Project sites: Diablo Canyon Power Plant, Pismo Beach Railyard, Santa Maria Valley Railyard Facility, and Betteravia Industrial Park. Aerial imagery shows that the Project sites are near uplands which may provide suitable refugia and breeding habitat features for CTS.

Specific Impacts: Potential ground- and vegetation-disturbing activities associated with Project activities include: collapse of small mammal burrows, inadvertent entrapment, loss of upland refugia, water quality impacts to breeding sites, reduced reproductive success, reduction in health and vigor of eggs and/or young, and direct mortality of individuals.

Evidence impact would be significant: Up to 75% of historic CTS habitat has been lost to urban and agricultural development (Searcy et al. 2013). The Project sites are within the range of CTS and has suitable habitat (i.e., grasslands interspersed with burrows and vernal pools). CTS have been determined to be physiologically capable of dispersing up to approximately 1.5 miles from seasonally flooded wetlands (Searcy and Shaffer 2011) and have been documented to occur near the Project sites (CDFW 2021). Given the presence of suitable habitat near the Santa Maria Valley Railyard Facility and Betteravia Industrial Park Project sites, ground-disturbing activities have the potential to significantly impact local populations of CTS.

Recommended Potentially Feasible Mitigation Measure(s)
Because suitable habitat features for CTS are present throughout the Project area, CDFW recommends conducting the following evaluation of the Project area, incorporating the following mitigation measures into the Final CEQA document prepared for this Project, and that these measures be made conditions of approval for the Project.

Recommended Mitigation Measure 4: Focused CTS Protocol-level Surveys
CDFW recommends that a qualified biologist evaluate the Project sites to determine if suitable habitat for CTS is present. If suitable habitat is present, CDFW recommends that a qualified biologist conduct protocol-level surveys in accordance with the USFWS "Interim Guidance on Site Assessment and Field Surveys for Determining Presence or a Negative Finding of the California Tiger Salamander" (USFWS 2003) at the appropriate time of year to determine the existence and extent of CTS breeding and refugia habitat. The protocol-level surveys for CTS require more than one survey season and are dependent upon sufficient rainfall to complete. As a result, consultation with CDFW and the USFWS is recommended well in advance of beginning the surveys and prior to any planned vegetation- or

ground-disturbing activities. CDFW advises that the protocol-level survey include a 100-foot buffer around the Project area in all areas of wetland and upland habitat that could support CTS. Please be advised that protocol-level survey results are viable for two years after the results are reviewed by CDFW.

Recommended Mitigation Measure 5: CTS Avoidance
If recommended surveys are not feasible and an Incidental Take Permit (ITP) is not acquired, CDFW advises that a minimum 50-foot no-disturbance buffer be delineated around all small mammal burrows in suitable upland refugia habitat within and/or adjacent to the Project sites. Further, CDFW recommends potential or known breeding habitat within and/or adjacent to the Project sites be delineated with a minimum 250-foot no-disturbance buffer. Both upland burrow and wetland breeding no-disturbance buffers are intended to minimize impacts to CTS habitat and avoid take of individuals.

Recommended Mitigation Measure 6: CTS Take Authorization
If through surveys it is determined that CTS are occupying or have the potential to occupy the Project sites, consultation with CDFW is warranted to determine if the Project can avoid take. If take cannot be avoided, acquisition of take authorization would be warranted prior to initiating ground-disturbing activities to comply with CESA. Take authorization would occur through issuance of an incidental take permit (ITP) by CDFW, pursuant to Fish and Game Code section 2081(b). In the absence of protocol surveys, the applicant can assume presence of CTS within the Project sites and obtain an ITP from CDFW.

COMMENT 3: Special-Status Plant Species

Issue: The Project area may contain habitat suitable to support special-status plant species that are listed pursuant to CESA or the Native Plant Protection Act and/or meet the definition of rare or endangered under CEQA Guidelines section 15380, including, but not limited to, the federally and State endangered California Rare Plant Ranked (CRPR) 1B.1 Marsh sandwort (*Arenaria paludicola*), federally endangered and State designated rare and CRPR 1B.1 Pismo clarkia (*Clarkia speciosa subsp. immaculata*), and CRPR 1B.2 Miles' milkvetch (*Astragalus didymocarpus var. milesianus*). These special-status plants have been observed throughout the San Luis Obispo County, and within the vicinity of the Project Area (CDFW 2021). Therefore, the Project has the potential to impact special-status plants.

Specific impact: Without appropriate avoidance and minimization measures for special-status plants, potential significant impacts resulting from ground- and vegetation-disturbing activities associated with Project construction include inability to reproduce and direct mortality.

Evidence impact would be significant: Special-status plant species known to occur in the vicinity of the Project Area are threatened by development activities and associated impacts including introduction of non-native plant species (CNPS 2021).

Recommended Potentially Feasible Mitigation Measure(s)
To evaluate potential impacts to special-status plant species associated with the Project, CDFW recommends conducting the following evaluation of the Project Area, incorporating the following mitigation measures into the Final EIR , and that these measures be made conditions of approval for the Project.

Recommended Mitigation Measure 7: Special-Status Plant Surveys
CDFW recommends that a qualified botanist assess if habitat suitable to support these special-status plants listed above or other special-status plant species is present within or adjacent to the Project area. If suitable habitat is present, CDFW recommends that the Project Area be surveyed for special-status plants by a qualified botanist following the "Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities" (CDFW 2018). This protocol, which is intended to maximize detectability, includes the identification of reference populations to facilitate the likelihood of field investigations occurring during the appropriate floristic period. In the absence of protocol-level surveys being performed, additional surveys may be necessary.

Recommended Mitigation Measure 8: Special-Status Plant Avoidance
CDFW recommends that special-status, non-State listed plant species be avoided whenever possible by delineating and observing a no-disturbance buffer of at least 50 feet from the outer edge of the plant population(s) or specific habitat type(s) required by special-status plant species. If buffers cannot be maintained, then consultation with CDFW is warranted to determine appropriate minimization and mitigation measures for impacts to special-status plant species.

Recommended Mitigation Measure 9: State-listed Plant Take Authorization
If a plant species listed pursuant to CESA or State designated as rare is identified during botanical surveys, consultation with CDFW is warranted to determine if the Project can avoid take. If take cannot be avoided, take authorization prior to any ground-disturbing activities may be warranted. Take authorization would occur through issuance of an ITP by CDFW, pursuant to Fish and Game Code section 2081, subdivision (b) for State-listed threatened or endangered plants or pursuant to the Native Plant Protection Act and Fish and Game Code section 1900 et seq. for State designated rare plants.

II. Would the Project have a substantial adverse effect on any riparian habitat or other sensitive national community identified in local or regional plans, policies, regulations, or by CDFW, USFWS, or NOAA Fisheries?

COMMENT 4: Habitat Areas of Particular Concern

Issue: Several types of Habitat Areas of Particular Concern (HAPC) occur at the Project site, including canopy kelp, rocky reefs, and seagrass (PG&E 2020b). Project activities have the potential to impact HAPC. CDFW recommends that the Final CEQA document include an impact analysis for HAPC as well as mitigation measures to avoid or minimize impacts to these important habitats.

Why impact would occur: Dredging, cofferdam installation, and dewatering would directly impact HAPC if these habitats exist within the cofferdam/dry work area footprint. These and other in-water activities could also impact HAPC by generating turbidity and blocking sunlight.

Evidence impact is potentially significant: HAPC, a subset of Essential Fish Habitat, are habitats of special importance to fish populations due to their rarity, vulnerability to development and anthropogenic degradation, and/or ability to provide key ecological functions. Canopy kelp (e.g., giant kelp, bull kelp), rocky reefs, and seagrass (e.g., eelgrass) have been designated as groundfish HAPC by the Pacific Fisheries Management Council under the Magnuson-Stevens Fishery Conservation and Management Act. Eelgrass (*Zostera* spp.) is further protected under State and federal "no-net-loss" policies for wetland habitats. Additionally, the importance of eelgrass protection and restoration as well as the ecological benefits of eelgrass are identified in the California Public Resources Code (PRC Section 35630).

Recommended Potentially Feasible Mitigation Measure(s): To avoid and minimize potential impacts of the Project to HAPC, CDFW recommends including the following mitigation measures and requiring them as conditions of approval in the Project's Final CEQA document. CDFW recommends consulting with CDFW and NOAA Fisheries on the Final CEQA document's impact analysis and all proposed mitigation measures for HAPC prior to release of the Final CEQA document.

Recommended Mitigation Measure 10: CDFW recommends that dredging, cofferdam installation, dewatering, and anchoring avoid HAPC to the greatest extent feasible. If impacts cannot be avoided, compensatory mitigation may be required. The Draft EIR should quantify the amount of canopy kelp, rocky reef, and seagrass that could be lost due to the Project and potential alternatives. To minimize turbidity impacts, CDFW recommends installing a turbidity curtain around in-water Project activities whenever possible, especially activities occurring in the Intake Cove.

Recommended Mitigation Measure 11: CDFW appreciates the Project's inclusion of Marine Measure 3 (Seagrass Mitigation Plan [SMP]) in the Alternatives section of the NOP/Application Package. CDFW agrees that this is a necessary mitigation measure if the Intake Structure Removal Alternative and/or Removal of Breakwaters Alternative are incorporated into the Project. CDFW recommends that a Seagrass Mitigation Plan be developed if any in-water work or modifications are planned to occur in the Intake Cove (e.g., riprap removal, barge anchoring). In addition to what is listed in the Application Package (pages 8 and 18 of the Alternatives section), the SMP should also include what mitigation actions (e.g., eelgrass transplanting) will be required in the event that eelgrass impacts do occur. We recommend that the SMP adhere to all protocols outlined in the California Eelgrass Mitigation Policy (NMFS 2014). CDFW recommends that PG&E consult CDFW, NOAA Fisheries, and the other resource agencies during the development of the SMP.

III. Editorial Comments and/or Suggestions

Lake and Streambed Alteration: The Project contains activities that may result in the Project sites being subject to CDFW's regulatory authority pursuant Fish and Game Code section 1600 et seq. Fish and Game Code section 1602 requires an entity to notify CDFW prior to commencing any activity that may (a) substantially divert or obstruct the natural flow of any river, stream, or lake; (b) substantially change or use any material from the bed, bank, or channel of any river, stream, or lake; or (c) deposit debris, waste or other materials that could pass into any river, stream, or lake. "Any river, stream, or lake" includes those that are ephemeral or intermittent, as well as those that are perennial in nature.

For additional information on notification requirements, please contact our staff in the Lake and Streambed Alteration Program at R4LSA@wildlife.ca.gov. It is important to note, CDFW is required to comply with CEQA, as a Responsible Agency, when issuing a Lake or Streambed Alteration Agreement (LSAA). If inadequate, or no environmental review, has occurred, for the Project activities that are subject to notification under Fish and Game Code section 1602, CDFW will not be able to issue the Final LSAA until CEQA analysis for the project is complete.

Nesting birds: CDFW encourages that Project implementation occur during the bird non-nesting season; however, if ground-disturbing or vegetation-disturbing activities must occur during the breeding season (February through mid-September), the Project applicant is responsible for ensuring that implementation of the Project does not result in violation of the Migratory Bird Treaty Act or relevant Fish and Game Codes as referenced above.

To evaluate Project-related impacts on nesting birds, CDFW recommends that a qualified wildlife biologist conduct pre-activity surveys for active nests no more than 10 days prior to the start of ground or vegetation disturbance to maximize the probability that nests that could potentially be impacted are detected. CDFW also recommends that surveys cover a sufficient area around the Project sites to identify nests and determine their status. A sufficient area means any area potentially affected by the Project. In addition to direct impacts (i.e., nest destruction), noise, vibration, and movement of workers or equipment could also affect nests. Prior to initiation of construction activities, CDFW recommends that a qualified biologist conduct a survey to establish a behavioral baseline of all identified nests. Once construction begins, CDFW recommends having a qualified biologist continuously monitor nests to detect behavioral changes resulting from the Project. If behavioral changes occur, CDFW recommends halting the work causing that change and consulting with CDFW for additional avoidance and minimization measures.

If continuous monitoring of identified nests by a qualified wildlife biologist is not feasible, CDFW recommends a minimum no-disturbance buffer of 250 feet around active nests of non-listed bird species and a 500-foot no-disturbance buffer around active nests of non-listed raptors. These buffers are advised to remain in place until the breeding season has ended or until a qualified biologist has determined that the birds have fledged and are no longer reliant upon the nest or on-site parental care for survival. Variance from these no-disturbance buffers is possible when there is compelling biological or ecological reason to do so, such as when the construction area would be concealed from a nest site by topography. CDFW recommends that a qualified wildlife biologist advise and support any variance from these buffers and notify CDFW in advance of implementing a variance.

Federally Listed Species: CDFW recommends consulting with the USFWS and NOAA Fisheries on potential impacts to federally listed species including, but not limited to, CTS, black abalone, steelhead, Southern sea otters, CRLF, and Monarch Butterfly. Take under FESA is more broadly defined than CESA; take under FESA also includes significant habitat modification or degradation that could result in death or injury to a listed species by interfering with essential behavioral patterns such as breeding, foraging, or nesting. Consultation with the USFWS in order to comply with FESA is advised well in advance of any ground-disturbing activities.

Scientific Collecting Permit: Fish and Game Code sections 1002, 1002.5 and 1003 authorize the CDFW to issue permits for the take or possession of wildlife and certain plants. CDFW currently implements this authority through Section 650, Title 14, California Code of Regulations, by issuing Scientific Collecting Permits (SCP). In order to relocate/transplant any marine species, including fish, kelp, and eelgrass, the Project must first obtain an SCP from CDFW. More information can be found on CDFW's SCP webpage: https://wildlife.ca.gov/Licensing/Scientific-Collecting.

Underwater Explosives: The use of underwater explosives in State waters inhabited by fish is prohibited except under a CDFW-issued permit consistent with terms and conditions set by the Fish and Game Commission (Fish and Game Code, Section 5500). If the Removal of Breakwaters Alternative is included in the Project and underwater explosives are needed, PG&E must contact CDFW and obtain a permit before this activity can occur.

Water Circulation Study: According to Appendix J, water exchange within the Intake Cove will decrease once the intake ceases operation. Regardless of whether the Intake Structure Removal Alternative is incorporated into the Project, water circulation changes in the Intake Cove could impact the habitats and species currently there. CDFW recommends that PG&E conduct a water circulation study of the Intake Cove to better understand what changes will occur and include this analysis in the final CEQA document. CDFW suggests that data could be collected on water circulation within the Intake Cove during an outage to better understand the potential future water conditions in the cove for the Draft EIR.

Marine Habitat Restoration Scientific Technical Advisory Team: CDFW agrees with the recommendation made in the Project's Marine Habitat Restoration and Monitoring Plan (Appendix J-2; PG&E 2020c) for a scientific technical advisory team (STAT) to guide and evaluate marine habitat restoration and monitoring activities. CDFW should be included on the STAT.

Oil Spill Response: CDFW's Office of Spill Prevention and Response has reviewed the Project's Oil Spill Response Plan (OSRP; Appendix G) and offers the following comments and recommendations:

- The OSRP only describes response procedures for a spill in the nearshore marine environment. Since substantial Project activities will occur inland, the OSRP should also include spill response procedures for inland tributaries/waterways at the Project site. The geographic response area (Section 2.1) should include all waterways onsite. Similarly, the spill scenarios (Section 3) should include inland scenarios, for instance, a worker vehicle/truck accident that spills fuel into an intermittent creek. Additional equipment may be needed for inland response (e.g., shovels, hay bales, short-skirted containment boom) and should be listed in the OSRP.
- Senate Bill 861 (2014) expanded California's oil spill prevention and response program to cover all statewide surface waters at risk of oil spills. CDFW recommends including Senate Bill 861 in Table 1.3-1 (Laws Applicable to the OSRP) since a spill could impact tributaries to coastal waters.
- California Assembly Bill 1197 would require an oil spill contingency plan to identify at least one certified Spill Management Team. Though the bill is still

under review, Spill Management Team certification may be a requirement at some point during the Project.

- High wave energy may negate any ability to deploy oil spill response equipment in the discharge cove. CDFW recommends addressing this possibility in the OSRP.
- To assist in modeling of oil releases in the ocean, CDFW recommends referring to the Southern California Coastal Ocean Observing System (SCOOS), a surface current mapping system.

CDFW recommends listing Pacific Wildlife Care (PWC), a member of the Oiled Wildlife Care Organization, in the OSRP in the event they are needed to assist with oiled wildlife. The PWC phone number is 805-543-WILD.

ENVIRONMENTAL DATA

CEQA requires that information developed in environmental impact reports and negative declarations be incorporated into a data base which may be used to make subsequent or supplemental environmental determinations. (Pub. Resources Code, § 21003, subd. (e).) Accordingly, please report any special status species and natural communities detected during Project surveys to the California Natural Diversity Database (CNDDB). The CNDDB field survey form can be found at the following link: https://www.wildlife.ca.gov/Data/CNDDB/Submitting-Data. The completed form can be mailed electronically to CNDDB at the following email address: CNDDB@wildlife.ca.gov. The types of information reported to CNDDB can be found at the following link: https://www.wildlife.ca.gov/Data/CNDDB/Plants-and-Animals.

FILING FEES

The Project, as proposed, would have an impact on fish and/or wildlife, and assessment of filing fees is necessary. Fees are payable upon filing of the Notice of Determination by the Lead Agency and serve to help defray the cost of environmental review by CDFW. Payment of the fee is required in order for the underlying project approval to be operative, vested, and final. (Cal. Code Regs, tit. 14, § 753.5; Fish & G. Code, § 711.4; Pub. Resources Code, § 21089.)

CONCLUSION

CDFW appreciates the opportunity to comment on the NOP to assist the County of San Luis Obispo in identifying and mitigating Project impacts on biological resources. More information on survey and monitoring protocols for sensitive species can be found at CDFW's website (https://www.wildlife.ca.gov/Conservation/Survey-Protocols). Please see the enclosed Mitigation Monitoring and Reporting Program (MMRP) table which corresponds with recommended mitigation measures in this comment letter. Questions regarding terrestrial species in this letter or further coordination should be directed to R4CEQA@wildlife.ca.gov, and for marine species Amanda Canepa, Environmental Scientist at (831) 277-9740 or Amanda.Canepa@wildlife.ca.gov

Sincerely,

DocuSigned by:
FAB3F09FE09845A...

Julie A. Vance
Regional Manager

Attachments
A. MMMRP for CDFW Recommended Mitigation Measures

cc: Office of Planning and Research, State Clearinghouse, Sacramento

REFERENCES

California Department of Fish and Wildlife (CDFW). 2018. Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities. California Department of Fish and Wildlife. March 20, 2018.

CDFW. 2021. Biogeographic Information and Observation System (BIOS). https://www.wildlife.ca.gov/Data/BIOS. Accessed November 9, 2021.

California Native Plant Society (CNPS), Rare Plant Program. 2021. Inventory of Rare and Endangered Plants of California (online edition, v9-01 1.0). Website http://www.rareplants.cnps.org

National Marine Fisheries Service (NMFS). 2014. California Eelgrass Mitigation Policy and Implementing Guidelines. NOAA Fisheries West Coast Region (October 2014)

Pacific Gas and Electric (PG&E). 2020a. Conceptual Intake & Discharge Structure Demolition Plan – Diablo Canyon Power Plant Rev 0. Report prepared for PG&E Diablo Canyon Nuclear Power Plant.

PG&E. 2020b. Marine Biological Resources Assessment Report – Diablo Canyon Power Plant Rev 0. Report prepared for PG&E Diablo Canyon Nuclear Power Plant.

PG&E. 2020c. Marine Habitat Restoration and Monitoring Plan – Diablo Canyon Power Plant Rev 0. Report prepared for PG&E Diablo Canyon Nuclear Power Plant.

PG&E. 2020d. Marine Wildlife Contingency Plan – Diablo Canyon Power Plant Rev 0. Report prepared for PG&E Diablo Canyon Nuclear Power Plant.

PG&E. 2020e. Underwater Noise Impact Assessment – Construction Noise – Diablo Canyon Power Plant Rev 0. Report prepared for PG&E Diablo Canyon Nuclear Power Plant.

Searcy, C.A., and Shaffer, H.B., 2011. Determining the migration distance of a vagile vernal pool specialist: How much land is required for conservation of California tiger salamanders? In Research and Recovery in Vernal Pool Landscapes, D. G. Alexander and R. A. Schlising, Eds. California State University, Chico, California.

Searcy, C.A., E. Gabbai-Saldate, and H.B. Shaffer. 2013. Microhabitat use and migration distance of an endangered grassland amphibian. Biological Conservation 158: 80-87.

USFWS. 2003. Interim Guidance on Site Assessment and Field Surveys for Determining Presence or a Negative Finding of the California Tiger Salamander, October 2003.

Attachment 1

CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE RECOMMENDED MITIGATION MONITORING AND REPORTING PROGRAM (MMRP)

PROJECT: Diablo Canyon Nuclear Power Plant Decommissioning Project - ED2021-174 / DRC2021-00092 (PROJECT)

SCH No.: 2021100559

RECOMMENDED MITIGATION MEASURE	STATUS/DATE/INITIALS
Before Disturbing Soil or Vegetation	
Mitigation Measure 1	
Mitigation Measure 2	
Mitigation Measure 3	
Mitigation Measure 4: Focused CTS Protocol-level Surveys	
Mitigation Measure 6: CTS Take Authorization	
Mitigation Measure 7: Special-Status Plant Surveys	
Mitigation Measure 9: State-listed Plant Take Authorization	
Mitigation Measure 10	
Mitigation Measure 11	
During Construction	
Mitigation Measure 5: CTS Avoidance	
Mitigation Measure 8: Special-Status Plant Avoidance	

[EXT]Re: EIR NOTICE OF PREPARATION AND SCOPING MEETINGS for DRC2021-00092/ED2021-174 - Diablo Canyon Nuclear Power Plant Decommissioning Project

government@cgnp.org <government@cgnp.org>

Fri 10/29/2021 4:46 PM

To: Susan Strachan <sstrachan@co.slo.ca.us>; Cindy A. Chambers <cchambers@co.slo.ca.us>
Cc: PL_Diablo <PL_Diablo@co.slo.ca.us>

1 attachments (2 MB)

Diablo Canyon Cessation of Operations NOP.Final 10 26 21.pdf;

Hello, Susan and Cindy: As you have been informed previously, Californians for Green Nuclear Power, Inc. (CGNP) objects to the improper limitation of project scope that excludes the most environmentally harmful phase, namely the cessation of operations of each DCPP reactor and replacement of that large quantity of dispatchable power with dispatchable fossil-fired generation, including significant amounts of Wyoming coal-fired generation.

A similar improper exclusion of reactor operation at the end of January, 2012 of the San Onofre Nuclear Generation Station (SONGS) followed by substitution of large quantities of fossil-fired generation was employed by the California State Lands Commission (CASLC) in their Environmental Impact Statement. CGNP raised timely objections to the CASLC's actions.

I have a pair of questions regarding the meeting format for the meetings set for November 9, December 1, and December 4.

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1. Will there be a PDF made available in advance to the audience regarding the meeting presentation contents?

2. Will the format for participant questions and concerns be like the format of the SLO County Board of Supervisors meetings: e.g. a maximum of three minutes for each member of the public?

Thank you in advance for your assistance.

Sincerely,

/s/ Gene Nelson, Ph.D. CGNP Legal Assistant
Californians for Green Nuclear Power, Inc. (CGNP)
1375 East Grand Ave Ste 103 #523
Arroyo Grande, CA 93420-2421
(805) 363 - 4697 cell
Government@CGNP.org email
http://CGNP.org website

[EXT]CGNP's Comments for Item 34, Public Comment Period - BOS Meeting of 11/16/21

government@cgnp.org <government@cgnp.org>

Tue 11/16/2021 3:01 AM

To: Board of Supervisors <Boardofsups@co.slo.ca.us>; PL_Diablo <PL_Diablo@co.slo.ca.us>

1 attachments (1 MB)

CGNP to SLO County Board of Supervisors 11 16 21.pdf;

San Luis Obispo County Board of Supervisors

1055 Monterey Street, Suite D430

San Luis Obispo, CA 93408

boardofsups@co.slo.ca.us, <diablo@co.slo.ca.us>,

November 16, 2021

Subject: CGNP's Comments for Item 34, Public Comment Period - BOS Meeting of 11/16/21

Please refer to CGNP's attached comments. Dr. Nelson will excerpt from them during today's Public Comment period.

This filing will also form a portion of CGNP's Scoping Comments regarding the proposed project to cease Diablo Canyon Power Plant operations and decommission the plant. CGNP will complete its scoping comments due by 5:00 p.m., December 6, 2021

Sincerely,

/s/ Gene Nelson, Ph.D. CGNP Legal Assistant
Californians for Green Nuclear Power, Inc. (CGNP)
1375 East Grand Ave Ste 103 #523
Arroyo Grande, CA 93420-2421
(805) 363 - 4697 cell
Government@CGNP.org email
http://CGNP.org website

San Luis Obispo County Board of Supervisors
1055 Monterey Street, Suite D430
San Luis Obispo, CA 93408
boardofsups@co.slo.ca.us

November 16, 2021

Subject: CGNP's Comments for Item 34, Public Comment Period - BOS Meeting of 11/16/21

Independent nonprofit Californians for Green Nuclear Power, Inc. (CGNP) is gratified to read the attached November 14, 2021 CalMatters commentary in the ***SLO Tribune*** on November 14, 2021 on page 10B, "Two SLO County Leaders call for keeping Diablo Open to help meet clean energy goals," by District 35 California Assemblyman Jordan Cunningham and District 3 Supervisor Dawn Ortiz-Legg. This commentary shows a bipartisan interest in the continued safe operation of Diablo Canyon Power Plant beyond 2025. Both Assemblyman Cunningham and Supervisor Ortiz-Legg have additional background and training that qualifies them to understand more of the nuances surrounding Diablo Canyon. They recommend that California decision makers should use the analysis of a November 8, 2021 114-page study released by a group of expert authors at MIT and Stanford as a starting point. The focus of my comments this morning are on Chapter 2 of this study, pages 33 to 85 which focuses on desalination.

The two threats to adequate water for the Central Coast are climate change dessicating our reservoirs, as is currently the case, and seismic activity of the San Andreas Fault destroying our single Central Coast Water Authority (CCWA) 57-inch steel pipeline that conveys water from the State Water Project.

SLO County recognized the water shortage threat when the County Flood Control and Water Conservation District contracted with the California Department of Water Resources for 25,000 acre-feet per year (afy) of water on February 26, 1963. Per CCWA the County's 2021 Table A request was 4,830 afy with actual deliveries projected at a mere 2,580 afy - about 1/10 of the contract amount set 58 years ago. To facilitate repairs, CCWA and DWR constructed this pipeline above the ground where it crosses the San Andreas Fault near Cholame, CA. The CCWA pipeline photograph on the next page was taken by CGNP over a year ago.

While CCWA has purchased and warehoused replacement pipe sections, aftershocks will prevent the repairs from taking place for likely several years based on the analogous experiences of Christchurch, New Zealand that are summarized in the fifth episode of a CBC Vancouver podcast "Fault Lines" regarding surviving a Cascadia subduction zone earthquake. https://www.cbc.ca/listen/cbc-podcasts/147-fault-lines

The cost advantages for the production of vital desalinated water from Diablo Canyon are coupled with keeping the plant running. The study examines many technical and financial aspects of enlarging DCPP's desalination plant. The County began investigating this option about six years ago. CGNP believes that the executive branch of the State of California applied pressure to halt the County's investigation.

The MIT Stanford study sets a lower bound for the air pollution burden caused by replacement natural gas fired generation. Based on CGNP's filings since 2017 before the CPUC and FERC, the likely State of California plan is to replace most of the safe, reliable, abundant, cost-effective, and zero-emission Diablo Canyon Power Plant output after 2025 with emission-laden Wyoming coal-fired generation (hidden behind the California legal euphemism "unspecified imports") at a greater cost. The Wyoming coal-fired emission intensity (about twice the level of natural gas) contravenes California statutes including SB 1368 (Perata) codified as PUC § 8340 and PUC § 8341.

The County has the power to halt this harmful plan promoted by the State of California by properly scoping the DCPP decommissioning project to include the required cessation of operations, as CGNP has called for in our numerous communications with the County during the past several years. This letter summarizes why the No Project Alternative (NPA) which preserves the Diablo Canyon desalination option and avoids the substantial air pollution increase is the superior alternative.

Sincerely,
/s/ Gene Nelson, Ph.D. CGNP Legal Assistant
Californians for Green Nuclear Power, Inc. (CGNP)
1375 East Grand Ave Ste 103 #523
Arroyo Grande, CA 93420-2421
(805) 363 - 4697 cell
Government@CGNP.org email
http://CGNP.org website
CC: **diablo@co.slo.ca.us**, as a portion of CGNP's Scoping Comment

THE TRIBUNE — Newspaper of the Central Coast

DAILY REPUBLIC — Solano County's News Source

CAL MATTERS

CalMatters

Commentary: Two SLO County Leaders call for keeping Diablo Open to help meet clean energy goals

https://www.sanluisobispo.com/opinion/readers-opinion/article255774436.html

https://www.dailyrepublic.com/all-dr-news/opinion/local-opinion-columnists/calmatters-commentary-keep-diablo-canyon-open-to-help-meet-emission-reduction-goals/

BY JORDAN CUNNINGHAM AND DAWN ORTIZ-LEGG CALMATTERS UPDATED NOVEMBER 15, 2021 9:09 AM

By Jordan Cunningham and Dawn Ortiz-Legg, Special to CalMatters

California has established itself as a global leader in the fight against climate change. It has set ambitious, economy-wide emission reduction targets and mandated that all of the state’s electricity come from carbon-free sources by 2045.

These are aggressive goals, befitting the clout and resolve of the world's fifth-largest economy. Yet, we continue to see rising temperatures, record drought and intense wildfires.

What if everything California and the nation is doing to slow climate change just isn't enough?

To reach our zero-carbon goals while maintaining system reliability and avoiding debilitating blackouts, we need a mix of clean energy sources – renewables like solar and wind power. We need aggressive investment in energy storage projects**. And we need to revisit whether Diablo Canyon Nuclear Power Plant should continue to operate another 10 years past its scheduled 2025 decommissioning.**

There is a serious risk that we will not be able to meet our emission reduction targets while maintaining grid reliability without Diablo Canyon. Merely replacing the clean power we lose from the plant will require 90,000 acres of development of renewable resources, even as the siting of new renewable energy plants and associated transmission have proven slow to develop and face substantial opposition. Keeping Diablo Canyon online would guard against these risks, and, if additional renewables are brought online, dramatically accelerate carbon reductions.

That is why so many leaders in the state have come together in bipartisan fashion to oppose closing the Diablo Canyon. Diablo Canyon is our largest producer of clean energy. Today, Diablo Canyon accounts for 15% of the state's emission-free electricity production and 8% overall energy production.

Closing Diablo Canyon in 2025 would mean increasing our dependence on gas-fired power plants to keep the lights on during periods when renewables aren't available, leading to greater CO_2 emissions, not less. And it shouldn't be overlooked that the closure would cost the Central Coast 1,200 good-paying jobs.

Solving our energy crisis does not mean abandoning our commitment to decarbonize. But we are taking a real gamble if we don't focus on diversifying our energy portfolio. **We need every carbon-free energy solution on the table, including solar, wind, geothermal, battery storage and nuclear power.**

A new joint study from researchers at MIT and Stanford University has reassessed the potential contribution Diablo Canyon can make to meet this goal through the continued production of clean, safe and reliable electricity, as well as the potential to provide water desalination and produce clean hydrogen.

The MIT-Stanford study assessed the impact of an inclusive approach, combining Diablo Canyon's electric power generation with the continued expansion of renewable clean energy sources. It found that extending the operation of Diablo Canyon to 2035 under a diversified approach would cut energy sector carbon emissions in the state by 11% compared to 2017 levels.

It also would save ratepayers billions – up to $2.6 billion if Diablo Canyon remained operational until 2035.

According to the study, Diablo Canyon has more to offer than clean, cost-effective electric power. It can be repurposed to produce both desalinated water and hydrogen – emission-free.

A desalination complex at Diablo Canyon could produce up to 80 times the output of the state's largest desalination plant currently in operation – at about half the cost. This would help mitigate our severe drought, ease shortages and provide fresh water to our cities, suburbs and farms.

And as demand for hydrogen fuels grows, Diablo Canyon would be able to generate clean hydrogen at half the cost of solar- or wind-generated hydrogen.

To meet the challenge of climate change, we need to deploy multiple sources of clean energy that, taken together, can achieve our zero-carbon goals. The last thing we should do is rush to shut down California's largest single source of clean energy.

Assemblyman Jordan Cunningham, a Republican from San Luis Obispo, represents the 35th Assembly District. Supervisor Dawn Ortiz-Legg, a Democrat, represents District 3 in San Luis Obispo County.

Solano County Daily Republic Tags: A8

Printed in the November 14, 2021 edition on page A8 | Published on November 14, 2021 | Last Modified on November 12, 2021 at 11:38 pm

Gene Nelson Ph.D. 11 15 21 comment on the *San Luis Obispo Tribune* website:
What makes the plans to close Diablo Canyon worse is the State of California plan apparently is to replace our local safe, reliable, cost-effective and zero-emission plant with emission-laden Wyoming coal-fired electricity. In order to learn this, please refer to obscure California Public Utility Commission documents referencing "unspecified imports" - a California legal euphemism for out-of-state coal-fired electricity. Please use the Google query "Diablo Canyon" "unspecified imports" site: cpuc.ca.gov . . . . . This harmful proposed policy leads me to ask the question, "Whose palms are being greased?"

Russ Byler comment
Closing Diablo has always been a major desire of the "chicken littles". They had the sky falling while the plans were still on the drawing board. Nuclear plants are a major source of electricity in Europe. Safe and clean.
It borders on insanity to close it at this time. As the push for more electric vehicles continues, soon we'll have to choose between driving and staying warm.

Email: Diablo Canyon Decommissioning Project Team

From: Jill ZamEk <jzamek@gmail.com>
Sent: Monday, November 29, 2021 6:44 PM
To: PL_Diablo <PL_Diablo@co.slo.ca.us>
Subject: [EXT]Diablo Canyon Decommissioning Environmental Impact Report Scoping Comment by San Luis Obispo Mothers for Peace

From: San Luis Obispo Mothers for Peace
mothersforpeace.org
Contacts: Linda Seeley lindaseeley@gmail.com
Jane Swanson janeslo@icloud.com
November 29, 2021
To Susan Strachan,

San Luis Obispo Mothers for Peace offers the following comments and questions on the scope and content of the Environmental Impact Report for the decommissioning of Diablo Canyon nuclear plant.

1. No Alternative Option to Evaluate License Extension

- There may be other participants advocating for license extension years beyond the anticipated closure dates. The consultants and the County must recognize that the added waste and hazards involved go far beyond the budgeted scope and timeline of this EIR. PG&E has deferred maintenance, and senior staff members have departed in anticipation of closure. Any project involving license extension must be treated as a separate application with separate environmental review.

2. High Level Waste Management

- The safe handling and storage of the high level radioactive waste remaining on-site is an issue of utmost concern. We understand that PG&E is in the process of choosing a new ISFSI storage system which will allow for more rapid transfer of the waste from the pools. There is great uncertainty regarding the amount of time this waste will remain on-site and how robust these new casks and/or canisters will be in the face of impacts from the ocean environment, routine aging, seismic risks, and the threats of terrorism.

- Will the casks and/or canisters be continuously monitored for degradation and radiation leakage?

- What is the process for repair?
- While the spent fuel pools are still in use, how will any adverse events be handled after the cessation of plant operation?
- If the pools are dismantled, what system will be in place to monitor and repair leaking containers?
- Will a hot cell or some system with similar capabilities be installed? Mothers for Peace advocates for on-site repair capability.
- Mothers for Peace advocates for HOSS - hardened on-site storage, a concept that aims to protect the public from the threats posed by the current vulnerable storage of nuclear waste. See attached document by Dr. Gordon Thompson.

3. Radiological and Chemical Decontamination of the Site: soil, concrete, components

- How will contamination during dismantling be prevented and monitored?
- How will contamination on land and in the sea be measured, including possible bioconcentration up the marine and terrestrial food chains?
- What technologies will be used to measure any possible spread of radiological contamination on and offsite?
- What procedures are in place to respond to unexpected events or emergencies?
- How will the contaminated materials be handled and contained?
- How will decontamination be done? (before/during/after dismantling?)
- How and where will the contaminated materials be transported offsite for disposal?
- What are the criteria for determining reuse vs disposal?
- Where will the contaminated material be disposed?
- What are the criteria for determining the destinations of various levels of contaminated materials?
- To what soil depth will contamination be monitored and ameliorated?
- How will the quality and safety of groundwater and protection from radiological and chemical contamination be assured?

4. Dismantlement and Air Quality

- Dismantlement will result in dust, CO2 emissions, release of harmful chemicals into the air, emissions from trucks, trains, and barges, and odors. How will the impacts of these releases be monitored and minimized?

5. Transportation and Traffic

- We understand that the dismantled materials will be transported by truck, rail, and barge.
- What infrastructure modifications and/or enhancements will be required to roads, rails, and for barge loading?
- What roads will be used to remove materials from Parcel P?
- What will be the impacts of the materials being trucked through the town of Avila Beach and by Harbor Terrace?
- How many trucks per day will be removing materials from Parcel P?
- At what hours and on what days will materials be trucked out of Parcel P?
- Will PG&E be responsible for maintenance of existing roads subjected to heavy use during decommissioning?
- Decommissioning-related traffic involving large numbers of construction personnel and vehicles over a period of many years will affect traffic flow and parking congestion. How will increased traffic be mitigated?
- There is potential for health impacts in the transportation of hazardous and/or radiological materials due to accidental release.
- How will these risks be mitigated and the warning of shipments communicated to first responders and residents on the transportation routes? What are the environmental justice impacts on disadvantaged communities of the routes selected?
- What are the environmental justice impacts on disadvantaged communities from the selection of the ultimate destinations of these hazardous materials?
- Is the Port San Luis Harbor District being consulted as a Responsible Agency? If not, why not?

6. Biological Resources

- What degrading impacts are expected on the terrestrial habitats and species as a result of demolition and removal activities?
- How can these be minimized?
- How will the potential impacts to marine species and habitats within the project area be identified and mitigated?
- What debris and contaminants will be released into the ocean?
- Over the lifetime of the plant, once-through-cooling has decimated the indigenous populations of vegetation,crustaceans and fish. The EIR must stipulate that PG&E monitor and report recovery of impacted species after the shutdown of the once-through-cooling system.

- Diablo Cove and adjacent land areas are home to seven endangered species including Bull Kelp, California Sheephead, Burrowing Owl, Green Sea Turtle, Black Abalone, Southern Sea Otter, and Morro Bay Kangaroo Rat.
- A monograph by the California Department of Fish and Game, (Burge, Richard T. and Schultz, Steven A. (1973 – prior to startup of the plant) The marine environment in the vicinity of Diablo Cove with special reference to abalones and bony fishes , [Marine Resources Technical Report, 19]} states, "Diablo Cove, a future warm water discharge site, is located about midpoint of a 13 mile long rocky shoreside reef in central California. The reef, physically isolated from other similar coastal areas, supports important kelp bed communities of nonmigratory vertebrates and invertebrates that must be constantly monitored to ensure they are protected. This 2-year study is a baseline inventory done in the vicinity of Diablo Cove with major emphasis on abalones, including their food chain, and bony fishes. Data was obtained on the life history and annual canopy development of the kelp Nereocystis and all macroalgae were cataloged. Seasonal collections of fishes were made to document those species indigenous to the system and to obtain life history information on the common forms." (Document has 429 pages.)
- From 1988 to 1991, following the startup of the Diablo Canyon units, the red and black abalone population in Diablo Cove declined by almost 90% as the result of withering syndrome, a chronic progressive disease exacerbated by elevated sea water temperatures. Thermal pollution from the Diablo Canyon units was identified by the Water Quality Control Board to be a significant contributor to the decline of the red and black abalone. Water temperatures in north Diablo Cove now prevent the successful developmental growth of black abalone and red abalone, both indigenous coastal water mollusk species.
- In 2003, the Water Quality Control Board and the California Department of Fish and Game prepared a cease and desist order for the reactor discharges into the ocean cove. "Overall, the effects of the discharge include loss and degradation of habitat, decrease in several species' diversity and density, and loss of entire species. It has been shown that the effects continue to expand beyond Diablo Cove and are greater than predicted. The discharge does not provide for the protection of propagation of species and does not provide habitat suitable for indigenous species." The agency further concluded: "The question presented is whether the degradation of the marine environment near DCPP [Diablo Canyon Power Plant] is acceptable to the Department of Fish and Game. Based on review of law and policies administered by the Department, and other laws requiring enhancement and protection of the marine ecosystem, the answer is no."
- The draft order cites that 97% of the cove's surface kelp forest (Bull Kelp) has literally been clear cut from its former habitat, with more kelp forests potentially impacted beyond the cove. As a result, the intertidal communities of Diablo Cove are now devoid of historically abundant quantities of perennial algae cover. Surfgrass, once the predominant plant thriving in continuous bands throughout the cove, survives only in isolated locations. The Department of Fish and Game maintained, based upon "the effects of elevated water temperature and the severe decrease in the adult populations densities below the recommended

Department levels, that it is questionable whether or not abalone populations will recover naturally in Diablo Cove should temperatures return to normal."

7. PG&E's Financial Status

- What category of PG&E funding is being used to pay Aspen?
- Is PG&E's financial and time budget for this EIR sufficient for the enormous complexity of the task of impact evaluation and development of mitigation measures? If not, how will additional resources be procured?
- What measures are in place to assure that the completion of the proposed project will be done in a manner that ensures prudent use of ratepayer funds?

8. Site Restoration and Future Land Uses within Parcel P and Surrounding Lands

- Once the site has been restored and deemed safe by NRC standards for public access, it is imperative that the land be used for the public good. It is this community which suffers the risks involved with the operation of the nuclear plant and storage of its radioactive waste. It is this community which is now entitled to reap benefits from the land as mitigation.
- The DREAM Initiative in 2000 was supported by over 75% of county voters - a clear message to set aside not only Parcel P but all the surrounding Diablo Canyon Lands for habitat preservation, agriculture, and passive public use upon closure of the plant. The EIR must investigate to what extent disruptive activities on Parcel P create a nexus for mitigation by way of conservation of and public access to surrounding lands to compensate affected communities. There is precedent for this with public access to Point Buchon.
- Mothers for Peace advocates for repurposing of non-contaminated facilities to be used rather than demolished.
    - These facilities should be used to create new local jobs and promote the establishment of clean, green, renewable energy sources.
    - The transmission lines should be explored for the transmission of wind, wave, solar and/or other clean energy sources.
    - The preservation of the existing desalination plant, the breakwaters, and the associated harbor area should be explored.
    - The preservation of Indigenous People's sites must be assured.
    - The request for land ownership by the local Indigenous community must be acknowledged and considered valid - with the understanding of their intent for conservation and managed use.
    - Which Indigenous groups are being consulted as Responsible Agencies?

9. NRC Pre-emption of Safety Issues with High Level Waste Handling

- To what extent could the EIR recommend, and the County require, added mitigation measures beyond those of the NRC if needed to make required health and safety findings?

Application No.: 04-01-009
Exhibit No.: ____________
Date: August 3, 2004
Witness: Gordon Thompson

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Application of Pacific Gas and Electric Company (U 39 E) for Authority to Increase Revenue Requirements to Recover the Costs to Replace Steam Generators in Units 1 and 2 of the Diablo Canyon Power Plant.	Application 04-01-009 (Filed January 9, 2004)

TESTIMONY OF GORDON THOMPSON ON BEHALF OF THE SAN LUIS OBISPO MOTHERS FOR PEACE, SIERRA CLUB, PUBLIC CITIZEN, GREENPEACE AND ENVIRONMENT CALIFORNIA

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For:

SAN LUIS OBISPO MOTHERS FOR PEACE, SIERRA CLUB, PUBLIC CITIZEN, GREENPEACE AND ENVIRONMENT CALIFORNIA

August 3, 2004

TABLE OF CONTENTS

I. INTRODUCTION

Q. Please state your name, business address, and professional affiliations.

A. I am Gordon Thompson. I am the executive director of the Institute for Resource and Security Studies (IRSS), a nonprofit, tax-exempt corporation based in Massachusetts. The IRSS office is located at 27 Ellsworth Avenue, Cambridge, MA 02139. IRSS was founded in 1984 to conduct technical and policy analysis and public education, with the objective of promoting peace and international security, efficient use of natural resources, and protection of the environment. In addition to working at IRSS, I hold an appointment as a research professor at the George Perkins Marsh Institute, Clark University, Worcester, MA.

Q. Please describe your professional and academic background.

A. I received an undergraduate education in science and mechanical engineering at the University of New South Wales, in Australia. Subsequently, I received a Doctorate of Philosophy in mathematics in 1973 from Oxford University, for analyses of plasmas undergoing thermonuclear fusion. During my graduate studies I was associated with the fusion research program of the United Kingdom Atomic Energy Authority. My undergraduate and graduate work provided me with a rigorous education in the methodologies and disciplines of science, mathematics, and engineering. Since 1977, a significant part of my work has consisted of technical analyses of safety, security and environmental issues related to nuclear facilities. These analyses have been sponsored by a variety of non-governmental organizations and local, state and national governments, predominantly in North America and Western Europe. Drawing upon these analyses, I have provided expert testimony in legal and regulatory proceedings, and have served on committees advising United States government agencies. My Curriculum Vitae is provided here as Appendix A.

Q. Please summarize your experience that is relevant to this testimony.

A. My analyses of security threats to nuclear facilities, and of options for defending these facilities, have withstood critical scrutiny and affected policy in Europe and the US. For example, my assessment in 1978-1979 of security threats and defense options related to the proposed Gorleben facility in Germany was accepted by the licensing authority, leading to new design standards that remain in effect. Similar assessments that I conducted in relation to the Sellafield site in the UK and the La Hague site in France, at various times between 1977 and 2000, have led to new design standards and government policies. My analyses of security threats and defense options related to storage of spent fuel from US nuclear power plants are currently influencing the development of national policy.

Q. What is the purpose of your testimony?

A. My testimony has two purposes. The first purpose is to show that, given present trends, it is reasonable and prudent to assume that the Diablo Canyon nuclear power plant and its spent fuel will receive an enhanced defense during the coming years. By enhanced defense, I mean the implementation of defensive measures additional to those currently required by the US Nuclear Regulatory Commission (NRC).[1] The testimony's second purpose is to provide an estimate of additional costs to Pacific Gas and Electric (PG&E) that could arise from the provision of the enhanced defense.

[1] Here, I use the term "defense" in its military sense. In a military context, the term "defense in depth" refers to a set of mutually-supportive but independent measures that protect a facility from external or internal attackers. Some safety experts in the nuclear power industry have appropriated the term defense in depth to refer to the provision of multiple safety systems. I use the term in its original, military sense.

PG&E has not included such costs in its application. Consideration of these costs affects the cost/benefit analyses related to replacement of the Diablo Canyon steam generators.

Q. Please briefly summarize your testimony.

A. This testimony has nine sections. After this introduction (Section I), Section II describes the Diablo Canyon nuclear power plant. Section III discusses the defense of nuclear power plants in the context of US national security. Section IV reviews the NRC's present requirements for defense of nuclear power plants. That review is followed, in Section V, by a discussion of the risk of attack on nuclear power plants and their spent fuel. In this context, the concept of risk encompasses vulnerability to attack, and the probability and consequences of attack. Section VI describes trends that are leading toward enhanced defense of US nuclear power plants and spent fuel. Section VII describes the type of enhanced defense of the Diablo Canyon plant and its spent fuel that, I believe, it is reasonable and prudent to assume will be implemented in the future. The costs of implementing the additional defensive measures are estimated in Section VIII. My conclusions are set forth in Section IX. Appendix B is a bibliography to support this testimony. Literature cited in the testimony appears in the bibliography.

This testimony discusses potential destructive attacks, at the Diablo Canyon plant and other nuclear facilities, that could cause great public harm. No information is contained in the testimony that could assist the perpetrator of such an attack. Accordingly, this testimony is appropriate for general distribution.

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II. THE DIABLO CANYON NUCLEAR POWER PLANT

Q. Please describe the Diablo Canyon nuclear power plant.

A. The Diablo Canyon plant has two nuclear generation units. These units employ essentially identical pressurized-water reactors (PWRs), each rated at a nominal 1,100 MWe. The two units share an auxiliary building and some components of auxiliary systems. Each reactor has a dedicated fuel-handling system and one spent-fuel pool. The reactors were furnished by Westinghouse. Unit 1 began commercial operation in May 1985 and Unit 2 in March 1986. The operating licenses expire in September 2021 for Unit 1 and April 2025 for Unit 2.[2]

Q. Please describe the storage facilities for spent fuel.

A. The two spent-fuel pools at Diablo Canyon were originally equipped with low-density racks, so that each pool could accommodate one and one-third cores of spent fuel. Each reactor core contains 193 fuel assemblies. In the late 1980s, the low-density racks were replaced by high-density racks that are currently in use. Each pool can now accommodate 1,324 spent fuel assemblies. Each unit operates on an 18-21 month refueling cycle and discharges 76-96 spent fuel assemblies per refueling. As of December 2001, each unit had operated for 10 cycles. It follows that each spent-fuel pool contained 760-960 spent fuel assemblies in December 2001. Thus, given a pool capacity of 1,324 assemblies, while allowing space for a full-core offload of 193 assemblies, each pool could, as of December 2001, accommodate an additional 171-371 assemblies beyond the assemblies then stored in the pool. PG&E has projected

[2] PG&E, 2001, page 1.1-1.

that each pool can accommodate a full-core offload and the accumulated inventory of discharged fuel until 2006.[3]

Q. What are PG&E's plans for storage of spent fuel assemblies produced at the Diablo Canyon plant after 2006?

A. To accommodate spent fuel discharged from Units 1 and 2 after the pools are full, PG&E has applied for permits from the NRC, San Luis Obispo County, and the California Coastal Commission to establish an independent spent-fuel storage installation (ISFSI) on the Diablo Canyon plant site. This facility would hold up to 140 dry-storage casks, employing the Holtec HI-STORM 100 cask system. PG&E expects that most of the casks would be capable of holding 32 fuel assemblies per cask. Assuming 140 casks each holding 32 assemblies, the proposed ISFSI could accommodate 4,480 spent fuel assemblies. PG&E projects that this storage capacity would be sufficient to hold all the spent fuel discharged by Diablo Canyon Units 1 and 2 through the duration of their present operating license terms (2021 for Unit 1 and 2025 for Unit 2).[4]

PG&E plans to build the ISFSI in increments. The storage casks would sit on concrete pads, 20 casks per pad in a 4 by 5 array. Initially, two pads would be built.[5] Ultimately, seven pads would be built side by side, covering an area about 500 feet by 105 feet. PG&E expects that spent fuel would be transferred from the pools to the ISFSI after at least 5 years of storage in the pools. Specifically, casks would be installed as needed to accommodate the spent fuel that would be removed from the pools in order to free up space in the pools for storage of fuel discharged from the

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[3] PG&E, 2001, page 1.1-1.
[4] PG&E, 2001, page 1.2-2.

reactors.[6] Thus, from 2006 through the present Unit 1 and 2 operating license terms, the pools would hold spent fuel at nearly their full capacity. After 2006, the average post-discharge age of the spent fuel in each pool would be about 10 years.

Each cask in the planned ISFSI would be about 11 feet in diameter and 20 feet high. The surface-to-surface distance between casks would be about 6 feet. The ISFSI's full capacity of 140 casks would be achieved by placing casks in a 5 by 28 array. A security fence would surround the area needed for this array, at a distance of about 50 ft from the outermost casks. That fence would in turn be surrounded by a second fence, at a distance of about 100 feet from the outermost casks.[7]

The HI-STORM 100 dry-cask storage system employs a multi-purpose canister (MPC) that contains the fuel, and a storage overpack that surrounds the MPC during storage. The MPC is a thin-walled stainless-steel cylinder containing a basket structure to hold the spent fuel assemblies. After the MPC receives fuel and is sealed, it is filled with helium. The overpack is a thick-walled concrete cylinder whose surfaces are clad with a thin coating of carbon steel. Cooling of the MPC occurs by natural circulation of ambient air in a space between the MPC and the overpack. This air enters the overpack through holes near its base, passes over the MPC, and leaves the overpack through holes near its top.[8]

Q. Was PG&E aware of the need for additional on-site, spent-fuel storage capacity when the NRC approved construction of the Diablo Canyon plant?

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[5] PG&E, 2001, page 3.1-1.
[6] PG&E, 2001, page 1.2-1.
[7] PG&E, 2001, Chapter 3.
[8] PG&E, 2001, Chapter 3.

A. No. The long-term, on-site storage of spent fuel at the Diablo Canyon plant was never considered because it was assumed that the waste would be transported to an off-site facility.

Q. Please describe the inventory of radioactivity that will be present in spent fuel at the site.

A. Each fuel assembly contains a variety of radioactive isotopes, but one isotope -- cesium-137 -- is especially useful as an indicator of the potential for radiological harm. Cesium-137 is a radioactive isotope with a half-life of 30 years. This isotope accounts for most of the offsite radiation exposure that is attributable to the 1986 Chernobyl reactor accident, and for about half of the radiation exposure that is attributable to fallout from testing nuclear weapons in the atmosphere.[9] Cesium is a volatile element that would be liberally released during the meltdown of a reactor core or during a fire in a drained spent-fuel pool.

The inventory of cesium-137 in the Diablo Canyon plant pools or the proposed ISFSI can be readily estimated. Three parameters govern the estimate -- the number of spent fuel assemblies, their respective burnups, and their respective ages after discharge. I have made such estimates, assuming a representative, uniform burnup of 46 gigawatt-days per tonne.[10] As a separate exercise, I have estimated the inventory of cesium-137 in the Diablo Canyon reactors.

PG&E projections indicate that each of the Diablo Canyon plant pools will contain, from 2006 until the 2020s and potentially beyond, an inventory of spent fuel approaching the pool's capacity of 1,131 assemblies. The average post-discharge age

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[9] DOE, 1987.

[10] Burnup is the cumulative fission energy released in a fuel assembly during its period of use.

of the fuel will be about 10 years. This inventory of spent fuel -- 1,131 assemblies aged for 10 years -- will contain about 56 million Curies (630 kilograms) of cesium-137. For comparison, the core of each Diablo Canyon reactor contains about 6 million Curies (67 kilograms) of cesium-137. At the proposed Diablo Canyon ISFSI, one cask containing 32 fuel assemblies with an average post-discharge age of 20 years would contain about 1.3 million Curies (14 kilograms) of cesium-137.

As a comparison, the Chernobyl reactor accident of 1986 released about 2.4 million Curies (27 kilograms) of cesium-137 to the atmosphere. That release represented 40 percent of the Chernobyl reactor core's inventory of 6 million Curies (67 kilograms) of cesium-137.[11] Atmospheric testing of nuclear weapons led to the deposition of about 20 million Curies (220 kilograms) of cesium-137 across the land and water surfaces of the Northern Hemisphere.[12]

III. NUCLEAR POWER PLANTS AND NATIONAL SECURITY

Q. Please describe the security threat to nuclear power plants and their spent fuel.

A. <u>The National Strategy for The Physical Protection of Critical Infrastructures and Key Assets</u>, which was published in February 2003, identifies nuclear power plants as key assets, defined as follows: [13]

> "Key assets represent individual targets whose destruction could cause large-scale injury, death, or destruction of property, and/or profoundly damage our national prestige, and confidence".

Prominent officials, such as the Chair of the National Intelligence Council, Robert Hutchings, have concurred on the security threat posed by nuclear power plants:[14]

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[11] Krass, 1991.
[12] DOE, 1987.
[13] White House, 2003, page 7.
[14] Hutchings, 2004.

> Targets such as nuclear power plants, water treatment facilities, and other public utilities are high on al-Qa'ida's targeting list as a way to sow panic and hurt our economy. . . . Just this past year, al-Qa'ida attacks in Kenya, Saudi Arabia, and Turkey have demonstrated the group's impressive expertise to build truck bombs, and we are concerned it will try to marry this capability to toxic or radioactive material to increase the damage and psychological impact of an attack. . . . I have already detailed the terrorist threat and feel it is important to point out that according to State Department statistics, more businesses are targeted in terrorist attacks than all other types of facilities combined. US interests both abroad and at home, as well as US citizens working abroad, are prime targets for terrorist groups seeking to damage the US economy and affect our way of life. High-profile facilities such as nuclear power plants, oil and gas production, and export and receiving facilities remain at risk; moreover al-Qa'ida and other terrorist groups' targets and methods may be evolving.

Q. In your opinion, is the concern expressed by Chairman Hutchings justified?

A. Yes. Nuclear power plants and their spent fuel are, in my opinion, likely targets in a sophisticated attack on the US homeland, for both symbolic and practical reasons. An important symbolic reason is the connection of nuclear power plants with nuclear weapons. The US government justified its March 2003 invasion of Iraq in large part by the possibility that the Iraqi government might have acquired a nuclear weapon. Yet, our government flaunts its own superiority in nuclear weapons and rejects the constraint of its weapons by international agreements such as the Non-Proliferation Treaty.[15] As an approach to international security, this policy has been criticized by the director general of the International Atomic Energy Agency as "unsustainable and counterproductive".[16]

It would be prudent to assume that this policy will motivate terrorist groups to respond asymmetrically to US nuclear superiority, possibly through an attack on a US nuclear power plant and/or its spent fuel. From a practical perspective, nuclear power

[15] Deller, 2002; Scarry, 2002.
[16] ElBaradei, 2004, page 9.

plants and ISFSIs are large, fixed targets. At present, as shown below, these facilities are lightly defended. In the eyes of an enemy, they can be regarded as pre-deployed radiological weapons that could release large amounts of radioactive material.

An attack on a US nuclear facility would be either an act of insanity or an act of malice. An insane attacker would have no political purpose, but a malicious attacker would be pursuing the political objectives of a domestic or foreign constituency. Currently, concern about attack is focused on foreign enemies and their domestic sympathizers. These groups are not the only sources of threat, but they deserve special consideration because their objectives relate to US foreign policy and military campaigns.

Q. What general actions can be taken in response to the threat of a foreign-origin attack?

A. There should be a mixture of offensive and defensive actions. "Offensive" refers to efforts to destroy or incapacitate attackers before they attack, and "defensive" refers to protecting ourselves from attack. The need for a balance between offensive and defensive actions was recognized by a task force convened by the Council on Foreign Relations. In an October 2002 report, this group stated:[17]

> "*Homeland security measures have deterrence value*: US counterterrorism initiatives abroad can be reinforced by making the US homeland a less tempting target. We can transform the calculations of would-be terrorists by elevating the risk that (1) an attack on the United States will fail, and (2) the disruptive consequences of a successful attack will be minimal. It is especially critical that we bolster this deterrent now since an inevitable consequence of the US government's stepped-up military and diplomatic exertions will be to elevate the incentive to strike back before these efforts have their desired effect".

Q. How would you describe the current level of defensive action at nuclear facilities?

[17] Hart et al, 2002, pp 14-15.

A. The NRC requires only a light defense for civilian nuclear facilities. It does not require security measures that reflect the actual security risks. The NRC is, in effect, rejecting the advice of the Council on Foreign Relations' task force that I quote above. An explicit rejection of this type of advice was articulated by the NRC chair, Richard Meserve, in late 2002:[18]

> "If we allow terrorist threats to determine what we build and what we operate, we will retreat into the past – back to an era without suspension bridges, harbor tunnels, stadiums, or hydroelectric dams, let alone skyscrapers, liquid-natural-gas terminals, chemical factories, or nuclear power plants. We cannot eliminate the terrorists' targets, but instead we must eliminate the terrorists themselves. A strategy of risk avoidance – the elimination of the threat by the elimination of potential targets – does not reflect a sound response."

Q. Do you agree with this statement?

A. No. To deter attack, the nation need not scrap every modern technology or infrastructure asset. Instead, potential targets can be ranked by their attractiveness as targets for attack. Then, each target can receive a level of defense that is commensurate with its attractiveness. The chosen level of defense would aim to reduce the likelihood of a successful attack and the consequences of an attack. In instances where the cost of providing the chosen level of defense appears prohibitive, the target can be replaced by another, more defensible, facility or activity that serves the same purpose.

Q. What is the significance of the NRC's approach to security at nuclear facilities?

A. Without any public debate, and apparently without any analysis of strategic risks, the NRC has chosen to rely primarily on US offensive capabilities to protect nuclear power plants.

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[18] Meserve, 2002a, page 22.

Q. Do you believe that this is an adequate approach?

A. No. As discussed above, defensive capabilities are equally important. In addition, the US government's offense-dominated response to terrorism has proven to be costly in terms of fracturing alliances and arousing hostility worldwide. If anything, this offensive approach has increased the risks of terrorist attack in the US. Drawing a balance between defending key assets and pursuing security through offensive actions is a crucial, but not always understood, aspect of homeland-security policy.

IV. PRESENT NRC REQUIREMENTS FOR DEFENSE OF NUCLEAR POWER PLANTS

Q. Briefly describe the history of government regulation of security at nuclear power plants.

A. The NRC's basic policy on the protection of nuclear facilities from attack is set forth in 10 Code of Federal Regulations (CFR) § 50.13. This regulation was originally promulgated in September 1967 by the US Atomic Energy Commission (AEC), the predecessor of the NRC. It states:[19]

> "An applicant for a license to construct and operate a production or utilization facility, or for an amendment to such license, is not required to provide for design features or other measures for the specific purpose of protection against the effects of (a) attacks and destructive acts, including sabotage, directed against the facility by an enemy of the United States, whether a foreign government or other person, or (b) use or deployment of weapons incident to US defense activities."

Q. Has this policy changed over time?

A. Regulation 10 CFR 50.13 remains in effect.[20] Nevertheless, experience has forced the NRC to increase licensees' obligations to defend nuclear facilities. A series of events,

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[19] Federal Register, Vol. 32, No. 186, 26 September 1967, page 13445.

[20] Regulation 10 CFR 50.13 does not preclude the US government from defending nuclear power plants. Indeed, the NRC chair has stated (Meserve, 2002a, page 22) that defense of nuclear plants against air attack would, if required, be a task for the US military.

including the 1993 bombing of the World Trade Center in New York, forced the NRC to introduce a rule in 1994, requiring licensees to defend nuclear power plants against vehicle bombs.[21] The terrorist events of September 11, 2001 have forced the NRC to require additional measures, described below. Yet, as shown below, the NRC currently requires only a light defense of nuclear facilities.

Q. What was the NRC's response to the events of September 11, 2001?

A. After the events of September 11, the NRC concluded that its requirements for nuclear-facility security were inadequate. Accordingly, the NRC issued an order to licensees of operating plants in February 2002, and similar orders to licensees of decommissioning plants in May 2002 and reactor-site ISFSI licensees in October 2002, requiring "certain compensatory measures", also described as "prudent, interim measures", whose purpose was to "provide the Commission with reasonable assurance that the public health and safety and common defense and security continue to be adequately protected in the current generalized high-level threat environment".[22] The additional measures required by these orders were not publicly disclosed, but the NRC chair stated that they included:[23]

(i) increased patrols;

(ii) augmented security forces and capabilities;

(iii) additional security posts;

(iv) vehicle checks at greater stand-off distances;

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[21] Final Rule, Protection Against Malevolent Use of Vehicles at Nuclear Power Plants, 59 Fed. Reg. 38,889 (August 1, 1994).

[22] The quoted language is from page 2 of the NRC's order of February 25, 2002 to all operating power reactor licensees. Almost-identical language appears in the NRC's orders of May 23, 2002 to all decommissioning power reactor licensees and October 16, 2002 to all ISFSI licensees who also hold 10 CFR 50 licenses.

[23] Meserve, 2002b.

(v) enhanced coordination with law enforcement and military authorities;

(vi) additional restrictions on unescorted access authorizations;

(vii) plans to respond to plant damage from explosions or fires; and

(viii) assured presence of Emergency Plan staff and resources.

The NRC also established a Threat Advisory System that warns of a possible attack on a nuclear facility. This system uses five color-coded threat conditions ranging from green (low risk of attack) to red (severe risk of attack). These threat conditions conform with those used by the Department of Homeland Security.

Q. What types of defensive measures does the NRC require?

A. Present NRC requirements for the defense of nuclear facilities are focused primarily on site security, which the NRC discusses under the heading "physical protection". As described in Section VII, below, site security is one of four types of measures that, taken together, could provide a defense in depth against acts of malice or insanity. The other three types of measures are: facility robustness; damage control; and emergency response planning. With some limited exceptions, these measures are ignored in present NRC requirements for nuclear-facility defense.[24]

Q. What is meant by "physical protection" in terms of NRC security requirements?

A. At a nuclear power plant or an ISFSI, the NRC requires the licensee to implement a set of physical protection measures. According to the NRC, these measures provide defense in depth by taking effect within defined areas with increasing levels of security. Within the outermost physical protection area, known as the Exclusion Area, the licensee is expected to control the area but is not required to employ fences and guard posts for this purpose. Within the Exclusion area is a Protected Area encompassed by physical barriers including one or more fences, together with gates and barriers at points of entry. Authorization for unescorted access within the Protected Area is based on background and behavioral checks. Within the Protected Area are Vital Areas and Material Access Areas that are protected by additional barriers and alarms; unescorted access to these locations requires additional authorization.

Associated with the physical protection areas are measures for detection and assessment of an intrusion, and for armed response to an intrusion. Measures for intrusion detection include guards and instruments whose role is to detect a potential intrusion and notify the site security force. Then, security personnel seek additional information through means such as direct observation and closed-circuit TV cameras, to assess the nature of the intrusion. If judged appropriate, an armed response to the intrusion is then mounted by the site-security force, potentially backed up by local law-enforcement agencies and the FBI. The design of physical protection areas and their associated barriers, together with the design of measures for intrusion detection, intrusion assessment and armed response, is required to accommodate a "design basis threat" (DBT) specified by the NRC.

Q. What is a DBT?

A. A DBT is a set of characteristics of a potential attack on a nuclear facility. It provides a basis for the design and assessment of defensive measures. At a nuclear power plant, the dominant sources of hazard are the reactor(s) and the spent-fuel pool(s). In theory, both of these items receive the same level of protection against attack, but in

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[24] For information about the NRC's requirements – expressed in regulations, rules and orders -- for nuclear-facility defense, see: the NRC website (www.nrc.gov); Markey, 2002; Meserve, 2002b; Meserve,

practice the reactor has been the main focus of attention. The DBT for an ISFSI is less demanding than that for a nuclear power plant.

Q. What is the DBT for a nuclear power plant?

A. In April 2003 the DBT for a nuclear power plant was revised, but the NRC announced that the features of the revised DBT would not be published. The previously-applicable DBT had the following features:[25]

> "(i) A determined violent external assault, attack by stealth, or deceptive actions, of several persons with the following attributes, assistance and equipment: (A) Well-trained (including military training and skills) and dedicated individuals, (B) inside assistance which may include a knowledgeable individual who attempts to participate in a passive role (e.g., provide information), an active role (e.g., facilitate entrance and exit, disable alarms and communications, participate in violent attack), or both, (C) suitable weapons, up to and including hand-held automatic weapons, equipped with silencers and having effective long range accuracy, (D) hand-carried equipment, including incapacitating agents and explosives for use as tools of entry or for otherwise destroying reactor, facility, transporter, or container integrity or features of the safeguards system, and (E) a four-wheel drive land vehicle used for transporting personnel and their hand-carried equipment to the proximity of vital areas, and
> (ii) An internal threat of an insider, including an employee (in any position), and (iii) A four-wheel drive land vehicle bomb."

In announcing the revised DBT in April 2003, the NRC stated:[26]

> "The Commission believes that this DBT represents the largest reasonable threat against which a regulated private security force should be expected to defend under existing law."

Q. What is the DBT for an ISFSI?

A. The NRC's April 2003 announcement of a revised DBT did not mention ISFSIs. Thus, it can be presumed that the previous DBT continues to apply to these facilities. For an ISFSI, the previous DBT was the same as for a nuclear power plant except that

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2003; and NRC, 2002.

[25] 10 CFR 73.1, Purpose and Scope, from the NRC web site (www.nrc.gov).

[26] NRC Press Release No. 03-053, 29 April 2003.

it did not include the use of a four-wheel-drive land vehicle, either for transport of personnel and equipment or for use as a vehicle bomb. This was true whether the ISFSI was at a new site or a reactor site.[27] Thus, an ISFSI at a reactor site would be less protected than the reactor(s) and spent-fuel pool(s) at that site. At a reactor site or a new site, an ISFSI would be vulnerable to attack by a vehicle bomb.

Q. If the new DBT is not published, how do we know what it contains?

A. Its general characteristics can be inferred with reasonable confidence. Four major considerations support such an inference. First, the new DBT must be consistent with 10 CFR 50.13. Second, the DBT will not exceed the capabilities of a "regulated private security force". Third, there is a well-documented history over the past two decades, showing vigorous resistance by the nuclear industry to measures that enhance site security, and a reluctance by the NRC to contest that resistance.[28] Fourth, available information shows no marked change in prevailing practices of site security.[29]

Q. In your opinion, what is the general nature of the new DBT?

A. The new DBT remains focused on a ground assault by a comparatively small group of lightly-armed attackers. The most destructive instrument included in the DBT is probably a vehicle bomb. The new DBT probably does not allow for aerial or multi-modal attack by a commando-type force. It probably does not allow for anti-tank missiles or lethal chemical weapons. There is probably no provision for an attack using a commercial or general-aviation aircraft, with or without a load of fuel or explosive. There is no provision for attack using a nuclear weapon. The insider threat probably does not include carefully-planned, sophisticated interventions by key

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[27] 10 CFR 73.1, Purpose and Scope, from the NRC web site (www.nrc.gov).
[28] Hirsch et al, 2003.

employees. Also, the new DBT does not apply to ISFSIs, so it can be assumed that ISFSIs continue to receive a lesser degree of protection than nuclear power plants. Finally, the scale of the presumed attack is such that backup for the licensee's site-security force continues to be provided by local law-enforcement agencies and the FBI, rather than the US military.

Q. You have discussed NRC requirements for defense of nuclear power plants and spent fuel, including your understanding of the general nature of the new DBT. Please summarize your conclusions regarding these requirements.

A. At present, the NRC requires only a light defense of nuclear power plants and spent fuel. These requirements are inadequate in view of the nature of the threat and the need to balance offensive and defensive means of protecting the nation.

V. RISK OF ATTACK ON NUCLEAR POWER PLANTS AND SPENT FUEL

Q. What are the factors that should be considered in securing a nuclear facility against the threat of an attack?

A. Before deciding upon the level and type of defense for securing a nuclear power plant and its spent fuel against the threat of an attack, a decision maker should assess the risk of a successful attack. In this context, the concept of risk encompasses vulnerability to attack, and the probability and consequences of attack.

One should assume that attackers are technically sophisticated and possess considerable knowledge about individual nuclear facilities. For decades, engineering drawings, photographs and technical analyses have been openly available for every civilian nuclear facility in the US. This material is archived at many locations around the world. Thus, a public discussion, in general terms, of potential modes and

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[29] POGO, 2002; Brian, 2003.

instruments of attack will not assist attackers. Indeed, such a discussion is needed to ensure that appropriate defensive actions are taken.[30]

Q. Are nuclear power plants and spent-fuel-storage facilities designed to resist attack?

A. No. It is possible to design a nuclear power plant to resist attack, an example being the proposed PIUS design.[31] However, no US civilian nuclear facility has been designed to resist attack. Any capacity that a facility has in this respect is a byproduct of designing to account for other factors (earthquake, fire, equipment failure, human error, etc.).

Q. What are the points of vulnerability of a nuclear power plant?

A. The safe operation of a US commercial reactor and its associated spent-fuel pool(s) depends upon the fuel in the reactor and the pool(s) being immersed in water. Moreover, that water must be continually cooled to remove fission heat or radioactive decay heat generated in the fuel. Various systems are used to ensure that water is available and is cooled, and that other safety-related functions -- such as shutdown of the fission reaction when needed -- are performed. Some of the relevant systems -- such as the electrical switchyard -- are highly vulnerable to attack. Other systems are located inside reinforced-concrete structures -- such as the reactor auxiliary building -- that provide some degree of protection against attack. The reactor itself is inside a containment structure. At some plants, but not all, the reactor containment is a concrete structure that is highly reinforced and comparatively robust. Spent-fuel pools have thick concrete walls but are typically covered by lightweight structures.

Q. Could attackers exploit points of vulnerability?

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[30] For more detailed discussion of nuclear-facility vulnerability, see: Thompson, 2003; Thompson, 2002a.

[31] Hannerz, 1983.

A, Yes. Knowledgeable attackers could obtain a large release of radioactive material from a nuclear power plant or its spent fuel by applying force in a targeted manner. To minimize the need for brute force, knowledgeable attackers would seek to unleash sources of energy (radioactive decay heat, stored thermal energy, energy of chemical reactions, etc.) that are already present in the facility. In their planning, attackers could benefit from the large published literature of probabilistic risk assessment (PRA) in the context of nuclear power plant accidents.[32] Attackers could hinder damage-control efforts by incapacitating plant personnel through means that include a release of short-lived radioactive material from a reactor core.

Q. Is the Diablo Canyon nuclear power plant unusual in its robustness or vulnerability?

A. The Diablo Canyon plant is a typical representative of the PWR nuclear power plants that are common in the US. Its two reactor containments are comparatively thick-walled concrete structures, and its two spent-fuel pools are partially sunk below grade level. These design features provide some protection against attack. Nevertheless, the Diablo Canyon plant has several points of vulnerability that will be evident to informed readers of PRA literature.

Q. Do you have a particular area of concern regarding the Diablo Canyon nuclear plant?

A. Yes. The vulnerability of the spent-fuel pools deserves special consideration for two reasons. First, each pool at the Diablo Canyon plant now contains an amount of long-lived radioactive material that is substantially larger than the amount in a reactor core. Second, the potential for a spent-fuel-pool fire exists because the Diablo Canyon pools have been equipped with high-density racks. Loss of water from a pool could cause

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[32] The state of the art for reactor PRAs is illustrated by: NRC, 1990.

some or all of the fuel in the pool to self-ignite and burn, releasing a large amount of radioactive material to the atmosphere.[33]

Because high-density racks have a closed structure, to suppress criticality, each fuel assembly is surrounded by solid, neutron-absorbing panels, and there is little or no gap between the panels of adjacent cells.[34] In the absence of water, this configuration allows only one mode of circulation of air and steam around a fuel assembly -- vertically upward within the confines of the neutron-absorbing panels. This mode of circulation provides less effective transfer of radioactive decay heat than would occur in a low-density, open-frame rack. Moreover, the upward flow of air or steam could be blocked by residual water or debris. Thus, across a broad range of conditions, loss of water from a high-density pool will cause the temperature of the fuel cladding to rise to the point where a self-sustaining, exothermic oxidation reaction with air or steam begins. Other exothermic oxidation reactions can also occur. For simplicity, the occurrence of one or more of the possible reactions can be referred to as a pool fire.

Q. Do you believe that an attack on a civilian nuclear facility is possible?

A. Yes. I believe that a determined and sophisticated attack on a US nuclear power plant and/or its spent fuel is a realistic possibility. There is a large amount of publicly available information on the design of commercial nuclear power plant facilities, as well as the amount, location, and method of storage of radioactive materials at each plant. Much is known about the nature of the security measures at each plant,

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[33] The NRC has published a variety of technical documents that address spent-fuel-pool fires. The most recent of these documents is: Collins et al, 2000. For more recent analyses of spent-fuel-pool fires, see: Alvarez et al, 2003; Thompson, 2003; and Thompson, 2002a. The NRC Staff stated in March 2003 (NRC, 2003, page 10) that it has completed an "integral analysis of a spent fuel pool accident scenario", but this analysis has not been published.

including the fact that there are no security measures designed specifically to address attacks from the air. Not only does the nuclear-plant defense currently required by the NRC not address the full spectrum of potential threats, but I believe that the US government's current policy of addressing terrorism through an offense-dominated strategy is increasing the threat of terrorist attack.

Q. Would an effective attack require weapons not generally available to civilians?

A. Not necessarily. A nuclear power plant or an ISFSI could be attacked using one or more of a variety of modes and instruments. Table V-1, below, shows a selection of potential modes and instruments, summarizes their key characteristics, and describes the defenses that are currently mounted against them.

One of the potential instruments of attack shown in Table V-1 is an explosive-laden smaller aircraft. In this connection, it is noteworthy that the US General Accounting Office (GAO) expressed concern, in September 2003 testimony to Congress, about the potential for malicious use of general-aviation aircraft. The testimony stated:[35]

> "Since September 2001, TSA [the Transportation Security Administration] has taken limited action to improve general aviation security, leaving it far more open and potentially vulnerable than commercial aviation. General aviation is vulnerable because general aviation pilots are not screened before takeoff and the contents of general aviation planes are not screened at any point. General aviation includes more than 200,000 privately owned airplanes, which are located in every state at more than 19,000 airports. Over 550 of these airports also provide commercial service. In the last 5 years, about 70 aircraft have been stolen from general aviation airports, indicating a potential weakness that could be exploited by terrorists."

A form of explosive that might be used in an attack on a nuclear power plant or an ISFSI is a shaped charge. These have many civilian and military applications, and have

[34] Criticality is a situation in which a nuclear fission reaction becomes self-sustaining.
[35] Dillingham, 2003, page 14.

been used for decades.[36] They are used, for example, as human-carried demolition charges or as warheads for anti-tank missiles. In illustration of their availability, a quick search of the Web identified a commercial supplier of military-surplus, shaped-charged warheads to licensed civilian users. A surplus warhead with a diameter of 14 cm and length of 21 cm was advertised as being capable of penetrating more than 65 cm of rolled homogeneous armor. Much larger shaped charges are available. For example, the US government has developed, and described in a published report, a shaped charge that can create a hole of 10 inches diameter to a depth of 20 feet in rock.[37]

Q. Can the probability of a successful attack on a US nuclear power plant be estimated?

A. There is no statistical basis for such an estimate, because there has been no determined attack on a US plant. It is prudent to assume that the probability of an attack on a US nuclear power plant, with a substantial probability of success, is a realistic possibility. This conclusion arises from the following qualitative considerations. First, the scale of the planning and resources needed to mount an attack on a nuclear power plant, with a substantial probability of success is a realistic possibility, would be comparable to the scale of preparations for the attacks of September 11, 2001, and it is prudent to assume that similar efforts will be mounted in the future. Second, senior officials in the US government have repeatedly acknowledged that nuclear power plants are prime potential targets. Third, groups like al-Qa'ida seek high-stakes objectives such as political control of Saudi Arabia and its oil fields, and history tells us that confrontations over such objectives have frequently involved high levels of violence.

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[36] Walters, 2003.

[37] This device has a diameter of 28 inches and a length of 29 inches, and weighs 900 pounds.

Fourth, the experience of the 20th century, during which the US homeland suffered only limited attacks, will not necessarily be repeated during the 21st century.

Q. What is your assessment of the potential release of cesium-137 from the Diablo Canyon plant in the event of an attack?

A. As discussed above, each of the two spent-fuel pools at the Diablo Canyon plant will contain, from 2006 forward, about 56 million Curies (630 kilograms) of cesium-137. Each of the two reactor cores contains about 6 million Curies (67 kilograms) of cesium-137. A typical dry-storage cask at the planned ISFSI will contain about 1.3 million Curies (14 kilograms) of cesium-137. During a spent-fuel-pool fire, the fractional release of cesium-137 to the atmosphere could range from 10 to 100 percent.[38] A similar range of release fractions can be assumed for attack-induced atmospheric releases from reactor cores or dry casks. An attack on the Diablo Canyon plant could lead to an atmospheric release of radioactive materials from one or both of the reactors, and/or one or both of the spent-fuel pools, and/or the planned ISFSI. Thus, the atmospheric release of cesium-137 following an attack on the Diablo Canyon plant could exceed 100 million Curies. The actual magnitude of the release would depend on the attack scenario.

Q. Are there studies on the consequences of such a release of cesium-137?

A. Yes. For example, some of the consequences of a large, atmospheric release of cesium-137 have been estimated in a recent paper by three of my colleagues.[39] They assumed a release of 3.5 or 35 million Curies of cesium-137 at each of five nuclear-power-plant sites (not including the Diablo Canyon site), and estimated the offsite

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[38] Alvarez et al, 2003.
[39] Beyea et al, 2004.

economic damage. For a release of 35 million Curies, the 5-site average economic damage was found to be about $400 billion. The costs considered were: (i) compensation for loss of contaminated real estate and other property; (ii) relocation costs; (iii) decontamination costs; and (iv) costs of disposing of wastes generated during decontamination. A simple analytic process was used, and the authors relied heavily on a 1996 study done for Sandia National Laboratories. That study identified factors that could bias its cost estimates downward, including: (i) its neglect of administrative and support costs that could double the cost estimates; (ii) its neglect of litigation costs; and (iii) its neglect of impacts on downtown business and commercial districts, heavy-industrial areas, and high-rise apartment buildings. Consideration of these factors would increase the $400 billion estimate made by my colleagues.

My colleagues' paper estimated that, for a release of 35 million Curies of cesium-137, the 5-site average of additional cancer deaths would be about 6,000 deaths. These deaths were valued at $4 million each, yielding a cost of $24 billion. If the release also included short-lived radioactive isotopes, as would occur if a reactor core were involved in the release incident, there could be additional cancer deaths.

My colleagues considered a set of direct costs arising from contamination of the environment with cesium-137. There would be many additional, indirect costs of a successful attack on a US nuclear power plant, including the following five examples. First, the attack would probably lead to temporary or permanent shutdown of other nuclear plants across the nation, leading to additional costs for electricity supply. Second, domestic and foreign markets for US agricultural products and other goods would be depressed by customers' fear of radioactive contamination. Third, the attack would be perceived internationally as a major blow to the US, thereby affecting capital flows, exchange rates, and market valuations. Fourth, the attack would probably lead to a reduction of civil liberties, potentially including a period of martial law, with long-term negative effects on the economy. Fifth, there would probably be large additional US expenditures on homeland security and, potentially, on offensive military operations.

Q. How is the above analysis relevant to this proceeding regarding the Diablo Canyon plant?

A. Analysis could be performed to estimate the direct costs of an atmospheric release of cesium-137 from the Diablo Canyon plant. Also, the accompanying indirect costs could be analyzed. In the absence of such analyses, it is prudent to assume that the direct and indirect economic consequences of a successful attack on the Diablo Canyon nuclear power plant would be not less than $1,000 billion.

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Table V-1
Potential Modes and Instruments of Attack on a Nuclear Power Plant[40]

Mode of Attack	Characteristics	Present Defense
Commando-style attack	• Could involve heavy weapons and sophisticated tactics • Successful attack would require substantial planning and resources	Alarms, fences and lightly-armed guards, with offsite backup
Land-vehicle bomb	• Readily obtainable • Highly destructive if detonated at target	Vehicle barriers at entry points to Protected Area
Anti-tank missile	• Readily obtainable • Highly destructive at point of impact	None if missile launched from offsite
Commercial aircraft	• More difficult to obtain than pre-9/11 • Can destroy larger, softer targets	None
Explosive-laden smaller aircraft	• Readily obtainable • Can destroy smaller, harder targets	None
10-kilotonne nuclear weapon	• Difficult to obtain • Assured destruction if detonated at target	None

VI. TRENDS TOWARD ENHANCED DEFENSE OF NUCLEAR POWER PLANTS AND SPENT FUEL

Q. What is the likelihood that there will be more stringent requirements for defense of nuclear power plants in the United States?

A. As stated in Section IV, above, the NRC has increased licensees' obligations to defend nuclear facilities in the aftermath of terrorist attacks. One important step was the adoption in 1994 of a rule requiring licensees to defend nuclear power plants against vehicle bombs. Other, similar steps have been taken since September 11, 2001. Present trends suggest that the NRC and/or other arms of the federal government will, over the coming years, require and/or provide further enhancement of the defense of nuclear power plants and spent fuel. These trends are evident in the general area of homeland security, and in the specific area of nuclear-facility security.

Q. Please describe the trends in homeland security.

A. An important indicator of overall homeland-security trends is the level of total expenditure in this area. Reliable data on total expenditure are lacking, so estimates must be made. One estimate of total US homeland-security expenditure – by federal, state, local and private entities – shows annual expenditure growing from $5 billion in 2000 to $85 billion in 2004, with anticipated growth to $130 billion, or perhaps as high as $210 billion, in 2010.[41]

A recent incident illustrates the increased attention now given to homeland-security threats. On June 9, 2004, an aircraft carrying the governor of Kentucky approached Washington, DC, without a functioning transponder. Detection of this approach triggered a rapid evacuation of the Capitol building and surrounding office buildings. Two patrolling F-15 fighter planes were directed to intercept the aircraft, but did not reach it in time to shoot it down if it had proceeded toward the Capitol. In discussing this incident, officials noted that the federal government provides a layered defense of Washington that includes ground-based anti-aircraft missiles.[42]

An aspect of the war in Iraq illustrates the challenge of defending energy infrastructure, and holds lessons for homeland security. Offshore terminals are part of Iraq's infrastructure for the export of oil. At these terminals, oil is transferred from underwater pipelines to tankers. Two of these terminals were attacked, but not extensively damaged, by boat-bomb suicide missions on April 24, 2004. Currently, the

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[40] Adapted from Table 1 of: Thompson, 2003.
[41] Barami, 2004.

terminals are defended by US, UK and Australian warships, and by gun emplacements on the terminals. Radar and optical imagery are used to detect approaching boats. An exclusion zone of 2,000 meters is maintained. Gunners are authorized to fire at boats approaching within 500 yards. During the April 2004 attacks, gunfire from Iraqi security forces caused two of the three attacking boats to explode prematurely.[43]

Q. Please describe the current trends in nuclear-plant security.

A. Increasingly, citizens and public officials across the US have called upon the federal government to re-think its approach to the defense of US nuclear power plants and spent fuel. For example, in October 2002 the Attorneys-General of 27 states sent a letter to the majority and minority leaders of the US Senate and House of Representatives.[44] The letter called for "passage of legislation this year to protect our states and communities from terrorist attacks against nuclear power plants and other sensitive nuclear facilities". Special attention was drawn to the vulnerability of spent-fuel pools. Congress has not yet acted on this letter. As another example, the Attorneys-General of California, Massachusetts, Utah and Washington, as well as San Luis Obispo County and Mothers for Peace, have joined in litigation seeking a full evidentiary hearing to examine the threat posed by potential acts of malice or insanity at the planned ISFSI at Diablo Canyon.

Q. In addition, publications by other authors and me helped to influence Congress to request from the National Academy of Sciences (NAS) an independent, classified

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[42] Solomon, 2004.
[43] Glanz, 2004.
[44] Letter from the Attorneys-General of Arizona, Arkansas, California, Colorado, Connecticut, Georgia, Hawaii, Iowa, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Montana, Nevada, New Jersey, New Mexico, New York, North Carolina, Ohio, Oregon, Pennsylvania, Rhode Island, Vermont, West Virginia, Washington and Wisconsin to the Senate Majority and Minority Leaders, the Speaker of the House and the House Minority Leader, 8 October 2002.

study on the security of spent-fuel storage. Congress was motivated to take this action by concern that the NRC was not properly considering the threat to spent fuel.[45] The study began in January 2004, and it is said that a classified report was provided to Congress in late June or early July 2004. Congress has requested the NRC to "take recommendations of the final NAS report seriously and to take actions to address these recommendations at the earliest possible date".[46] There is speculation that NAS recommendations for enhancing the security of spent-fuel pools include: (i) distributing fuel in a pool so that hotter and cooler assemblies are separated; and (ii) installing spray equipment to cool spent fuel in the event that water is lost from a pool. Another illustration of the trend toward enhanced defense of nuclear facilities is the pressure upon the US Department of Energy (DOE) to improve the security of Category I special nuclear material – plutonium and highly-enriched uranium. At a Congressional hearing in April 2004, a GAO witness and the chair of the committee holding the hearing pointed out that DOE's present DBT -- promulgated in May 2003 -- for Category I material was developed too slowly, will be implemented over too long a period, and is inadequate to meet the threat. A Postulated Threat to the security of Category I material has been articulated by the intelligence community.[47] For sites that handle nuclear weapons, DOE's present DBT represents the lower range of the threat identified in the Postulated Threat. For other Category I sites, the present

[45] Inside NRC staff, 2003.
[46] Weil, 2004.
[47] A Postulated Threat is a hypothetical threat that can be used for planning purposes and is, in effect, a suggested DBT.

DBT is significantly smaller than the Postulated Threat.[48] It is likely that DOE will come under increasing pressure to rectify these deficiencies.

As another example, the final version of the Coast Guard Authorization Act, which passed the US Senate in late July 2004, includes a provision that requires the Coast Guard to assess the vulnerability of US nuclear power plants to attack from adjacent bodies of water. The Coast Guard must complete this assessment within one year and report the findings to Congress.

Q. How has the nuclear industry reacted to the trends you describe?

A. Within the nuclear-power industry, there is growing recognition that the industry will be obliged to respond to public demands for an enhanced defense of nuclear power plants and spent fuel. In illustration, a group of owners of nuclear power plants in Germany has contracted with the armaments company Rheinmetall to install smoke-generating machines at their plants, to hinder the approach of hostile aircraft. A system of this kind has been tested successfully. It is said that full deployment could occur within one year.[49] As another example, in April 2004 the Holtec company asked the NRC to provide expedited generic approval of partial-underground placement of casks for dry storage of spent fuel. This system would employ the Holtec HI-STORM 100 cask, the type of cask that is to be used at the planned ISFSI at the Diablo Canyon plant. The top of the cask would project about 2 feet above ground. Holtec has described this system as offering "the next level of protection against terrorist

[48] Schwartz, 2004.
[49] Reuters, 2004.

attacks".[50] There is no indication that PG&E intends to employ this system at the Diablo Canyon plant.

VII. A POTENTIAL PLAN FOR ENHANCED DEFENSE OF THE DIABLO CANYON PLANT

Q. What are the implications for the Diablo Canyon plant of the trends that you have described above?

A. It is reasonable and prudent to assume that the Diablo Canyon nuclear power plant and its spent fuel will receive an enhanced defense during the coming years. In order to estimate the additional costs to PG&E that could arise from the provision of an enhanced defense, it is necessary to articulate a plan for enhanced defense. Here, I set forth a potential plan that could be required by the NRC and/or other arms of the federal government.

Q. What are the features of the potential plan?

A. I assume that the plan would employ the principles of defense in depth, and would encompass four categories of defensive measures: (i) site security; (ii) facility robustness; (iii) damage control; and (iv) emergency response planning.

Q. Please describe the additional site-security measures.

A. Site-security measures are those that reduce the potential for implementation of destructive acts of malice or insanity at a nuclear site. Two types of measures -- "generic" measures and "site-specific" measures -- fall into this category. Generic measures are implemented at offsite locations, and protect multiple sites. The implementing agencies might have no direct connection with a particular site. Airline or airport security measures are examples of generic measures. Site-specific measures

[50] Conley, 2004.

would be implemented at or near a nuclear site. Implementing agencies would include the licensee, the NRC and other entities such as the National Guard. The physical protection measures now required by the NRC, as discussed in Section IV, above, are examples of site-specific measures.

Additional, generic, site-security measures are not discussed here. The lack of such a discussion does not imply that present measures of this kind are adequate or optimal. The focus here is on site-specific measures, because these measures are directly relevant to the economics of the Diablo Canyon plant. I believe that the following set of additional site-security measures is representative of what would be required for the Diablo Canyon site under an enhanced-protection plan:

(i) Establishment of a mandatory aircraft-exclusion boundary around the site.

(ii) Deployment of an aircraft-detection system that triggers security alerts as the exclusion boundary is approached and crossed.

I assume that the Sentinel system – a portable, phased-array radar system -- would be used to detect approaching aircraft. Two units of Sentinel should suffice. The units would be owned and operated by the military, probably the National Guard, but PG&E would bear the costs of their deployment and operation. The objective of deploying Sentinel would be to provide continuous detection, tracking and identification of aircraft near to and within the mandatory aircraft-exclusion boundary. This information would be conveyed to the Diablo Canyon plant by secure, redundant communication links. As an approaching aircraft reached specified distances from the plant, with specified vectors, Sentinel would trigger a succession of security alerts.

(iii) Deployment of an automated system to destroy aircraft at short range if they are closing on the plant.

I assume that the Phalanx system – an automated gun – would be used for this purpose. Originally designed to intercept anti-ship missiles, Phalanx has been modified to intercept a range of fast- and slow-moving targets including missiles, fixed-wing and rotary-wing aircraft, and sea-surface targets. At the Diablo Canyon plant, two Phalanx units could provide reliable coverage. Again, the units would be owned and operated by the military, probably the National Guard, but PG&E would bear the costs of their deployment and operation.

(iv) <u>Expansion of the DBT, beyond that now specified by the NRC, to include additional intruders, heavy weapons, aircraft attack, lethal chemical weapons and more than one vehicle bomb.</u>

(v) <u>Provision at the planned ISFSI on the site of protection equivalent to that provided for the nuclear generating units.</u>

The additional defensive measures in (iv) and (v), above, would require an expanded defensive perimeter to accommodate the planned ISFSI, might require strengthening of vehicle barriers to resist more than one vehicle bomb, and would require a larger and more capable guard force. A model for the upgraded guard force could be the force that protects DOE's most sensitive sites. GAO has described the protection of these sites as follows:[51]

> "While specific measures vary from site to site, all protective systems at DOE's most sensitive sites employ a defense-in-depth concept that includes sensors, physical barriers, hardened facilities and vaults, and heavily armed paramilitary protective forces equipped with such items as automatic weapons, night vision equipment, body armor, and chemical protective gear."

[51] Nazzaro, 2004, page 4.

This set of measures reflects the threat of attack from the air, and the present lack of defense against air attack. Measures to enhance defense against ground or sea attack are also included. The measures I describe would seek to accommodate separate or combined attacks from air, land or sea, together with actions by insiders.

Q. Please describe the second category of additional defensive measures, namely "facility-robustness measures".

A. Facility-robustness measures are defensive measures that improve the ability of a nuclear facility to experience destructive acts of malice or insanity without a significant release of radioactive material to the environment. An integrated set of additional facility-robustness measures that I believe could be required for the Diablo Canyon plant is as follows:

(i) <u>Automated shutdown of the reactors upon initiation of a specified alert status at the plant, with provision for completion of the automated shutdown sequence if a control room is disabled.</u>

Automated shutdown of the reactors would serve two purposes. First, it could increase the time interval between reactor shutdown and onset of damage to safety systems, thereby reducing the level of decay heat that would have to be removed from the reactor by degraded safety systems. Second, it could increase the probability that a reactor would be brought to a safe-shutdown condition if the control room were disabled. The second of these purposes is probably the most significant from a risk-reduction perspective. To achieve the second purpose, the automated-shutdown system would have to be located apart from the control room, with redundant communication links to the control room, plant safety systems, and offsite facilities.

The automated-shutdown system would be designed to detect a loss of capability in the control room, and would thereupon assume command of the shutdown process.

(ii) Permanent deployment of diesel-driven pumps and pre-engineered piping to be available to provide emergency water supply to the reactors and the spent-fuel pools.

This capability would provide an additional supply of water, under emergency conditions, to cool the reactor cores and spent fuel in the pools. It would support the additional damage-control measures that are discussed below. If other sources of water were not available, the additional pumps would draw water from the ocean. As needed during an emergency, this new system could be manually connected to existing cooling systems such as the component-cooling system, the feedwater system, the safety-injection system, the containment-cooling system, and the fire-protection system. Also, the new system could be used to refill a drained spent-fuel pool or to spray water on exposed fuel. The existing cooling systems at the Diablo Canyon plant are designed to contain radioactive material and preserve the integrity of the plant in the event of an accident. By contrast, the new system would have one overriding objective – to prevent or limit the release of radioactive material to the atmosphere. In some attack scenarios, meeting that objective could involve releases of radioactive material to surface water, ground water or the ocean. Use of ocean water for emergency cooling could render the plant unfit for further operation if the plant survived the incident.

(iii) Re-equipment of the spent-fuel pools with low-density racks, excess fuel being stored in an onsite ISFSI.

The following discussion illustrates how this might be done. First, each of the two Diablo Canyon reactors would operate on a 20-month refueling cycle and discharge 90 spent-fuel assemblies per refueling. Second, each pool would contain 1,100 fuel assemblies at the point when operations begin to re-equip the pools with low-density racks. Third, each pool would, after re-equipment with low-density racks, have a capacity of 470 fuel assemblies.[52] This capacity would support a full-core offload of 193 fuel assemblies plus three refueling discharges of 90 assemblies per discharge, thereby allowing fuel to age over three refueling cycles -- 60 months, or 5 years -- before it is transferred to an onsite ISFSI. Thus, while the core is in the reactor, each pool would contain up to 270 fuel assemblies. Fourth, reduction of the spent-fuel inventory in each pool, from 1,100 assemblies to 270 assemblies, would occur over a period of 2 years. It follows that the onsite ISFSI would receive 830 fuel assemblies per year during an initial 2-year period, and an average of 108 fuel assemblies per year thereafter.

(iv) <u>Construction of the ISFSI to employ hardened, dispersed, dry storage of spent fuel.</u>

There is, at present, no indication that PG&E intends to change the design of the planned ISFSI at the Diablo Canyon plant, so as to employ hardened, dispersed, dry storage of spent fuel. As I have noted above, the Holtec company has asked the NRC to provide expedited generic approval of partial-underground placement of HI-STORM 100 dry-storage casks, the type of cask that is to be used at Diablo Canyon.

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[52] Each Diablo Canyon spent-fuel pool has a floor area, excluding the cask pit, of 1,282 square feet (see: PG&E, 1985, Figures 2.1a and 2.1b). Racks with a capacity of 470 fuel assemblies would occupy, on average, 2.73 square feet per fuel assembly. This density would allow a center-to-center spacing of fuel assemblies of up to 20 inches, which would allow the use of open-frame racks.

This arrangement might satisfy requirements for hardened, dispersed, dry storage, although concerns have been expressed about the quality and durability of Holtec casks. I have written at length about the need for hardened, dispersed, dry storage of spent fuel, and the options for providing such storage.[53]

Q. Please describe the third category of additional defensive measures, namely "damage-control measures".

A. Damage-control measures are those that reduce the potential for a release of radioactive material following damage to a facility by destructive acts of malice or insanity. Measures of this kind could be ad hoc or pre-engineered. An example of a damage-control measure is a set of arrangements for patching and restoring water to a spent-fuel pool that has been breached. It appears that the NRC has required licensees of nuclear power plants to undertake some planning for damage control following explosions or fires.[54] The following are additional measures that could be taken at Diablo Canyon:

(i) establishment of a pre-planned damage-control capability at the site, using onsite personnel and equipment for first response and offsite resources for backup;

(ii) periodic exercises of damage-control capability;

(iii) establishment of a set of damage-control objectives -- to include patching and restoring water to a breached spent-fuel pool, fire suppression at the onsite ISFSI, and provision of cooling to a reactor whose safety systems and/or control room are disabled -- with accompanying detailed plans and stockpiling of needed supplies; and

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[53] Thompson, 2003.
[54] Meserve, 2002b.

(iv) provision of equipment and training to allow damage control to proceed on a radioactively-contaminated site.

Q. Please describe the fourth category of additional defensive measures, namely "emergency-response measures".

A. Emergency-response measures are those that reduce the potential for exposure of offsite populations to radiation, following a release of radioactive material from a nuclear facility. Measures in this category could accommodate releases attributable to acts of malice or insanity, or "accidental" releases arising from human error, equipment failure or natural forces (e.g., earthquake). However, there are two major ways in which malice- or insanity-induced releases might differ from accidental releases. First, a malice- or insanity-induced release might be larger and begin earlier than an accidental release.[55] Second, a malice- or insanity-induced release might be accompanied by deliberate degradation of emergency response capabilities (e.g., the attacking group might block an evacuation route). Accommodating these differences could require additional measures of emergency response.

A team based at Clark University in Massachusetts has developed a model emergency response plan that could be implemented at the Diablo Canyon plant to significantly enhance emergency-response capability.[56] This model plan was specifically designed to accommodate radioactive releases from spent-fuel-storage facilities, as well as from reactors. That provision, and other features of the plan, would provide a capability to

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[55] Present plans for emergency response do not account for the potential for a large release of radioactive material from spent fuel, as would occur during a pool fire. The underlying assumption is that a release of this kind is very unlikely. That assumption cannot be sustained in the present threat environment.

[56] Golding et al, 1992.

accommodate both accidental releases and malice- or insanity-induced releases. Major features of the model plan include:[57]

(i) structured objectives;

(ii) improved flexibility and resilience, with a richer flow of information;

(iii) precautionary initiation of response, with State authorities having an independent capability to identify conditions calling for a precautionary response[58];

(iv) criteria for long-term protective actions;

(v) three planning zones, with the outer zone extending to any distance necessary[59];

(vi) improved structure for accident classification;

(vii) increased State capabilities and power;

(viii) enhanced role for local governments;

(ix) improved capabilities for radiation monitoring, plume tracking and dose projection;

(x) improved medical response;

(xi) enhanced capability for information exchange;

(xii) more emphasis on drills, exercises and training;

(xiii) improved public education and involvement; and

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[57] Golding et al, 1992, pp 8-13.
[58] A security alert could be a condition calling for a precautionary response.
[59] In the original Clark University plan, the inner and intermediate zones would have radii of 5 and 25 miles, respectively. As an example of the planning measures in each zone, potassium iodide would be pre-distributed within the 25-mile zone and made generally accessible nationwide. This zonal arrangement would require adaptation to the specific circumstances of the Diablo Canyon site.

(xiv) requirement that emergency preparedness be regarded as a safety system equivalent to in-plant systems.

VIII. COSTS OF IMPLEMENTING THE ENHANCED-DEFENSE PLAN FOR THE DIABLO CANYON PLANT

Q. How have you estimated the additional costs to PG&E that would arise from introduction of the enhanced-defense measures that you have described above?

A. As a first step, I have reviewed data on the overall operating and maintenance (O&M) expenses and capital expenses at the Diablo Canyon plant. These data provide a baseline for considering the costs that arise from defending the plant. Second, I have reviewed PG&E historical data and projections on the portions of the O&M expenses and capital expenses for the Diablo Canyon plant that are attributable to measures for defending the plant. As a third and final step, I have estimated the additional costs of providing the enhanced-defense measures that are set forth in Section VII, above.

Q. What are the overall O&M expenses for the Diablo Canyon plant with its present level of defense?

A. Table VIII-1 below, which is taken from PG&E's 2003 General Rate Case filing, shows the overall O&M and nuclear fuel expenses for the Diablo Canyon plant, as projected by PG&E in 2003 for the period 2002-2005. I recognize that PG&E has updated these projections in the context of these proceedings. However, the projections shown in Table VIII-1 remain useful for two reasons. First, this table shows the number of personnel for each expense category. Second, this table shows "loss prevention" as an expense category. That category covers site security, industrial safety and health, emergency preparedness, and fire protection. There is no equivalent category in the PG&E projections that have been submitted in these proceedings.[60] Those projections show average O&M expenses of $280 million per year for the period 2002-2005, a value 9 percent higher than the $257 million shown in Table VIII-1.

Q. What are the overall capital expenses for the Diablo Canyon plant with its present level of defense?

A. PG&E states that capital expenses for the period 2000-2002 averaged $14.3 million per year. PG&E projects, assuming that the plant's steam generators are replaced, that capital expenses will average $141 million per year for the period 2003-2011 and $42.2 million per year for the period 2012-2024.[61]

Q. What portion of the overall O&M expenses for the Diablo Canyon plant is attributable to measures for defending the plant at the present level of defense?

A. Some relevant historical data have become available in data responses from PG&E in these proceedings.[62] These data show that O&M costs for site security at the Diablo Canyon plant averaged $13.3 million annually over the period 1997-2003, with a maximum annual value of $17.8 million in 2003, while O&M costs for emergency-response planning averaged $1.3 million annually over the period 1998-2003.

PG&E has estimated the additional O&M costs for site security that will arise from security enhancements attributable to the attacks of September 11, 2001. The annual value of these additional costs is $2 million in 2003, $5 million in 2004, $4 million in 2005, and $5 million during the period 2006-2010.[63]

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[60] PG&E, Chapter 5A, Detailed Testimony on Operation and Maintenance Expenses and Capital Expenditures, revised 05/27/04, Table 5A-1.
[61] PG&E, Chapter 5A, Detailed Testimony on Operations and Maintenance and Capital Expenditures, Workpapers – Application, pages 5A-17 and 5A-18.
[62] PG&E Data Responses MFP002-12 and 002-13, June 30, 2004.
[63] PG&E, Chapter 5A, Detailed Testimony on Operation and Maintenance Expenses and Capital Expenditures, revised 05/27/04, Table 5A-14.

Q. What portion of the overall capital expenses for the Diablo Canyon plant is attributable to measures for defending the plant at the present level of defense?

A. A data response from PG&E in these proceedings shows that capital expenses for site security over the period 1997-2003 averaged $1.6 million annually, while capital expenses for emergency-response planning averaged $0.2 million annually over the same period.[64]

PG&E has estimated the additional capital costs for site security that will arise from compliance with NRC orders. The annual value of these additional costs is $1 million in 2003, $5 million in 2004, and zero during the period 2005-2006.[65]

Q. What are your estimates of the additional costs to PG&E that would arise from deployment of the Sentinel and Phalanx systems?

A. For Sentinel, I estimate a capital expense of $15 million over an initial 2-year period in providing infrastructure support and an annual O&M expense of $8.5 million. Based on a projected sale, I estimate the cost of the Sentinel system to be approximately $3.7 million per unit.[66] I assume here that: (i) the Sentinel units at Diablo Canyon would be owned and operated by the US military, but PG&E would bear the costs of their deployment and operation; (ii) the capital cost to the military of deploying two Sentinel units at Diablo Canyon would be $10 million; (iii) the capital cost would be recovered from PG&E over 4 years without interest; and (iv) continuous operation

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[64] PG&E Data Response, MFP002-14.

[65] PG&E, Chapter 5A, Detailed Testimony on Operation and Maintenance Expenses and Capital Expenditures, revised 05/27/04, Table 5A-25.

[66] DSCA, 2002.

would require a 30-FTE crew costing, with overheads and supplies, $0.2 million per annum per person.[67]

For Phalanx, I estimate a capital expense of $20 million over an initial 2-year period in providing infrastructure support and an estimated annual O&M expense of $11 million. The same O&M assumptions discussed above for Sentinel are applied to the Phalanx system, except that the capital cost of two Phalanx units is assumed to be $20 million.[68]

Q. What is your estimate of the additional costs to PG&E of meeting an expanded DBT and providing the planned ISFSI with the same level of protection as is provided for the nuclear generating units?

A. I estimate an additional annual O&M expense of $15 million to meet these requirements, assuming that PG&E would need to increase the size of its security workforce by approximately 75 FTE, at a cost, with overheads and supplies, of $0.2 million per annum per person. In addition, I assume an additional annual capital cost of $5 million.

Q. What are your estimates of the additional costs of providing an automated shutdown system and a new system to supply cooling water under emergency conditions?

A. In both cases I estimate an additional capital expense of $75 million over an initial 2-year period.[69] Also, I assume that R&D costs for these new systems would be borne by the NRC or another arm of the federal government, potentially with cost recovery from all licensees of US nuclear power plants.

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[67] From Table VIII-1, it will be noted that the O&M cost per FTE staff member at Diablo Canyon is $194,000.

[68] An amateur website (Doehring, 2004) gives a unit cost of $5.6 million for Phalanx.

[69] This estimate reflects a range of $50-60 million.

Q. What is your estimate of the additional costs of reducing inventory in the spent-fuel pools and providing hardened, dispersed, dry storage of the excess fuel in an onsite ISFSI?

A. I estimate an additional capital expense of $91 million per year for an initial 2-year period and $6 million per year thereafter. In Section VII, above, I describe a reduction of the spent-fuel inventory in each Diablo Canyon pool from 1,100 assemblies to 270 assemblies over a period of 2 years. Thus, the onsite ISFSI would receive 830 fuel assemblies per year during an initial 2-year period, and an average of 108 fuel assemblies per year thereafter. Note that the onsite ISFSI would receive an average of 108 fuel assemblies per year in the absence of a plan for providing an enhanced defense of the Diablo Canyon plant. Additional costs would arise in three respects. First, during an initial 2-year period, the onsite ISFSI would receive an additional 830 minus 108 = 722 fuel assemblies per year. Second, additional costs would arise in providing hardened, dispersed storage at the onsite ISFSI. Third, costs would arise in replacing the existing racks in the Diablo Canyon pools with low-density, open-frame racks.

The capital cost of placing spent fuel in dry casks at ISFSIs at US nuclear power plants ranges from $90 to $210 per kg of uranium.[70] Here, I assume that the capital cost for the currently-planned ISFSI at Diablo Canyon would be $120 per kg of uranium, while the capital cost for a hardened, dispersed ISFSI would be $240 per kg of uranium. A fresh Diablo Canyon fuel assembly contains 460 kg of uranium. Thus, placing 722 fuel assemblies in a hardened, dispersed ISFSI at Diablo Canyon would involve a capital expense of $80 million. The incremental capital expense of placing

108 fuel assemblies in a hardened, dispersed ISFSI at Diablo Canyon, instead of in the currently-planned ISFSI, would be $6 million. I assume that replacement of the high-density racks in the Diablo Canyon spent-fuel pools with low-density racks would involve a capital expense of $10 million over a 2-year period.

Q. What are your estimates of the additional costs of providing enhanced capabilities for onsite damage control and offsite emergency response?

A. In both cases I estimate an additional annual O&M expense of $10 million and an additional annual capital cost of $2 million. Providing the enhanced capability for onsite damage control would require an increase in the size of the Diablo Canyon workforce. I assume a 50-FTE increase. At a cost, with overheads and supplies, of $0.2 million per annum per person, this step would increase PG&E's annual O&M expense by $10 million. I assume that the same increase in personnel and annual O&M expense would be required to provide the enhanced capability for offsite emergency response. In this instance, however, some of the additional staff would work for state and local governments.

Q. What is the overall additional cost of providing the enhanced defense of the Diablo Canyon plant?

A. Table VIII-2 summarizes the cost estimates developed above. Note that these costs are additional to the O&M expenses and capital expenses that PG&E is currently incurring.

My cost estimates are preliminary. More accurate cost estimates would require: (i) articulation of the enhanced-defense measures in more detail; (ii) comparison of the enhanced-defense measures with similar projects that have been recently implemented

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[70] Alvarez et al, 2003, page 31.

at US nuclear power plants or other security-intensive facilities; and (iii) use of the comparisons developed in (ii) to extrapolate from actual costs of recently-implemented projects.

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Table VII-1
Diablo Canyon O&M and Nuclear Fuel Expenses:
Annual Average for 2002-2005 as Projected by PG&E in 2003[71]

Expense Category	2002-2005 Annual Average Expense ($ million)	Approximate Number of Personnel
Manage production	37.2	284
Manage DCPP plant assets	112	499
People performance	19.5	67
Manage business and information management	23.8	100
Manage supply chain	5.59	51
Manage engineering assets and maintain license and strategic projects	36.7	156
Loss prevention	22.5	168
Subtotal	257	1,325
Nuclear fuel	86.9	
Total	343.9	

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[71] **Notes:**
(i) Expenses are in mixed, unadjusted, current-year dollars.
(ii) O&M expenses are actual 2001 values adjusted to account for projected changes.
(iii) Personnel numbers "are approximate since employees often work in more than one process and split their time accordingly".
(iv) A 1987 study (EIA, 1995, page 3) found that about two-thirds of reported O&M expenses at US nuclear power plants are for labor, the remaining one-third being for materials and supplies.

Source: PG&E, 2003, Chapter 4.

Table VIII-2
Estimated Additional Costs of Potential Measures to Provide Enhanced Defense of the Diablo Canyon Nuclear Power Plant and its Spent Fuel

Defensive Measure	Capital Expense ($ million)	Annual O&M Expense ($ million)
Sentinel (2 units)	7.5/yr for 2 yrs	8.5
Phalanx (2 units)	10/yr for 2 yrs	11
Expanded DBT and stronger defense of the onsite ISFSI	5/yr	15
Automated shutdown system	37.5/yr for 2 yrs	N/A
Emergency cooling system	37.5/yr for 2 yrs	N/A
Re-equipment of spent-fuel pools with low-density racks and transfer of excess fuel to a hardened, dispersed, onsite ISFSI	91/yr for 2 yrs; 6/yr thereafter	N/A
Enhanced capability for onsite damage control	2/yr	10
Enhanced capability for offsite emergency response	2/yr	10
Total	192.5/yr for 2 yrs; 15/yr thereafter	54.5

IX. CONCLUSIONS

Q. What are your conclusions in this testimony?

A. Nuclear power plants are key national assets that are especially likely to be targeted by enemies of the US. Drawing a balance between defending key assets and pursuing security through offensive actions is a crucial, but not always understood, aspect of homeland-security policy.

The NRC currently requires only a light defense of US nuclear power plants and spent fuel. As a result, these facilities are vulnerable to sophisticated, determined attacks. There is a trend in decision-making circles across the US to call for enhanced defense of US nuclear power plants and spent fuel. It is therefore prudent to assume that the Diablo Canyon plant and its spent fuel will receive an enhanced defense during the coming years.

This testimony describes measures that would be included in a potential plan for enhanced defense of the Diablo Canyon plant and its spent fuel. These measures could be required by the NRC and/or other arms of the federal government. Preliminary estimates are made here of the additional capital and O&M expenses that would be incurred by PG&E if the measures were implemented. PG&E has not included any of these additional costs in its cost-benefit analyses, assuming instead a zero probability of additional requirements for an enhanced defense during the operational life of the Diablo Canyon plant and its spent fuel storage. Such an assumption is not appropriate, and the costs that I have estimated should be considered in evaluating PG&E's application.

Appendix A: Curriculum Vitae for Gordon Thompson (August 2003)

Professional expertise

Technical and policy analyst in the fields of energy, environment, sustainable development, and international security.

Current appointments

- Executive director, Institute for Resource & Security Studies (IRSS), Cambridge, Massachusetts.
- Research Professor, George Perkins Marsh Institute, Clark University, Worcester, Massachusetts.

Education

- D.Phil. in applied mathematics, Oxford University (Balliol College), 1973.
- B.E. in mechanical engineering, University of New South Wales, Sydney, Australia, 1967.
- B.Sc. in mathematics & physics, University of New South Wales, 1966.

Project sponsors and tasks (selected)

- STAR Foundation, New York, 2002-2003: reviewed planning and actions for decommissioning of research reactors at Brookhaven National Laboratory.
- Attorney General of Utah, 2003: conducted technical analysis on a proposed storage facility for spent nuclear fuel.
- Mothers for Peace, California, 2002-2003: analyzed risk issues associated with the Diablo Canyon nuclear power plant; prepared a Call for Action to protect US nuclear power plants and spent fuel.
- Citizens Awareness Network, Massachusetts, 2002-2003: conducted analysis on robust storage of spent nuclear fuel.
- Tides Center, California, 2002-2003: conducted analysis for the Santa Susana Field Laboratory (SSFL) Advisory Panel regarding the history of releases of radioactive material from the SSFL.
- Orange County, North Carolina, 1999-2002: assessed risk issues associated with the Harris nuclear power plant; identified risk-reduction options.
- William and Flora Hewlett Foundation and other sponsors, 1999-2003: performed research and project development for conflict-management projects, through IRSS's International Conflict Management Program.
- STAR Foundation, New York, 2000-2001: assessed risk issues associated with the Millstone nuclear power plant; identified risk-reduction options.
- Massachusetts Water Resources Authority, 2000: evaluated risks associated with water supply and wastewater systems that serve greater Boston.
- Canadian Senate, Energy & Environment Committee, 2000: reviewed risk issues associated with the Pickering Nuclear Generating Station.

• Greenpeace International, Amsterdam, 2000: reviewed impacts associated with the La Hague nuclear complex in France.
• Government of Ireland, 1998-2001: developed framework for assessment of impacts and alternative options associated with the Sellafield nuclear complex in the UK.
• Clark University, Worcester, Massachusetts, 1998-1999: participated in review of a major foundation's grant-making related to climate change.
• UN High Commissioner for Refugees, 1998: developed a strategy for conflict management in the CIS region.
• General Council of County Councils (Ireland), W. Alton Jones Foundation (USA), and Nuclear Free Local Authorities (UK), 1996-2000: assessed safety and economic issues of nuclear fuel reprocessing in the UK; assessed alternative options.
• Environmental School, Clark University, Worcester, Massachusetts, 1996: session leader at the Summer Institute, "Local Perspectives on a Global Environment".
• Greenpeace Germany, Hamburg, 1995-1996: a study on war, terrorism and nuclear power plants.
• HKH Foundation, New York, and Winston Foundation for World Peace, Washington, DC, 1994-1996: studies and workshops on preventive action and its role in US national security planning.
• Carnegie Corporation of New York, Winston Foundation for World Peace, Washington, DC, and others, 1995: collaboration with the Organization for Security and Cooperation in Europe to facilitate improved coordination of activities and exchange of knowledge in the field of conflict management.
• World Bank, 1993-1994: a study on management of data describing the performance of projects funded by the Global Environment Facility (joint project of IRSS and Clark University).
• International Physicians for the Prevention of Nuclear War, 1993-1994: a study on the international control of weapons-usable fissile material.
• Government of Lower Saxony, Hannover, Germany, 1993: analysis of standards for radioactive waste disposal.
• University of Vienna (using funds supplied by the Austrian government), 1992: review of radioactive waste management at the Dukovany nuclear plant, Czech Republic.
• Sandia National Laboratories, 1992-1993: advice to the US Department of Energy's Office of Foreign Intelligence.
• US Department of Energy and Battelle Pacific Northwest Laboratories, 1991-1992: advice for the Intergovernmental Panel on Climate Change regarding the design of an information system on technologies that can limit greenhouse gas emissions (joint project of IRSS, Clark University and the Center for Strategic and International Studies).
• Winston Foundation for World Peace, Boston, Massachusetts, and other funding sources, 1992-1993: development and publication of recommendations for strengthening the International Atomic Energy Agency.
• MacArthur Foundation, Chicago, Illinois, W. Alton Jones Foundation, Charlottesville, Virginia, and other funding sources, 1984-1993: policy analysis and public education on a "global approach" to arms control and disarmament.
• Energy Research Foundation, Columbia, South Carolina, and Peace Development Fund, Amherst, Massachusetts, 1988-1992: review of the US government's tritium production (for nuclear weapons) and its implications.

• Coalition of Environmental Groups, Toronto, Ontario (using funds supplied by Ontario Hydro under the direction of the Ontario government), 1990-1993: coordination and conduct of analysis and preparation of testimony on accident risk of nuclear power plants.
• Greenpeace International, Amsterdam, Netherlands, 1988-1990: review of probabilistic risk assessment for nuclear power plants.
• Bellerive Foundation, Geneva, Switzerland, 1989-1990: planning for a June 1990 colloquium on disarmament and editing of proceedings.
• Iler Research Institute, Harrow, Ontario, 1989-1990: analysis of regulatory response to boiling-water reactor accident potential.
• Winston Foundation for World Peace, Boston, Massachusetts, and other funding sources, 1988-1989: analysis of future options for NATO (joint project of IRSS and the Institute for Peace and International Security).
• Nevada Nuclear Waste Project Office, Carson City, Nevada (via Clark University), 1989-1990: analyses of risk aspects of radioactive waste management and disposal.
• Ontario Nuclear Safety Review (conducted by the Ontario government), Toronto, Ontario, 1987: review of safety aspects of CANDU reactors.
• Washington Department of Ecology, Olympia, Washington, 1987: analysis of risk aspects of a proposed radioactive waste repository at Hanford.
• Natural Resources Defense Council, Washington, DC, 1986-1987: preparation of testimony on hazards of the Savannah River Plant.
• Lakes Environmental Association, Bridgton, Maine, 1986: analysis of federal regulations for disposal of radioactive waste.
• Greenpeace Germany, Hamburg, 1986: participation in an international study on the hazards of nuclear power plants.
• Three Mile Island Public Health Fund, Philadelphia, Pennsylvania, 1983-1989: studies related to the Three Mile Island nuclear power plant.
• Attorney General, Commonwealth of Massachusetts, 1984-1989: analyses of the safety of the Seabrook nuclear plant.
• Union of Concerned Scientists, Cambridge, Massachusetts, 1980-1985: studies on energy demand and supply, nuclear arms control, and the safety of nuclear installations.
• Conservation Law Foundation of New England, Boston, Massachusetts, 1985: preparation of testimony on cogeneration potential at a Maine papermill.
• Town & Country Planning Association, London, UK, 1982-1984: coordination and conduct of a study on safety and radioactive waste implications of the proposed Sizewell nuclear plant.
• US Environmental Protection Agency, Washington, DC, 1980-1981: assessment of the cleanup of Three Mile Island Unit 2 nuclear plant.
• Center for Energy & Environmental Studies, Princeton University, Princeton, New Jersey, and Solar Energy Research Institute, Golden, Colorado, 1979-1980: studies on the potentials of renewable energy sources.
• Government of Lower Saxony, Hannover, Federal Republic of Germany, 1978-1979: coordination and conduct of studies on safety aspects of the proposed Gorleben nuclear fuel cycle center.

Other experience (selected)

• Principal investigator, project on "Exploring the Role of 'Sustainable Cities' in Preventing Climate Disruption", involving IRSS and three other organizations, 1990-1991.
• Visiting fellow, Peace Research Centre, Australian National University, 1989.
• Principal investigator, Three Mile Island emergency planning study, involving IRSS and Clark University, 1987-1989.
• Co-leadership (with Paul Walker) of a study group on nuclear weapons proliferation, Institute of Politics, Harvard University, 1981.
• Foundation (with others) of an ecological political movement in Oxford, UK, which contested the 1979 Parliamentary election.
• Conduct of cross-examination and presentation of evidence, on behalf of the Political Ecology Research Group, at the 1977 Public Inquiry into proposed expansion of the reprocessing plant at Windscale, UK.
• Conduct of research on plasma theory (while a D.Phil candidate), as an associate staff member, Culham Laboratory, UK Atomic Energy Authority, 1969-1973.
• Service as a design engineer on coal-fired plants, New South Wales Electricity Commission, Sydney, Australia, 1968.

Publications (selected)

• "Reducing the Hazards from Stored Spent Power-Reactor Fuel in the United States" (with Robert Alvarez, Jan Beyea, Klaus Janberg, Jungmin Kang, Ed Lyman, Allison Macfarlane and Frank N. von Hippel), *Science and Global Security*, Volume 11, 2003, pp 1-51.
• "Health, Human Security and Social Reconstruction in Afghanistan" (with Paula Gutlove and Jacob Hale Russell), in John D. Montgomery and Dennis A. Rondinelli (eds), *Beyond Reconstruction in Afghanistan*, Palgrave Macmillan, in press.
• *Psychosocial Healing: A Guide for Practitioners, based on programs of the Medical Network for Social Reconstruction in the Former Yugoslavia* (with Paula Gutlove), IRSS, Cambridge, Massachusetts and OMEGA Health Care Center, Graz, Austria, May 2003.
• *A Call for Action to Protect the Nation Against Enemy Attack on Nuclear Power Plants and Spent Fuel*, and a Supporting Document, Mothers for Peace, San Luis Obispo, California, April 2003 and May 2003.
• "Human Security: Expanding the Scope of Public Health" (with Paula Gutlove), *Medicine, Conflict and Survival*, Volume 19, 2003, pp 17-34.
• *Social Reconstruction in Afghanistan through the Lens of Health and Human Security* (with Paula Gutlove and Jacob Hale Russell), IRSS, Cambridge, Massachusetts, May 2003.
• *Robust Storage of Spent Nuclear Fuel: A Neglected Issue of Homeland Security*, a report commissioned by Citizens Awareness Network, Shelburne Falls, Massachusetts, January 2003.
• *Medical Network for Social Reconstruction in the Former Yugoslavia: A Survey of Participants' Views on the Network's Goals and Achievements*, IRSS, Cambridge, Massachusetts, September 2001.
• *The Potential for a Large, Atmospheric Release of Radioactive Material from Spent Fuel Pools at the Harris Nuclear Power Plant: The Case of a Pool Release Initiated by a*

Severe Reactor Accident, a report for Orange County, North Carolina, 20 November 2000.
• *A Review of the Accident Risk Posed by the Pickering 'A' Nuclear Generating Station,* a report for the Standing Committee on Energy, Environment and Natural Resources, Canadian Senate, August 2000.
• *High-Level Radioactive Liquid Waste at Sellafield: An Updated Review*, a report for the UK Nuclear Free Local Authorities, June 2000.
• *Hazard Potential of the La Hague Site: An Initial Review*, a report for Greenpeace International, May 2000.
• *A Strategy for Conflict Management: Integrated Action in Theory and Practice* (with Paula Gutlove), Working Paper No. 7, IRSS, Cambridge, Massachusetts, March 1999.
• *Risks and Alternative Options Associated with Spent Fuel Storage at the Shearon Harris Nuclear Power Plant*, a report for Orange County, North Carolina, February 1999.
• *High Level Radioactive Liquid Waste at Sellafield: Risks, Alternative Options and Lessons for Policy*, IRSS, Cambridge, Massachusetts, June 1998.
• "Science, democracy and safety: why public accountability matters", in F. Barker (ed), *Management of Radioactive Wastes: Issues for local authorities*, Thomas Telford, London, 1998.
• "Conflict Management and the OSCE" (with Paula Gutlove), *OSCE/ODIHR Bulletin*, Volume 5, Number 3, Fall 1997.
• *Safety of the Storage of Liquid High-Level Waste at Sellafield* (with Peter Taylor), Nuclear Free Local Authorities, UK, November 1996.
• *Assembling Evidence on the Effectiveness of Preventive Actions, their Benefits, and their Costs: A Guide for Preparation of Evidence*, IRSS, Cambridge, Massachusetts, August 1996.
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• "The Potential for Cooperation by the OSCE and Non-Governmental Actors on Conflict Management" (with Paula Gutlove), *Helsinki Monitor*, Volume 6 (1995), Number 3.
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Expert presentations and testimony (selected)

• European Parliament, 2003: gave an invited presentation to members regarding safety and security issues at the Sellafield nuclear site; discussed broader implications.
• US Congress, 2002 and 2003: gave member-sponsored staff briefings on vulnerabilities of nuclear-power facilities and options for improved defenses.

• Numerous public forums in the USA, 2001-2003: gave invited presentations to public officials and general audiences regarding vulnerabilities of nuclear-power facilities and options for improved defenses.
• UK Consensus Conference on Radioactive Waste Management, 1999: provided invited testimony on information and decision-making.
• Joint Committee on Public Enterprise and Transport, Irish Parliament, 1999: provided invited testimony on nuclear fuel reprocessing and international security.
• UK and Irish Parliaments, 1998: gave members' briefings on risks and alternative options associated with nuclear fuel reprocessing in the UK.
• Center for Russian Environmental Policy, Moscow, 1996: presentation at a forum in parallel with the G-7 Nuclear Safety Summit.
• Lacey Township Zoning Board, New Jersey, 1995: testimony regarding radioactive waste management.
• Ontario Court of Justice, Toronto, Ontario, 1993: testimony regarding Canada's Nuclear Liability Act.
• Oxford Research Group, seminar on "The Plutonium Legacy", Rhodes House, Oxford, UK, 1993: presentation on nuclear safeguards.
• Defense Nuclear Facilities Safety Board, Washington, DC, 1991: testimony regarding the proposed restart of K-reactor, Savannah River Site.
• Conference to consider amending the Partial Test Ban Treaty, United Nations, New York, 1991: presentation on a global approach to arms control and disarmament.
• US Department of Energy, hearing on draft EIS for new production reactor capacity, Columbia, South Carolina, 1991: presentation on tritium need and implications of tritium production options.
• Society for Risk Analysis, 1990 annual meeting, New Orleans, special session on nuclear emergency planning: presentation on real-time techniques for anticipating emergencies.
• Parliamentarians' Global Action, 11th Annual Parliamentary Forum, United Nations, Geneva, 1990: presentation on the potential for multilateral nuclear arms control.
• Advisory Committee on Nuclear Facility Safety, public meeting, Washington, DC, 1989: submission on public access to information and on government accountability.
• Peace Research Centre, Australian National University, seminar on "Australia and the Fourth NPT Review Conference", Canberra, 1989: proposal of a universal nuclear weapons non-proliferation regime.
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• Atomic Safety & Licensing Board, US Nuclear Regulatory Commission, 1983: use of filtered venting at the Indian Point nuclear plants.
• US National Advisory Committee on Oceans and Atmosphere, 1982: implications of ocean disposal of radioactive waste.
• Environmental & Energy Study Conference, US Congress, 1982: implications of radioactive waste management.

Miscellaneous

• Married, two children.
• Extensive experience in public speaking and interviews by mass media.
• Author of numerous essays and letters in newspapers and magazines.

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CERTIFICATE OF SERVICE

I, Jack McGowan, certify that I have, on this date, caused the foregoing TESTIMONY OF GORDON THOMPSON ON BEHALF OF THE SAN LUIS OBISPO MOTHERS FOR PEACE, SIERRA CLUB, PUBLIC CITIZEN, GREENPEACE AND ENVIRONMENT CALIFORNIA to be served by electronic mail on the parties listed on the Service List, and by U.S. Mail for those who have not provided an electronic address, for the proceeding in California Public Utilities Commission Docket No. A.04-01-009.

I declare under penalty of perjury, pursuant to the laws of the State of California, that the foregoing is true and correct.

Executed on August 3, 2004, 2004 in San Francisco, California.

Jack McGowan

Diablo Canyon Decommissioning Environmental Impact Report Scoping Comment by San Luis Obispo Mothers for Peace

To: diablo@co.slo.ca.us
From: San Luis Obispo Mothers for Peace
mothersforpeace.org
Contacts:
Linda Seeley lindaseeley@gmail.com
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November 29, 2021

To Susan Strachan,

San Luis Obispo Mothers for Peace offers the following comments and questions on the scope and content of the Environmental Impact Report for the decommissioning of Diablo Canyon nuclear plant.

1. No Alternative Option to Evaluate License Extension

   There may be other participants advocating for license extension years beyond the anticipated closure dates. The consultants and the County must recognize that the added waste and hazards involved go far beyond the budgeted scope and timeline of this EIR. PG&E has deferred maintenance, and senior staff members have departed in anticipation of closure. Any project involving license extension must be treated as a separate application with separate environmental review.

2. High Level Waste Management

   The safe handling and storage of the high level radioactive waste remaining on-site is an issue of utmost concern. We understand that PG&E is in the process of choosing a new ISFSI storage system which will allow for more rapid transfer of the waste from the pools. There is great uncertainty regarding the amount of time this waste will remain on-site and how robust these new casks and/or canisters will be in the face of impacts from the ocean environment, routine aging, seismic risks, and the threats of terrorism.

- Will the casks and/or canisters be continuously monitored for degradation and radiation leakage?

- What is the process for repair?

- While the spent fuel pools are still in use, how will any adverse events be handled after the cessation of plant operation?

- If the pools are dismantled, what system will be in place to monitor and repair leaking containers? Will a hot cell or some system with similar capabilities be installed? Mothers for Peace advocates for on-site repair capability.

- Mothers for Peace advocates for HOSS - hardened on-site storage, a concept that aims to protect the public from the threats posed by the current vulnerable storage of nuclear waste. See attached document by Dr. Gordon Thompson.

3. Radiological and Chemical Decontamination of the Site: soil, concrete, components

- How will contamination during dismantling be prevented and monitored?

- How will contamination on land and in the sea be measured, including possible bioconcentration up the marine and terrestrial food chains?

- What technologies will be used to measure any possible spread of radiological contamination on and offsite?

- What procedures are in place to respond to unexpected events or emergencies?

- How will the contaminated materials be handled and contained?

- How will decontamination be done? (before/during/after dismantling?)

- How and where will the contaminated materials be transported offsite for disposal?

- What are the criteria for determining reuse vs disposal?

- Where will the contaminated material be disposed?

- What are the criteria for determining the destinations of various levels of contaminated materials?

- To what soil depth will contamination be monitored and ameliorated?

- How will the quality and safety of groundwater and protection from radiological and chemical contamination be assured?

4. Dismantlement and Air Quality

   Dismantlement will result in dust, CO_2 emissions, release of harmful chemicals into the air, emissions from trucks, trains, and barges, and odors. How will the impacts of these releases be monitored and minimized?

5. Transportation and Traffic

We understand that the dismantled materials will be transported by truck, rail, and barge.

- What infrastructure modifications and/or enhancements will be required to roads, rails, and for barge loading?

- What roads will be used to remove materials from Parcel P?

- What will be the impacts of the materials being trucked through the town of Avila Beach and by Harbor Terrace?

- How many trucks per day will be removing materials from Parcel P?

- At what hours and on what days will materials be trucked out of Parcel P?

- Will PG&E be responsible for maintenance of existing roads subjected to heavy use during decommissioning?

- Decommissioning-related traffic involving large numbers of construction personnel and vehicles over a period of many years will affect traffic flow and parking congestion. How will increased traffic be mitigated?

- There is potential for health impacts in the transportation of hazardous and/or radiological materials due to accidental release. How will these risks be mitigated and the warning of shipments communicated to first responders and residents on the transportation routes? What are the environmental justice impacts on disadvantaged communities of the routes selected?

- What are the environmental justice impacts on disadvantaged communities from the selection of the ultimate destinations of these hazardous materials?

- Is the Port San Luis Harbor District being consulted as a Responsible Agency? If not, why not?

6. Biological Resources

- What degrading impacts are expected on the terrestrial habitats and species as a result of demolition and removal activities? How can these be minimized?

- How will the potential impacts to marine species and habitats within the project area be identified and mitigated?

- What debris and contaminants will be released into the ocean?

- Over the lifetime of the plant, once-through-cooling has decimated the indigenous populations of vegetation, crustaceans and fish. The EIR must stipulate that PG&E monitor and report recovery of impacted species after the shutdown of the once-through-cooling system.

    - *Diablo Cove and adjacent land areas are home to seven endangered species including Bull Kelp, California Sheephead, Burrowing Owl, Green Sea Turtle, Black Abalone, Southern Sea Otter, and Morro Bay Kangaroo Rat.*

    - *A monograph by the California Department of Fish and Game, (Burge, Richard T. and Schultz, Steven A. (1973 – prior to startup of the plant) The marine environment in the vicinity of Diablo Cove with special reference to abalones and bony fishes , [Marine Resources Technical Report, 19]} states, “Diablo Cove, a future* *warm water discharge site, is located about midpoint of a 13 mile long rocky shoreside reef in central California. The reef, physically isolated from other similar coastal areas, supports important kelp bed communities of nonmigratory vertebrates and invertebrates that must be constantly monitored to ensure they are protected. This 2-year study is a baseline inventory done in the vicinity of Diablo Cove with major emphasis on abalones, including their food chain, and bony fishes. Data was obtained on the life history and annual canopy development of the kelp Nereocystis and all macroalgae were cataloged. Seasonal collections of fishes were made to document those species indigenous to the system and to obtain life history information on the common forms." (Document has 429 pages.)*

- *From 1988 to 1991, following the startup of the Diablo Canyon units, the red and black abalone population in Diablo Cove declined by almost 90% as the result of withering syndrome, a chronic progressive disease exacerbated by elevated sea water temperatures. Thermal pollution from the Diablo Canyon units was identified by the Water Quality Control Board to be a significant contributor to the decline of the red and black abalone. Water temperatures in north Diablo Cove now prevent the successful developmental growth of black abalone and red abalone, both indigenous coastal water mollusk species.*

- *In 2003, the Water Quality Control Board and the California Department of Fish and Game prepared a cease and desist order for the reactor discharges into the ocean cove. "Overall, the effects of the discharge include loss and degradation of habitat, decrease in several species' diversity and density, and loss of entire species. It has been shown that the effects continue to expand beyond Diablo Cove and are greater than predicted. The discharge does not provide for the protection of propagation of species and does not provide habitat suitable for indigenous* *species." The agency further concluded: "The question presented is whether the degradation of the marine environment near DCPP [Diablo Canyon Power Plant] is acceptable to the Department of Fish and Game. Based on review of law and policies administered by the Department, and other laws requiring enhancement and protection of the marine ecosystem, the answer is no."*

- *The draft order cites that 97% of the cove's surface kelp forest (Bull Kelp) has literally been clear cut from its former habitat, with more kelp forests potentially impacted beyond the cove. As a result, the intertidal communities of Diablo Cove are now devoid of historically abundant quantities of perennial algae cover. Surfgrass, once the predominant plant thriving in continuous bands throughout the cove, survives only in isolated locations. The Department of Fish and Game maintained, based upon "the effects of elevated water temperature and the severe decrease in the adult populations densities below the recommended Department levels, that it is questionable whether or not abalone populations will recover naturally in Diablo Cove should temperatures return to normal."*

7. PG&E's Financial Status

- What category of PG&E funding is being used to pay Aspen?

- Is PG&E's financial and time budget for this EIR sufficient for the enormous complexity of the task of impact evaluation and development of mitigation measures? If not, how will additional resources be procured?

- What measures are in place to assure that the completion of the proposed project will be done in a manner that ensures prudent use of ratepayer funds?

8. Site Restoration and Future Land Uses within Parcel P and Surrounding Lands

Once the site has been restored and deemed safe by NRC standards for public access, it is imperative that the land be used for the public good. It is this community which suffers the risks involved with the operation of the nuclear plant and storage of its radioactive waste. It is this community which is now entitled to reap benefits from the land as mitigation.

The DREAM Initiative in 2000 was supported by over 75% of county voters - a clear message to set aside not only Parcel P but all the surrounding Diablo Canyon Lands for habitat preservation, agriculture, and passive public use upon closure of the plant. The EIR must investigate to what extent disruptive activities on Parcel P create a nexus for mitigation by way of conservation of and public access to surrounding lands to compensate affected communities. There is precedent for this with public access to Point Buchon.

Mothers for Peace advocates for repurposing of non-contaminated facilities to be used rather than demolished.

- These facilities should be used to create new local jobs and promote the establishment of clean, green, renewable energy sources.

- The transmission lines should be explored for the transmission of wind, wave, solar and/or other clean energy sources.

- The preservation of the existing desalination plant, the breakwaters, and the associated harbor area should be explored.

- The preservation of Indigenous People's sites must be assured.

- The request for land ownership by the local Indigenous community must be acknowledged and considered valid - with the understanding of their intent for conservation and managed use.

- Which Indigenous groups are being consulted as Responsible Agencies?

9. NRC Pre-emption of Safety Issues with High Level Waste Handling

- To what extent could the EIR recommend, and the County require, added mitigation measures beyond those of the NRC if needed to make required health and safety findings?

Email: Diablo Canyon Decommissioning Project Team

From: Mike Gatto <mike@actiumllp.com>
Sent: Wednesday, December 1, 2021 11:24 AM
To: PL_Diablo <PL_Diablo@co.slo.ca.us>
Subject: [EXT]SCOPING Comments re Diablo Canyon from CGNP

This firm represents Californians for Green Nuclear Power (CGNP), a non profit dedicated to caring for the environment and halting harmful climate change. The Board and members of CGNP include dedicated scientists, educated at top universities, considered to be elite specialists in their fields, with decades of experience on issues of power generation, grid safety, and emissions reduction. CGNP has been following closely the proposed retirement of Diablo Canyon, and hereby submits these comments regarding CEQA scoping.

The Scope must consider the proposal's broad effects on climate.

CGNP is concerned about, and cautions against, the County artificially limiting the scope of its review to the local impacts of the decommissioning process. Diablo Canyon provides approximately 10% of the state's power, around-the-clock, greenhouse-gas-free.

Pursuant to the 2018 revisions to the CEQA guidelines, the County's mandate to consider this project's climate-change ramifications is broad:

- The County must analyze the greenhouse-gas emissions that will result. *See* CEQA Guidelines § 15064.4, subd. (a).)
- The County's analysis should focus on the project's effect on climate change. *See* CEQA Guidelines § 15064.4, subd. (b).)
- The County's "impacts analysis" of greenhouse-gas emissions must be global in nature and thus should be considered in the broadest context. *See* CEQA Guidelines § 15064.4, subd. (b).)

The current CEQA guidelines make clear that the County must consider the effects of how taking 10% of California's greenhouse-gas-free power offline will affect climate change.

Responsibility falls squarely on the County to undertake this analysis, as no other agency has or will do it. Accepting vague or evasive promises from the applicant will not suffice to meet the County's CEQA duties. When assessing the effect of Diablo's proposed retirement on climate change, the County must make sure that Diablo's power will not be replaced with things like out-of-state coal, in-state combustible power, or wind power or batteries with massive carbon and ecological footprints.

The need for thorough analysis and genuine attention to climate-change concerns are evinced in extant public documents concerning this matter. For example, the PUC has acknowledged that 5000 megawatts of "unspecified imports" will be needed to replace Diablo's power if it is taken offline. Because given their preferential tariffs and incentives, renewable sources of power (*e.g.*, solar, wind, etc.) are always identified –- indeed touted –- and because previous PUC decisions listed all proposed renewable sources of replacement power for Diablo –- this "unspecified" imported power can only refer to coal or other combustibles. Thus, for the County to conduct a CEQA-compliant climate-change analysis, it will need to demand information on these 5000 MW that go beyond the adjective "unspecified", and the County will need to determine the effect of this aspect of the project on climate change.

We have requested before, and renew our request for a CEQA consultation with our members. Please contact me at your earliest convenience to arrange the same.

Thank you,

Mike Gatto
Partner
Actium LLP
1.323.819.0300
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December 1, 2021 Public Comments of Californians for Green Nuclear Power, Inc. (CGNP) by Gene Nelson, Ph.D., CGNP Legal Assistant

San Luis Obispo County depends on lifelines that cross the San Andreas Fault. Those lifelines convey water, energy, and information. CGNP has been studying those lifelines for more than a decade. The proposed scope of the Draft Environmental Impact Statement (DEIS) for Plan Number: DRC2021-00092 will likely exclude the most harmful action, namely the planned cessation of Diablo Canyon Power Plant (DCPP) operation in 2025. Cessation of plant operations is a logical requirement to commence decommissioning. CGNP continues to express sharp opposition to this harmful proposed action. These comments form a portion of CGNP's advocacy for the "no project alternative." (NPA)

The continued safe operation of DCPP beyond 2025 provides at least two valuable things to contribute to the post-disaster resiliency of San Luis Obispo County. The plant provides the equivalent of five Hoover Dams of electricity without emitting a speck of carbon. (Cessation of DCPP operation would boost carbon emissions by about 15 million metric tons a year.) The plant's desalination plant could be substantially enlarged to provide more water to the County than the Central Coast currently receives from the State Water Project via a CCWA pipeline that crosses the San Andreas Fault near Cholame, California. Aftershocks will likely prevent that pipeline from being restored to service for several years after a major earthquake there.

Per a May 8, 2020 NRC post-Fukushima review, DCPP is expected to continue to safely operate during and after the beyond design basis events (including severe weather) studied. A copy of the NRC letter is attached. John Lindsey's attached November 2, 2021 *SLO Tribune* article describes some of the severe weather events that could harm San Luis Obispo County. The arid Carrizo Plain in far eastern SLO County preserves evidence of geologically-recent atmospheric river (AR) events that have inundated our county. The Wallace Creek stream offsets documented after the John Lindsey article show significant SLO County inundations about 3,700 years ago and 10,000 years ago. These inundations are likely to recur. DCPP is expected to continue to safely operate in spite of any credible earthquake or flood in the vicinity of the plant.

SLO County needs the life-saving benefits of continued safe Diablo Canyon operation. The NPA is the superior alternative.

THE TRIBUNE Newspaper of the Central Coast

Weather disasters can happen at any time. Here's how SLO County prepares for the worst

By John Lindsey   Special to *The Tribune*

Tuesday, November 2, 2021 5:00 AM

https://www.sanluisobispo.com/news/weather/weather-watch/article255449551.html

The city of San Luis Obispo held a severe-weather drill for first responders in preparation for their training at FEMA's Emergency Management Institute (EMI) to enhance their capabilities to minimize the impact of disasters on the public. JOHN LINDSEY

I got to participate in a severe-weather response drill for the city of San Luis Obispo last week with former fire chiefs Steve Knuckles and Robert Lewin. It was in preparation for their training at FEMA's Emergency Management Institute to enhance their capabilities to minimize the impact of disasters on the public.

San Luis Obispo and Barbara counties have some of the best weather in the world. Because of our idyllic conditions, Central Coast residents are often lulled into a false sense of security about the possibility of a natural disaster, but they do occur.

For example, in March 1995, a storm developed about 900 miles off California's Central Coast and caused an intense cold front to stall over our area. It tapped into a plume of subtropical moisture that stretched to Hawaii, which became a massive river of water vapor in the sky.

This atmospheric river (AR) hosed the Central Coast with enormous amounts of rain, which caused extensive flooding. Rainfall amounts ranged from a low of 3.0 inches at the Santa Maria Airport to 11.6 inches in Santa Margarita. The stalled cold front was accompanied by gale-force to storm-force (55- to 73-mph) southeasterly winds in the coastal regions of the Central Coast.

In 1969, nearly 40 inches of rain was recorded in San Luis Obispo during January and February. It turned the area where Costco and Home Depot are located along Highway 101 and Los Osos Valley Road into a vast lake.

Many years ago, my grandmother, Frances Graham, passed along this bit of family folklore to me from her mother about a deluge of biblical proportions. The flood devastated their farm in Colusa County. She said it was like nature taking revenge for the hydraulic mining during the California Gold Rush. Many called this flood the “Noachian deluge of California Floods.”

Toward the end of 1861, a series of storms produced nearly continuous rain that lasted through February over most of California. Los Angeles recorded about 36 inches of rain, while Sonora in the Sierra Nevada foothills measured more than 100 inches! By February 1862, the Sacramento and San Joaquin valleys became almost an inland sea stretching nearly 300 miles in length, forcing the state capital in Sacramento to move to San Francisco. San Francisco and San Pablo Bay’s typically salty waters became almost fresh with a continuous and unimaginably heavy flow of silted water through the Golden Gate.

The Santa Ana River in Southern California became a raging torrent, laying waste to farms along its banks. River settlements throughout California were inundated.

Weather data from so long ago is sparse. However, a few weather experts believe that an AR stretching across the Pacific Ocean was responsible for channeling vast amounts of precipitation into the state.

Less than two years later, a terrible drought-ravaged California. Dan Krieger, professor emeritus of history at Cal Poly, wrote, “By the fall of 1863, many traditional watering holes were low. Nojoqui Falls (pronounced Naw-ho-wee) just south of Buellton disappeared for the first time. So, too, did the Santa Ynez, Cuyama, Nacimiento and San Antonio rivers. Santa Rosa Creek along the North Coast also dried up. The skies were unusually filled with buzzards. Grizzly bears and wolves that had virtually vanished for a decade began to appear out of the Santa Lucia and coast ranges, pursuing the helpless, dying cattle. Soon, they would also fall victim to the relentless drought.”

In 1863, none of our manmade lakes or reservoirs were built yet, dramatically adding to the drought’s severity.

The magnitude of the above perils put into sharp focus the need for all of us to prepare for natural disasters. As Rick London of United Way will tell you, the canard that “an ounce of prevention is worth many pounds of cure” certainly rings true.

However, the real trick is to bring community members with different experiences and skill sets together and work as a team to prepare, execute and recover from various emergencies that can occur simultaneously.

I witnessed the importance of this type of preparedness firsthand when I attended a training event at FEMA’s Emergency Management Institute in Emmitsburg, Maryland, a few years ago. Law enforcement, fire, medical, education, county and city officials, and representatives from the private sector came together to learn how to work as an integrated team.

This group of first responders began each training day with lectures taught by knowledgeable instructors with years of firsthand experiences, such as the 9-11 attacks, the Oakland Hills fire, and hurricanes

Katrina and Sandy. These classes progressed into scenario-related, large-scale exercises of increasing complexity and threat that required participants to work as a team successfully. In other words, the FEMA instructors tossed various scenarios to the students, from wildfires to tsunamis and everything in between. The results were stunning.

Certified Emergency Management Specialist Dave Mathe was so impressed with the quality of training and the potential to save lives and property that he donated almost 1,000 hours of his own time to apply for the federal grant and coordinate participants. The federal funding covered the costs.

Tracey Vardas, manager of emergency management and public safety exercises with PG&E, told me, "It was some of the most comprehensive and coordinated training evolutions I've been involved with. This type of community-based interaction will certainly help all of us prepare for future emergencies." This same praise was echoed by other attendees.

The federal grant covered the costs, which was particularly valuable when local training budgets were strained.

Training like this will be needed even more in the future, as the atmosphere and oceans continue to warm, and storms become more severe.

"We are living in a time of climate extremes; longer droughts, deadly wildfires in winter months, storms that confound meteorological modeling, and baking temperatures that are killing our elderly. So while we must reduce and reverse our carbon emissions, we must simultaneously change our paradigm and strengthen our preparation and increase our ability to respond to the devastating impacts of climate extreme induced disasters," Lewin told me.

Stream offsets at Wallace Creek, Carrizo Plain, California

http://www.public.asu.edu/~arrows/images.html

View northeast across the San Andreas fault showing several offset stream channels. Main channel is offset about 130 m and was incised **approximately 3,700 years ago**. Channel farther to left on near side of fault has been displaced approximately 350 m, is beheaded, and was incised **approximately 10,000 years ago.** These offsets and ages provide a long term slip rate of approximately 35 mm/yr along the San Andreas fault here (Sieh and Jahns, 1984). Small gulches at right display about 9 m offset from the 1857 earthquake. No fault creep is observed here and this section of the San Andreas fault is considered locked. Sieh and Wallace (1987) provide a detailed field description of this site. This slide is #13 from Wallace and Schulz (1983).

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https://www.blm.gov/visit/wallace-creek

Wallace Creek

Here you are standing on the San Andreas Fault. At this location it runs northwest to southeast at the base of the hills. At one time Wallace Creek drained straight across the fault, but movement by the San Andreas Fault has offset its drainage course, with the downstream segment about 430 feet northwest of the upstream segment. This is one of the best examples of stream offset across a fault in the world. An interpretive trail is available to learn more about this portion of the San Andreas Fault.

https://www.nrc.gov/docs/ML2009/ML20093B934.pdf Archived 11 10 21 by CGNP
Note highlighted passage on page 7: **"existing seismic capacity or effective flood protection will address the unbounded reevaluated hazards."**

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

May 8, 2020

Mr. James M. Welsch
Senior Vice President, Generation
and Chief Nuclear Officer
Pacific Gas and Electric Company
P.O. Box 56
Mail Code 104/6
Avila Beach, CA 93424

SUBJECT: DIABLO CANYON POWER PLANT, UNIT NOS. 1 AND 2 – DOCUMENTATION OF THE COMPLETION OF REQUIRED ACTIONS TAKEN IN RESPONSE TO THE LESSONS LEARNED FROM THE FUKUSHIMA DAI-ICHI ACCIDENT

Dear Mr. Welsch:

The purpose of this letter is to acknowledge and document that the actions required by the U.S. Nuclear Regulatory Commission (NRC) in orders issued following the accident at the Fukushima Dai-ichi Nuclear Power Station have been completed for Diablo Canyon Power Plant, Unit Nos. 1 and 2 (Diablo Canyon). In addition, this letter acknowledges and documents that Pacific Gas and Electric Company (PG&E, the licensee), has provided the information requested in the NRC's March 12, 2012, request for information under Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.54(f), related to the lessons learned from that accident. Completing these actions and providing the requested information, in conjunction with the regulatory activities associated with the Mitigation of Beyond-Design-Basis Events (MBDBE) rulemaking, implements the safety enhancements mandated by the NRC based on the lessons learned from the accident. Relevant NRC, industry, and licensee documents are listed in the reference tables provided in the enclosure to this letter. The NRC will provide oversight of these safety enhancements through the Reactor Oversight Process (ROP).

BACKGROUND

In response to the events in Japan resulting from the Great Tōhoku Earthquake and subsequent tsunami on March 11, 2011, the NRC took immediate action to confirm the safety of U.S. nuclear power plants:

- On March 18, 2011, the NRC issued Information Notice 2011-05, "Tōhoku-Taiheiyou-Oki Earthquake Effects on Japanese Nuclear Power Plants" (Reference 1.1). The information notice was issued to inform U.S. operating power reactor licensees and applicants of the effects from the earthquake and tsunami. Recipients were expected to review the information for applicability to their facilities and consider actions, as appropriate. Suggestions contained in an information notice are not NRC requirements; therefore, no specific action or written response was required.

- On March 23, 2011, the NRC issued Temporary Instruction (TI) 2515/183, "Followup to the Fukushima Daiichi Fuel Damage Event." The purpose of TI 2515/183 was to provide NRC inspectors with guidance on confirming the reliability of licensees' strategies intended to maintain or restore core cooling, containment, and spent fuel pool cooling capabilities following events that may exceed the design basis for a plant. The results of the inspection for each licensee were documented in an inspection report (Reference 1.2).

- On March 23, 2011, the Commission provided staff requirements memorandum (SRM) COMGBJ-11-0002, "NRC Actions Following the Events in Japan." The tasking memorandum directed the Executive Director for Operations to establish a senior level agency task force, referred to as the Near-Term Task Force (NTTF), to conduct a methodical and systematic review of the NRC processes and regulations to determine whether the agency should make additional improvements to the regulatory system and make recommendations to the Commission within 90 days for its policy direction (Reference 1.3).

- On April 29, 2011, the NRC issued TI 2515/184, "Availability and Readiness Inspection of Severe Accident Management Guidelines (SAMGs)." The purpose of TI 2515/184 was to inspect the readiness of nuclear power plant operators to implement SAMGs. The results of the inspection were summarized and provided to the NTTF, as well as documented in a 2011 quarterly integrated inspection report for each licensee (Reference 1.4).

- On May 11, 2011, the NRC issued Bulletin (BL) 2011-01, "Mitigating Strategies." BL 2011-01 required licensees to provide a comprehensive verification of their compliance with the regulatory requirements of 10 CFR 50.54(hh)(2), as well as provide information associated with the licensee's mitigation strategies under that section. In 10 CFR 50.54(hh)(2), it states, in part: "Each licensee shall develop and implement guidance and strategies intended to maintain or restore core cooling, containment, and spent fuel pool cooling capabilities under the circumstances associated with loss of large areas of the plant due to explosions or fire… ." BL 2011-01 required a written response from each licensee (Reference 1.5). Note that the final MBDBE rule (Reference 1.15) moved the requirements formerly in 10 CFR 50.54(hh)(2) to 10 CFR 50.155(b)(2).

- On July 21, 2011, the NRC staff provided the NTTF report, "Recommendations for Enhancing Reactor Safety in the 21st Century: The Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident" to the Commission in SECY-11-0093, "Near-Term Report and Recommendations for Agency Actions Following the Events in Japan" (Reference 1.6).

- On October 3, 2011, the staff prioritized the NTTF recommendations into three tiers in SECY-11-0137, "Prioritization of Recommended Actions to Be Taken in Response to Fukushima Lessons Learned." The Commission approved the staff's prioritization, with comment, in the SRM to SECY-11-0137 (Reference 1.7).

  A complete discussion of the prioritization of the recommendations from the NTTF report, additional issues that were addressed subsequent to the NTTF report, and the disposition of the issues that were prioritized as Tier 2 or Tier 3 is provided in SECY-17-0016, "Status of Implementation of Lessons Learned from Japan's March 11, 2011, Great Tōhoku Earthquake and Subsequent Tsunami" (Reference 12.10). A listing of the previous Commission status reports, which were provided semiannually, can be found in Table 12 in the enclosure to this letter.

The NRC undertook the following regulatory activities to address the majority of the Tier 1 recommendations:

- On March 12, 2012, the NRC issued Orders EA-12-049, "Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events," EA-12-050, "Order Modifying Licenses with Regard to Reliable Hardened Containment Vents," and EA-12-051, "Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation," and a request for information under 10 CFR 50.54(f) (hereafter referred to as the 50.54(f) letter) to licensees (References 1.8, 1.9, 1.10, and 1.11, respectively).

- On June 6, 2013, the NRC issued Order EA-13-109, "Order Modifying Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation under Severe Accident Conditions" (Reference 1.12), which superseded Order EA-12-050, replacing its requirements with modified requirements.

- In addition to the three orders and the 50.54(f) letter, the NRC completed rulemaking, 10 CFR 50.155, "Mitigation of Beyond-Design-Basis Events," that made generically applicable the requirements of Orders EA-12-049 and EA-12-051. The draft final rule and supporting documentation were provided to the Commission for approval in SECY-16-0142, "Draft Final Rule – Mitigation of Beyond-Design-Basis Events (RIN 3150-AJ49)" (Reference 1.13). The MBDBE rulemaking effort consolidated several of the recommendations from the NTTF report.

  On January 24, 2019, the Commission, via SRM-M190124A (Reference 1.14), approved the final MBDBE rule, with edits. The final rule approved by the Commission contains provisions that make generically applicable the requirements imposed by Orders EA-12-049 and EA-12-051 and supporting requirements. The Commission's direction in the SRM makes it clear that the NRC will continue to follow a site-specific approach to resolve the interaction between the hazard reevaluation and mitigation strategies using information gathered in the 50.54(f) letter process. The NRC staff made conforming changes to the final rule package (Reference 1.15) as directed by the Commission, which included changes to two regulatory guides (References 1.16 and 1.17). The final rule was published in the *Federal Register* on August 9, 2019 (84 FR 39684), with an effective implementation date of September 9, 2019.

  Subsequent to Commission approval of the final MBDBE rule, the staff engaged with stakeholders to pursue the expeditious closure of the remaining post-Fukushima 50.54(f) letter responses on a timeframe commensurate with each item's safety significance.

  In a draft discussion paper (Reference 1.18) used to support a Category 3 public meeting held on February 28, 2019 (Reference 1.19), the NRC staff outlined the process to be used to review the reevaluated hazard and mitigation strategies assessment (MSA) information provided by licensees considering the differences between the draft final MBDBE rule and the approved final MBDBE rule. Subsequently, the NRC staff provided a screening letter (also called a "binning" letter) for both seismic and flooding hazard reevaluations (References 5.22 and 6.26), which categorized sites based on available information and the status of any commitments made in prior reports and assessments. The process is discussed in greater detail in the "Hazard Reevaluation" and "Mitigation Strategies Assessment" sections of the discussion which follows.

This letter acknowledges and documents that the actions required by the NRC in response to the orders, as well as the information provided in response to the March 12, 2012, 50.54(f) letter, have been completed for Diablo Canyon. However, the staff is not determining whether the licensee complies with the final MBDBE rule. Oversight of compliance with the final MBDBE rule at Diablo Canyon will be conducted through the ROP.

DISCUSSION

Mitigation Strategies Order

Order EA-12-049, which applies to Diablo Canyon, requires licensees to implement a three-phase approach for mitigation of beyond-design-basis external events (BDBEEs). It requires licensees to develop, implement, and maintain guidance and strategies to maintain or restore core cooling, containment, and spent fuel pool (SFP) cooling capabilities in the event of a BDBEE that results in a simultaneous loss of all alternating current (ac) power and loss of normal access to the ultimate heat sink (LUHS). Phases 1 and 2 of the order use onsite equipment, while Phase 3 requires obtaining sufficient offsite resources to sustain those functions indefinitely.

In August 2012, the Nuclear Energy Institute (NEI) issued Revision 0 of industry guidance document NEI 12-06, "Diverse and Flexible Coping Strategies (FLEX) Implementation Guide," as guidance to comply with the order. The NRC endorsed the guidance in Revision 0 of Japan Lessons-Learned Project Directorate (JLD) interim staff guidance (ISG) document JLD-ISG-2012-01, "Compliance with Order EA-12-049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events." Subsequently, in December 2015, NEI issued Revision 2 of NEI 12-06 and the NRC endorsed that guidance in Revision 1 of JLD-ISG-2012-01 (Reference 2.1). Licensees were required to provide an overall integrated plan (OIP) to describe how they would comply with the order, along with status reports every 6 months until compliance was achieved (Reference 2.2). The NRC staff provided an interim staff evaluation (ISE) related to the OIP (Reference 2.3). The NRC concluded in the ISE that the licensee provided sufficient information to determine that there is reasonable assurance that the plan, when properly implemented, including satisfactory resolution of the open and confirmatory items, would meet the requirements of Order EA-12-049 at Diablo Canyon. The NRC staff also conducted a regulatory audit of the licensee's strategies and issued a report which documented the results of the audit activities (Reference 2.4). Upon reaching compliance with the order requirements, the licensee submitted a compliance letter and a final integrated plan (FIP) to the NRC (Reference 2.5). The FIP describes how the licensee is complying with the order at Diablo Canyon.

The NRC staff completed a safety evaluation (SE) of the licensee's FIP (Reference 2.6). The SE informed the licensee that its integrated plan, if implemented as described, provided a reasonable path for compliance with Order EA-12-049 at Diablo Canyon. The staff then evaluated the implementation of the plans through inspection, using TI 2515/191, "Implementation of Mitigation Strategies and Spent Fuel Pool Instrumentation Orders and Emergency Preparedness Communications/Staffing/Multi-Unit Dose Assessment Plans." An inspection report was issued to document the results of the TI 2515/191 inspection (Reference 2.7). The NRC will oversee implementation of the mitigation strategies requirements under the final MBDBE rule requirements through the ROP.

Phase 3 of Order EA-12-049 required licensees to obtain sufficient offsite resources to sustain the required functions indefinitely. There are two redundant National Strategic Alliance for

FLEX Emergency Response (SAFER) Response Centers (NSRCs), one located in Memphis, Tennessee, and the other in Phoenix, Arizona, which have the procedures and plans in place to maintain and deliver the equipment needed for Phase 3 from either NSRC to any participating U.S. nuclear power plant when requested (Reference 2.8). The NRC staff evaluated and inspected the NSRCs and the SAFER program, plans, and procedures (References 2.9 and 2.10). Subsequently, SAFER provided two addenda to document the treatment of equipment withdrawn from the NSRCs (Reference 2.11). The NRC reviewed the addenda and documented its conclusion in an updated staff assessment (Reference 2.12). The NRC concluded that licensees may reference the SAFER program and implement their SAFER response plans to meet the Phase 3 requirements of the order. The licensee's FIP (Reference 2.5) includes the plans for utilizing the NSRC equipment at Diablo Canyon. In its SE (Reference 2.6), the NRC staff concluded that the licensee has developed guidance that, if implemented appropriately, should allow utilization of offsite resources following a BDBEE consistent with NEI 12-06 guidance and should adequately address the requirements of the order.

Spent Fuel Pool Instrumentation Order

Order EA-12-051, which applies to Diablo Canyon, required licensees to install reliable SFP level instrumentation with a primary channel and a backup channel, independent of each other, and with the capability to be powered independent of the plant's power distribution systems. The NEI issued NEI 12-02, "Industry Guidance for Compliance with NRC Order EA-12-051, 'To Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation,'" as guidance to be used by licensees to comply with the order. The NRC endorsed this guidance in JLD-ISG-2012-03, "Compliance with Order EA-12-051, Reliable Spent Fuel Pool Instrumentation" (Reference 3.1). Licensees were required to provide an OIP to describe how they would comply with the order, along with status reports every 6 months until compliance was achieved (Reference 3.2). The NRC issued an ISE, providing feedback on the OIP (Reference 3.3). The NRC staff conducted a regulatory audit of the licensee's strategies and issued a report that documented the results of the audit activities (Reference 3.4). Upon reaching compliance with the order requirements, the licensee submitted a compliance letter to the NRC (Reference 3.5), describing how the licensee complied with the order at Diablo Canyon.

The NRC staff completed an SE of the actions taken by the licensee in response to the order (Reference 3.6). The SE informed the licensee that its integrated plan, if implemented as described, provided a reasonable path for compliance with Order EA-12-051 at Diablo Canyon. The staff then evaluated the implementation of the plan through inspection, using TI 2515/191. An inspection report was issued to document the results of the TI 2515/191 inspection (Reference 3.7). The NRC will oversee implementation of the SFP instrumentation requirements under the final MBDBE rule requirements through the ROP.

Reliable Hardened Containment Vent Order

Order EA-13-109 (Reference 1.12) is only applicable to operating boiling-water reactors (BWRs) with Mark I and Mark II containments. Because the reactors at Diablo Canyon are pressurized water reactors with large, dry, ambient-pressure containments, this order is not applicable to Diablo Canyon.

Request for Information Under 10 CFR 50.54(f)

The 50.54(f) letter requested operating power reactor licensees to:

- reevaluate the seismic and flooding hazard at their sites using present-day NRC requirements and guidance, and identify actions that are planned to address plant-specific vulnerabilities associated with the reevaluated seismic and flooding hazard;

- perform seismic and flooding walkdowns to verify compliance with the current licensing basis; verify the adequacy of current strategies and maintenance plans; and identify degraded, nonconforming, or unanalyzed conditions related to seismic and flooding protection; and

- provide an assessment of their current emergency communications and staffing capabilities to determine if any enhancements are needed to respond to a large-scale natural emergency event that results in an extended loss of ac power to all reactors at the site, and/or impeded access to the site.

In COMSECY-14-0037, "Integration of Mitigating Strategies for Beyond-Design-Basis External Events and the Reevaluat[i]on of Flooding Hazards" (Reference 6.13), the NRC staff described issues related to the implementation of Order EA-12-049 and the related MBDBE rulemaking, and the completion of flooding reevaluations and assessments. In the SRM to COMSECY-14-0037 (Reference 6.14), the Commission directed the NRC staff to provide a plan for achieving closure of the flooding hazard assessments to the Commission for review and approval. The NRC staff provided this plan in COMSECY-15-0019, "Closure Plan for the Reevaluation of Flooding Hazards for Operating Nuclear Power Plants" (Reference 6.16), which the Commission approved in the SRM to COMSECY-15-0019 (Reference 6.17).

Hazard Reevaluations (Enclosures 1 and 2 of the 50.54(f) letter)

Each licensee followed a similar two-phase process to respond to the hazard reevaluations requested by the 50.54(f) letter. In Phase 1, licensees submitted hazard reevaluation reports using NRC-endorsed, industry-developed guidance. The guidance specified that a licensee should determine if interim protection measures were needed while a longer-term evaluation of the impacts of the hazard was completed. The NRC staff reviewed the reevaluated hazard information. Using the reevaluated hazard information and a graded approach, the NRC identified the need for, and prioritization and scope of, plant-specific assessments. For those plants that were required to perform a flooding integrated assessment or a seismic probabilistic risk assessment (SPRA), Phase 2 decisionmaking (as described in a letter dated September 21, 2016 (Reference 5.17)), would determine whether additional plant-specific regulatory actions were necessary. In addition, as discussed in COMSECY-15-0019, most licensees performed an MSA to demonstrate that the licensee had adequately addressed the reevaluated hazards within their mitigation strategies developed for BDBEEs.

In a draft discussion paper (Reference 1.18) used to support a Category 3 public meeting held on February 28, 2019 (Reference 1.19), the NRC staff outlined the process to be used to review the reevaluated hazard and MSA information provided by licensees considering the differences between the draft final MBDBE rule and the approved final MBDBE rule. The purpose of these reviews is to ensure that the conclusions in the various staff assessments continue to support a determination that no further regulatory actions are needed.

As stated in the discussion paper, the NRC subsequently issued a seismic screening letter (Reference 5.22) and a flooding screening letter (Reference 6.25), also called “binning” letters, to all operating power reactor licensees. The purpose of the binning letters is to categorize sites based on available information and the status of any commitments made in prior reports and assessments. Diablo Canyon was binned as a Category 1 site for both seismic and flooding. Category 1 includes sites where no additional information or regulatory action is required. This category includes sites, such as Diablo Canyon, where the licensee has previously demonstrated that existing seismic capacity or effective flood protection will address the unbounded reevaluated hazards.

Seismic Hazard Reevaluation (Enclosure 1 of the 50.54(f) letter)

Enclosure 1 of the 50.54(f) letter requested each operating power reactor licensee to complete a reevaluation of the seismic hazard that could affect their sites using updated seismic hazard information and present-day regulatory guidance and methodologies to develop a ground motion response spectrum (GMRS). The licensee was asked to compare their results to the safe-shutdown earthquake (SSE) ground motion and then report to the NRC in a seismic hazard screening report (SHSR). To provide a uniform and acceptable industry response, the Electric Power Research Institute (EPRI) developed a technical report, EPRI 1025287, “Screening, Prioritization and Implementation Details (SPID) for the Resolution of Fukushima Near-Term Task Force Recommendation 2.1: Seismic,” and the NRC endorsed the guidance in a letter dated February 15, 2013 (Reference 5.1). From November 2012 to May 2014, the NRC and the industry provided guidance for the performance of the reevaluated hazard reviews (References 5.2-5.7). The licensee provided a SHSR for Diablo Canyon (Reference 5.8). In addition, the licensee responded (Reference 5.8) to four NRC letters with additional requests for information (Reference 5.9).

If the new GMRS was not bound by the current design basis (CDB) SSE, Enclosure 1 of the 50.54(f) letter requested more detailed evaluations of the impact from the hazard. Also, the licensee was asked to evaluate whether interim protection measures were needed while the more detailed evaluation was completed. By letter dated May 7, 2013, the NRC endorsed industry-developed guidance, a proposed path forward, and schedules, which were provided in a letter from NEI dated April 9, 2013. Attachment 1 of the NEI letter contains EPRI report 300200704, “Augmented Approach for the Resolution of Fukushima Near-Term Task Force Recommendation 2.1: Seismic,” to provide the guidance needed to perform an evaluation of any needed interim protective measures (Reference 5.3). This expedited seismic evaluation process (ESEP) is a screening, evaluation, and equipment modification process performed by licensees to provide additional seismic margin and expedite plant safety enhancements for certain core cooling and containment components while the more detailed and comprehensive plant seismic risk evaluations are being performed. Diablo Canyon was not required to perform an ESEP for the reasons noted below.

In its SHSR, PG&E included a description on their interim evaluation to address the seismic safety of Diablo Canyon. The licensee's interim evaluation included a comparison between the GMRS and the results of the Long-Term Seismic Program (LTSP) margin evaluation. The LTSP is a "seismic margin analysis" included as an original plant license condition. The LTSP addressed concerns at the time the plant was licensed. Based on the margins between the GMRS and LTSP margin spectrum, PG&E concluded in the SHSR that Diablo Canyon’s safety-related systems, structures and components (SSCs) will continue to perform their intended safety function if subjected to the ground motions at the GMRS levels.

In its SHSR, PG&E provided the NRC an assessment of the ESEP commitment. The licensee stated that their previous LTSP margins evaluation demonstrates capacities above the GMRS and therefore, there is no significant safety benefit from performing the ESEP. Because of the reasons stated above, PG&E does not intend to perform the ESEP for Diablo Canyon.

In a letter dated July 14, 2015 (Reference 5.13), the staff concluded that PG&E's interim evaluation in the SHSR is an acceptable response in lieu of an ESEP as an interim action to the 50.54(f) letter. The staff concluded that PG&E has previously demonstrated the plant's capacity to withstand a seismic hazard that bounds the reevaluated hazard which supports continued plant operation while any additional seismic risk evaluations are conducted. The NRC staff previously reviewed PG&E's LTSP margins evaluation and documented its conclusions and acceptance in Safety Evaluation Report (SER) No. 34[1]. In the July 14, 2015, letter, the NRC staff considered the conclusions reached in SER 34, along with the information provided in the SHSR, and concluded that the information provided is an adequate alternative to performing the ESEP interim evaluation.

By letter dated May 13, 2015 (Reference 5.10), the NRC informed licensees of the initial screening and prioritization results based on a review of the licensees' SHSRs. The NRC provided the final determination of required seismic evaluations in a letter dated October 27, 2015 (Reference 5.18). These evaluations could consist of an SPRA (Reference 5.1, SPID, Section 6.1.1), limited scope evaluations (High Frequency (Reference 5.14) and/or SFP evaluations (Reference 5.15)), or a relay chatter evaluation (Reference 5.4). If an SPRA was required, then additional Phase 2 regulatory decisionmaking was required (References 5.16 and 5.17).

The NRC staff completed and documented its review of the licensee's reevaluated seismic hazard in a staff assessment (Reference 5.9). In order to complete its response to the 50.54(f) letter, the licensee submitted a SFP evaluation and an SPRA report for Diablo Canyon (Reference 5.19). An audit was performed for each submittal (Reference 5.20). The audit results are documented in the applicable staff assessment (Reference 5.21). The NRC reviewed the SFP evaluation. The NRC staff concluded that the licensee's implementation of the SFP integrity evaluation met the criteria of the SFP Evaluation Guidance Report for Diablo Canyon and therefore, the licensee responded appropriately to Item (9) in Enclosure 1 of the 50.54(f) letter (Reference 5.21). The NRC reviewed the SPRA report, as documented in Reference 5.21, using the regulatory review guidance provided in Reference 5.17. The staff's review concluded that the SPRA was of sufficient technical adequacy to support Phase 2 regulatory decisionmaking and that Diablo Canyon responded appropriately to Enclosure 1, item (8) of the 50.54(f) letter (Reference 5.21). Based on the results and risk insights of the SPRA report, the NRC staff concluded that no further response or regulatory actions were required related to the seismic hazard reevaluation activities requested by Enclosure 1 of the 50.54(f) letter.

Because the staff's reviews were completed prior to when the final MBDBE rule was approved, the NRC staff, using the process discussed in the seismic binning letter (Reference 5.22), re-visited these conclusions considering the final approved MBDBE rule. The staff confirmed that the conclusions in the various staff assessments continue to support a determination that no further regulatory actions are required for Diablo Canyon.

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[1] The SER can be found in ADAMS under Accession No. ML14279A130

The NRC staff reviewed the information provided and, as documented in the staff assessments (References 5.9 and 5.21), concluded that the licensee provided sufficient information in response to Enclosure 1 of the 50.54(f) letter. The staff acknowledges that all seismic hazard reevaluation activities requested by Enclosure 1 of the 50.54(f) letter have been completed for Diablo Canyon. No further information related to the reevaluated seismic hazard is required.

Flooding Hazard Reevaluation (Enclosure 2 of the 50.54(f) letter)

Enclosure 2 of the 50.54(f) letter requested each operating power reactor licensee to complete a reevaluation of applicable flood-causing mechanisms at their site using updated flooding hazard information and present-day regulatory guidance and methodologies. Licensees were asked to compare their results to the CDB for protection and mitigation from external flood events. The NRC developed guidance to conduct the reevaluations (References 6.1 through 6.6). By letter dated March 11, 2015, the licensee submitted a flood hazard reevaluation report (FHRR) for Diablo Canyon (Reference 6.7) to the NRC as requested by the 50.54(f) letter. By letter dated February 8, 2016, the licensee submitted a revised FHRR (Reference 6.7) to update the calculation for local intense precipitation (LIP). Interim actions needed to protect against the reevaluated flood hazard were specified in the FHRR. The NRC inspected the interim actions using TI 2515/190, "Inspection of Licensee's Proposed Interim Actions as a Result of the Near-Term Task Force Recommendation 2.1 Flooding Evaluation" and documented the results in a quarterly integrated inspection report (Reference 6.9). A regulatory audit to support the review of the FHRR was performed and the results documented in an audit report] (Reference 6.8). The NRC staff reviewed the FHRR and provided an interim hazard letter (Reference 6.10) to provide feedback on the staff's review of the flooding hazard reevaluations. The interim hazard letter was used by the licensee to complete the flood hazard MSA and other flood hazard evaluations. Separately, the NRC staff documented the technical bases for its conclusions in the interim hazard letters by issuing a staff assessment (Reference 6.11).

In COMSECY-14-0037 (Reference 6.13), the NRC staff requested Commission direction to more clearly define the relationship between Order EA-12-049, the related MBDBE rulemaking, and the flood hazard reevaluations and assessments. Because the NRC was reevaluating its approach to the flooding evaluations, the NRC provided an extension of the due dates for any integrated assessments in a letter dated November 21, 2014 (Reference 6.12). In the SRM to COMSECY-14-0037 (Reference 6.14), the Commission directed the NRC staff to provide a plan for achieving closure of the flooding portion of NTTF Recommendation 2.1 to the Commission for its review and approval. On May 26, 2015, the NRC deferred, until further notice, the date for submitting the integrated assessment reports (Reference 6.15). On June 30, 2015, the NRC staff provided a plan to the Commission in COMSECY-15-0019 (Reference 6.16). On July 28, 2015, the Commission approved the plan in the SRM to COMSECY-15-0019 (Reference 6.17). On September 29, 2015, the NRC issued a letter to licensees to describe the graded approach to the flood hazard reevaluations approved by the Commission (Reference 6.18).

The COMSECY-15-0019 action plan required the NRC staff to develop a graded approach to identify the need for, and prioritization and scope of, plant-specific integrated assessments and evaluation of plant-specific regulatory actions. The NRC staff's graded approach enabled a site with hazard exceedance above its CDB to demonstrate the site's ability to cope with the reevaluated hazard through appropriate protection or mitigation measures which are timely, effective, and reasonable. Integrated assessments were focused on sites with the greatest potential for additional safety enhancements. New guidance for performing the integrated assessments and focused evaluations (FEs) was developed for this graded approach.

The guidance also provided schedule information for submission of any required integrated assessment. On July 18, 2016, the staff issued JLD-ISG-2016-01, “Guidance for Activities Related to Near-Term Task Force Recommendation 2.1, Flooding Hazard Reevaluation, Focused Evaluation and Integrated Assessment” (Reference 6.19). The ISG provided the guidance for Phase 1 flooding assessments, as described in COMSECY-15-0019, and endorsed industry guidance provided in NEI 16-05, “External Flooding Integrated Assessment Guidelines” (Reference 6.19). If an integrated assessment was necessary, then Phase 2 regulatory decisionmaking was required (References 6.23 and 6.24).

As noted in the interim hazard response letter (Reference 6.10), the LIP flood-causing mechanism at Diablo Canyon was not bounded by the CDB. Therefore, additional assessment of this flood-causing mechanism was required. The NRC staff used a graded approach to determine if this site would need to perform an integrated assessment for the reevaluated flooding hazard, or if an FE would suffice. Based on the graded approach, Diablo Canyon completed an FE (Reference 6.20) to ensure appropriate actions were identified and taken to protect the plant from the reevaluated flood hazard. The NRC staff conducted a regulatory audit (Reference 6.22), completed its review of the focused evaluation, and concluded in the staff assessment (Reference 6.21) that the licensee provided sufficient information in response to the 50.54(f) letter. Audit results were summarized in the staff assessment. No further regulatory actions are required related to the flood hazard reevaluations.

Because the staff’s reviews were completed prior to when the final MBDBE rule was approved, the NRC staff, using the process discussed in the flooding binning letter (Reference 6.25), re-visited these conclusions considering the final approved MBDBE rule. The staff confirmed that the conclusions in the various staff assessments continue to support a determination that no further regulatory requirements are required for Diablo Canyon.

The NRC staff reviewed the information provided by the licensee and has concluded that sufficient information was provided to be responsive to Enclosure 2 of the 50.54(f) letter. The staff acknowledges that all flooding hazard reevaluation activities requested by Enclosure 2 of the 50.54(f) letter have been completed for Diablo Canyon. No further information related to the reevaluated flood hazard is required.

Mitigating Strategies Assessment

In addition to the closure plan for NTTF Recommendation 2.1, the action plan approved by the Commission in the SRM to COMSECY-15-0019 (Reference 7.4) identified the staff efforts to ensure licensees would address the reevaluated hazard information in their mitigation strategies. Proposed requirements related to the MSA were included in the draft final MBDBE rule, but were removed as a requirement from the final approved rule language. The Commission’s direction in SRM-M190124A (Reference 1.14) makes clear that the NRC will continue to follow a site-specific approach to resolve the interactions between the hazard reevaluation and mitigation strategies using information gathered in the 50.54(f) letter process.

In a draft discussion paper (Reference 1.18) used to support a Category 3 public meeting held on February 28, 2019 (Reference 1.19), the NRC staff outlined the process to be used to review the reevaluated hazard and MSA information provided by licensees considering the differences between the draft final MBDBE rule and the approved final MBDBE rule. Subsequently, the NRC staff provided a screening letter (also called a “binning” letter) for both seismic and flooding information (References 5.22 and 6.25), which categorized sites based on available information and the status of any commitments made in prior reports and assessments. The majority of MSAs had been submitted and evaluated by the staff prior to the issuance of the binning letters. For the MSA reviews that had not yet been completed, or MSAs that had not yet been submitted, the staff would evaluate the hazard impacts on the mitigation strategies, as appropriate, as part of its review of SPRA reports, flooding FEs, and/or flooding integrated assessments.

The objective of the MSA is to determine whether the mitigation strategies developed for Order EA-12-049 can still be implemented given the reevaluated hazard levels. If it was determined that the mitigation strategies could not be implemented for the reevaluated hazard levels, the MSA could provide other options such as performing additional evaluations, modifying existing mitigating strategies, or developing alternate mitigating strategies or targeted hazard mitigating strategies to address the reevaluated hazard levels. In Revision 1 to JLD-ISG-2012-01, the NRC endorsed industry-developed guidance contained in Appendices G and H of Revision 2 to NEI 12-06 (Reference 7.5) for completing the MSAs. In Revision 2 to JLD-ISG-2012-01, the NRC endorsed the industry-developed guidance of NEI 12-06, Revision 4 (Reference 7.5). Revision 4 of NEI 12-06, among other changes, provides additional guidance in Section H.4.5 for the performance of seismic MSAs for plants with reevaluated seismic hazard information that includes a GMRS that has spectral ordinates greater than twice the plant's SSE anywhere in the frequency range of 1 to 10 Hertz. Diablo Canyon used the guidance in Section H.4.5 to complete the seismic MSA.

The licensee completed both a flood hazard MSA (Reference 7.6) and a seismic hazard MSA (Reference 7.8) for Diablo Canyon. The NRC performed a regulatory audit for the flooding MSA (Reference 7.10) and the audit results are documented in the flooding MSA staff assessment (Reference 7.7). The audit process was not used for the seismic MSA. The NRC staff reviewed the flooding MSA submittal and issued a staff assessment (References 7.7) documenting its review. The NRC staff concluded that the licensee has demonstrated that the mitigation strategies appropriately address the reevaluated flooding hazard conditions. As discussed in the flooding binning letter (Reference 6.26), the staff re-visited this conclusion considering the final approved MBDBE rule. The staff confirmed that the conclusions in the flooding MSA staff assessment continue to support a determination that no further regulatory actions are required for the flooding hazard reviews.

As noted in the seismic hazard binning letter (Reference 5.22), the staff suspended its review of certain seismic MSA submittals, including the MSA for Diablo Canyon. For the reviews not yet completed (such as Diablo Canyon), the staff evaluated the mitigation strategies as part of its review of the SPRA report (Reference 5.21). Based on the results and risk insights of the SPRA report, combined with the results of the SFP evaluation (Reference 5.21), the NRC staff concluded that no further response or regulatory actions were required related to the seismic hazard reevaluation activities requested by Enclosure 1 of the 50.54(f) letter.

Walkdowns (Enclosures 3 and 4 of the 50.54(f) letter)

Enclosures 3 and 4 of the 50.54(f) letter requested that licensees perform plant walkdowns to verify compliance with the current licensing basis as it pertains to seismic and flood protection. By letter dated May 31, 2012 (Reference 8.2), the NRC endorsed industry-developed guidance contained in Technical Report EPRI 1025286, "Seismic Walkdown Guidance" (Reference 8.1), for the performance of the seismic walkdowns. By letter dated May 31, 2012 (Reference 9.2), the NRC endorsed industry-developed guidance contained in NEI 12-07, "Guidelines for Performing Verification Walkdowns of Plant Flood Protection Features" (Reference 9.1), for performance of the flooding walkdowns. The licensee provided a report for both the seismic and flooding walkdowns at Diablo Canyon (References 8.3 and 9.3). The NRC performed onsite inspections per TI 2515/188, "Inspection of Near-Term Task Force Recommendation 2.3 Seismic Walkdowns," and TI 2515/187, "Inspection of Near-Term Task Force Recommendation 2.3 Flooding Walkdowns," and documented the inspection results in a quarterly integrated inspection report (References 8.4 and 9.4). The NRC staff issued staff assessments for both the seismic and flooding walkdowns (References 8.6 and 9.5). Because there were inaccessible items identified during the initial licensee seismic walkdowns, the licensee submitted a subsequent seismic walkdown report after accessing the areas (Reference 8.5). The NRC documented its review of the Unit 2 subsequent walkdown report in the staff assessment (Reference 8.6). The Unit 1 subsequent walkdown report was reviewed as noted in a memo dated September 25, 2015 (Reference 8.7).

The NRC staff reviewed the information provided by the licensee and determined that sufficient information was provided to be responsive to Enclosures 3 and 4 of the 50.54(f) letter. The staff acknowledges that all seismic and flooding walkdown activities requested by the 50.54(f) letter have been completed for Diablo Canyon.

Communications and Staffing (Enclosure 5 of the 50.54(f) letter)

Enclosure 5 of the 50.54(f) letter requested licensees to assess their means to power equipment needed to communicate onsite and offsite during a prolonged station blackout event and to identify and implement enhancements to ensure that communications can be maintained during such an event. Also, licensees were requested to assess the staffing required to fill all necessary positions to respond to a multiunit event with impeded access to the site, or to an extended loss of all ac power for single unit sites. Licensees were requested to submit a written response to the information requests within 90 days, or provide a response within 60 days and describe an alternative course of action and estimated completion dates. The licensee proposed an alternative course of action and schedule for Diablo Canyon (Reference 10.2), which included a 90-day partial response (Reference 10.3). The NRC acknowledged the schedule changes in a letter dated July 26, 2012 (Reference 10.4).

By letter dated May 15, 2012, the NRC endorsed industry-developed guidance contained in NEI 12-01, "Guideline for Assessing Beyond Design Basis Accident Response Staffing and Communications Capabilities" (Reference 10.1), for the performance of the communications and staffing assessments. The licensee provided the communications assessment and implementation schedule for Diablo Canyon (Reference 10.5), and the NRC completed a staff assessment of the licensee's communications assessment (Reference 10.6).

Licensees responded to the staffing portion of the 50.54(f) letter in two phases to account for the implementation of mitigation strategies. Phase 1 staffing assessments were based on the existing station blackout coping strategies with an assumption of all reactors at the site being affected concurrently. The Phase 1 staffing assessment is required for multiunit sites and was completed for Diablo Canyon (Reference 10.7). In Phase 2, all licensees assessed the staffing necessary to carry out the mitigation strategies (Reference 10.9). The NRC staff issued staffing assessment response letters (References 10.8 and 10.10) for each submittal. The NRC performed an onsite inspection using TI 2515/191 to verify that the emergency communications and staffing plans at Diablo Canyon have been implemented as described by the licensee (Reference 10.11).

Proposed Regulatory Guide 1.228 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML16218A236) was expected to endorse, with clarifications, NEI 12-01, NEI 13-06, "Enhancements to Emergency Response Capabilities for Beyond-Design-Basis Events and Severe Accidents" (Reference 11.16), and NEI 14-01, "Emergency Response Procedures and Guidelines for Beyond-Design-Basis Events and Severe Accidents" (Reference 11.7). However, the final MBDBE rule's language was revised to remove these requirements from the rule. The NRC staff canceled proposed Regulatory Guide 1.228 to reflect the approved changes in the final rule. The NRC will oversee the licensee's implementation of communications and staffing plans which support the mitigation strategies requirements through the ROP.

The NRC staff reviewed the information provided by the licensee and determined that sufficient information was provided to be responsive to Enclosure 5 of the 50.54(f) letter. The staff acknowledges that all emergency preparedness communications and staffing activities requested by Enclosure 5 of the 50.54(f) letter have been completed for Diablo Canyon. No further information related to the communications and staffing assessments is required.

Additional Industry Commitments

Update and Maintain Severe Accident Management Guidelines

The NRC staff provided the proposed MBDBE rule to the Commission on April 30, 2015, in SECY-15-0065, "Proposed Rulemaking: Mitigation of Beyond-Design-Basis Events (RIN 3150-AJ49)" (Reference 11.1) and the Commission issued the SRM to SECY-15-0065 on August 27, 2015 (Reference 11.2). The Commission approved publication of the proposed rule subject to removal of the proposed requirements pertaining to the SAMGs. The Commission also directed the staff to update the ROP to explicitly provide periodic oversight of industry's implementation of the SAMGs. By letter dated October 26, 2015 (Reference 11.3), NEI described the industry initiative, approved by the Nuclear Strategic Issues Advisory Committee as mandatory for all NEI members, to update and maintain the SAMGs. Specifically, each licensee will perform timely updates of their site-specific SAMGs based on revisions to generic severe accident technical guidelines. Licensees will also ensure that SAMGs are considered within plant configuration management processes. As noted in the NEI letter, the licensee provided a letter (Reference 11.4) to establish a site-specific regulatory commitment for Diablo Canyon.

In a letter to NEI dated February 23, 2016 (Reference 11.5), the staff outlined its approach for making changes to the ROP in accordance with the Commission direction. The staff engaged NEI and other stakeholders to identify the near-term and long-term changes to the ROP, consistent with the Commission direction and the licensees' near-term and long-term SAMG commitments. In November 2016, the staff revised Inspection Procedure (IP) 71111.18, "Plant Modifications" (Reference 11.6, effective January 1, 2017), to provide oversight of the initial inclusion of SAMGs within the plant configuration management processes to ensure that the SAMGs reflect changes to the facility over time. In November 2018, the staff published a revision to IP 71111.18 (Reference 11.6, effective January 1, 2019) to provide oversight of the site-specific incorporation of generic owner's groups SAMG guidance revisions.

Multiunit/Multisource Dose Assessments

In COMSECY-13-0010, "Schedule and Plans for Tier 2 Order on Emergency Preparedness for Japan Lessons Learned," dated March 27, 2013 (Reference 11.13), the NRC staff requested Commission approval to implement the NTTF recommendation concerning multiunit/multisource dose assessments by having licensees document their commitment to obtain multiunit/multisource dose assessment capability by the end of 2014, rather than by issuing an order. Multiunit dose assessment capabilities would be made generically applicable through subsequent rulemaking. The Commission approved the staff's requests in the SRM to COMSECY-13-0010, dated April 30, 2013 (Reference 11.14). The licensee commitments are documented in References 11.8 through 11.11.

The NRC staff included the multiunit/multisource dose assessment requirement in the proposed MBDBE rulemaking (Reference 11.1). However, in response to a public comment concerning the 10 CFR 50.109 backfitting justification for the proposed multiple source term dose assessment requirements, the NRC staff determined that this requirement did not meet the criteria for imposition under 10 CFR 50.109(a)(4)(ii). The NRC staff also concluded that this could not be justified as a compliance backfit or as a substantial safety improvement whose costs, both direct and indirect, would be justified considering the potential safety gain. Therefore, these requirements were removed from the draft final rule (Reference 1.13).

The licensee provided the requested information and stated that Diablo Canyon will have multiunit/multisource dose assessment capabilities (Reference 11.11) by December 31, 2014. The NRC acknowledged the licensee's submittal (Reference 11.12), verified the implementation of these dose assessment capabilities through inspection per TI 2515/191, and issued an inspection report (Reference 11.15).

CONCLUSION

The NRC staff concludes that Pacific Gas and Electric Company, the licensee, has implemented the NRC-mandated safety enhancements resulting from the lessons learned from the Fukushima Dai-ichi accident through its implementation of Orders EA-12-049 and EA-12-051 at Diablo Canyon. The staff further concludes that the licensee has completed its response to the 50.54(f) letter for Diablo Canyon. No further regulatory decisionmaking is required for Diablo Canyon related to the Fukushima lessons-learned.

A listing of the applicable correspondence related to the Fukushima lessons-learned activities for Diablo Canyon is included as an enclosure to this letter.

If you have any questions, please contact me at 301-415-2621 or by e-mail at Robert.Bernardo@nrc.gov.

Sincerely,

/RA/

Robert J. Bernardo, Project Manager
Integrated Program Management
and BDB Branch
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-275 and 50-323

Enclosure:
Documents Related to Required
Response

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Reference Documents Related to Required Response to the Lessons Learned from the Fukushima Dai-ichi Accident

TABLE 1
Initial Actions in Response to the Events in Japan Caused by the Great Tōhoku Earthquake and Subsequent Tsunami

Ref	Document	Date	ADAMS[2] Accession No.
1.1	NRC Information Notice 2011-05	March 18, 2011	ML110760432
1.2	NRC Follow-up to the Fukushima Dai-ichi Fuel Damage Event		
	Temporary Instruction (TI) 2515/183	March 23, 2011	ML11077A007
	NRC TI 2515/183 Inspection Report 2011-006	May 13, 2011	ML11133A310
	NRC Integrated Inspection Report 2011-003 (TI 2515/183 closeout)	August 10, 2011	ML112220428
	Summary of Observations – TI-183	November 28, 2011	ML11325A020
1.3	NRC Tasking Memorandum, Staff Requirements Memorandum (SRM) to COMGBJ-11-0002	March 23, 2011	ML110820875
1.4	NRC Availability and Readiness Inspection of SAMG		
	NRC Availability and Readiness Inspection of SAMG - TI 2515/184	April 29, 2011	ML11115A053
	NRC Integrated Inspection Report 2011-003 (TI 2515/184 inspection results)	August 10, 2011	ML112220428
	NRC TI 2515/184 Inspection Results, Region 4 Summary	May 26, 2011	ML111470264
	NRC Summary of TI 2515/184 Results	June 6, 2011	ML11154A109
1.5	NRC Bulletin 2011-01, “Mitigating Strategies”		
	NRC Bulletin 2011-01	May 11, 2011	ML111250360
	Licensee 30 day response to BL 2011-01	June 10, 2011	ML111640426
	Licensee 60 day response to BL 2011-01	July 11, 2011	ML111930165
	NRC Request for Additional Information (RAI) regarding Licensee 60 day response to BL 2011-01	November 28, 2011	ML113260090
	Licensee response to RAI	December 21, 2011	ML113570168
	NRC Closeout of BL 2011-01 for PG & E	June 18, 2012	ML12164A536
1.6	NRC NTTF Report (SECY-11-0093)	July 12, 2011	ML11186A950

[2] Agencywide Documents Access and Management System (ADAMS)

TABLE 1
Initial Actions in Response to the Events in Japan Caused by the Great Tōhoku Earthquake and Subsequent Tsunami

Ref	Document	Date	ADAMS[2] Accession No.
1.7	NRC SECY-11-0137, Prioritization of Recommended Actions to Be Taken in Response to Fukushima Lessons Learned		
	NRC SECY-11-0137	October 3, 2011	ML11272A111
	SRM-SECY-11-0137	December 15, 2011	ML113490055
1.8	NRC Order EA-12-049	March 12, 2012	ML12054A735
1.9	NRC Order EA-12-050	March 12, 2012	ML12054A694
1.10	NRC Order EA-12-051	March 12, 2012	ML12054A679
1.11	NRC Request for Information Under 10 CFR 50.54(f) (the 50.54(f) letter)	March 12, 2012	ML12053A340
1.12	NRC Order EA-13-109	June 6, 2013	ML13143A321
1.13	NRC SECY-16-0142, "Draft Final Rule: Mitigation of Beyond-Design-Basis Events"	December 15, 2016	ML16301A005
1.14	SRM-M190124A: Affirmation Session-SECY-16-0142: Final Rule: Mitigation of Beyond-Design-Basis Events (RIN 3150-AJ49) - Package	January 24, 2019	ML19023A038
1.15	Final Rule: Mitigation of Beyond-Design-Basis Events (Package)	August 9, 2019	ML19058A006
1.16	Regulatory Guide 1.226, Revision 0, Flexible Mitigation Strategies for Beyond-Design-Basis Events	June 30, 2019	ML19058A012
1.17	Regulatory Guide 1.227, Revision 0, Wide Range Spent Fuel Pool Level Instrumentation	June 30, 2019	ML19058A013
1.18	NRC Staff Preliminary Process for Treatment of Reevaluated Seismic and Flooding Hazard Information in Backfit Determinations	February 14, 2019	ML19037A443
1.19	Category 3 Public Meeting to Discuss Staff's Preliminary Process for Treatment of Reevaluated Seismic and Flooding Hazard Information in Backfit Determinations	February 14, 2019	ML19052A511

TABLE 2 Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events – EA-12-049			
Ref	Document	Date	ADAMS Accession No.
2.1	Guidance for Compliance with EA-12-049 - Diverse and Flexible Coping Strategies (FLEX)		
	Industry Guidance on Diverse and Flexible Coping Strategies (FLEX) NEI 12-06, Revision 0	August 21, 2012	ML12242A378
	NRC endorsement of NEI 12-06, Revision 0 - JLD-ISG-2012-01, Revision 0	August 29, 2012	ML12229A174
	Industry Guidance on Diverse and Flexible Coping Strategies (FLEX) NEI 12-06, Revision 2	December 2015	ML16005A625
	NRC endorsement of NEI 12-06, Revision 2 - JLD-ISG-2012-01, Revision 1	January 22, 2016	ML15357A163
2.2	Licensee Overall Integrated Plan (OIP)		
	Licensee OIP submittal	February 27, 2013	ML13059A501
	OIP 1st six month status report	August 22, 2013	ML13235A097
	OIP 2nd six month status report	February 26, 2014	ML14058A221
	OIP 3rd six month status report	August 21, 2014	ML14233A636
	OIP 4th six month status report	February 23, 2015	ML15054A628
	OIP 5th six month status report	August 26, 2015	ML15238B884
	OIP 6th six month status report	February 29, 2016	ML16060A510
2.3	NRC Interim Staff Evaluation of OIP	February 3, 2014	ML13364A192
2.4	NRC audit of EA-12-049 OIP		
	NRC Notification of Audit of EA-12-049	August 28, 2013	ML13234A503
	NRC Site-Specific Audit Plan	July 20, 2015	ML15189A338
	NRC Audit Report	October 30, 2015	ML15289A370
2.5	Licensee Compliance Letter for EA-12-049 and Final Integrated Plan (FIP)		
	Licensee Compliance Letter for Unit 1	January 5, 2016	ML16005A638
	Licensee Compliance Letter for Unit 2 and FIP for Units 1 and 2	July 28, 2016	ML16221A390
2.6	NRC Safety Evaluation of Implementation of EA-12-049	December 28, 2016	ML16349A386
2.7	NRC Inspection of Licensee Responses to EA-12-049, EA-12-051, and Emergency Preparedness Information		
	NRC TI 2515/191	December 23, 2015	ML15257A188
	NRC TI 2515/191 Inspection Report 2017-007	January 24, 2018	ML18025A000
2.8	Industry White Paper – National SAFER Response Centers (NSRC)	September 11, 2014	ML14259A221
2.9	NRC Staff Assessment of NSRCs	September 26, 2014	ML14265A107

TABLE 2 Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events – EA-12-049			
Ref	Document	Date	ADAMS Accession No.
2.10	NRC Inspection of Implementation of EA-12-049 Regarding the use of NSRC		
	NRC Inspection Procedure (IP) 43006	September 30, 2016	ML16273A318
	NRC Vendor Inspection of the Phoenix NSRC Report No. 99901013/2016-201	January 12, 2017	ML17012A186
	NRC Vendor Inspection of the Memphis NSRC Report No. 99901013/2017-201	May 5, 2017	ML17117A576
2.11	Addenda I and II to industry NSRC white paper	May 24, 2018	ML18150A658
2.12	NRC Updated Staff Assessment of NSRCs	September 20, 2018	ML18157A014

TABLE 3 Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation – EA-12-051			
Ref	Document	Date	ADAMS Accession No.
3.1	Guidance for Compliance with EA-12-051 – Spent Fuel Pool Instrumentation (SFPI)		
	Industry Guidance for Compliance with EA-12-051 – NEI 12-02, Revision 1	August 2012	ML12240A307
	NRC endorsement of NEI 12-02, Revision 1 - JLD-ISG-2012-03, Revision 0	August 29, 2012	ML12221A339
3.2	Licensee Overall Integrated Plan (OIP)		
	Licensee OIP	February 27, 2013	ML13059A500
	NRC RAI	July 3, 2013	ML13178A364
	Licensee response to RAI	July 18, 2013	ML13200A123
	OIP 1st six month status report	August 22, 2013	ML13235A103
	OIP 2nd six month status report	February 26, 2014	ML14058A222
	OIP 3rd six month status report	August 21, 2014	ML14233A637
	OIP 4th six month status report	February 23, 2015	ML15054A642
	OIP 5th six month status report	August 26, 2015	ML15238B883
3.3	NRC Interim Staff Evaluation (ISE) of OIP		
	NRC ISE and RAI	November 25, 2013	ML13311B362
	Licensee response to RAI	February 26, 2014	ML14058A222
3.4	NRC Audit of EA-12-051		
	NRC Notification of Audit of EA-12-051	March 26, 2014	ML14083A620
	NRC Audit Report of Westinghouse SFPI design specifications	August 18, 2014	ML14211A346
	NRC Site-Specific Audit Plan	July 20, 2015	ML15189A338
	NRC Audit Report	October 30, 2015	ML15289A370
3.5	Licensee Compliance Letter for EA-12-051	January 5, 2016	ML16005A637
3.6	NRC Safety Evaluation of Implementation of EA-12-051	December 28, 2016	ML16349A386
3.7	NRC Inspection of Licensee Responses to EA-12-049, EA-12-051, and Emergency Preparedness Information		
	NRC TI 2515/191	December 23, 2015	ML15257A188
	NRC TI 2515/191 Inspection Report 2017-007	January 24, 2018	ML18025A000

Note: Table 4 relates to the Hardened Containment Vent System and is not applicable to Diablo Canyon

TABLE 5
Request for Information under Title 10 of the *Code of Federal Regulations*, Section 50.54(f), Enclosure 1: Recommendation 2.1 Seismic Hazard Reevaluation

Ref	Document	Date	ADAMS Accession No.
Guidance Documents			
5.1	Screening, Prioritization and Implementation Details (SPID)		
	Industry Guidance (SPID) – EPRI 1025287	November 2012	ML12333A170
	NRC letter endorsing SPID	February 15, 2013	ML12319A074
5.2	NRC guidance for performing a Seismic Margin Assessment (SMA) – JLD-ISG-2012-04	November 16, 2012	ML12286A029
5.3	Expedited Seismic Evaluation Process (ESEP)		
	Industry Letter – Proposed path forward for NTTF Recommendation 2.1: Seismic	April 9, 2013	ML13101A345
	Industry Guidance – Expedited Seismic Evaluation Process (ESEP) - EPRI 3002000704	April 2013	ML13102A142
	NRC letter endorsing the ESEP approach. Extension of ESEP due date to 3/31/14 for Central and Eastern U.S. (CEUS) sites	May 7, 2013	ML13106A331
5.4	Industry letter on relay chatter review	October 3, 2013	ML13281A308
5.5	NRC letter with guidance on the content of seismic reevaluation submittals (includes operability and reportability discussions)	February 20, 2014	ML14030A046
5.6	Industry letter on seismic risk evaluations for CEUS plants – Not Applicable	March 12, 2014	ML14083A596
5.7	NRC background paper - Probabilistic seismic hazard analysis	May 20, 2014	ML14140A648
Seismic Hazard Screening Report			
5.8	Licensee SHSR and licensee responses to RAIs		
	Licensee SHSR	March 11, 2015	ML15071A046
	Response to RAIs dated 6/29/2015	August 12, 2015	ML15224B575
	Response to RAIs dated 8/27/2015	September 16, 2015	ML15259A600
	Response to RAIs dated 10/1/2015 and 11/13/2015	December 21, 2015	ML15362A569
5.9	NRC Staff Assessment of Reevaluated Seismic Hazard Information and NRC RAIs	December 21, 2016	ML16341C057
	NRC RAIs	June 29, 2015	ML15153A033
	NRC RAIs	August 27, 2015	ML15238B774
	NRC RAIs	October 1, 2015	ML15267A774
	NRC RAIs	November 13, 2015	ML15323A200
	NRC staff assessment of SHSR	December 21, 2016	ML16341C057
Screening and Prioritization Results			
5.10	NRC Letter - Seismic screening and prioritization results for WUS plants	May 13, 2015	ML15113B344
5.11	NRC Letter – Updated seismic screening and prioritization results – Not Applicable	October 3, 2014	ML14258A043

TABLE 5
Request for Information under Title 10 of the *Code of Federal Regulations*, Section 50.54(f), Enclosure 1: Recommendation 2.1 Seismic Hazard Reevaluation

Ref	Document	Date	ADAMS Accession No.
5.12	NRC letter regarding development of Seismic Risk Evaluations – suitability of updated seismic hazard information for assessments	December 10, 2014	ML14307B707
5.13	ESEP Submittal and Evaluation – Not Required. NRC response states that the LTSP is an acceptable alternative to ESEP	July 14, 2015	ML15173A428
Additional Guidance Documents			
5.14	High Frequency (HF) Application Guidance		
	Industry HF Application Guidance - EPRI 3002004396	July 30, 2015	ML15223A095
	NRC letter endorsing HF Application Guidance	September 17, 2015	ML15218A569
5.15	Spent Fuel Pool Evaluation Guidance		
	Industry SFP evaluation guidance – EPRI 3002007148	February 23, 2016	ML16055A017
	NRC letter endorsing SFP evaluation guidance	March 17, 2016	ML15350A158
5.16	NRC Letter - Treatment of Seismic and Flooding Hazard Reevaluations in the Design and Licensing Basis	September 29, 2015	ML15127A401
5.17	NRC Guidance for Regulatory Decisionmaking of seismic hazards	September 21, 2016	ML16237A103
Final Determinations of Required Seismic Evaluations			
5.18	NRC Final Determination of Required Seismic Evaluations	October 27, 2015	ML15194A015
5.19	Licensee Required Seismic Evaluation Submittals		
	Spent Fuel Pool Evaluation	December 18, 2017	ML17352A703
	Seismic Probabilistic Risk Assessment	April 24, 2018	ML18120A201
5.20	Audit plan of seismic evaluations submittals	July 6, 2017	ML17177A446
5.21	NRC Staff Assessment of Seismic Evaluations		
	Spent Fuel Pool Evaluation	August 8, 2018	ML18211A322
	SPRA Response Letter	January 22, 2019	ML18254A040
5.22	NRC Treatment of Reevaluated Seismic Hazard Information (seismic binning letter)	July 3, 2019	ML19140A307
NA	NRC approval of relaxation of SPRA due date from September 2017 to April 2018	October 23, 2017	ML17269A177

TABLE 6
Request for Information under Title 10 of the *Code of Federal Regulations*, Section 50.54(f), Enclosure 2: Recommendation 2.1 Flooding Hazard Reevaluation

Ref	Document	Date	ADAMS Accession No.
Initial Guidance Documents			
6.1	NRC prioritization of plants for completing flood hazard reevaluations	May 11, 2012	ML12097A509
6.2	NRC-issued guidance for performing an integrated assessment for external flooding (JLD-ISG-2012-05)	November 30, 2012	ML12311A214
6.3	NRC letter to industry describing when an integrated assessment is expected	December 3, 2012	ML12326A912
6.4	NRC-issued guidance for performing a tsunami, surge, or seiche hazard assessment (JLD-ISG-2012-06)	January 4, 2013	ML12314A412
6.5	NRC letter to industry with guidance on the content of flooding reevaluation submittals	March 1, 2013	ML13044A561
6.6	NRC-issued guidance for assessing flooding hazards due to dam failure (JLD-ISG-2013-01)	July 29, 2013	ML13151A153
Flood Hazard Reevaluation Report			
6.7	Licensee FHRR Submittal		
	FHRR Submittal	March 11, 2015	ML15071A045
	FHRR Revised Response	February 8, 2016	ML16040A009
6.8	FHRR Regulatory Audit		
	NRC FHRR Site-Specific Audit Plan	June 10, 2015	ML15148A207
	NRC FHRR Audit Report	December 1, 2016	ML16176A058
6.9	NRC Inspection of licensee interim actions (if applicable)		
	NRC TI 2515/190, Revision 1, Inspection of proposed interim actions as a result of FHRR	September 4, 2015	ML15176A790
	NRC TI 2515/190 inspection report 2015-003	November 13, 2015	ML15317A216
6.10	NRC Interim Staff Response to Reevaluated Flood Hazards	March 30, 2016	ML16083A552
6.11	NRC Staff Assessment of FHRR	December 18, 2017	ML17024A207
Modified Approach to Flood Hazard Reevaluations			
6.12	NRC extension of due dates for Integrated Assessment reports	November 21, 2014	ML14303A465
6.13	NRC COMSECY-14-0037, “Integration of Mitigating Strategies for Beyond-Design-Basis External Events and the Reevaluation of Flooding Hazards”	November 21, 2014	ML14309A256
6.14	NRC SRM for COMSECY-14-0037	March 30, 2015	ML15089A236
6.15	NRC letter on second extension of due date for flooding integrated assessment reports	May 26, 2015	ML15112A051
6.16	NRC COMSECY-15-0019 “Closure Plan for the Reevaluation of Flooding Hazards”	June 30, 2015	ML15153A104
6.17	NRC SRM-COMSECY-15-0019	July 28, 2015	ML15209A682

TABLE 6
Request for Information under Title 10 of the *Code of Federal Regulations*, Section 50.54(f), Enclosure 2: Recommendation 2.1 Flooding Hazard Reevaluation

Ref	Document	Date	ADAMS Accession No.
6.18	NRC letter describing the graded approach to flood hazard reevaluation directed by SRM-COMSECY-14-0037	September 1, 2015	ML15174A257
6.19	Flooding Assessment Guidance		
	NEI 16-05, "External Flooding Assessment Guidelines"	June 2016	ML16165A178
	NRC endorsement of NEI 16-05 - JLD-ISG-2016-01	July 11, 2016	ML16162A301
6.20	Licensee Focused Evaluation	July 19, 2017	ML17200D161
6.21	NRC Staff Assessment of Focused Evaluation	December 18, 2017	ML17328A249
6.22	NRC Generic FE and IA Regulatory Audit Plan	July 18, 2017	ML17192A452
6.23	NRC Letter - Treatment of Seismic and Flooding Hazard Reevaluations in the Design and Licensing Basis	September 29, 2015	ML15127A401
6.24	NRC Guidance for Regulatory Decisionmaking of reevaluated flooding and seismic hazards	September 21, 2016	ML16237A103
6.25	NRC Treatment of Reevaluated Flooding Hazard Information (flooding binning letter)	August 20, 2019	ML19067A247

TABLE 7 Mitigating Strategies Assessments (MSA)			
Ref	Document	Date	ADAMS Accession No.
7.1	NRC COMSECY-14-0037, Integration of Mitigating Strategies with Hazard Reevaluations	November 21, 2014	ML14309A256
7.2	NRC SRM-COMSECY-14-0037	March 30, 2015	ML15089A236
7.3	NRC COMSECY-15-0019, Closure Plan for Flooding Hazard Reevaluations	June 30, 2015	ML15153A104
7.4	NRC SRM-COMSECY-15-0019	July 28, 2015	ML15209A682
7.5	Process for Mitigating Strategies Assessments (MSA)		
	Industry Guidance for performing MSAs - NEI 12-06, Revision 2, including Appendices E, G, & H	December 2015	ML16005A625
	NRC endorsement of NEI 12-06, Revision 2 - JLD-ISG-2012-01, Revision 1	January 22, 2016	ML15357A163
	Industry Guidance for performing MSAs - NEI 12-06, Revision 4	December 12, 2016	ML16354B416
	NRC endorsement of NEI 12-06, Revision 2 - JLD-ISG-2012-01, Revision 1	February 8, 2017	ML17005A182
7.6	Licensee’s MSA submittal - Flooding	April 6, 2017	ML17096A766
7.7	NRC Staff Assessment of MSA - Flooding	December 18, 2017	ML17321B040
7.8	Licensee’s MSA submittal – Seismic	April 24, 2018	ML18120A119
7.9	NRC Staff Assessment of MSA - Seismic	Not Required	Not Required
7.10	NRC MSA Audit Plan	December 5, 2016	ML16259A189

TABLE 8
Request for Information under Title 10 of the *Code of Federal Regulations*, Section 50.54(f), Enclosure 3: Recommendation 2.3 Seismic Walkdown

Ref	Document	Date	ADAMS Accession No.
8.1	Industry Seismic Walkdown Guidance with NRC endorsement letter - EPRI 1025286	May 31, 2012	ML12188A031
8.2	NRC letter endorsing EPRI 1025286	May 31, 2012	ML12145A529
8.3	Licensee Seismic Hazard Walkdown Report		
	Licensee Seismic Hazard Walkdown Report Package, Unit 1	November 27, 2012	ML123330362
	Licensee Seismic Hazard Walkdown Report Package, Unit 2	November 27, 2012	ML123330375
	Licensee response to NRC RAIs	December 2, 2013	ML13337A449
8.4	NRC Inspection of Seismic Walkdowns		
	NRC TI 2515/188	July 6, 2012	ML12156A052
	NRC Integrated Inspection Report 2013-003 (TI 2515/188 inspection results)	August 12, 2013	ML13224A314
8.5	Licensee subsequent seismic walkdown report		
	NRC RAI	November 1, 2013	ML13304B418
	Subsequent walkdown report, Unit 1	May 8, 2014	ML14129A001
	Subsequent walkdown report, Unit 2	May 22, 2013	ML13143A168
8.6	NRC Staff Assessment of Seismic Walkdown Report		
	NRC RAI	November 1, 2013	ML13304B418
	NRC Staff Assessment (includes subsequent walkdown items for Unit 2)	March 14, 2014	ML14070A050
8.7	NRC review of seismic subsequent walkdown report for Unit 1	September 25, 2015	ML15268A477

TABLE 9
Request for Information under Title 10 of the *Code of Federal Regulations*, Section 50.54(f), Enclosure 4: Recommendation 2.3 Flooding Walkdown

Ref	Document	Date	ADAMS Accession No.
9.1	Industry Flooding Walkdown Guidance - NEI 12-07	May 31, 2012	ML12173A215
9.2	NRC letter endorsing NEI 12-07	May 31, 2012	ML12144A142
9.3	Licensee Flooding Hazard Walkdown Report		
	Flooding Hazard Walkdown Report	November 27, 2012	ML12333A145
	Update to Flooding Hazard Walkdown Report – APM Assessment	January 29, 2014	ML14029A702
9.4	NRC Inspection of Flooding Walkdowns		
	NRC TI 2515/187	June 27, 2012	ML12129A108
	NRC Integrated Inspection Report 2013-003 (TI 2515/187 inspection results)	August 12, 2013	ML13224A314
9.5	NRC Staff Assessment of Flooding Walkdown Report	June 23, 2014	ML14136A194

TABLE 10
Request for Information under Title 10 of the *Code of Federal Regulations*, Section 50.54(f), Enclosure 5: Recommendation 9.3 Emergency Preparedness Communications and Staffing

Ref	Document	Date	ADAMS Accession No.
10.1	Guidance Documents		
	Industry Guidance for Emergency Preparedness staffing and communications - NEI 12-01	May 2012	ML12125A412
	NRC letter endorsing NEI 12-01	May 15, 2012	ML12131A043
10.2	PG&E 60 day response and proposed alternative course of action	May 9, 2012	ML12131A410
10.3	PG&E 90 day response to communications and staffing information requests	June 7, 2012	ML12160A298
10.4	NRC letter – status of 90-day response	July 26, 2012	ML12200A106
10.5	Licensee communications assessment		
	Licensee communications assessment	October 29, 2012	ML12305A427
	NRC letter on generic technical issues	January 23, 2013	ML13010A162
	Licensee communications assessment supplement	February 21, 2013	ML13053A203
10.6	NRC staff assessment of licensee's communications assessment	June 6, 2013	ML13154A007
10.7	Licensee Phase 1 staffing assessment (multi-unit sites only)	April 24, 2013	ML13115A083
10.8	NRC response to licensee's Phase 1 staffing assessment	October 23, 2013	ML13233A183
10.9	Licensee Phase 2 staffing assessment submittal (Non-public)	May 27, 2015	ML15147A679
10.10	NRC Phase 2 staff assessment response	September 9, 2015	ML15231A322
10.11	NRC Inspection of Licensee Responses to EA-12-049, EA-12-051, and Emergency Preparedness Information		
	NRC TI 2515/191	December 23, 2015	ML15257A188
	NRC TI 2515/191 Inspection Report 2017-007	January 24, 2018	ML18025A000

TABLE 11 Additional Licensee Commitments – SAMGs and Multisource Dose Assessments			
Ref	Document	Date	ADAMS Accession No.
Update and Maintain SAMGs			
11.1	SECY-15-0065: Proposed Rulemaking: Mitigation of Beyond-Design-Basis Events (RIN 3150-AJ49)	April 30, 2015	ML15049A201
11.2	SRM-SECY-15-0065	August 27, 2015	ML15239A767
11.3	NEI Letter describing industry initiative to update and maintain SAMGs	October 26, 2015	ML15335A442
11.4	Site Commitment to Maintain SAMGs	December 28, 2015	ML15362A521
11.5	NRC letter to NEI describing approach to SAMG oversight	February 23, 2016	ML16032A029
11.6	NRC Inspection Procedure 71111.18, "Plant Modifications"		
	Revision effective January 1, 2017	November 17, 2016	ML16306A185
	Revision effective January 1, 2019	November 19, 2018	ML18176A157
11.7	NEI 14-01, "Emergency Response Procedures and Guidelines for Extreme Events and Severe Accidents, Rev. 1	February 2016	ML16224A619
Multisource Dose Assessments			
11.8	NEI Letter: Industry survey and plan for multiunit dose assessments	January 28, 2013	ML13028A200
11.9	NRC Letter to request additional information from NEI on multiunit dose assessment capability	February 27, 2013	ML13029A632
11.10	NEI Letter: Implementation of Multiunit Dose Assessment Capability	March 14, 2013	ML13073A522
11.11	Licensee Response Regarding the Capability to Perform Multisource Offsite Dose Assessment	June 26, 2013	ML13178A027
11.12	NRC Acknowledgement of Licensee Dose Assessment Submittals	January 29, 2014	ML13233A205
11.13	COMSECY-13-0010	March 27, 2013	ML12339A262
11.14	SRM-COMSECY-13-0010	April 30, 2013	ML13120A339
11.15	NRC Inspection of Licensee Responses to EA-12-049, EA-12-051, and Emergency Preparedness Information		
	NRC TI 2515/191	December 23, 2015	ML15257A188
	NRC TI 2515/191 Inspection Report 2017-007	January 24, 2018	ML18025A000
11.16	NEI 13-06, "Enhancements to Emergency Reponses Capabilities for Beyond Design Basis Accidents and Events, Rev. 1	February 2016	ML16224A618

TABLE 12
NRC Semi-Annual Status Reports to the Commission

Ref	Document	Date	ADAMS Accession No.
12.1	SECY-12-0025, Enclosure 8, “Proposed Orders and Requests for Information in Response to Lessons Learned from Japan’s March 11, 2011, Great Tōhoku Earthquake and Tsunami”	February 17, 2012	ML12039A103
12.2	SECY-12-0095 - Enclosure 1: Six-Month Status Update on Charter Activities - February 2012 - July 2012	July 13, 2012	ML12165A092
12.3	SECY-13-0020 - Third 6-Month Status Update on Response to Lessons Learned from Japan's March 11, 2011, Great Tōhoku Earthquake and Subsequent Tsunami	February 14, 2013	ML13031A512
12.4	SECY-13-0095 - Fourth 6-Month Status Update on Response to Lessons Learned from Japan's March 11, 2011, Great Tōhoku Earthquake and Subsequent Tsunami	September 6, 2013	ML13213A304
12.5	SECY-14-0046 - Fifth 6-Month Status Update on Response to Lessons Learned from Japan's March 11, 2011, Great Tōhoku Earthquake and Subsequent Tsunami	April 17, 2014	ML14064A520
12.6	SECY-14-0114 - Sixth 6-Month Status Update on Response to Lessons Learned from Japan's March 11, 2011, Great Tōhoku Earthquake and Subsequent Tsunami	October 21, 2014	ML14234A498
12.7	SECY-15-0059 - Seventh 6-Month Status Update on Response to Lessons Learned from Japan's March 11, 2011, Great Tōhoku Earthquake and Subsequent Tsunami	April 9, 2015	ML15069A444
12.8	SECY-15-0128: Eighth 6-Month Status Update on Response to Lessons Learned from Japan's March 11, 2011, Great Tōhoku Earthquake and Subsequent Tsunami	October 14, 2015	ML15245A473
12.9	SECY-16-0043: Ninth 6 Month Status Update on Response to Lessons Learned from Japan's March 11, 2011, Great Tōhoku Earthquake and Subsequent Tsunami	April 5, 2016	ML16054A255
12.10	SECY-17-0016: Status of Implementation of Lessons Learned from Japan's March 11, 2011, Great Tōhoku Earthquake and Subsequent Tsunami	January 30, 2017	ML16356A084

SUBJECT: DIABLO CANYON POWER PLANT, UNIT NOS. 1 AND 2 – DOCUMENTATION OF THE COMPLETION OF REQUIRED ACTIONS TAKEN IN RESPONSE TO THE LESSONS LEARNED FROM THE FUKUSHIMA DAI-ICHI ACCIDENT DATED MAY 8, 2020

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DATE	04/01/2020	04/03/2020	05/05/2020	05/08/2020

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SIERRA CLUB
SANTA LUCIA

SURFRIDER FOUNDATION
SAN LUIS OBISPO CHAPTER

12/6/21

County of San Luis Obispo Planning & Building, Room 300
Attention: S. Strachan
976 Osos Street
San Luis Obispo, CA 93408

Re: Notice of Preparation for the preparation of an Environmental Impact Report for the DCPP Decommissioning Project.

Dear Ms. Strachan,

The Sierra Club is the nation's oldest and largest grassroots environmental organization. The Santa Lucia Chapter represents the more than 2,000 members of the Sierra Club in San Luis Obispo County. Surfrider is a non-profit organization that works to protect our ocean, waves, and beaches for the enjoyment of all people through a powerful community-based network. We request that all scoping comments received on this project be forwarded to California Coastal Commission staff. According to the timeline presented by PG&E at the November DCEP meeting, the applicant intends to pursue a CDP concurrently with the decommissioning application to the County, and the CCC has jurisdiction under Coastal Act Section 30601.

Once Through Cooling (OTC) will be used to cool the SFP until the material is transferred to casks for storage.[i] It is not defined in the Project Description whether OTC will end by 2031 or in Phase 2, projected to end in 2039.[ii] Phase 1 is covered and mitigated under a project EIR; phase 2 is planned as a programmatic EIR with mitigation deferred until implementation in Phase 2. In either case, a waiver or new permit will need to be issued for OTC during Phase 1. Operation of OTC beyond the current permit, while necessary for the project, will require substantial mitigation. Mitigation measures must be imposed in the Phase 1 CDP process.

The EIR should review the permits and Conditions of Approval for DCPP received from the CCC to ensure that all Conditions of Approval (COAs) associated with the permits were fulfilled, including outstanding issues regarding conservation and trail COAs and terms of the permitting, e.g., ISFSI storage.[iii] While the ISFSI installation is a baseline condition, the permitting condition of approval was for temporary storage, hence the baseline condition is also perceived to be temporary. All indicators re-enforce the reality that on-site spent fuel storage will be permanent, and permanent storage violates the language and conditions of the original permit.

The ISFSI facility will experience a "**change in intensity of use** . . .." pursuant to Pub Res Code 30106, thereby triggering the CDP requirement. In addition, Special Condition 2 of the 2004 ISFSI permit uses an even lower standard for requiring a new or amended permit when "**changes not described in permit**

submittals" occur. The following changes, both separately and in aggregate, meet both standards for requiring a new/amended CDP for the ISFSI:

1. An increase in the term of expected use of the ISFSI from interim to indefinite and probably permanent.
2. Demolition of the rest of the facility that generated the waste, which turns the ISFSI into a stand-alone facility with no necessity to be on its current site.
3. Reduction of the security buffer zone from 12,000 acres to less than 100 acres, which would require significant new security structures and procedures.
4. Commencement of commercial activities immediately outside of the new 100-acre facility, which will have employees without security clearances, also increasing security risks.
5. An increase from 58 SNF storage cannisters to 138, which will max out and overcrowd the ISFSI, increasing various risks.
6. A new generation of dry storage casks to be stored in the ISFSI are designed to withstand higher heat levels, which increases risks. The current ISFSI permit is based on the existing casks. A new permit is necessary to determine if the existing ISFSI is adequate for storage of the new casks.

The entire decommissioning is dependent on the ISFSI becoming the permanent onsite storage facility. Although it requires a separate permit, that permit should be considered either before or concurrently with the decommissioning. The fuel stored in the ISFSI will increase by 200% and an entirely new GTCC waste facility will be built to store radioactive equipment waste. The two facilities must be permitted for these future uses prior to the demolition, or there will be no place to put this waste. The Coastal Act requires submittal of related permits simultaneously.

PG&E plans to develop and install an SFPI, which is an independent cooling system for the Spent Fuel Pools that enables abandonment of the in-place plant systems supporting SFP cooling. A new separate permit should be required for the SFPI.

Given the need for ongoing monitoring of both the ISFSI and the GTCC Waste Storage Facility, an inspection, monitoring and reporting program similar to the one required for the SONGs decommissioning is appropriate. These requirements are found in Coastal Commission permit 9-19-0194, Special Condition 3.3 Annual Reports, and Special Condition 7 Spill Prevention Control and Countermeasure Plan for the SONGS decommissioning. The County (for the GTCCWSF) and the CCC (for the ISFSI) should have the power to require inspection, maintenance, and annual reports. The Executive Director of the CCC and an appropriate officer of the County should have the power to require new or amended permits based on such reports.

The decommissioning process will require the permitting of a permanent storage facility on-site for GTCC waste material in appropriate casks.[iv] The DC ISFSI site-specific license SNM-2511 does not include GTCC waste material as part of the allowed contents of the DC ISFSI. Permanent storage of this highly radioactive material requires appropriate mitigation:

> "Currently, there is no offsite facility licensed for disposal of GTCC waste, nor are there any federal disposal facilities licensed to receive GTCC waste. Therefore, all GTCC waste must be packaged and stored at the site at which the waste was generated." However, the DC ISFSI site-specific license SNM-2511 does not include GTCC waste material as part of the allowed contents of the DC ISFSI[v]."

New industrial facilities are generally not permitted under the same permit as a demolition permit. In addition, the NRC requires a site-specific waste handling permit for the GTCC facility. The ISFSI has its own separate permit; the GTCC waste facility should as well. Although the GTCC facility is not in the Coastal Zone, the County should follow the precedent established by the CCC of providing perpetual conservation and coastal access easements as mitigation for Diablo permits. The Project Description is clear that there are significant risks attendant to permanent or very long-term storage of highly radioactive material on site. These kinds of storage will require significant commensurate mitigation measures. We do not see a means for proper mitigation for such long-term impacts within Parcel P A requirement for offsite mitigation in the form of permanent and irrevocable conservation easements on the surrounding lands is appropriate.

We note:

> Some segmentation waste may require onsite storage prior to disposal due to either activity levels or unexpected delays in transportation logistics. The materials classified as GTCC waste, will be loaded into storage containers and casks and transferred to the GTCC Waste Storage Facility for storage, remaining there until a licensed repository becomes available, another entity takes possession, or the U.S. Department of Energy (DOE) accepts the containers for offsite disposal. The remaining waste packages that may require on-site storage, including Class A, B and C waste, may also be placed for storage at the existing Old Steam Generator Storage Facility (OSGSF) or another existing onsite location. Storage would be for varying durations until such time that delays encountered during the transportation cycle have been resolved or radioactivity levels of the waste have been reduced to an acceptable level for offsite transport[vi].

We do not see a means for proper mitigation for the long-term impacts as described above within Parcel P. A requirement for offsite mitigation in the form of permanent and irrevocable conservation and access easements of North Ranch, Wild Cherry Canyon, and South Ranch are the only appropriate mitigation measures available. The Pecho Coast Trail should be extended along the coastal bluffs in South Ranch, Parcel P, and North Ranch to connect to the Pt. Buchon Trail. This will complete an essential link in the California Coastal Trail.

The Project Description anticipates that the County will be issuing certain ministerial permits, including grading permits, building permits, and demolition permits. The EIR should review impacts related to ministerial permits and mitigate possible impacts. Potential ministerial permits should be listed in the EIR for public review.

The EIR should review the impacts of these two project goals listed in 1.6. Project Objectives:

- retain existing energy-infrastructure (e.g., switchyards, transmission lines, etc.) to meet customer needs;
- create marine/harbor opportunities while protecting ecological resources through repurposing of the breakwater, Intake Structure, and associated harbor area.

Demolition projects unavoidably create impacts to air quality. While rigorous controls will be in place during the decommissioning including consultation with SLOAPCD tracking airborne asbestos, and other pollutants, the decommissioning of DCPP is a special circumstance with a potential for release of radiological particles. Several real time monitoring stations should be installed on site to detect airborne radiological particles. The data from the monitoring stations should be available for public review in real time. We have not seen any reference to monitoring radioactive particles[vii].

Section 2.3.3 Site Infrastructure Modifications lists several components deemed necessary for the decommissioning project. These modifications should be reviewed for impacts and possible redesign to alleviate negative impacts. We are particularly concerned about mitigating the impacts generated by new Concrete Batch Plants. There is extensive literature on the toxicity and environmental impacts of concrete operations, materials, and handling of concrete wash water from ready mix operations.

Stockpile areas should be reviewed and carefully sited, with particular attention paid to retaining any runoff from the stockpiled material in a rain event. Construction debris and contaminated soils could remain on site longer than anticipated if no depository is available. Soils and groundwater near stockpiles be monitored for migration of toxins from the piles.

Special review should be given to the engineering plan for the cofferdam and the restoration of the discharge structure area after demolition. Placement of riprap at the site has the potential for erosion of surrounding native cliff areas[viii].

The Project Description lists numerous facilities that are anticipated to be recipients of waste generated by the decommissioning process, and the anticipated impacts from truck trips etc. The EIR should consider the impacts of using alternatives sites if those sites listed will not be available to receive the waste, and the impacts if the waste should have to be stored for longer periods on site[ix].

Frequent rigorous monitoring and testing of fill materials engineered from crushed clean concrete and soils that will be used on site should be required.

The dismantling and segmentation of the most radioactive components of the facility will be done under water. We could not find a reference to how that water will be disposed of. Please include more information on this type of waste water disposal[x].

Is the groundwater aquifer capable of producing 95 ac/y (26 million gallons) when the decommissioning is at peak water use in 2032 and beyond? If necessary, the EIR should include an analysis of where additional imported water will come from. The Project Description identifies various toxins present in the groundwater. We request that the EIR analyze what effect the groundwater pumping might have on the quality of the groundwater when decommission and restoration are complete[xi].

Thank you for this opportunity to comment,

Sue Harvey, Conservation Chair
Sierra Club – Santa Lucia Chapter
P.O. Box 15755, San Luis Obispo, CA 93401
(805) 5343-8717

Jim Miers, Executive Committee
San Luis Obispo Chapter – Surfrider Foundation
PO Box 13222
San Luis Obispo, CA 93406-3222
slo@surfrider.org

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[i] 2.3.5.2.3.6. Spent Fuel Island Installation/Auxiliary Saltwater System
The current configuration for SFP cooling utilizes the original once-through-cooling auxiliary saltwater system, component cooling water system, and the SFP cooling system. The existing once-

through cooling- auxiliary saltwater cooling system will remain in place as the method for SFP cooling until all spent nuclear fuel is transferred to the ISFSI.
2.3.5.2.3.6. Spent Fuel Island Installation/Auxiliary Saltwater System
[ii] 1.3. Project Components **...** (2) Phase 2: Final Site Restoration (2035
2032 through 20422039) and Independent Spent Fuel Storage Installation (ISFSI) Only Operations. Phase 1 includes decontamination and dismantling of structures, systems, and components, transfer of spent fuel from the spent fuel pool (SFP) to the ISFSI, soil remediation associated with Phase 2 activities,
Phase 1 - Pre-Planning and Decommissioning Project Activities (20254-203531) Spent Fuel Transfer to DC ISFSI
[iii] 1.5.2.1. California Coastal Commission

- In 1983, the CCC approved CDP No. A-4-82-593 for the Trainer/Simulator Building at the DCPP.
- In 2004, the CCC approved CDP No. A-3-SLO-04-035 for the construction and operation in perpetuity of the ISFSI at the DCPP site.
- In 2006, the CCC approved CDP No. E-06-011 and A-3-SLO-06-017 for the Steam Generator Replacement Project.

[iv] 2.3.18.2.3.19. Spent Nuclear Fuel and Greater Than Class C/Low-Level Radioactive Waste Management/Storage Table 2.1-1. Decommissioning Project Activities Summary
[v] *ibid*
[vi] 2.3.11.2.3.12. Reactor Pressure Vessel and Internals Removal and Disposal
[vii] Table 1.8-1. Anticipated Approvals and Authorizations for DCPP Decommissioning
[viii] 2.3.16.2.3.17. Discharge Structure Restoration
[ix] Table 2.3.20-1. Waste Transportation Trips Per Period; Table 2.3.20-2. Waste Transportation Tons Per Period; 2.3.19.2.2.3.20.2. Disposal Sites

[x] 2.3.11.2.3.12. Reactor Pressure Vessel and Internals Removal and Disposal
[xi] 2.3.23.1.2.3.24.1. Groundwater Remediation

Susan Strachan, Nuclear Power Plant Decommissioning Manager
Planning Department, County of San Luis Obispo, California
976 Osos Street, Room 200
San Luis Obispo, CA 93408
Main Tel: (805) 781-5600 Fax: (805) 781-1242
Email: sstrachan@co.slo.ca.us and diablo@co.slo.ca.us

December 6, 2021

Subject: Collection of Articles Supporting CGNP's Advocacy for the "No Project Alternative" in ED2021-174 / DRC2021-00092

Hello, Ms Strachan:

Here is a Table of Contents for this collection of articles supporting the No Project Alternative for the Diablo Canyon Power Plant (DCPP) cessation of operations and decommissioning project. CGNP continues to observe that per CEQA, this Project as currently documented at the County of San Luis Obispo website is improperly scoped. The project artificially omits the most environmentally harmful step in the process, namely the cessation of operations of the pair of DCPP reactors in 2024 and 2025.

These documents are chronologically organized from newest to oldest. Many of the article titles are self-explanatory. Closing DCPP would prevent expansion of its existing desalination plant. Currently, DCPP uses 2 billion gallons of water per day in "once through cooling" to discharge the plant's waste heat into the largest heat sink on the planet, the Pacific Ocean. Research has established that DCPP's operational environmental impacts are negligible because the temperature change between the intake and outfall is only 10 degrees. The increased volume of reject brine with expanded desalination would be difficult to detect at the outfall. The barnacles and mussels that line the intake tunnels grow so vigorously that halfway through the refueling cycle, they must be scraped off while half of the tunnels are temporarily sequentially closed. These filter feeders account for a large fraction of the loss of tiny life forms that are entrained by the plant - comparable to the action of the barnacles and mussels on a few miles of California's rocky coastline. Please note the final document shows how in 2016, PG&E falsely inflated the post-2025 cost of DCPP's generation. The variance that DCPP has been operating under since it began operation in 1984 is consistent with federal 316(b) EPA regulations that take into account the environmental benefits of emission-free nuclear power relative to fossil-fired generation. 316(b) Compliance costs are to avoid being out of proportion to the environmental benefits they provide. CGNP will provide additional documentation supporting the properly-scoped No Project Alternative.

Sincerely, /s/ Gene Nelson, Ph.D. CGNP Legal Assistant
email: government@CGNP.org Phone: (805) 363 - 4697

THE TRIBUNE
Newspaper of the Central Coast

Diablo Canyon supporters rally in SLO to keep nuclear power plant open

(This article appeared in the Monday, December 6 2021 print edition of the SLO Tribune on page 5A)

https://www.sanluisobispo.com/news/local/environment/article256324382.html

A “Save Clean Energy” rally held on Saturday, Dec. 4, 2021, in San Luis Obispo called for keeping Diablo Canyon nuclear power plant open.

Group members walked a miniature blimp down Monterey Street. LAURA DICKINSON

More than 100 people gathered in downtown San Luis Obispo on Saturday to voice their support for keeping California’s last remaining nuclear power plant open.

Supporters held a “Save Clean Energy” rally in front of the San Luis Obispo County Government Center on Monterey Street at 11 a.m., shouting their support for keeping Diablo Canyon open.

Speakers included SLO County Supervisor Dawn Ortiz-Legg and Isabelle Boemeke, founder of the Save Clean Energy group.

At one point, participants paraded a miniature blimp down Monterey Street. It was designed to represent the one ton of carbon dioxide.

According to a flyer for the event, the Saturday rally was to express support for keeping open the state's "largest single producer of clean energy."

Stephen Williams of Santa Cruz sported a Diablo Canyon hat. A "Save Clean Energy" rally held on Saturday, Dec. 4, 2021, in San Luis Obispo called for keeping Diablo Canyon nuclear power plant open. Laura Dickinson LDICKINSON@THETRIBUNENEWS.COM

"We cannot afford to take a step backwards in our fight to save the planet," the flyer read. "Join us as we rally to save this essential source of zero-emissions energy." The nuclear power plant is set to shutter in 2025 when the final license for nuclear reactors expires.

The rally was being held in the wake of a new push to keep the plant open. A Stanford and Massachusetts Institute of Technology report released in November claimed keeping Diablo Canyon open for 10 years beyond its expected closure would drastically help the state meet its clean energy goals.

After the report was released, government officials — both local and national — have voiced support for keeping the plant open.

PG&E however, has repeatedly said it does not plan to reverse course on decommissioning the plant.

Isabelle Boemeke, founder of the Save Clean Energy group, spoke at a rally to keep Diablo Canyon nuclear power plant from closing, on Saturday, Dec. 4, 2021, in San Luis Obispo. Laura Dickinson

SLO County Supervisor Dawn Ortiz-Legg spoke at the "Save Clean Energy" rally held on Saturday, Dec. 4, 2021, in San Luis Obispo. It called for keeping Diablo Canyon nuclear power plant open. Laura Dickinson

Isabelle Boemeke is founder of the Save Clean Energy group that held a rally to keep Diablo Canyon from closing, on Saturday, Dec. 4, 2021, in San Luis Obispo. Laura Dickinson

A “Save Clean Energy” rally held on Saturday, Dec. 4, 2021, in San Luis Obispo called for keeping Diablo Canyon nuclear power plant open. Laura Dickinson LDICKINSON@THETRIBUNENEWS.COM

ENVIRONMENT Diablo Canyon is closing soon. Here’s why the Biden administration wants it open DECEMBER 02, 2021 3:26 PM

ENVIRONMENT Study says keeping Diablo Canyon open would help CA meet energy needs — but is it too late? NOVEMBER 11, 2021 1:32 PM

KAYTLYN LESLIE 805-781-7928 Kaytlyn Leslie writes about business and development for The San Luis Obispo Tribune. Hailing from Nipomo, she also covers city governments and happenings in the South County region, including Arroyo Grande, Pismo Beach and Grover Beach. She joined The Tribune in 2013 after graduating from Cal Poly with her journalism degree.

Gene Nelson, Ph.D. notes:

I would estimate there were closer to 200 people at the Rally for Clean Energy. I took many photos and videos.

The above article failed to mention the speaker whose speech brought several people, including Isabelle Boemeke, to tears. Her name is **Dr. Carolyn Porco.** Isabelle credits Dr. Porco for sparking her advocacy for nuclear power via her 2015 talk on molten salt reactors. More here: https://www.vice.com/en/article/y3gg3k/tiktok-influencer-isodope-is-stanning-for-nuclear-energy Dr. Porco noted in her December 4, 2021 remarks, "There is no Planet B" - a theme from her March 16, 2020 TED talk https://www.youtube.com/watch?v=dR9uhc_yQjQ

Here's her bio from **http://carolynporco.com/about/biography/**

Carolyn Porco Photo Credit: BENJO ARWAS/GETTY IMAGES

Carolyn Porco is the leader of the imaging science team on the **Cassini** mission in orbit around Saturn from 2004 to 2017, a veteran imaging scientist of the **Voyager** mission to the outer solar system in the 1980s, and an associate member of the **New Horizons** mission to Pluto and the Kuiper Belt. Carolyn has co-authored over 125 scientific papers on a variety of subjects in astronomy and planetary science and has become a regular public commentator on science, astronomy, planetary exploration, and the intersection of science and religion. Her popular science writings have appeared in such distinguished publications as the London Sunday Times, The New York Times, The Wall Street Journal, the Guardian, Astronomy magazine, the PBS and BBC websites, the Arizona Daily Star, Sky and Telescope, Scientific American, and American Scientist.

Carolyn's research over the past 40 years has ranged across the outer solar system to the interstellar medium. Before Cassini's arrival at Saturn in 2004, her research focused on the planetary rings encircling the giant planets and the interactions between rings and orbiting moons. In particular, she was responsible for the discovery of one of the Neptune ring arcs; for elucidating the behavior of the non-axisymmetric rings and ring edges in the rings of Saturn, Uranus and Neptune; and working with Mark Marley (now at NASA Ames Research Center) in predicting in 1993 that acoustic occultation within the body of Saturn could produce specific wave features in Saturn's rings. This prediction was verified 20 years later using Cassini occultation observations, resulting in the first demonstration that planetary rings could serve as a seismograph and ultimately provide the means to improve knowledge of a planet's internal structure.

Carolyn has also been responsible for leading the Cassini imaging team in a host of seminal discoveries on Jupiter and its ring during Cassini's flyby of that planet in 2000/2001, and on Saturn and its rings and moons since the spacecraft's arrival there in 2004.

For the past decade, Carolyn has turned her attention primarily to the study of **Enceladus**, the small Saturnian moon whose south polar region was found, in images taken by her Cassini team, to be the site of over 100 tall geysers of icy particles erupting from four distinct, deep fractures crossing the region. This and many other Cassini findings point to a long-lived, sub-surface, salty, organics-rich global ocean, thicker beneath the south polar terrain than elsewhere, as the geysers' source, making Enceladus home to the most accessible extraterrestrial habitable zone in the solar system.

Carolyn continues to be active in the presentation of science to the public as the leader of the Cassini Imaging Team. She is the creator/editor of the team's **CICLOPS** website where Cassini images are posted, and she writes the site's homepage "Captain's Log" greetings to the public. Carolyn is a popular public lecturer and **speaks frequently** on the Cassini mission and planetary exploration in general. She has presented at such renowned cross-disciplinary conferences as TED (2009, 2007) and PopTech (2006, 2005). She also **appears frequently** in the media; as of 2016, she is a StarTalk All Stars host. Carolyn is the CEO and President of **Diamond Sky Productions, LLC**.

For the 1997 film Contact, based on the novel by fellow astronomer Carl Sagan, Carolyn served as the **consultant on the main character, Ellie Arroway**. In 2008, she was invited by J.J. Abrams, the director/producer of the 2009 release, Star Trek, to join the film's production crew as a consultant on planetary imagery. Carolyn was responsible for the proposal to honor the late renowned planetary geologist Eugene Shoemaker by sending a portion of his **cremains to the moon** aboard the Lunar Prospector spacecraft. She also conceived of the **epitaph**, engraved on a thin brass foil, which accompanied the ashes to the moon.

Carolyn played instrumental roles in the taking of three iconic photographs of planet Earth from the outer solar system. She participated, along with Carl Sagan, in planning and executing the 1990 "Portrait of the Planets" taken with the Voyager 1 spacecraft, which included the famous **Pale Blue Dot** image of Earth. Later with Cassini, she and her team took one of Cassini's **most beloved images** of Saturn and its rings during the planet's solar eclipse, with Earth visible in the distance.

And she is the creator of **The Day The Earth Smiled**, an event that took place on July 19, 2013, when Cassini once again pointed sunward to image Saturn, its rings and the Earth. This time, however, a **long-distance photo of Earth** was taken with the full advance knowledge of members of the public, who were invited to take part in a day of reflection and celebration of humanity's place in the cosmos. The event was **enjoyed by people all over the globe**.

Carolyn has been the recipient of a number of **awards and honors** for her contributions to science and the public sphere. She is the namesake of Asteroid (7231) Porco, which was named to honor her work in planetary science. In 1999, she was selected by the London Sunday Times as one of 18 scientific leaders of the 21st century, and by Industrial Week as one of "50 Stars to Watch". In 2009, New Statesman named her as one of the "50 People Who Matter Today." In 2010 she was awarded the Carl Sagan Medal, presented by the American Astronomical Society for Excellence in the Communication of Science to the Public. And in 2012, she was named one the 25 most influential people in space by TIME magazine. Since 2015, Carolyn has been a visiting distinguished scholar at the University of California at Berkeley and, since 2017, a fellow of the California Academy of Sciences.

Cassini Imaging Team Website: **http://ciclops.org/?js=1**

Diamond Sky Productions: **http://diamondskyproductions.com/recent/**

NASA's Cassini: Best Photos of Saturn and its Moons As Spacecraft Prepares for Grand Finale Death Dive BY **STAV ZIV** ON 09/06/17 AT 12:16 PM EDT, NEWSWEEK.

HTTPS://WWW.NEWSWEEK.COM/2017/09/22/NASA-CASSINI-BEST-PHOTOS-SATURN-MOONS-SPACECRAFT-PREPARES-GRAND-FINALE-DEATH-659830.HTML

THE SACRAMENTO BEE

California’s last nuclear plant will close soon. Why the Biden administration wants it open

https://www.sacbee.com/news/california/article256286862.html and
https://www.sanluisobispo.com/news/local/environment/article256297532.html
Front page story in the December 5, 2021 *The San Luis Obispo Tribune* print edition.

Steam is released from reactor No. 1 at Diablo Canyon nuclear power plant at Avila Beach in a May 2000 file image. STEVE OSMAN LOS ANGELES TIMES/TNS

It’s California’s last nuclear plant, destined to be mothballed in four years amid concerns that its closure could leave a gaping hole in the state’s power supply.

Now the Biden administration is pushing the idea that PG&E Corp.’s Diablo Canyon power plant should stay open, after all.

U.S. Energy Secretary Jennifer Granholm, in an interview this week with Reuters, said California might want to preserve Diablo Canyon, located on the Pacific coast in San Luis Obispo County, as a source of low-carbon energy in an era of climate change.

“California has been very bullish on zero-carbon emission energy,” Granholm said. Keeping the plant open “may be something that they decide to take a look at, given that I think there is a change underfoot about the opinion that people may have about nuclear.”

Although PG&E says it still plans to close Diablo Canyon, the energy secretary’s comment comes as others are pushing for a reprieve. In November, a high-profile study produced by scientists at Stanford and MIT called for the plant to stay open.

Opponents of Diablo Canyon said they fear a bandwagon effect is emerging to prolong the plant's life. "It's like a freight train coming toward us," said Linda Seeley, of the group San Luis Obispo Mothers for Peace. "They're not looking at the issue of having a 40-year-old nuclear power plant on 13 faults."

Diablo Canyon produces about 9% of the state's electricity supply, and state officials have warned that its planned shutdown in 2025 could undermine the state's efforts to keep the lights on. California already experienced two nights of rolling blackouts in 2020 and narrowly avoided more blackouts during this year's heatwave in July.

"The period after the Diablo Canyon retirement will be a critical point for system reliability," the Independent System Operator, which manages the state's power grid, said in a May 2020 report to the Public Utilities Commission.

Officials with the grid operator and the utilities commission weren't immediately available for comment. And some critics of Diablo Canyon say the state's energy picture isn't as dire as it seemed even a few months ago.

Mark Specht, an energy analyst with the Union of Concerned Scientists in Oakland, said state officials have done a good job of forcing utilities to procure more clean energy as a means of plugging the gap that Diablo Canyon will leave. "I've seen the state make some significant progress...they're taking this issue pretty seriously," he said.

Still, Granholm's comments gave hope to those in the region pushing for Diablo Canyon to stay open. **"We need the reliable power," said Gene Nelson, a leader in a San Luis Obispo County group called Californians for Green Nuclear Power. "We definitely have optimism that sane minds do exist within**

Dawn Ortiz-Legg, a county supervisor whose district includes the area around Diablo Canyon, said she's "encouraged that the conversation is continuing .... If we are serious about climate change, we can't take any conversation off the table."

Nevertheless, PG&E insists it's committed to closing the plant — largely because of economic reasons — and is moving ahead with plans to add more renewable energy such as solar and wind power to its portfolio. "As a regulated utility we're required to follow the energy policies of the state of California. We are committed to California's clean energy future," utility spokeswoman Suzanne Hosn said Thursday. "That is our unwavering position."

The Legislature and the Public Utilities Commission have signed off on PG&E's plan to close Diablo Canyon's two operating units in 2024 and 2025. Granholm said that while the decision is up to California, she might talk to state officials about saving the plant. "Perhaps it's something that they might reconsider," she said. The plant opened in the mid-1980s and has performed reliably. In 2013 questions about plant safety arose when an inspector with the Nuclear Regulatory Commission raised concerns about earthquake faults around the facility.

Three years later, PG&E said it would close the plant but cited financial and operational concerns, not earthquake risks.

"As more solar generation comes on line over time, and when its output is at peak supply (e.g., in the middle of the day), there is less room on the electric system for energy from inflexible and large baseload resources such as Diablo Canyon," the company said in a 2016 report to the utilities commission.
This story was originally published December 2, 2021 12:56 PM.

DALE KASLER 916-321-1066 Dale Kasler covers climate change, the environment, economics and the convoluted world of California water. He also covers major enterprise stories for McClatchy's Western newspapers. He joined The Bee in 1996 from the Des Moines Register and graduated from Northwestern University.

DAILY BREEZE

Keep Diablo Canyon nuclear plant open

This Nov. 3, 2008, file photo shows one of Pacific Gas and Electric's Diablo Canyon Power Plant's nuclear reactors in Avila Beach, Calif.

By **THE EDITORIAL BOARD** | opinion@scng.com |

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https://www.dailybreeze.com/2021/12/02/keep-open-diablo-canyon-nuclear-plant/

California needs reliable, zero-carbon energy to power the state and meet its climate goals, yet the last remaining nuclear power plant in the state, Diablo Canyon, is set to close. Investor-owned utility PG&E made the decision in 2016 to allow the licenses for the plant's two reactors to expire. They will shut down in 2024 and 2025.

Diablo Canyon has been producing about 8% of the electricity used in California. It is a zero-carbon energy source that's steady and reliable when the sun goes down, when the wind doesn't blow and when drought conditions reduce the output of large hydroelectric plants. In July, as a wildfire in Oregon threatened transmission lines on which California relies for imported electricity, the Diablo Canyon nuclear plant was essential to keeping the state's lights on.

When Diablo begins to shut down, what will replace the energy it produces? That's still a work in progress.

The California Public Utilities Commission issued an order to utilities demanding that they buy a massive amount — a total of more than 14,000 megawatts — of renewable energy and battery storage in the coming years. However, that may not be sufficient to prevent electricity shortages in the hot summer months, according to the California Energy Commission and the state's grid operator.

The Biden administration may get involved. On Tuesday, Energy Secretary Jennifer Granholm said she thinks “there is a change underfoot about the opinion that people may have about nuclear” and she said she would be willing to talk with state officials about keeping Diablo open. Also on Tuesday, the Biden administration said it is actively searching for communities that would be willing to do their part to fight climate change by hosting nuclear waste sites. Then “those communities that have nuclear facilities won’t have to worry about that problem,” Granholm said.

We’ll keep checking in to see how that search is coming along, but in the meantime, California has to figure out how to procure enough electricity to meet the needs of the state’s residents and businesses without the perpetual risk of dangerous power outages. In addition to shutting down Diablo Canyon, the state is phasing out **four** electricity-generating plants that run on natural gas. They are all scheduled to be closed by the end of 2023, if not sooner.

In the scramble to procure more renewable energy, there has not been much discussion of the cost to ratepayers. Southern California Edison estimated in 2019 that it could cost up to $250 billion to meet the state’s goal of carbon neutrality by 2045. It would not be surprising if state regulators allowed utilities to recoup those billions of dollars through higher rates or surcharges.

An honest public discussion of the cost and limitations of solar, wind and battery-storage energy would be helpful as the state works through these challenges. Solar and wind energy will always be intermittent, and large-scale batteries that can supply power for longer than four hours are still in development.

Nuclear power has serious challenges, too. The dangerous waste-storage problem has simply not been solved, anywhere in the world. **But if the goal is zero-carbon energy that is reliable and affordable, keeping Diablo Canyon open beyond 2024 and 2025 makes sense.** Ultimately, the future of the nuclear plant is up to its owner, PG&E. However, public officials would be wise to do what they can to extend the life of Diablo Canyon until other renewable energy sources can stand on their own.

THE WALL STREET JOURNAL.

California Prepares for More Water Restrictions as Drought Worsens

The state plans to virtually eliminate the water it supplies to local communities, which are running out of alternatives

Houseboats on California's Lake Oroville in October after storms raised the reservoir more than 16 feet, according to the California Department of Water Resources.
PHOTO: NOAH BERGER/ASSOCIATED PRESS

By Jim Carlton Dec. 1, 2021 5:18 pm ET
https://www.wsj.com/articles/california-prepares-for-more-water-restrictions-as-drought-worsens-11638397099

Californians may face new restrictions, including fines for improperly washing their cars, as the state prepares to virtually eliminate the water it supplies to local communities as it grapples with an unrelenting drought.

The state's Department of Water Resources said Wednesday that for the first time it is preparing to allocate 0% of the water it is contracted to give next year to local districts, which handle what goes into the taps of homes, businesses and farms. That means that unless drought conditions ease, no supplies will be shipped except for critical health and safety needs, such as drinking water and sanitation.

The most the state previously cut back on its water allocations was 5% of what was contracted, which it did twice over the past quarter of a century, including last spring.

“We need to prepare now for a dry winter and severe drought conditions to continue through 2022,” said Department of Water Resources Director Karla Nemeth.

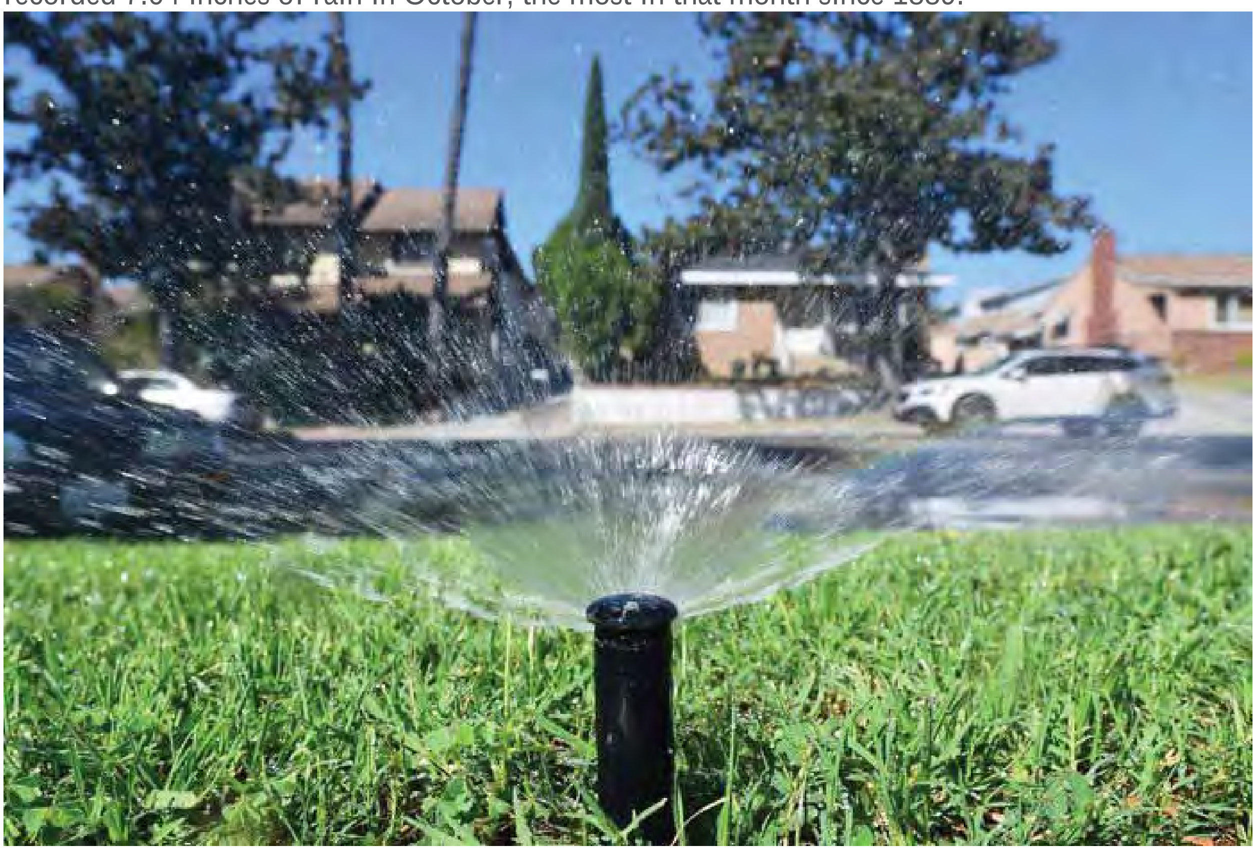
Local agencies will have to rely largely on other sources to try to make up the difference. Many have supplies stored underground as well as in local reservoirs that are fed by rainwater and water, such as runoff from golf courses and wastewater, that has been treated. However, that often isn’t enough to cover all of communities’ water needs for multiple years.

Southern California agencies are generally better stockpiled with their own reserves than those in Northern California because the Los Angeles region went through a crippling drought in the 1990s and took steps to adapt in the aftermath, according to water management authorities.

Several local water agencies, including in the city of San Francisco, don’t use state water at all.

Reservoirs and wells across California are drying up as a two-year drought threatens to extend into a third year. The state’s second-biggest reservoir, Lake Oroville, is at 30% capacity compared with a historic average for this time of year of 60%. The Folsom Lake reservoir has fallen to 37% of capacity from its historic level of 92%, according to state figures.

Those readings would be worse if not for a deluge of precipitation in October when one of the strongest atmospheric rivers in decades slammed into California. Downtown San Francisco recorded 7.04 inches of rain in October, the most in that month since 1889.



A sprinkler was used to water grass in Alhambra, Calif., in September.

PHOTO: FREDERIC J. BROWN/AGENCE FRANCE-PRESSE/GETTY IMAGES

Dryness returned in November, when San Francisco recorded just 1.28 inches, or half its normal amount, as a ridge of high pressure diverted storms to the Pacific Northwest. With forecasts of a La Niña weather pattern that often results in dry winters in California, officials are worried that prolonged drought could wreak more havoc on a state where the agriculture industry is already struggling with reduced water supplies.

“We’re worried about running out next year,” said Gary Kremen, vice chair of the Santa Clara Valley Water District, which supplies water to two million people in Silicon Valley.

On Tuesday, California’s State Water Resources Control Board unveiled draft emergency regulations to make practices such as washing a car without a shut-off nozzle a violation punishable by a fine. The board employed similar bans during California’s last drought, which lasted from 2013 to 2017..

Local water agencies are rolling out their own conservation plans. The Indian Wells Valley Water District, around Palm Springs, and the Marin Municipal Water District north of San Francisco have mandated cutbacks by customers, as have agricultural ones such as the Modesto Irrigation District in central California. Most other agencies so far have asked users to conserve, but water officials say that if necessary restrictions will be ramped up.

Some water providers are in worse shape than others. The Santa Clara district, which gets nearly half from imported state and federal supplies, has little backup water because its local reservoirs have declined to 11% of capacity, according to Mr. Kremen.

“Praying for rain will help,” he said.

Write to Jim Carlton at jim.carlton@wsj.com

Appeared in the December 2, 2021, print edition as 'More Water Curbs Loom in California.'

REUTERS COMMODITIES NEWS
NOVEMBER 30, 2021 3:51 PM UPDATED 2 DAYS AGO

U.S. energy chief hints California may grant reprieve to its last nuclear plant

2/2 Secretary of Energy Jennifer Granholm takes questions during a media briefing at the White House in Washington, U.S., November 23, 2021. REUTERS/Evelyn Hockstein

By Timothy Gardner
https://www.reuters.com/article/usa-nuclearpower-granholm-idAFL1N2SL3SS
5 MIN READ

WASHINGTON, Nov 30 (Reuters) - California may reconsider whether to close its last nuclear power plant as public support has grown for the low-carbon energy source, U.S. Energy Secretary Jennifer Granholm told Reuters on Tuesday.

She added she was willing to eventually talk with state officials about keeping the Diablo Canyon plant open.

The Biden administration has expressed support for the nuclear power industry as crucial to its goal of decarbonizing the U.S. electrical grid by 2035.

"California has been very bullish on zero-carbon emission energy," Granholm said in a wide-ranging interview to be broadcast next week at the Reuters Events conference Energy Transition North America 2021 here, where leaders will discuss the move to clean energy.

“It may be something that they decide to take a look at, given that I think there is a change underfoot about the opinion that people may have about nuclear.”

Utility PG&E decided in 2016 to allow the licenses for two Diablo Canyon reactors to expire in 2024 and 2025. That move would close the last nuclear power plant in the country’s most populous state where the public was worried about earthquakes, nuclear waste and use of seawater to cool the plants.

But because nuclear power now accounts for about a fifth of U.S. electricity, reactor shutdowns expand the country’s need for clean energy, making Biden’s goals harder to reach.

Reactors in Connecticut, New York, South Carolina and other states are also in danger of shutting as utilities turn to plants that burn low-cost natural gas to generate electricity.

The Biden administration on Tuesday announced it is seeking feedback from local communities on whether they would host interim sites to store nuclear waste. Such a step could lead to a more permanent and centralized fix for dealing with radioactive waste now stored in casks and pools at 76 reactor sites across 34 states.

Granholm said the Energy Department will talk with communities in the next few months about opportunities for interim sites that can create local jobs.

“If it’s a community that is more favorable toward nuclear power, they might not be averse to taking on the waste problem, so that those communities that have nuclear facilities won’t have to worry about that problem,” Granholm said.

While California is well known for earthquakes, nuclear plants in South Carolina and Missouri face far higher quake risks here than Diablo Canyon does, according to the Union of Concerned Scientists nonprofit group.

A report this month from researchers at Stanford and the Massachusetts Institute of Technology (MIT) said California should extend the life of Diablo Canyon to meet state climate goals.

Granholm said any decision on keeping Diablo open is up to California and did not indicate she had any information that regulators were set to change their position.

“This is clean dispatchable base load power. ... I know the decision has been made already to close it down, perhaps it’s something that they might reconsider,” she said.

And she hinted she would be willing to give her persuasion skills with officials in California, a state plagued with power outages and climate-related wildfires, a try. “Let’s just get through this consent-based siting process first and certainly I’m willing to have those conversations.”

PG&E spokesperson Suzanne Hosn said the plan to shut the plant was approved by the California legislature and state regulators and the company's focus is on safely operating the plant until the end of its licenses.

California Public Utility Commission spokesperson Terrie Prosper said the commission had not received any proposals to extend the life of the reactors, and said certain upgrades would be required for the licenses to be extended. (Reporting by Timothy Gardner; additional reporting by Nichola Groom; Editing by David Gregorio)

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https://www.reuters.com/article/usa-nuclearpower-earthquakes-idINL1N2HD11P

OIL REPORT
OCTOBER 22, 20208:21 AM UPDATED A YEAR AGO

U.S. nuclear plants in S. Carolina, Missouri face the highest quake risks - report

By Timothy Gardner
3 MIN READ

WASHINGTON, Oct 22 (Reuters) - The U.S. nuclear power reactors facing the highest risks of a meltdown from earthquakes are not in tremor-prone California, but states including South Carolina and Missouri, an analysis of government data published on Thursday said.

The chances of an earthquake leading to meltdowns are small, but the results would be grave. A tsunami generated by a 2011 earthquake led to the meltdowns of three reactors at the Fukushima Daiichi nuclear power station in Japan, causing radiation releases and mass evacuations.

The U.S. reactor facing the highest risk is Duke Energy Corp's H.B. Robinson near Hartsville, South Carolina, according to the analysis here by the Union of Concerned Scientists.

Robinson faces a one in 7,700 chance annually that a quake would cause a meltdown, said the analysis, based on Duke's estimates submitted to the U.S. Nuclear Regulatory Commission (NRC). **That risk is five times higher than for each of PG&E Corp's two Diablo Canyon reactors, the only ones left in California. Those reactors are scheduled to be shut in 2024 and 2025.**

The three reactors at a Duke plant called Oconee in Seneca, South Carolina, face a one in 17,500 chance of a meltdown annually, according to the analysis.

All Duke nuclear plants are in compliance with NRC requirements for earthquakes, and the company has bolstered structures, systems and components, said Mary Kathryn Green, a company spokeswoman.

Ameren Corp’s Callaway reactor in Fulton, Missouri faces a one in 13,800 chance of a meltdown annually, the analysis said. Barry Cox, the site vice president at Callaway, said the plant invests millions of dollars on protections against earthquakes and other natural disasters.

Edwin Lyman, the director of nuclear power safety at the Union of Concerned Scientists, who wrote the analysis, said that the NRC should not approve license renewals for Duke’s reactors unless the company does more to guard against risks.

The NRC is satisfied that Duke has made “binding commitments” to install permanent fixes at Robinson and would assess earthquake risks in a license renewal application, said spokesman Scott Burnell. (Reporting by Timothy Gardner; editing by Jonathan Oatis)

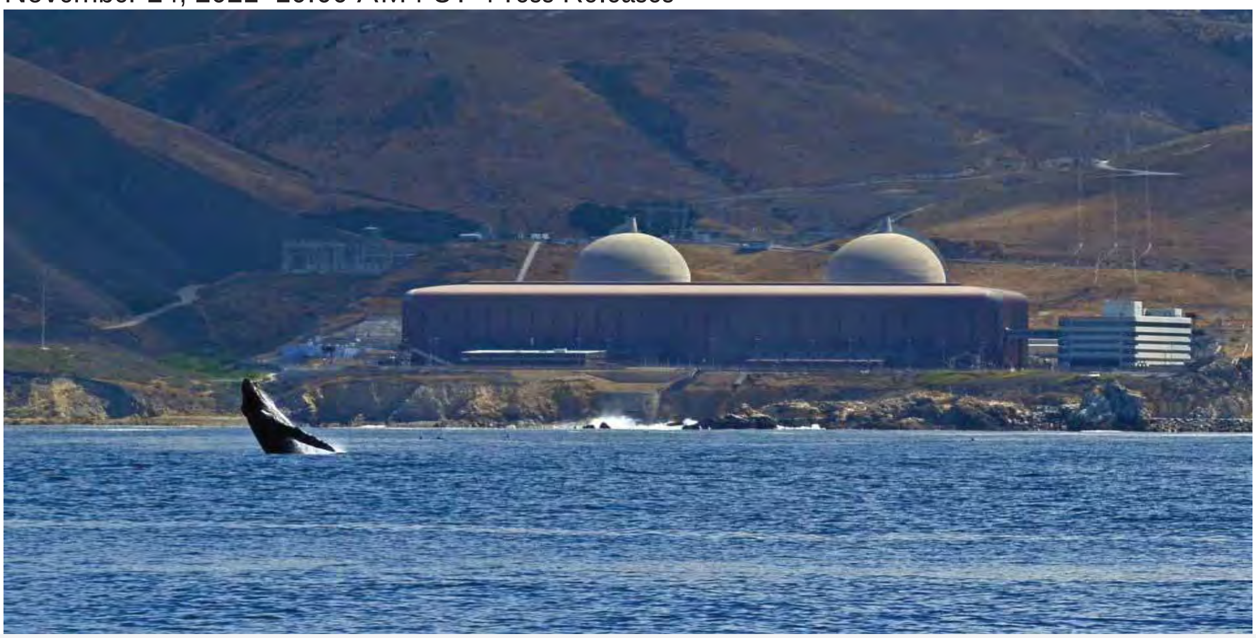
NuclearNewswire

POWER & OPERATIONS

The American Nuclear Society supports keeping Diablo Canyon open

Statement from American Nuclear Society President Steven Nesbit and Executive Director/CEO Craig Piercy

November 24, 2021 10:00 AM PST Press Releases



A whale swims off the coast by Diablo Canyon nuclear power plant. (Image: PG&E)

The American Nuclear Society supports the continued operation of California's Diablo Canyon nuclear power plant. The premature shutdown of Diablo Canyon units 1 and 2, slated respectively in November 2024 and August 2025, will inflict grave harm to California's economy and environment.

Diablo Canyon is a well-performing nuclear power plant that has operated safely for nearly 40 years under the strict oversight of the U.S. Nuclear Regulatory Commission. Diablo Canyon’s nuclear generation produces clean electricity without harmful emissions of greenhouse gases and other combustion products. Additionally, Diablo Canyon’s energy is available around the clock in all seasons and weather conditions.

Closing California's remaining nuclear power plant will cause more grid instability and rolling blackouts for the state because Diablo Canyon reliably supplies approximately 10 percent of in-state power. Along with further weakening California’s fragile power grid, the premature closure of Diablo Canyon will deprive California of its largest carbon-free energy resource and worsen the state's growing dependency on electricity from out-of-state fossil power plants. The premature loss of Diablo Canyon will result in millions of tons of additional greenhouse gas emissions per year, ruining state and federal plans for decarbonization.

Blackouts are harmful and deadly. During the August 2020 heatwave that strained California's already overloaded power grid, the California Independent System Operator (CAISO) ordered rolling blackouts across the state to cope with a power supply shortage of 4,400 megawatts that left approximately 3.3 million households in the dark and without air conditioning. The blackouts would have been far worse and more extensive without Diablo Canyon's 2,240 megawatts of safe, reliable, fuel-secured, and dispatchable zero-emissions baseload power.

Solar, wind, geothermal, and battery storage will surely be an important part of any decarbonization plan for California, but the state will need every clean energy resource that it has – including Diablo Canyon – to meet its climate goals. A reliable grid requires a strong backbone of always-on and available baseload generation like Diablo Canyon. Intermittent sources alone cannot replace Diablo Canyon's reliable 24/7 production of dispatchable carbon-free electricity for Californians. If the planned closure goes ahead, Diablo Canyon's carbon-free electricity would be replaced by carbon-emitting natural gas- and coal-fired generation.

Without Diablo Canyon, California will be forced to depend on the charity of neighboring regions to make up for shortfalls in power supplies, including meeting demand after sunset when solar resources become unavailable. Given the inevitable potential for conditions limiting the availability of out-of-state energy, including the current drought impacting hydropower sources throughout the western United States, that is not a prudent situation.

According to CAISO, about 25% of California's total electricity needs are currently met by imports. California's vulnerability to blackouts and pipeline disruptions – including those caused by wildfires and earthquakes – demonstrates the necessity in keeping Diablo Canyon's clean baseload power online beyond 2025 for the safety and prosperity of 40 million Californians. In wake of any blackout or extreme event, Diablo Canyon's fuel-secured, reliable, firm, and dispatchable baseload power will surely be needed by Californians.

Years ago, California made a decision to shut down the Diablo Canyon units. However, circumstances have changed. The clean energy imperative is even stronger, and the importance of Diablo Canyon to the reliability of California's current and future supply of carbon-free electricity is undeniable. It is time to revisit outdated decisions made in the last decade in the light of today's facts and prepare for the continued operation of Diablo Canyon. ANS calls upon Gov. Newsom to reconsider the decision and keep Diablo Canyon online.

Tags:
base load california carbon-free diablo canyon grid reliability grid stability nuclear power pg&e rolling blackouts

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Los Angeles Times

Op-Ed: California needs to keep the Diablo Canyon nuclear plant open to meet its climate goals

Even assuming rapid buildout of renewable energy, the continued operation of Diablo Canyon would significantly reduce California's use of natural gas for electricity production from 2025 to 2035.
(Joe Johnston / San Luis Obispo Tribune)

BY STEVEN CHU AND ERNEST MONIZ

NOV. 21, 2021 3:05 AM PT

https://www.latimes.com/opinion/story/2021-11-21/diablo-canyon-nuclear-plant-climate-change-zero-emissions

The Diablo Canyon nuclear power plant is scheduled to close when its federal 40-year license expires in 2025 — marking the end of nuclear power generation in California. This schedule was set in a complex multi-stakeholder process approved by state regulators in 2018, and modifying it would be at least as complex.

However, much has changed in the last few years, underscoring the need to revisit this decision — including rolling blackouts in California in 2020, global awareness of the need for greater ambition in reducing greenhouse gas emissions and a better understanding of the limitations of existing technology within a reliable and resilient system. Reconsidering the future of Diablo Canyon is now urgently needed in advancing the public good.

At the global climate talks in Glasgow, Scotland, the nearly 200 nations attending acknowledged the need for deep reductions in carbon emissions by mid-century. California deserves credit for leading the way in transitioning to a zero-carbon economy. Groundbreaking legislation requires all sources of electricity in the state to be emission-free by 2045. Former Gov. Jerry Brown directed the state to achieve economy-wide climate neutrality by the same date. And Gov. Gavin Newsom signed an executive order last year requiring all new cars sold in the state to be zero-emission, starting in 2035.

The effects of climate change are unmistakable and severe around the world and in California, with record temperatures, drought and wildfires of unprecedented ferocity and destruction. Moving toward deep decarbonization is of paramount importance.

Timing matters. Most of the carbon we emit today stays in the atmosphere and warms the planet for centuries. To avoid the worst effects of climate change, we need to avoid carbon dioxide emissions even as we aim to reach zero emissions by mid-century.

Today, the Diablo Canyon Power Plant accounts for 15% of California's carbon-free electricity production, and 8% of overall electricity output. Natural gas accounts for almost half of California's generation. Without nuclear power, even as deployment of renewable power expands, California will have to increase reliance on gas-fired peaker plants (power plants that run when energy demand peaks) at a time when we need all the clean power we can produce. **Congress and the administration recognized the importance of existing nuclear power by providing incentives to keep nuclear plants running in the bipartisan infrastructure law.**

Researchers at MIT and Stanford University have completed an independently funded joint study to reassess Diablo Canyon's potential value for helping California meet the challenges of climate change by providing clean, safe and reliable electricity. The study also assessed Diablo Canyon's potential for powering water desalination and hydrogen fuel production.

The researchers found that an inclusive strategy that preserves the clean electricity from Diablo Canyon will augment new energy generation from renewables and other sources of clean power. We need to increase renewables at a massive scale, but that will take decades, so any zero-carbon source we retire today will set us back years on the zero-carbon journey.

Carbon-free power is also essential for system reliability and resilience because, beyond the short-term variability, there are weeks and months when wind and solar power are low and storage technologies are of inadequate duration. This is not an either/or situation: California needs both Diablo Canyon and renewables to significantly reduce emissions over the next two decades.

Keeping Diablo Canyon running through 2035 would cut carbon emissions from the electricity sector by 11% annually compared with 2017 levels and **save ratepayers billions of dollars — an estimated $2.6 billion through 2035 and up to $21 billion by 2045**. It also would alleviate the need to develop 90,000 acres of land for renewable energy production just to replace the facility's capacity.

But the potential benefits of preserving Diablo Canyon go beyond generation of more clean electric power.

The MIT-Stanford study found that Diablo Canyon could be repurposed to become a power source for water desalination and for clean hydrogen production, operating as a polygeneration facility. Diablo Canyon's continued operation would thus help address three of the state's largest challenges: energy reliability, persistent drought, and the transition to emission-free transportation and industry — two sectors that are challenging to decarbonize.

A desalination facility at Diablo Canyon could produce up to 80 times the output of the state's largest desalination plant at about half the cost. The researchers also found that, as demand for hydrogen increases, Diablo Canyon could produce it at about half the cost of hydrogen produced by other clean energy sources.

The challenges here in California and globally are bigger than ever and the window of opportunity to mitigate climate change is closing fast. Extending the license of Diablo Canyon buys critical time for the innovation needed to reach net-zero emissions. An important example would be developing cost-effective long-duration electricity storage, an enabler for variable renewables at very large scale.

Revisiting the decision to close Diablo Canyon will involve many stakeholders, including federal regulators needed to permit restart of the license extension process. But that dialogue needs to happen because the stakes are so high.

Reimagining Diablo Canyon's role in California's energy future is an opportunity we cannot afford to ignore.

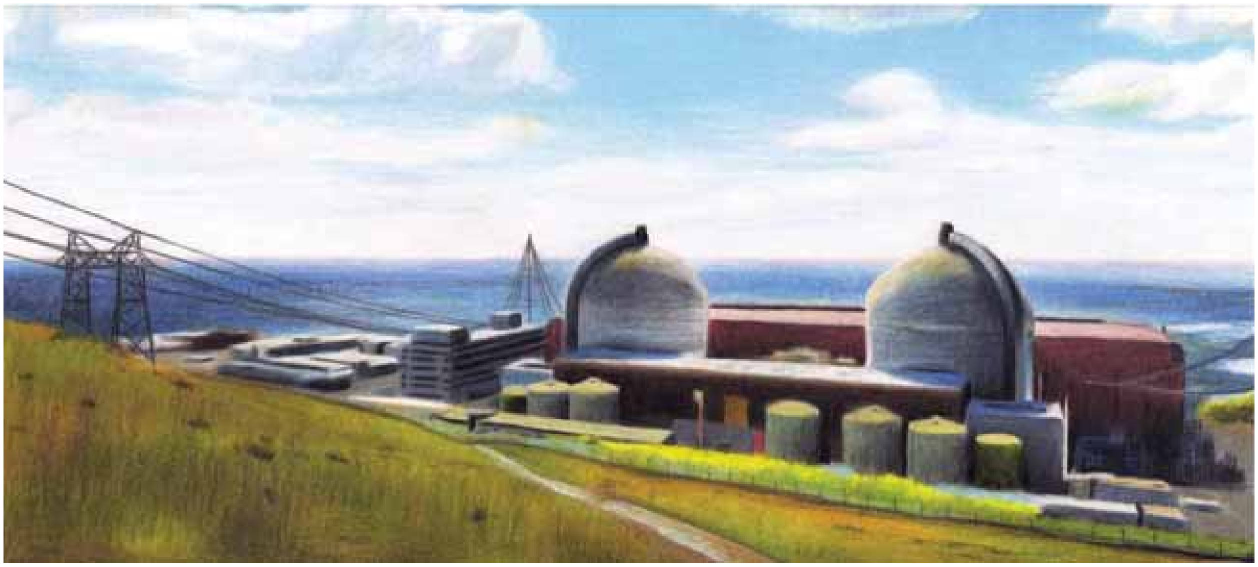
Steven Chu is a former U.S. secretary of Energy, Nobel laureate in physics and professor of physics and molecular and cellular physiology at Stanford University. Ernest Moniz is a former U.S. secretary of Energy, CEO of the Energy Futures Initiative and professor of physics and engineering systems emeritus at MIT.

THE NEW YORKER Annals of Technology

The Activists Who Embrace Nuclear Power

By Rebecca Tuhus-Dubrow

February 19, 2021



In the face of climate change, some environmentalists are fighting not to close power plants but to save them.Illustration by Clément Thoby; Source photograph by David Paul Morris / Bloomberg / Getty

In 2004, Heather Hoff was working at a clothing store and living with her husband in San Luis Obispo, a small, laid-back city in the Central Coast region of California. A few years earlier, she had earned a B.S. in materials engineering from the nearby California Polytechnic State University. But she'd so far found work only in a series of eclectic entry-level positions—shovelling grapes at a winery, assembling rectal thermometers for cows. She was twenty-four years old and eager to start a career.

One of the county's major employers was the Diablo Canyon Power Plant, situated on the coastline outside the city. Jobs there were stable and well-paying. But Diablo Canyon is a nuclear facility—it consists of two reactors, each contained inside a giant concrete dome—and Hoff, like many people, was suspicious of nuclear power. Her mother had been pregnant with her in March, 1979, when the meltdown at a nuclear plant on Three Mile Island, in Pennsylvania, transfixed the nation. Hoff grew up in Arizona, in an unconventional family that lived in a trailer with a composting toilet. She considered herself an environmentalist, and took it for granted that environmentalism and nuclear power were at odds.

Nonetheless, Hoff decided to give Diablo Canyon a try. She was hired as a plant operator. The work took her on daily rounds of the facility, checking equipment performance—oil flows, temperatures, vibrations—and hunting for signs of malfunction. Still skeptical, she asked constant questions about the safety of the technology. “When four-thirty on Friday came, my co-workers were, like, ‘Shut up, Heather, we want to go home,’ ” she recalled. “When I finally asked enough questions to understand the details, it wasn’t that scary.”

In the course of years, Hoff grew increasingly comfortable at the plant. She switched roles, working in the control room and then as a procedure writer, and got to know the workforce—mostly older, avuncular men. She began to believe that nuclear power was a safe, potent source of clean energy with numerous advantages over other sources. For instance, nuclear reactors generate huge amounts of energy on a small footprint: Diablo Canyon, which accounts for roughly nine per cent of the electricity produced in California, occupies fewer than six hundred acres. It can generate energy at all hours and, unlike solar and wind power, does not depend on particular weather conditions to operate. Hoff was especially struck by the fact that nuclear-power generation does not emit carbon dioxide or the other air pollutants associated with fossil fuels. Eventually, she began to think that fears of nuclear energy were not just misguided but dangerous. Her job no longer seemed to be in tension with her environmentalist views. Instead, it felt like an expression of her deepest values.

In late 2015, Hoff and her colleagues began to hear reports that worried them. P.G. & E., the utility that owns Diablo Canyon, was in the process of applying to renew its operating licenses—which expire in the mid-twenty-twenties—with the federal Nuclear Regulatory Commission. Because its cooling system takes in and spits out about 2.5 billion gallons of ocean water each day, the plant also needs a lease from the California State Lands Commission in order to operate, and P.G. & E. was applying to renew that as well. Environmental groups had come to the commission with long-standing concerns about the effects of the cooling system on marine life and about the plant’s proximity to several geologic faults. The commission, chaired by Gavin Newsom, then the lieutenant governor, had agreed to take those issues into account. At a meeting that December, Newsom said, “I just don’t see that this plant is going to survive beyond ’24-2025.”

Around this time, Hoff discovered a Web site called Save Diablo Canyon. The site had been launched by a man named Michael Shellenberger, who ran an organization called Environmental Progress, in the Bay Area. Shellenberger was a controversial figure, known for his pugilistic defense of nuclear power and his acerbic criticism of mainstream environmentalists. Hoff had seen “Pandora’s Promise,” a 2013 documentary about nuclear power, in which Shellenberger had been featured. She e-mailed him to ask about getting involved, and he offered to give a talk to plant employees. Hoff publicized the event among her colleagues, and baked about two hundred chocolate-chip cookies for the audience.

On the evening of February 16, 2016, a couple hundred people filed into a conference room at a local Courtyard Marriott hotel. Shellenberger told the audience that Diablo Canyon was essential to meeting California’s climate goals, and that it could operate safely for at least another twenty years. He said that it was at risk of being closed for political reasons, and urged the workers to organize to save their plant, for the sake of their jobs and the planet.

Kristin Zaitz, one of Hoff’s co-workers, was also in attendance. A California native and civil engineer, she had worked at Diablo Canyon since 2001, first conducting structural analyses—including some meant to fortify the plant against earthquakes—and then managing projects. Zaitz, too, came from a background that predisposed her to distrust nuclear power—in her case, an environmentally minded family and a left-leaning social circle. When she first contemplated working at Diablo Canyon, she imagined the rat-infested Springfield Nuclear Power Plant on "The Simpsons," where green liquid oozes out of tanks. Eventually, like Hoff, she changed her thinking. "What we were doing actually aligned with my environmental values," she told me. "That was shocking to me."

Zaitz and Hoff sometimes bumped into each other at state parks, where both volunteered on weekends with their children. After Shellenberger's talk, they lingered, folding up chairs and talking. Before long, they decided to team up. Using the name of Shellenberger's site Save Diablo Canyon, they organized a series of meetings at a local pipe-fitters' union hall. They served pizza for dozens of employees and their family members, who wrote letters to the State Lands Commission and other California officials. Other nuclear plants across the country were also at risk of closing, and soon they decided that their mission was bigger than rescuing their own plant. They wanted to correct what they saw as false impressions about nuclear power—impressions that they had once had themselves—and to try to shift public opinion. They would show that "it's O.K. to be in favor of nuclear," Zaitz said—that, in fact, if you're an environmentalist, "you should be out there rooting for it."

Hoff and Zaitz formed a nonprofit. Like the leaders of many other movements led by women—protests against war, drunk driving, and, of course, nuclear power—they sought to capitalize on their status as mothers. They toyed with a few generic names—Mothers for Climate, Mothers for Sustainability—because they worried that the word "nuclear" would scare some people off. But they ultimately discarded those more innocuous options. "We wanted to be really clear that we think nuclear needs to be part of the solution," Zaitz said. They now run a small activist organization, **Mothers for Nuclear,** https://www.mothersfornuclear.org/ which argues that nuclear power is an indispensable tool in the quest for a decarbonized society.

On December 8, 1953, President Dwight Eisenhower delivered his "Atoms for Peace" speech at the United Nations General Assembly. He described the dangers of atomic weapons, but also declared that "this greatest of destructive forces can be developed into a great boon, for the benefit of all mankind." Eisenhower proposed that governments make contributions from their stockpiles of uranium and fissionable materials to an international atomic-energy agency. One purpose of such an agency, he suggested, would be "to provide abundant electrical energy in the power-starved areas of the world."

The first commercial nuclear power plant in the United States opened four years later, in Beaver County, Pennsylvania. In the following decades, dozens more were constructed. There are currently fifty-six nuclear power plants operating in the U.S. They provide the country with roughly twenty per cent of its electricity supply— more than half of its low-carbon electricity.

The plants were not always presumed to be environmentally unfriendly. At the dawn of the nuclear age, some conservationists, including David Brower, the longtime leader of the Sierra Club, supported nuclear power because it seemed preferable to hydroelectric dams, the construction of which destroyed scenery and wildlife by flooding valleys and other ecosystems. But Brower changed his mind in the late nineteen-sixties and, after a bitter split within the Sierra Club over whether to support the construction of Diablo Canyon, left to found Friends of the Earth, which was vehemently anti-nuclear. As John Wills explains in his 2006 book, "Conservation Fallout," these disputes coincided with broader philosophical shifts. Conservationism—with its focus on the preservation of charismatic scenery for outdoor adventures—was giving way to the modern environmentalist movement, sparked in part by Rachel Carson's 1962 book, "Silent Spring." Carson's book, which investigated the dangers posed by pesticides, articulated an ecological vision of nature in which everything was connected in a delicate web of life. Nuclear power was associated with radiation, which, like pesticides, could threaten that web.

By 1979, the U.S. had seventy-two commercial reactors. That year proved pivotal in the shaping of public opinion toward nuclear power in America. On March 16th, "The China Syndrome," starring Jane Fonda, Jack Lemmon, and Michael Douglas, was released; the film portrayed corruption and a meltdown at a fictional nuclear plant. Twelve days later, one of the two reactors at the Three Mile Island Nuclear Generating Station in southeastern Pennsylvania partially melted down. Most epidemiological studies would eventually determine that the accident had no detectable health consequences. But at the time there was no way the public could know this, and the incident added momentum to the anti-nuclear movement. By the time of the Chernobyl catastrophe, in Soviet Ukraine, in 1986—widely considered to be the worst nuclear disaster in history—opposition to nuclear power was widespread. Between 1979 and 1988, sixty-seven planned nuclear-power projects were cancelled. In the mid-eighties, the Department of Energy began research into the "integral fast reactor"—an innovative system designed to be safer and more advanced. In 1994, the Clinton Administration shut the project down.

Today, the looming disruptions of climate change have altered the risk calculus around nuclear energy. James Hansen, the NASA scientist credited with first bringing global warming to public attention, in 1988, has long advocated a vast expansion of nuclear power to replace fossil fuels. Even some environmental groups that have reservations about nuclear energy, such as the Natural Resources Defense Council and the Environmental Defense Fund, have recognized that abruptly closing existing reactors would lead to a spike in emissions. But U.S. plants are aging and grappling with a variety of challenges. In recent years, their economic viability has been threatened by cheap, fracked natural gas. Safety regulations introduced after the meltdowns at Japan's Fukushima Daiichi nuclear plant, in 2011, have increased costs, and, in states such as California, legislation prioritizes renewables (the costs of which have also fallen steeply). Since 2013, eleven American reactors have been retired; the lost electricity has largely been replaced through the burning of fossil fuels. At least eight more closures, including Diablo Canyon's, are planned. In a 2018 report, the Union of Concerned Scientists concluded that "**closing the at-risk plants early could result in a cumulative 4 to 6 percent increase in US power sector carbon emissions by 2035.**"

The past decade has seen the rise of a contingent of strongly pro-nuclear environmentalists. In 2007, Shellenberger and his colleague Ted Nordhaus co-founded the Breakthrough Institute, a Bay Area think tank known for its heterodox, "ecomodernist" approach to environmental problems. The organization, which presents itself as more pragmatic than the mainstream environmental movement, supports nuclear power alongside G.M.O.s and agricultural intensification. Other pro-nuclear groups include Third Way, a center-left think tank, and Good Energy Collective, a policy-research organization. (Shellenberger left the Breakthrough Institute, in 2015, and founded Environmental Progress, partly to focus more on efforts to save existing plants.)

The 2011 Fukushima disaster shifted the landscape of opinion, but not in entirely predictable ways. Immediately after Fukushima, anti-nuclear sentiment surged; Japan began to shutter its nuclear plants, as did Germany. And yet, as Carolyn Kormann has written, studies have found few health risks connected to radiation exposure in Japan in the wake of the accident. (The evacuation itself was associated with more than a thousand deaths, as well as a great deal of economic disruption.) Pro-nuclear advocates now point out that, **after retiring some of their nuclear plants, Japan and Germany have become increasingly reliant on coal**.

Heather Hoff watched news footage of the Fukushima disaster while at Diablo Canyon. What she saw resembled the scenarios she had learned about in training—situations that she had prepared for but never expected to face. "My heart instantly filled with fear," she later wrote, on the Mothers for Nuclear Web site. For a time, her confidence in nuclear power was shaken. But, as more information emerged, she came to believe that the accident was not as cataclysmic as it had initially appeared to be. Eventually, Hoff concluded that the incident was an opportunity to learn how to improve nuclear power, not a reason to give up on it. She and Zaitz visited the site in 2018. They saw black plastic bags of contaminated soil heaped on the roadside, and ate the local fish. Afterward, they both blogged about the experience. Zaitz wrote that she understood the fear provoked by radiation, "with its deep roots in the horrendous human impacts caused by the atomic bomb."

Pro-nuclear environmentalists often tell a conversion story, describing the moment when they began to see nuclear power not as something that could destroy the world but as something that could save it. **They argue that much of what we think we know about nuclear energy is wrong. Instead of being the most dangerous energy source, it is one of the safest, linked with far fewer deaths per terawatt-hour than all fossil fuels**. We perceive nuclear waste as uniquely hazardous, but, while waste from oil, natural gas, and coal is spewed into the atmosphere as greenhouse gases and as other forms of pollution, spent nuclear-fuel rods, which are solid, are contained in concrete casks or cooling pools, where they are monitored and prevented from causing harm. (The question of long-term storage remains fraught.) Most nuclear enthusiasts believe that renewables have a role to play in the energy system of the future. But they are skeptical of the premise that renewables alone can reliably power modern societies. And—in contrast to an environmental movement that has historically advocated the reduction of energy demand—pro-nuclear groups tend to focus more on the value that abundant nuclear energy could have around the world.

Charlyne Smith, a twenty-five-year-old Ph.D. candidate in nuclear engineering at the University of Florida, who shared her story on the Mothers for Nuclear Web site, grew up in rural Jamaica, where she had firsthand experience of "energy poverty." During hurricanes, she told me, no one knew when the electricity would come back; food would spoil in the fridge. Smith learned about nuclear power as an undergraduate and decided to enter the field, with the goal of bringing reactors to the Caribbean. She is not naïve about the risks: she is writing a dissertation on nuclear proliferation. But, she says, "Waste and radiation—those are risks that are minimizable. Proliferation of nuclear material—that risk is minimizable. Versus what you can get out of nuclear energy, weighing the pros and cons. I strongly believe that nuclear energy can solve countless problems."

The pro-nuclear community is small and fractious. There are debates about how large a role renewables should play and about whether to focus on preserving existing plants or developing advanced reactors, which have the potential to shut down automatically in the event of overheating and to run on spent fuel. (These reactors are still in the experimental phase.) There are also differences in rhetoric. At one end of the spectrum is Shellenberger, who seems to see mainstream environmentalists as his main adversaries; his newest book is titled "Apocalypse

Never: Why Environmental Alarmism Hurts Us All." His recent commentary decrying what he calls the climate scare has been widely circulated in right-wing circles and has perplexed some pro-nuclear allies. At the other end is Good Energy Collective, co-founded, recently, by Jessica Lovering, Shellenberger's former colleague at the Breakthrough Institute. Her organization situates itself specifically on the progressive left, and is attempting to ally itself with the broader environmental movement and with activists focussed on social and racial justice. Mothers for Nuclear falls somewhere in between: their tone is less combative than Shellenberger's, but Hoff and Zaitz often seem frustrated with anti-nuclear arguments and, in their social media feeds, point out the downsides of renewables—an emphasis that may turn off some of the people they are trying to persuade. (They believe that nuclear power should do most of the work of decarbonization, supplemented by renewables.)

Nuclear energy scrambles our usual tribal allegiances. In Congress, Democratic Senators Cory Booker and Sheldon Whitehouse have co-sponsored a bill with Republican Senators John Barrasso and Mike Crapo that would invest in advanced nuclear technology and provide support for existing plants that are at risk of closure; a climate platform drafted by John Kerry and Alexandria Ocasio-Cortez included a plan to "create cost-effective pathways" for developing innovative reactors. And yet some environmental organizations, including Greenpeace and Climate Justice Alliance, deplore nuclear energy as unsafe and expensive. Perhaps most telling is the ambivalence that some groups express. Although the Union of Concerned Scientists has warned about the climate impacts of shutting down nuclear facilities, it has historically sounded the alarm about nuclear risk. Ed Lyman, its director of nuclear-power safety, told me that, because "there are so many uncertainties associated with nuclear safety analysis," it's "very hard to make a conclusion about whether it's safe or not." He noted, dispiritingly, that climate change could increase the hazards at nuclear plants, which will have to contend with more extreme weather events.

When Hoff and Zaitz officially launched Mothers for Nuclear, on Earth Day, 2016, they had to figure out how to tell their story and to change minds. The standard images of renewables—gleaming solar panels, elegant wind turbines in green fields—are welcoming, even glamorous. It seemed to Hoff and Zaitz that, **by comparison, the nuclear industry had done a terrible job at public relations.** By emphasizing safety, they thought, the industry had activated fears. Airlines don't advertise by touting their safety records**. It might be better to unapologetically celebrate nuclear energy for its strengths.**

They gave talks at schools and conferences, shared stories on their Web site, posted on social media, and eventually started chapters in other countries. Iida Ruishalme, a Finnish cell biologist who lives in Switzerland and now serves as Mothers for Nuclear's director of European operations, told me that she was drawn to the organization, in part, because of its appeal to emotion. The widespread impression, she said, is that "people who like nuclear are old white dudes who like it because it's technically cool." Mothers for Nuclear offered "this very emotional, very caring point of view," she said. "**The motivation comes from wanting to make it better for our children.**" Ruishalme said that online commenters often tell her that the group is "clearly propaganda, a lobbyist front, not sincere—because it's so preposterous to think that mothers would actually do this." On the organization's Web site, a photo montage of women and children is accompanied by a caption clarifying that they are pictures of real people who support the group—not stock images.

Among opponents, there is a long-standing assumption that anyone who promotes nuclear power must be a shill. The name “Mothers for Nuclear” sounds so much like something dreamed up by industry executives that it can elicit suspicion, even anger, in those who are anti-nuclear. The organization is entirely volunteer-run, with a tiny budget, and has not accepted donations from companies. But Hoff and Zaitz work at a nuclear plant and have been flown to give talks at industry-sponsored events; Mothers for Nuclear has received small donations from others who work in the industry. There is no denying the conflict of interest posed by their employment; even within the pro-nuclear community, their industry ties provoke uneasiness. Nordhaus, the executive director of the Breakthrough Institute, wrote in an e-mail that, although he thinks Hoff and Zaitz are “well-intentioned,” nuclear advocacy should be independent of what he called “the legacy industry.” (The Breakthrough Institute has a policy against accepting money from energy interests.) Yet, from another angle, their connection to industry may be an asset. “Where they’ve been successful is coming at it from a personal perspective,” Jessica Lovering, the co-founder of Good Energy Collective, told me. Their approach to telling their stories, as outdoorsy, hippie moms, “humanizes the industry,” she said.

On a drizzly morning in May, 2019, when such visits were possible, Hoff and Zaitz offered me a tour of their plant. Hoff picked me up from my hotel in San Luis Obispo in her slate-gray electric Ford Focus, adorned with a “Split Don’t Emit” bumper sticker. While we waited for Zaitz at a café a few blocks away, Hoff told me about the lavender pendant hanging around her neck. Crafted for her by an artist she knew in Arizona, it was made partly of uranium glass, an old-fashioned material that has a touch of uranium added in for aesthetic purposes. “I wear it as a demonstration—radiation is not necessarily dangerous,” she said. Like many nuclear advocates, Hoff believes that the fears provoked by radiation are often unfounded or based on information that is not contextualized. A CT scan of the abdomen involves about ten times as much radiation exposure as the average nuclear worker gets in a year. Some scientists argue that no level of radiation exposure is safe, but others doubt that exposure below a certain threshold causes harm, and note that we are all exposed to natural “background” radiation in daily life. (Uranium glass emits a near-negligible amount**.) Hoff and Zaitz believe that panic about radiation from nuclear energy has, cumulatively, caused more harm than the radiation itself.**

After Zaitz arrived, we set out for Diablo Canyon. I rode up front; Zaitz sat in the back, pumping breast milk for her year-old daughter. The light rain had stopped, but mist still hung in the air. We passed through the town of Avila Beach, driving alongside the ocean. To our left, aquamarine water sparkled. On our right lay gently sloping terrain of grasses, sagebrush, wildflowers, and shrubs. The facility sits amid twelve thousand acres of otherwise unoccupied seaside land. Along the curving road, a sign proclaimed “Safety Is No Accident.” In the distance, the two massive containment domes rose above a cluster of shorter structures.

We pulled into the parking lot. In one of the outbuildings, I handed over my passport, then placed my jacket and bag in a plastic bin for an X-ray. I walked through a metal detector, then stood under the arch of a “puffer machine,” which blasted me with air, shaking loose particles and analyzing them for traces of explosives. Once I’d been cleared, we walked upstairs to Hoff’s office, where the two women exchanged greetings with a few co-workers. We put on safety glasses and hard hats before entering “the bridge,” a narrow corridor with large windows that connects the administration building to the turbine hall. Through the windows, we could see the ocean, where water was continually cycling into and out of the plant. A security guard, armed with a handgun and a rifle, and wearing a red backpack, sauntered by.

The turbine hall, a vast space with a soaring, arched ceiling, was dominated by two large generators. Outside, within the two containment domes, uranium atoms were splitting apart in a chain reaction, heating water to more than six hundred degrees Fahrenheit; the steam spun the turbines, which in turn drove the generators. The resulting electricity would bring power to about three million Californians. Warm air rushed noisily around us. Through the din, Hoff explained different parts of the system: the pipes, the springs that supported them, the condenser, which takes wet vapor from the turbine exhaust and turns it back into liquid. Vending machines selling Pepsi and Chex Mix stood against one wall. I wasn't allowed to take photos, but Hoff snapped a few of me and Zaitz. We smiled as if we were at Disneyland.

In June, 2016, not long after the formation of Mothers for Nuclear, P.G. & E. announced that it would not renew its operating licenses: the reactors at Diablo Canyon would cease operations in 2024 and 2025, respectively. The company said that its decision was based largely on economic considerations. Customer demand was declining, in part because of the growing popularity of a system called community-choice aggregation, in which localities can choose their energy sources; often they choose wind or solar farms (though they still need to rely on natural gas at night, when solar is unavailable). The year before, California had passed Senate Bill 350, which requires the state to derive half of its energy from renewable sources by 2030; since P.G. & E. would be legally required to increase its procurement of renewable energy, it could end up with more electricity than it needed if it kept Diablo Canyon online.

The environmental groups that supported P.G. & E.'s plan, including the National Resources Defense Council and Friends of the Earth, see it as a model for gradually transitioning to a grid fed entirely by renewable energy. P.G. & E. has pledged to replace Diablo Canyon with other low-carbon energy sources. And yet energy storage remains a major challenge. Even if P.G. & E. does manage to fill the gap without help from natural gas—a heavy lift—some argue that, **given California's ambitious climate goals, the state should be adding to its total portfolio of low-carbon energy rather than subtracting from it**. Experts differ on the wisdom of the choice. Steven Chu, the Nobel Prize-winning physicist who served as President Barack Obama's Secretary of Energy, told me that he had urged P.G. & E. not to decommission the plant. "It's really the last twenty to thirty per cent of electricity where it's going to be hard to go a hundred per cent renewable," he said. Daniel Kammen, a physicist and a professor of nuclear energy at the University of California, Berkeley, however, was more sanguine. Although he is not opposed to nuclear power, or even to keeping Diablo Canyon open, he said, "We don't need nuclear, and we certainly can get to a zero-carbon future without nuclear. The mixture of other renewables means you don't have to go there."

Hoff and Zaitz are not especially optimistic about the future of Diablo Canyon, but they hope that, between now and the planned closure, P.G. & E. and state officials can be persuaded to reverse course. They seek to recruit ordinary Californians to their cause. After touring the plant, I accompanied them to a radio studio, where they were scheduled to be guests on Dave Congalton Hometown Radio, a popular local talk show. On the air, Hoff explained who they were. "Mothers for Nuclear offers a different voice," she said. "Nuclear power plants are run by lots of men, and women have been more scared of nuclear energy. We're here to offer the motherly side of nuclear—nuclear for the future, for our children, for the planet."

The phone lines lit up. The first couple of calls were favorable. "It's kind of nice to hear a little bit of sanity about nuclear power, for a change," a caller named John said. But then Pete, a listener who said that he had protested the construction of Diablo Canyon back in the early eighties, brought up nuclear waste. “There’s been numerous efforts to put it here, put it there, put it in barrels, bury it in the sea, bury it in deep caves—this, that, the other thing,” he said. “I don’t think any really good solution has even come up.”

“Pete, where do you put your garbage?” Hoff asked. “Where do you put your plastic waste?”

“That’s not radioactive!”

“It’s still really damaging to the environment,” Hoff said.

“An accident at a nuclear plant is a lot worse than an explosion at an oil plant,” Pete said.

Zaitz jumped in. “The surprising thing, Pete, that we found out is that nuclear is actually the safest way to make reliable electricity when you look at even the consequences of the worst accidents we’ve ever had,” she said. “**Any other energy source ends up, in the long run, killing more people, whether it’s due to air pollution, whether it’s due to industrial accidents. Air pollution kills about eight million people per year**.”

As the conversation continued, Hoff and Zaitz held their own, but it seemed unlikely that many minds would be changed decisively. In trying to plan a carbon-free future, we are faced with imperfect choices and innumerable unknowns. In such situations, we typically go with our guts. Gut feelings are hard to alter. And yet, especially for younger people, nuclear power may not elicit visceral fears. Many people who did not grow up with the threat of a nuclear holocaust now **face a future of climate chaos. Many lie awake at night imagining not meltdowns but lethal heat waves and calving glaciers; they dread life on an inexorably less hospitable planet.**

Since I first met with Hoff and Zaitz, the coronavirus pandemic has upended the world. At Diablo Canyon, the comparatively small fraction of the plant’s workers who need to be on site—security guards, control-room operators, and the like—are now doing so in masks, and with other safety protocols in place; Hoff and Zaitz have been working from home. Meanwhile, last summer, wildfires set the West Coast ablaze. For Hoff and Zaitz, both crises have reinforced their existing beliefs. **Evidence that air pollution exacerbates vulnerability to COVID-19 is yet another reason to move away from fossil fuels**; the importance of **ventilators and other devices at hospitals underscores the need for reliable, around-the-clock electricity**. Last August, when thick smoke blocked the sun in parts of California, solar output in those areas temporarily plummeted.

Rolling blackouts have raised questions about how California’s grid will function after Diablo Canyon is shut down. In May, the office of the California Independent System Operator, which is responsible for maintaining the grid’s reliability, filed comments to the state’s Public Utilities Commission. Its modelling, the office reported, showed that “**incremental resource needs may be much greater than originally anticipated and that the system hits a critical inflection point after Diablo Canyon retires**.” At the same time, the plant’s outsized role is not without drawbacks. The reactors periodically need to be taken offline for maintenance, withdrawing a substantial amount of electricity from the grid.

Our energy system is in flux. There are innovations under way in the renewables sphere—advances in battery storage, demand management, and regional integration—which should help overcome the challenges of intermittency. Nuclear scientists, for their part, are working on smaller, more nimble nuclear reactors. There are complex economic considerations, which are inseparable from policy—for example**, nuclear power would immediately become more competitive if we had a carbon tax**. And there are huge risks no matter what we do.

To be fervently pro-nuclear, in the manner of Hoff and Zaitz, is to see in the peaceful splitting of the atom something almost miraculous. It is to see an energy source that has been steadily providing low-carbon electricity for decades—**doing vastly more good than harm, saving vastly more lives than it has taken—but which has received little credit and instead been maligned**. It is to believe that the most significant problem with nuclear power, by far, is public perception. Like the anti-nuclear world view—and perhaps partly in response to it—the pro-nuclear world view can edge toward dogmatism. Hoff and Zaitz certainly seem readier to tout studies that confirm their views, and reluctant to acknowledge any flaws that nuclear energy may have. Still, even if one does not embrace nuclear power to the same extent, one can recognize its past contributions and **question the wisdom of counting it out in the future**.

One of the last times I spoke with Zaitz, she noted that a lot of people seemed to be feeling discouraged at this moment, overwhelmed by the scale of the challenges ahead. But she counselled against despair. "The hopeful way to go into that is, '**Oh, wow, we actually have technology that can do this**,' " she said. "**And that's nuclear. And so I'd rather stay hopeful**."

More:Nuclear PowerClimate ChangeActivismRenewable EnergyCaliforniaPower Plants

January 8, 2020

Shutting down nuclear makes no sense - Financial Times

Shutting Down Nuclear Power Plants Makes No Sense

https://www.mothersfornuclear.org/news/2020/1/8/lwotjyas5hm5yo4swetaw8rkpya85f

By Heather Hoff and Kristin Zaitz, Mothers for Nuclear

Across Europe, countries are shutting down nuclear power plants. It's happening in the U.S. as well. To us, it doesn't make sense.

Across the U.S., we are closing perfectly good existing nuclear plants because of low natural gas prices and discriminatory policies that, in the name of climate action, support renewables but not carbon-free nuclear energy. When existing nuclear plants close, they are almost always replaced by fossil fuels. Even if we make big gains on adding renewables, the strategy of replacing one clean energy source with another means backwards or no progress on climate. It also means that we pay more: building new clean energy to replace existing clean energy means spending money for little to no actual emissions reductions. This high cost for low progress is also causing polarizing political conversations when it comes to action on climate.

Instead of continuing to rely on the renewables-only bandwagon, we need to focus on building public support for nuclear energy. There is growing public awareness on the importance of using science to inform our decisions as a nation. The science is clear—nuclear is the safest way of generating reliable electricity. Of all of the "clean" energy sources, nuclear occupies the smallest land footprint per unit of energy produced, and we have the technology right now. We cannot continue to delay action on climate until some future solution is produced.

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Grist

Closing nuclear plants risks rise in greenhouse gas emissions, (UCS) report warns

Environmentalists are divided over nuclear energy, the single largest source of low-carbon electricity.

The Diablo Canyon nuclear power plant outside San Luis Obispo, California. Pacific Gas and Electric

Oliver Milman Published Nov 18, 2018

https://grist.org/article/closing-nuclear-plants-risks-rise-in-greenhouse-gas-emissions-report-warns/

Topic Climate + Climate & Energy

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Looming climate breakdown is opening fresh divisions among environmentalists over nuclear energy, with a major advocacy group calling for struggling nuclear plants to be propped up to avoid losing their low-carbon power.

Nuclear is the single largest source of low-carbon electricity in the U.S. But a third of nuclear plants are unprofitable or scheduled to close, risking a rise in greenhouse gas emissions if they are replaced by coal or natural gas, a major Union of Concerned Scientists (UCS) report has found.
https://www.ucsusa.org/sites/default/files/attach/2018/11/Nuclear-Power-Dilemma-full-report.pdf

U.S. emissions could increase by as much as 6 percent if struggling plants are shuttered early, the report warns. This scenario has put pressure on many environmental groups to reevaluate their intrinsic opposition to nuclear energy as a dangerous blight that must be eradicated.

"We are running out of time to make the emissions reductions needed to avoid the worst impacts of the climate crisis," said Steve Clemmer, director of energy research for the UCS climate and energy program. "Losing a low-carbon source of electricity like nuclear power is going to make decarbonization even harder than it already is. Nuclear has risks, it's not a perfect technology, but there have to be trade-offs."

The U.S., like the rest of the world, faces a steep challenge to avoid the worst ravages of heatwaves, drought, extreme weather, and flooding. The IPCC report states emissions must reach net zero by 2050 to avoid the most punishing climate change impacts, whereas the Trump administration is currently dismantling every major policy aimed at lowering emissions in the U.S.

The U.S. has an aging fleet of nearly 100 reactors at 60 nuclear plants, with many nearing the ends of their expected lifetimes. Five plants have shut down since 2013, with a further five set to shutter over the next eight years.

In total, a third of U.S. nuclear power plants are set to close down or are unprofitable largely due to a major shift to cheaper natural gas. As nuclear provides more than half of the United States' low-carbon energy, this situation "raises serious concerns about our ability to achieve the deep cuts in carbon emissions needed to limit the worst impacts of climate change," the UCS report states.

Replacements for nuclear will vary across the country. The huge Diablo Canyon plant in California, for example, will probably spawn a surge in renewable energy when it shuts in 2025. But in other states, such as Ohio and Pennsylvania, weak clean energy policies and the abundance of natural gas mean the closure of nuclear plants will probably raise emissions.

"Renewables can fill a lot of the gap but it's a timing issue," Clemmer said. "Over a long timeframe, we can ramp up renewables and phase out coal, gas, and nuclear generation, but we don't have that time. We have to cut half of all emissions by 2030, according to the IPCC. We can't physically ramp up renewables fast enough."

Anti-nuclear campaigning has been a foundational shibboleth for groups such as Greenpeace, which has pointed to disasters such as Chernobyl in 1986 and Fukushima in 2011 as evidence that the sector should be shut down.

While the UCS have never been militant opponents of nuclear power, Clemmer said "we are getting a bit more vocal" about the benefits of keeping plants open as the scale of the climate crisis has become clearer.

Many opponents remain implacable, however.

"Nuclear reactors are a bad bet for a climate strategy," said Gregory Jaczko, who was chair of the U.S. Nuclear Regulatory Commission during the Obama administration. "The Union of Concerned Scientist models don't reflect the reality of the United States electricity market. Renewables are getting cheaper faster than expected and are in some cases the least expensive source of electricity."

Jaczko said new nuclear is a "financial boondoggle," with investments better placed in solar or wind. "Employing nuclear for climate change is like Dorothy seeking the Wizard of Oz to get home," he added. "It's an expensive enticing mirage."

Clemmer said he agreed that new nuclear plants are enormously expensive, but **said there was a case for the U.S. government to invest around $814 million a year to keep existing unprofitable plants online, given the cleaner energy they provide. "Environmental groups may come round to this, but I'm just not sure," he said.**

**BEFORE THE PUBLIC
UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA**

Application of Pacific Gas and Electric Company for Approval of the Retirement of Diablo Canyon Power Plant, Implementation of the Joint Proposal, And Recovery of Associated Costs Through Proposed Ratemaking Mechanisms (U 39 E)	Application 16-08-006 (Filed August 11, 2016)

ENVIRONMENTAL PROGRESS'S PROTEST OF PACIFIC GAS AND ELECTRIC COMPANY'S APPLICATION FOR APPROVAL OF THE RETIREMENT OF DIABLO CANYON POWER PLANT, IMPLEMENTATION OF THE JOINT PROPOSAL, AND RECOVERY OF ASSOCIATED COSTS THROUGH PROPOSED RATEMAKING MECHANISMS

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PROTEST OF ENVIRONMENTAL PROGRESS

Pursuant to Rules 1.4(a)(2) and 2.6 of the Commission's Rules of Practice and Procedure, Environmental Progress ("EP") files this protest to the above-captioned application filed by Pacific Gas & Electric Company ("PG&E"). EP strongly opposes the Joint Proposal which is the subject of this application, and strongly opposes PG&E's decision to retire the Diablo Canyon Power Plant ("DCPP"). Notwithstanding this protest, EP in a separate motion asks CPUC to suspend all hearings on DCPP in light of the on-going federal and state criminal investigation of CPUC, the withholding of emails involving CPUC President Michael Picker, and the intention by the California legislation to implement reforms or abolish the CPUC.

A. Introduction and Summary

EP is incorporated and organized under the laws of the State of California. EP's principal place of business is in Berkeley, California. EP's President is Michael Shellenberger, a PG&E customer, and many of EP's supporters are residential customers of PG&E.

EP's purpose is to help achieve the dream of universal prosperity and environmental protection for all human beings. EP works with climate scientists, conservationists, citizens, students and environmentalists to educate the public about the need for all sources of clean energy for California energy consumers.

EP's participation in CPUC proceedings is motivated by a desire for cleaner and cheaper electricity that can not only meet current needs but also rapidly replace petroleum used for transportation, and accelerate the creation and diffusion of cleaner and cheaper fuels and technologies globally to achieve its mission.

EP opposes all of the positions on the specific authorities being requested by PG&E in its application because they would violate CPUC's mandate to protect California ratepayers from market manipulation, price increases and pollution.

CPUC must be responsive to the demands of the Governor, the Legislature and civil society. All of these institutions, including CPUC, are on the record supporting California's stated policy objective of reducing greenhouse gas emissions 40 percent levels below 1990 level by 2030, a policy EP also strongly supports.

PG&E should be denied its request to increase electricity rates as future rate increases. Accelerating decarbonization requires radically *accelerated* deployment of near zero-carbon power sources, not their loss or mere replacement. If PG&E should still go forward with DCPP's closure, then any future rate increases should go to adding new power, not paying for the replacement of a power plant that does not need to be closed.

B. Discussion.

1. Achieving California's 2030 climate objective will require that the state reduce carbon emissions at a rate 7 times faster than it did from 2000 to 2014 — a period that saw the worst economic downturn since the Great Depression.

According to California Air Resources Board, total greenhouse covered by state laws ("included emissions") in 1990 were 431 million megatons of carbon dioxide equivalent (MMTCO2), of which 40 percent is 172 MMTCO2. Achieving that will require California reduce emissions by 259 MMTCO2 between 2017 and 2030, or 20 MMTCO2 per year. By contrast, California only reduced its emissions 1.7 MMTCO2 per year between 2000 and 2014.[1]

431	MT CO2	1990 Emissions
172.4	MT CO2	40% of 1990 levels
258.6	MT CO2	by 2030, by law
441.5	MT Co2	2014 Emissions
12.19	MT CO2 drop per year	2015-2030 rate
465.91	MT CO2	2000 Emissions
1.74	MT CO2 drop per year	2000-2014 rate

2. California has been going backwards on emissions since 2011.

Where emissions declined 24 million tons between 2000 and 2010, they have been flat since 2011. Where emissions from California's electricity sector declined 12 million tons between 2000 and 2010, they actually *rose* 10.45 million tons between 2011 and 2014, the most recent year data is available. The loss of one of

[1] California Air Resources Board (CARB), "2016 Edition California Greenhouse Gas C1:P3 for 2000-2014 — by Sector and Activity," 2016

the state's two nuclear plants, San Onofre Nuclear Generating Station, known as SONGS, in 2012, which was replaced largely by power from natural gas, is responsible for 55 percent of the emissions increase.

3. California's population will rise and energy consumption could thus rise significantly between today and 2030.

In California, over 90 percent of the emissions counted by California Air Resources Board are from electricity or transportation. Transportation alone is 37 percent of California's emissions.[2]

Electricity demand is likely to rise with a growing population. The number of Californians is set to rise from 39 million today to 44 million in 2030, a 13 percent increase. [3]

4. More Energy Efficiency Is Likely to Raise Electricity Rates Without Lowering Overall Electricity Demand

California's per capita electricity consumption has been relatively flat since 1975, hovering around 6,900 kwh per person, with no pattern of increase or decline during this period.[4] Also during this time, California has had in place aggressive efficiency measures.

PG&E offers no assurance that any of the efficiency measures it would procure would be additional or additive to what is already happening. California already offers generous subsidies for retrofitting homes and for households to purchase more efficient appliances. While there are legitimate and interesting debates over whether even more efficiency programs, investments, mandates,

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[2] CARB 2016
[3] California Department of Finance, "Projections: Population" 2016, http://www.dof.ca.gov/Forecasting/Demographics/projections/
[4] CARB, "Per Capita Electricity Sales, 1975 – 2014," http://energyalmanac.ca.gov/electricity/per_capita_electricity_sales.html

subsidies and measures would reduce electricity consumption, what matters here is that there is a very good possibility that California's electricity demand will rise 13 percent rather than rise, as PG&E claims in its Application, simply due to an increasing population.

The efficiency measures could significantly increase rates without reducing consumption or pollution. There is a large body of evidence that additional energy efficiency measures will raise rates, and here we cite just two.

The first comes from a workshop that CPUC co-hosted with the California Energy Commission (CEC) to discuss how to replace the power lost after the closure of SONGs on July 15, 2013.[5] At that meeting, the heads of the CEC, the California Air Resources Board (CARB), CPUC's then-President Peevey and parties to PG&E's joint proposal all acknowledge that they would replace SONGS with natural gas and not avoid replacing the power through demand reductions resulting from energy efficiency.

CPUC President Peevey was told by Southern California Edison that more energy efficiency would make electricity rates rise, not decline. This is from the transcript:

> PRESIDENT PEEVEY: Just a quick question on the energy efficiency. If I'm reading this chart correctly, it's a pretty -- if I read this chart correctly, it's a pretty sizeable increase in rates due to energy efficiency….
>
> MR. HOWARD [Southern California Edison]: We believe you'll see that in the customer bills, but we also have it levelized. So as you invest in energy efficiency you're not going to see direct rate decreases. You will see rates potentially go up as you see less users, as you use more energy efficiency (emphasis added).

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[5] California Energy Commission and California Public Utilities Commission, "Joint Workshop on Electricity Infrastructure Issues Resulting from SONGS Closure," July 5, 2013. http://www.energy.ca.gov/2013_energypolicy/documents/2013-07-15_workshop/2013-07-15_Transcript.pdf

What Edison's Howard is arguing is that even if efficiency works in reducing energy consumption, it will reduce Edison's customer base — just as PG&E is proposing to reduce its customer base — and rates will either remain the same or rise.

The second point of evidence comes from a rigorous study by three University of California – Berkeley and University of Chicago economists that found home weatherization costs twice as much as electricity is saved.[6]

Conventional wisdom suggests that energy efficiency (EE) policies are beneficial because they induce investments that pay for themselves and lead to emissions reductions. However, this belief is primarily based on projections from engineering models. This paper reports on the results of an experimental evaluation of the nation's largest residential EE program conducted on a sample of more than 30,000 households. The findings suggest that the **upfront investment costs are about twice the actual energy savings.** Further, the model-projected savings are roughly 2.5 times the actual savings. While this might be attributed to the "rebound" effect – when demand for energy end uses increases as a result of greater efficiency – the paper fails to find evidence of significantly higher indoor temperatures at weatherized homes. Even when accounting for the broader societal benefits of energy efficiency investments, the costs still substantially outweigh the benefits; the average rate of return is approximately -9.5% annually.

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[6] Meredith Fowlie, Michael Greenstone, and Catherine Wolfram, "Do Energy Efficiency Investments Deliver? Evidence from the Weatherization Assistance Program," June 2015, http://econresearch.uchicago.edu/sites/econresearch.uchicago.edu/files/paper_draft_06_15_clean.pdf

5. Achieving California climate goals requires significantly replacing petroleum in transportation.

Replacing a significant share of petroleum used in transportation with near-zero emissions energy, whether electricity, hydrogen or some other fuel.

California will need to increase electric vehicle (EV) on the road from today's 160,000 to 5 million cars by 2030, according to California Governor Jerry Brown and California Air Resources Board Chair Mary Nichols.[7] There are 34 million registered vehicles in California with 24 million of them cars.[8] In 2015 there were 62,166 EVs among the two million cars sold in California.[9]

Much more detailed analyses should be done, but a shorthand example suffices for this Motion. To fuel 5 million electric cars with the same electricity usage as Nissan Leafs[10], **California will need almost the exact amount of electricity annually (17,500 GWh) that would be generated by a near-zero carbon power plant the size of Diablo Canyon**.[11] And to generate enough power for 24 million cars, California would require the equivalent of 5 power plants the size of Diablo Canyon.

6. Closing Diablo Canyon will not alleviate curtailment of renewable power.

PG&E's Testimony asserts that keeping Diablo Canyon open will increase the curtailment of RPS-eligible renewables because it cannot easily ramp down during

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[7] Chris Megerian, "California Falling Short in Push for More Clean Vehicles," LA Times, December 8, 2015. http://www.latimes.com/politics/la-me-pol-sac-climate-vehicle-emissions-20151208-story.html

[8] DMV, December 2015. https://www.dmv.ca.gov/portal/wcm/connect/5aa16cd3-39a5-402f-9453-0d353706cc9a/official.pdf?MOD=AJPERES

[9] Charles Fleming, "Honda Leads California New Car Sales for 2015," *LA Times*, February 17, 2016. http://www.latimes.com/business/autos/la-fi-hy-california-car-sales-20160217-story.html

[10] The Nissan Leaf needs 30 kWh of electricity to travel 100 miles, or .3 kWh per miles. Department of Energy, 2016. http://www.fueleconomy.gov/feg/Find.do?action=sbs&id=37066

[11] 5,000,000 Nissan Leafs at 0.3kWh per mile, multiplied by 12,000 miles (California average)

periods of over-generation. (These episodes mainly occur on sunny days when surges of solar power threaten to overwhelm the California grid.)

But PG&E's own estimates indicate that closing Diablo Canyon would alleviate just 850 GWh per year of renewables curtailment (**PG&E Testimony, p. 3-8**). This is a trivial amount, about 1 percent of the 84,000 GWh of RPS-eligible RE that CAISO forecasts for 2024.[12] Alleviating the curtailment of those 850 GWh of low-carbon renewable electricity through Diablo's closure would entail the loss of Diablo's 17,660 GWh of low-carbon electricity.

PG&E argues that "The CAISO needs resources with ramping flexibility and the ability to start and stop multiple times per day based on real-time grid conditions" (**PG&E Testimony, p. 2-20**)—in other words, natural gas plants with all their carbon emissions.

But the expedient of shutting Diablo will bring little reprieve from the curtailment crunch. That's because renewables curtailment isn't caused by nuclear power, it's caused by other renewables—especially solar panels that overgenerate on sunny days. CAISO studies suggest that by 2024, with a 40 percent RPS penetration, the marginal curtailment rate of additional increments of solar generation will be 28 to34 percent;[13] that marginal curtailment rate will increase rapidly as solar penetrations grow.

Rather than easing curtailment, closing Diablo to make way for more solar makes curtailment problems worse.

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[12] CAISO, "Report of the No Renewable Curtailment Sensitivity Case Studies;" https://www.caiso.com/Documents/May8_2015_DeterministicStudies_nocurtailment_ExistingTrajectory_40percentRPS_R13-12-010.pdf

[13] CAISO, "2015-2016 Transmission Plan" pp. 254-56, http://www.caiso.com/Documents/Board-Approved2015-2016TransmissionPlan.pdf

7. DCPP will be replaced mostly by fossil fuels either within PG&E's "bundled load," its service territory, California, or the United States.

Every kilowatt-hour of renewable electricity that's used to replace low-carbon nuclear power is a kilowatt-hour that's not available to displace fossil fuels from the grid. Because of that lost decarbonization opportunity, Diablo's lost power should properly be regarded as being *entirely* replaced by fossil fuels, for as long as there are fossil fuels on the grid. By that truer measure, Diablo's closure will result in an extra 144 million tons of carbon dioxide emissions than would occur if the plant were to renew its license and operate until 2045.

One of the architect of the Joint Proposal himself acknowledged at the workshop that SONGS would need to be replaced by natural gas not efficiency. V. John White, whose renewable energy, natural gas and energy efficiency industry association, Center on Energy Efficiency and Renewable Energy Technologies (CEERT) was hired by Friends of the Earth to create the framework for the Joint Proposal, acknowledged that efficiency and demand response would not be anywhere near enough to replace SONGS. White said the choice was between electricity imported from out-of-state or new natural gas electricity production in state. "We really have choices to make between are we going to import electricity or are we going to import gas and burn it."

The strongest advocate of building more natural gas plants to replace SONGS was Alliance for Nuclear Responsibility. Its lawyer, former California Energy Commissioner John Geesman, urged CEC and CPUC to expedite natural gas burning:

> Now, I am a big advocate of transparency and all of that stuff, but those of us that trace our political genealogy back through the Grey Davis Administration know that first and foremost you keep the damn lights on…. I think if you can find gas-generation capacity, you ought to take advantage of that opportunity…. And I think that those are the marching orders you're under. It certainly should be….

PG&E's Application and Testimony prey on widespread confusion about three different things:

1. California's electrical grid;
2. PG&E's *service* territory: all consumers who receive electricity through PG&E's power lines, including those customers who buy power from alternative retailers known as "Community Choice Aggregators" (CCAs);
3. PG&E's "bundled load": those customers in PG&E's service territory who purchase their electricity from PG&E, not from a CCA.

PG&E justifies its proposal to close DCPP and raise electricity rates on the basis of the needs of its *customer base* while ignoring the impact on PG&E's *service base* and on California's *whole electrical grid*.

In its Testimony, PG&E argues that the electricity usage it supplies will decline for three reasons:

- Lower demand due to greater energy efficiency;
- Lower demand due to more "distributed generation" such as rooftop solar.
- Migration of its customers to CCAs.

However, this accounting focuses on just one part of California: PG&E's shrinking bundled load, not its larger service area or California. And while the focus here is California, CPUC should reject any proposal that would result in higher emissions in other states from natural gas electricity generation exported to California. Currently, California imports about one-third of its power. If California is truly committed to climate goals, then simply exporting its pollution to other states cuts against the effort to reduce emissions in the US as a whole.

8. More natural gas electricity generation would very likely increase deaths from pollution and pipeline explosions.

On September 9, 2010, a Pacific Gas & Electric (PG&E) natural gas pipeline running underneath the city of San Bruno, California, exploded, killing eight people and destroying 38 homes. Six years later, a federal jury found PG&E, California's largest electric utility, guilty of violating safety regulations and deliberately misleading investigators. PG&E's lawyer argued to the jury that "Nobody at PG&E is a criminal."[14]

But even without criminal or unethical conduct, natural gas is far more dangerous than uranium, the fuel used by DCPP. In a large review of the evidence compiled for the British medical journal *Lancet*, scientists found that nuclear power is the safest way to make reliable power. Natural gas accidents kill a full order of magnitude more members of the public than nuclear accidents. The same study found that pollution from natural gas kills 54 times more and injures 136 times more people than from nuclear.[15]

Using standard public health accounting, closing DCPP would result in 831 to 5,637 premature deaths. Using the same calculations, Diablo Canyon has prevented up to 14,421 deaths since it began producing electricity. That's because using nuclear energy instead of coal and natural gas saves lives. In a study for the journal *Environmental Science and Technology,* climate scientist James Hansen and Pushker Kharecha in 2013 calculated that nuclear energy has prevented 1.8 million deaths since 1971.[16]

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[14] Sudhin Thanawala, "California Utility Guilty of Obstructing Investigators," *AP*, August 10, 2016.
[15] Anil Markandya and Paul Wilkinson, "Electricity and Health," *Lancet*, September 15, 2007
[16] Kharecha and Hansen, "Prevented Mortality and Greenhouse Gas Emissions from Historical and Projected Nuclear Power," Environmental Science and Technology, 2013

9. PG&E's Application rests on its false claim that DCPP will require cooling towers or some other very expensive OTC requirement.

PG&E forecasts in its Prepared Testimony that in 2025 Diablo's revenue requirements will be $1.661 billion, rising to $1.743 billion in 2030, on a total output of 16,300 GWh per year. Neither PG&E's Application nor its Testimony breakdown or explicitly justify 60 percent inflation in DCPP's costs.

In its Application, PG&E rests the $1.6 billion in revenue requirements on assumption that "the cost to operate Diablo Canyon may significantly increase due to [once-through-cooling regulatory requirement]." It adds:

Future operating costs are uncertain due to a variety of regulatory and other factors and could increase as the facility ages. Compliance with California's environmental protection regulations and other state and federal requirements may increase costs beyond 2025. These include, for example, any environmental mitigation or compliance measures required by California resource agencies, retrofits to comply with the State Water Resources Control Board's ("SWRCB") Once-Through Cooling ("OTC") regulation.

PG&E offers account of OTC is misleading in several ways:

PG&E's Proposal and Testimony ignore the fact that framework for an OTC mitigation settlement was already negotiated and focused on land conservation and artificial reef.

In 2000, the Central Coast Regional Water Quality Board created the framework for an OTC settlement with PG&E. Michael Thomas from Board oversaw the process, and hired Peter Raimundi from UC-Santa Cruz who worked with PG&E consultant John Steinbeck of Tenera Consultants. In January 2016, all three men were interviewed by Michael Shellenberger and the transcripts of the interviews are attached as an appendix.

The Regional Water Board — not the *State* Water Board, as PG&E claims — decides on OTC compliance. Explained Michael Thomas of the Central Coast

Regional Water Quality Board: “Both boards have a role, **but the Regional Water is who decides whether to adopt cooling towers**.” Indeed, as we’ll note below, the State has deferred to Raimondi, Thomas and Steinbeck.

The artificial reef was proposed at one-time cost of $15 - $50 million. According to Raimondi’s presentation to the State Water Board, and based on research with Steinbeck and Thomas, “An artificial reef of sufficient size and with appropriate design and placement could compensate for the majority of impacts associated with entrainment at DCPP….The estimated cost for the construction of an artificial reef ranged from 15 million to 50 million dollars.”[17]

Rainmodi (2016):

> “We proposed compensatory mitigation through habitat creation. Most species affected were ones associated with rocky subtidal reefs. So we proposed they build artificial reefs. There was precedent in southern California where for SONGS a compensatory reef was built and is still operating…. **The cost of the construction of the San Onofre artificial reef was $30 to $35 million, and that’s close to the estimate from Diablo.”**
>
> The negotiated settlement focused on land conservation. Said Thomas, “We came up with a package that comprised several million in projects and the setting aside about 2,000 acres of land north of the power plant in a conservation easement.”

The cost of land conservation was estimated at $4.3 million per year. According to Thomas:

> For Diablo, if you go through the calculations, OTC compliance comes out to $4.3 million per year, for 2.5B gallons a day. PG&E can pay the $4 million per year. The State Water Board preference is that that the money goes toward supporting and implementing the marine protected areas. So if you establish marine protected areas, it would help make up for losses by the power plant

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[17] Peter Raimondi, “The Science of Mitigation: Based on work done with Michael Thomas, Greg Cailliet and John Steinbeck and many others,” 2008. Submitted to the State Water Quality Board.

> When we did it with PG&E it was several million plus the land. **They could pay $4.3 million a year, or they could propose something else.** What they propose is pretty wide open. They could say they've already taken mitigation measures that should be taken into account. There's only one case where a power company has done that, and it was approved. I would expect PG&E to document everything they have done that they could consider beneficial to environment and make that as compelling as possible.
>
> All the parties rejected cooling towers, including the Water Board. Said Thomas, "I don't think they are feasible or optimal. There have been multiple studies for towers that aren't feasible. We hired our own consultants separate from PG&E and they came to same conclusion."

Said PG&E's consultant Steinbeck:

> "PG&E may make the decision to shut Diablo Canyon down but under existing state regulation they can continue to operate without building cooling towers. PG&E just needs the Board to make decision that we're going to do this or that and then come up with a proposal and then they're going to move forward with that. I don't understand why PG&E is so concerned."

a. PG&E falsely claims that DCPP's compliance with OTC would require a longer outage.

PG&E in its Testimony writes:

> As part of its OTC mitigation compliance, it is assumed that DCPP would transition from the historical maintenance schedule to an annual two-month spring outage schedule with refueling occurring every other year. This two-month outage schedule in the spring would also help to mitigate over-generation events. Based on this two-month annual outage schedule, post-2025 generation from Diablo Canyon is projected to decline from historical levels to 16,300 GWh.

But “longer outage” was never included in mitigation framework proposed to the Regional Water Quality Board. PG&E cites no evidence for this claim and instead cites a dead web link: “Error: 404 – The page you requested could not be found.” on the State Water Resource Control Agency web site.

b. PG&E Exaggerates OTC Compliance by at least $600 million annually.

The Highest estimate named for mitigation was $50 million *total* for an artificial reef. The parties (State and PG&E) were not far from each other in total cost. Said Raimondi:

> “I can’t remember exact figures but the ballpark was a $20 - $30 million difference between the two mitigation proposals. Ours was something like $35 million and theirs was like $5 million.”

PG&E’s estimates for Diablo’s revenue requirements and unit costs per megawatt-hour are way out of line with estimates made by other experts, with Diablo cost data itself and with other PG&E estimates.

Other estimates of Diablo’s revenue requirements in the coming decade are much lower than PG&E’s Testimony figures. A recent study by V. John White and Associates for Friends of the Earth estimated that Diablo’s revenue requirement in 2025 would be between $1.003 billion and $1.069 billion, far lower than PG&E’s $1.661 billion.[18] A 2015 estimate submitted to the CPUC by John Geesman, an attorney for the Alliance for Nuclear Responsibility, put the 2019 revenue requirement of the plant at $1.02 billion.[19] A 2013 report funded by PG&E also estimated that Diablo’s revenue in 2027 would be about $1 billion. All these

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[18] V. John White and Associates, “A Cost Effective and Reliable Zero Carbon Replacement Strategy for Diablo Canyon Power Plant;” p. 37. http://lowcarbongrid2030.org/wp-content/uploads/2016/PDFs/160627_Diablo-Final-Report.pdf

[19] Public Utilities Commission of the State of California, “Prepared Direct Testimony of John L. Geesman on Behalf of The Alliance for Nuclear Responsibility in Application No. 15-09-001 Pacific Gas and Electric Company Test Year 2017 General Rate Case,” p. 16. http://a4nr.org/wp-content/uploads/2016/03/A1509001-A4NR-Geesman-Ratemaking.pdf

estimate converge on a probable Diablo revenue requirement of about $1 billion in the 2025 to 2030 period, about $700 million lower than PG&E's forecast. **(PG&E Testimony, p. 8-AtchA-51)**

Current cost figures for Diablo Canyon support these estimates. PG&E data on Diablo submitted in its General Rate Case showed total operating and capital expenses of $627 million for the plant in 2015,[20] about $36 per MWh, which accords well with industry averages. Adding an 11.8 percent return on the plant's $1.805 billion net value (**PG&E Testimony, p. 10-5)** would give a total revenue requirement of $840 million in 2015, for a unit cost of $48 per MWh. To reach PG&E's Testimony cost figures, Diablo's revenue requirement and unit costs would have to double over the next 10 years. This forecast is drastically out of line with the estimates cited above that indicate a revenue requirement in 2025 of about $1 billion, or $57 per MWh.

Since PG&E's case for closing Diablo Canyon relies on these erroneous and unfounded cost estimates, the closure proposal should be rejected by the CPUC.

10. Even with its inflated future costs, DCPP would still be cheaper than replacing it with other low-carbon power sources.

PG&E's inflated cost forecasts show that in 2025 Diablo's revenue requirements would be $1.661 billion, rising to $1.743 billion in 2030, on a total output of 16,300 GWh per year. (**PG&E Testimony, Table 2-6**) That puts the average unit cost of the power at $102 per megawatt-hour (MWh) in 2025, rising to $107 per MWh in 2030. PG&E's estimate of the cost of renewable resources to replace Diablo is $103 per MWh in 2025, rising to $113 per MWh in 2030 (**PG&E Testimony, pp. 3-9 to 3-10**).

[20] Public Utilities Commission of the State of California, "Pacific Gas and Electric Company 2017 General Rate Case Exhibit (PG&E-1) Summary of PG&E's 2017 General Rate Case Supplemental Workpapers Supporting Chapter 1." pp. B5-1 to B5-6.

Thus, PG&E's numbers still show Diablo with a slight cost advantage over RE sources, and give no support to a financial case for closing Diablo.

PG&E's estimates of the cost of renewable energy ("RE") resources are too low. PGE assumes a RE resource mix to replace Diablo of 80 percent wind and 20 percent utility-scale solar. This is very different from California's actual RE mix, which has a much higher proportion of higher-cost solar in relation to lower-cost wind. In 2015 the utility-scale intermittent energy mix in California was 45 percent wind to 55 percent solar,[21] vastly different from the 80:20 wind to solar mix PG&E assumes, and solar power is growing much faster than wind power. The skewed resource mix that PG&E assumes underestimates the likely costs of RE power and ignores the greater likelihood of curtailment in a mix with a higher proportion of solar.

PG&E's estimated RE costs also factored in the federal and state subsidies RE will receive. Without the subsidies, the RE costs would be substantially higher. Federal subsidies are due to sunset by 2025, making subsidy assumptions uncertain.

Once outlandish and unfounded assumptions about OTC mitigation and cooling towers are replaced with realistic cost estimates, continued operation of Diablo is seen to be much cheaper than replacing it with renewable sources, with a cost in the neighborhood of $57 per MWh range in the post-2025 period. That is about half the cost of PG&E's estimate of the cost of replacing it with renewables and energy efficiency. It's also about the same as the price PG&E estimates that Diablo's surplus power would sell for on wholesale markets. PG&E's bundled customers would therefore pay the same low average cost as other wholesale customers would pay, a cost below what they would pay for low-carbon replacement resources

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[21] U. S. Energy Information Administration, Electricity Data Browser, http://www.eia.gov/electricity/data/browser/#/topic/0?agg=2,0,1&fuel=vtvv&geo=000000000004&sec=g&linechart=ELEC.GEN.ALL-CA-99.A&columnchart=ELEC.GEN.ALL-CA-99.A&map=ELEC.GEN.ALL-CA-99.A&freq=A&ctype=linechart&ltype=pin&rtype=s&pin=&rse=0&maptype=0

according to PG&E's estimates. Relicensing of the plant and operating it until 2045 is thus the most economical option both for its bundled customers and for other consumers in the PG&E service territory and the larger CAISO grid. Allowing the closure to proceed would mean needless rate increases for PG&E's bundled customers and other California ratepayers.

The cost issue is central to the case for closing Diablo Canyon. PG&E has no duty to close the plant simply because some of its power is surplus to its bundled load when it can sell the surplus to the larger grid. Nor does it have a duty to close the plant in order to prevent a trivial degree of curtailment of renewable generation when that curtailment is actually caused by chaotic overproduction from renewable generators themselves. It does have a fiduciary duty to minimize costs for its customers. A realistic cost forecast for the plant would show that continuing to operate it will fulfill that obligation—and PG&E's case for closing Diablo Canyon would collapse

CONCLUSION

An independent CPUC committed to its mission — defending the public interest — should recognize its duties go well beyond those of PG&E. It would consider the impact of closure on the success of California's emissions-reduction initiatives. It would consider the balance of impacts on the state's air quality, land uses and environment. It would consider the impact on all the state's rate-payers in the PG&E service territory and on the larger grid, not just the rate-payers in PG&E's bundled customer base.

An independent CPUC would carefully weigh these considerations and find that keeping Diablo open accords best with the interests of Californians and the qualities of efficiency and sustainability that the state wants in its energy supply.

Therefore, EP opposes the Joint Proposal.

Respectfully submitted September 15, 2016.

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APPENDIX

- Interview with Michael Thomas, Assistant Executive Officer, Central Coast Regional Water Quality Control Board, interviewed January 12, 2016
- Interview of Pete Raimondi, expert consultant to regional water board. Professor at UC-Santa Cruz ecology and evolutionary biology, interviewed January 8, 2016
- Interview with John Steinbeck, Tenera Consultants, January 8, 2016

Michael Thomas, Assistant Executive Officer, Central Coast Regional Water Quality Control Board; Interviewed by Michael Shellenberger; 3:45 pm January 12, 2016.

Who are you what is your role here?

I am the Assistant Executive Officer and the head of our enforcement unit. Almost all of the enforcement actions go through me. I was the lead staff person in 2000 and worked with Pete Raimondi, and hired him to assist us. And I worked with PG&E's consultant John Steinbeck. Pete's a great guy and a great scientist, John is also really good.

Where is the whole process at?

Back then we did all the environmental studies and there were two issues. What gets sucked in — entrainment — and the discharge of water 22 degrees above background levels.

In Regional Water Board staff's opinion, there were only significant environmental impacts from entrainment, and for PG&E to renew its permit, we said they had to address them.

So we came up with proposal for regional board to settle all of those impacts. We came up with a package that comprised several million in projects and the setting aside about 2,000 acres of land north of the power plant in a conservation easement.

The Board in 2000 and again in 2003 did not accept the settlement, and at the same time EPA decided that they were going to revise their Clean Water Act 3060b regulations that govern intake, entrainment and impingement. The EPA set out to advise and that put us on hold. EPA finally revised and adopted the the new regulations. But then the State Water board in Sacramento decided to adopt their own policy, and that took several years.

So now we're back to renewing a discharge permit for Diablo and we have to look at all those issues again. We have to look at the work we did previously, and the work we did since, and come up with a proposal for settling all the issues.

When will the process be finished?

We want to bring a proposal to the board in January 2017 to revise the permit

What will you do between now and then?

We have to revise the draft, update the draft, and work with the State Water Board because the state has some authority over the mitigation of impacts from OTC policy.

How did feds change rules and how did state change theirs?

I think the Feds basically affirmed their rule — which was very controversial — that the power companies have to do everything to minimize impacts, including imposing closed cycle cooling where it's feasible to do so

California State decided similarly. There are categories for different plants and nuclear has its own category. Nuclear has extra time for studies and analyses for minimizing impacts and deciding whether it's feasible.

Are cooling towers feasible?

I don't think they are feasible or optimal. There have been multiple studies for towers that aren't feasible. We hired our own consultants separate from PG&E and they came to same conclusion. We did a lot of work but the State Water Board put together their own review panel and looked at all these issues again after we did.

Will the Regional Board or State Board decide?

Both boards have a role, but the Regional Water is who decides whether to adopt cooling towers. On entrainment and impingement we will work with State Water Board executive director Tom Howard.

What is the main issue?

Entrainment is a significant issue because the volume of water is 2.5 billion gallons per day. We estimated larvae and our position was it is a potentially significant impact and so some level of mitigation is needed. How do you quantify that? It's extremely difficult because you're dealing with larvae — how do you put a price on that? And how do you mitigate for it? Do you do off-shore reefs, wetlands? And how much? They did that at San Onofre and it's very controversial as to what to do about it and how much to do about it. You have scientists on both sides. Some say you should do a substantial amount of it and others say it's relatively insignificant.

Have you found any change to fish populations over time?

No we haven't. The problem is that fish populations go up and down dramatically and there's so much data you can't determine cause and effect like from a power plant.

So we just assume that there is an impact and err on the conservative side.

What are the factors?

There are many factors including seasonal warming, El Nino, warming from the blob, climate change, and just the general warming of the ocean — plus fishing. We have fishing pressure all along the central coast, and now we have marine protected areas. There's one to the north of Diablo canyon, so you have all of these things acting on the fish population.

Is the pretense that science? Or do other things come in to play?

Both. A State panel recommended to the state board that power plants pay a fee. The looked at the data and converted entrainment losses into habitat. They asked how much habitat would it take to create the loss by power plant. You do that conversion and you ask how much is that worse. And they simplified and now we can look at volume of water by power plant and we can convert to acres and dollars.

How much money would it likely cost if PG&E paid by volume of water?

For Diablo, if you go through the calculations, OTC comes out to $4.3 million per year, for 2.5B gallons a day. PG&E can pay the $4 million per year. The State Water Board preference is that that the money goes toward supporting and implementing the marine protected areas. So if you establish marine protected areas, it would help make up for lossesloses by the power plant.

Could Water Board staff make such a proposal for mitigation?

Yes. I anticipate we'll be talking to PG&E about exactly that. Asking them what they propose. Policy allows PG&E to propose option. They can say we have already done x, y, and z environmental projects and we want that to be accepted as mitigation. There's a power plant that just did that a few months ago.

Is it even likely you'd come back with something as small as $4 million a year?

Well, if it operates 10 years, that's $40 million. If it operates 20 years, that's $80 million.

Is that your ballpark estimate?

I don't know. When we did it with PG&E it was several million plus the land. Now we have to bring into context today's State Water Board policy to minimize entrainment and impingement to level of cool water or something else. They could pay $4.3 million a year, or they could propose something else. What they propose is pretty wide open.

They could say they've already taken mitigation measures that should be taken into account. There's only one case where a power company has done that, and it was approved.

I would expect PG&E to document everything they have done that they could consider beneficial to environment and make that as compelling as possible.

Why is everyone asking whether plant can survive?

Good question. The other thing is the re-licensing with the Public Utilities Commission and the Coastal Commission. They need to get a renewal for extending their license.

Couldn't the Regional Water board still decide to make PG&E build towers?

Our staff's opinion is based on the review of the evidence which is that cooling towers are not feasible. There are organizations that disagree with us and they will be present and involved and will argue that we should not permit. But I want to clarify that board makes its own decisions.

When will the board vote?

Depends. If it's not controversial, they may decide in one meeting. But controversial topics might take several meetings, and board meetings are several times each year. We could be dealing with it for the first part of next year.

Interview of Pete Raimondi, Professor at UC-SC ecology and evolutionary biology; Interviewed by Michael Shellenberger at 1:30 pm on January 8, 2016.

Can you help me understand who are you and your role here?

I work for the State of California, the California Coastal Commission, the California Energy Commission, and the Regional Water Board for assessments of power plants, desalination plants, and for designing mitigation.

The State Regional Water Quality Control Board is the regional group that administers the State Water Board's [National Environmental Policy Act's] NEPA determinations, 316a and 316b. The first, 316a is thermal effects, and 316b is intake effects. I typically do intake effects.

The State convened two technical working groups in the 1990s on thermal and entrainment. Both came up with results.

I'll only tell you about intake. We were charged with working with consultants hired by PG&E to come up with independent assessments. The State people would address questions of interest to intake impacts under 316b.

We had agreement with PG&E that we would have oversight of assessment. [PG&E's consultant] Tenera did a great study. There was no difference of opinion over the design or the results or the math. But there was a difference over whether there was an impact and, if so, its magnitude, and how much it should be. [PG&E

and Tenera] proposed a mitigation package that I thought was not enough to compensate for the losses found in study.

But before anything happened, PG&E declared bankruptcy. So it stalled because PG&E declared bankruptcy. So that stopped progressing.

What was the mitigation PG&E proposed?

They proposed a whole bunch of things for mitigation. We came up with a counter package for intake. They proposed a package for thermal and intake. We proposed a suitable mitigation for intake.

We proposed to use information collected to come up with a loss to the biology. The mitigation intent was to provide those resources, to have "complete compensation," as we call it. The key word is "compensatory" mitigation.

In this situation we proposed compensatory mitigation through habitat creation. Most species affected were ones associated with rocky subtidal reefs. So we proposed they build artificial reefs. There was precedent in southern California for SONGS where a compensatory reef was built and is still operating.

How much would your package have cost?

I can't remember exact figures but the ballpark was a $20 - $30 million difference between the two mitigation proposals. Ours was something like $35 million and theirs was like $5 million.

Is building an artificial reef much more than dumping rocks on a sandy beach?

It's a little harder than that. You have to have a particular sand, otherwise the whole reef will sink. The cost of the construction of the San Onofre artificial reef was $30 to $35 million, and that's close to the estimate from Diablo.

Isn't 30 million a bargain mitigation for once-through cooling?

I agree. When [utility] staff analysts look at it next to net operating profits, it's typically not noticeable on the ledger. It's a fraction of all the other costs going on. At the time PG&E was suffering for reasons that didn't have to do with mitigation and ultimately filed for bankruptcy. At the time they made the reasonable claim they couldn't afford. But the idea was that something would happen, and it didn't.

Why?

I don't know. The State just dropped. Coming out of that period we went through high growth in the State and there were brownouts and everyone was worried about the plants going off line. A huge amount of the electricity was in the two nukes [San Onofre and Diablo Canyon] at the time and they worried about brown-outs.

John Steinbeck, Tenera, Interviewed by Michael Shellenberger; 3:21 pm January 8, 2016

You worked for PG&E to evaluate how to handle its once-through cooling. How long have you been working on this?

I've been out there for 30 years. I wrote the report that me and [UC-Santa Cruz professor and Water Board Consultant] Pete [Raimundi] were coauthor on that became the guidelines. All of these intake assessments have to use our approach. Pete and I are friends but we're on opposite sides. But we have a lot of respect for each other.

Is it true the State Water Board is likely to require PG&E build cooling towers at Diablo Canyon?

There's a large misconception of what the State did with [the Federal Clean Water Act's] once-through cooling [OTC] requirement. I keep seeing wrong stuff in print. The State did not make OTC illegal or stop the use of OTC. Plants can still use OTC, they just have to initiate some kind of useful measures, operational or technological, to reduce the effects of OTC. [Natural gas power plant] Moss Landing has an agreement with state on how they're going to do that. The other carve-out was nuclear plants. The State recognized that they couldn't go in and jeopardize nuclear safety. So, the State was going to require Diablo to do a lot of work, but I am assuming they're going to do mitigation since it doesn't make sense to try to retrofit the plant.

Why then is PG&E saying it might shut Diablo down?

PG&E may make the decision to shut Diablo Canyon down but under existing state regulation they can continue to operate without building cooling towers. PG&E just needs the Board to make decision that we're going to do this or that and then come up with a proposal and then they're going to move forward with that. I don't understand why PG&E is so concerned.

How much could mitigation cost PG&E?

Mitigation may cost them $200 million. That's what [closed nuclear plant] San Onofre shelled out to the Coastal Commission [to build an artificial reef]. Maybe it goes up to $300 million. Whatever it is, it will be a lot less than billions.

How then did the conversation ever even get to $6 billion cooling towers?

[California Environmental Quality Act] CEQA required the study as part of the regulations. CEQA required PG&E to look at all options to reduce the effects of OTC that was reasonable and cost effective and didn't threaten safety. But CEQA never required PG&E to get rid of OTC, just to look at the options from a realistic standpoint, select an option, and get it approved.

San Luis Obispo County Board of Supervisors
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boardofsups@co.slo.ca.us, <diablo@co.slo.ca.us>,

November 16, 2021 11:01 GMT

Subject: CGNP's Comments for Item 34, Public Comment Period - BOS Meeting of 11/16/21

Please refer to CGNP's attached comments. Dr. Nelson will excerpt from them during today's Public Comment period.

This filing will also form a portion of CGNP's Scoping Comments regarding the proposed project to cease Diablo Canyon Power Plant operations and decommission the plant. CGNP will complete its scoping comments due by 5:00 p.m., December 6, 2021

Sincerely,

/s/ Gene Nelson, Ph.D. CGNP Legal Assistant
Californians for Green Nuclear Power, Inc. (CGNP)
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Attachment: CGNP to SLO County Board of Supervisors 11 16 21.pdf (6 pages)

County of San Luis Obispo Planning & Building,
Room 300, Attention: Susan Strachan
976 Osos Street
San Luis Obispo, CA 93408

Subject: CGNP's Public Comments in DRC2021-00092 - 12 01 21

December 1, 2021: 14:52 GMT

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Please confirm receipt of today's Comments.

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Subject: CGNP's Comments Supporting the No Project Alternative for Diablo Canyon Power Plant

December 6, 2021 4:29 PST

Hello, Susan: Please include CGNP's attached file in the record of

ED2021-174 / DRC2021-00092

CGNP would appreciate a confirmation of this email's timely receipt.

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(The cover sheet for the 72-page attachment follows.)

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December 6, 2021

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December 6, 2021 4:51 PST

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ED2021-174 / DRC2021-00092

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This is another argument for the No Project Alternative.

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Attachment: PG&E Documents the Economic Benefits of DCPP Continued Operation to 2045.pdf (123 pages)

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December 6, 2021 5:00 PM PST

Subject: CGNP's recent filings before the CPUC

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Attachments:

R2005003 CGNP Comments Appendix 09 27 21.pdf (19 pages)
R2005003 CGNP Comments 09 27 21.pdf (11 pages)
R2005003 CGNP's Comments 11 22 21.pdf (14 pages)
R2005003 CGNP Motion for Leave to Late Fille Comments 11 22 21.pdf (2 pages)
R2005003 CGNP's Comments - Billions of Dollar Takings Accepted 10 26 21.PDF (13 pages)
R2005003 CGNP Reply Comments Stamped In 06 15 21.pdf (5 pages)
(Total 64 pages)

[Page count for all attachments: 300 pages]

Email: Diablo Canyon Decommissioning Project

From: government@cgnp.org <government@cgnp.org>
Sent: Tuesday, December 7, 2021 12:43 AM
To: PL_Diablo <PL_Diablo@co.slo.ca.us>
Cc: Susan Strachan <sstrachan@co.slo.ca.us>
Subject: [EXT]Chronology of CGNP's Messages Regarding ED2021-174 / DRC2021-00092

Susan Strachan, Nuclear Power Plant Decommissioning Manager
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December 7, 2021

Hello, Susan: For the convenience of the San Luis Obispo County Planning Department, CGNP is attaching a chronology of its five cover letters in ED2021-174 / DRC2021-00092. In addition, you received an email message from our Lead Counsel, Attorney Mike Gatto. Brief oral comments were provided during scoping hearings by Attorney Gatto, CGNP President Carl Wurtz, and myself. The total page count for CGNP's attachments provided by me in this matter is 300 pages.

In the event there are technical difficulties opening or viewing any of our files, please contact CGNP. We will submit a duplicate file.

Sincerely,
/s/ Gene Nelson, Ph.D. CGNP Legal Assistant
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R2005003 CGNP Comments Appendix 09 27 21.pdf (19 pages)
R2005003 CGNP Comments 09 27 21.pdf (11 pages)
R2005003 CGNP's Comments 11 22 21.pdf (14 pages)
R2005003 CGNP Motion for Leave to Late Fille Comments 11 22 21.pdf (2 pages)
R2005003 CGNP's Comments - Billions of Dollar Takings Accepted 10 26 21.PDF (13 pages)
R2005003 CGNP Reply Comments Stamped In 06 15 21.pdf (5 pages)
(Total 64 pages)

[Page count for all attachments: 300 pages]

Avila Valley Advisory Council

San Luis Obispo County, California
P.O. Box 65
Avila Beach, CA 93424 www.avac-avila.org

November 9, 2021

Ref: PROJECT NUMBER & NAME: DRC2021-00092, PG&E Diablo Canyon Power Plant Decommissioning: Development Plan/Coastal Development Permit and Conditional Use Permit Application

To: Ms. Susan Strachan sstrachan@co.slo.ca.us
County of San Luis Obispo Department of Planning and Building

This letter contains topics AVAC would like the EIR to address. Our comments supplement earlier communications the AVAC on May 10, 2021, and August 9, 2021 and are attached below for your consideration.

Area of Concern – Underwater Construction Noise
With the migrating Elephant Seals to Piedras Blancas, the Humpback Whales in the local waters and the Otters, Porpoise and Seals, sea life in our estuary and harbor area are sensitive species which could be impacted by the sounds and vibrations during deconstruction operations such from Impact Pile Driving, Vibratory Pile Driving, Drilling and Vessel activity. To the greatest extent possible, AVAC request that PG&E plan and schedule their deconstruction activities around the migration patterns of the local sea life.

Area of Concern – Transportation
AVAC reiterates its believe that this project needs to significantly reduce Transportation requirements of demolished non-radioactive concrete and materials by blending these materials with on-site fill and retaining this mix on-site for re-use in site restoration. (Refer to Executive Summary, pg. 4, and to Appendix O for Concrete Re-use)

Area of Concern – Dry Casks Storage
AVAC understands that despite an always intended permanent federal repository for spent fuel, no such repository is proposed. Therefore, AVAC reiterates the need for safer protection of the Dry Casks containing Spent Nuclear Fuel which are subject to Sea Air corrosion. PG&E should consider storage of these Casks inside a climate-controlled containment structure and NOT outside in the environments.

AVAC requests that the Planning Department address these points prior to recommending this project to the Planning Commission. Feedback on this report would be appreciated.

Thank you for consideration of our comments for this significant project.

.

Stephen Benedict
Stephen Benedict, Chair

C: Planning Commissioners, c/o Ramona Hedges rhedges@co.slo.ca.us
Trevor Keith, Director of Planning & Building tkeith@co.slo.ca.us
Dawn Ortiz-Legg, 3rd District Supervisor; c/o Sarah Sartain ssartain@co.slo.ca.us

[EXT]Comments on EIR scope

Coleman Miller <cclint1@att.net>
Mon 11/1/2021 4:20 PM
To: PL_Diablo <PL_Diablo@co.slo.ca.us>

I believe the scope of the EIR should include:

1- the addition of a 3rd south bound lane on 101 from Avila to Pismo Beach to handle the additional truck traffic and reduce pollution from Diablo Canyon to the Pismo yard for rail shipment of bulk materials. Truck traffic is very different from auto traffic as can be seen on this stretch of 101 anytime the grape vine closes.
2- use of electric tractors for trucks to reduce pollution from transport of bulk waste from Diablo Canyon to Pismo yard.
3- consideration to leave the containment domes in place, after they are gutted and surveyed for radioactive clearance, and serve as a historic landmark. The CO2 generation and water consumption for dust suppression to demolish the domes should be determined. This pollution and water consumption can be avoided if the domes are left in place.

Clint Miller
Pismo Beach

Sent from my iPhone

[EXT]Decommissioning

Peggy Sharpe <peggysharpe@yahoo.com>
Wed 11/10/2021 6:08 PM
To: PL_Diablo <PL_Diablo@co.slo.ca.us>

I Do NOT support the decommissioning of Diablo Canyon Nuclear Power Plant ! San Luis Obispo and outlying areas need to rely on continuous affordable, clean energy. PG & E has provided this clean, reliable electricity for around 30 years—without any complications that I'm aware of.

Please register my comments in support of keeping Diablo Canyon Nuclear Power Plant open for business, as long as it operates without any danger to the public !!!

Thank you

Peggy Sharpe---- SLO resident for almost 44 years !

Sent from Mail for Windows

Email: Diablo Canyon Decommissioning Project Team

From: Maia Petrovic <maia.petrovic2002@gmail.com>
Sent: Monday, November 29, 2021 10:42 AM
To: PL_Diablo <PL_Diablo@co.slo.ca.us>
Subject: [EXT]Diablo Canyon

Hello,
My name is Maia Petrovic and I am a second year student at California Polytechnic State University.

In regards to the closure of the Diablo Canyon Power Plant, I was wondering what alternative energy system will be replacing the plant. What is going to generate power for the 3 million California residents that currently rely on Diablo Canyon? Will that alternative be able to generate the same magnitude of energy that the current power plant is able to? Will that alternative be a clean source of energy? And lastly, I was wondering if geothermal energy systems have been considered as replacement energy systems for the Diablo Canyon Power Plant.

Thank you,
Maia Petrovic

Email: Diablo Canyon Decommissioning Project Team

From: Melinda Forbes <melindatforbes@att.net>
Sent: Monday, November 29, 2021 9:33 AM
To: PL_Diablo <PL_Diablo@co.slo.ca.us>
Subject: [EXT]Diablo Canyon

To the Board of Supervisors-

I am amazed to hear of the serious conversation around the continued use of Diablo Canyon. It is a debate I believed was in the past.

I never did support the opening of the plant for the following reasons-

It creates tons of radioactive waste that sits on our shoreline

Movement of toxic waste is dangerous and will require infrastructure to attempt to protect the environment

It is build very close to earthquake fault lines

It releases waste water that changes ocean temperatures and contributes contaminants to water near release

It is not cheap energy if real costs of storage and disposal are factored in

It is not clean energy, not even close

There are still unanswered question about the safety of nuclear plants, questions that have not been answered after all these years

Do not allow the extended use of the plant to carry on, please!

Sincerely, Melinda Forbes

Sent from my iPad

Email: Diablo Canyon Decommissioning Project Team

From: sybil jacobs <sybilashley22@gmail.com>
Sent: Tuesday, November 30, 2021 7:40 AM
To: PL_Diablo <PL_Diablo@co.slo.ca.us>
Subject: [EXT]Restoring Diablo Canyon Lands

Please restore the surrounding Diablo Canyon lands just the way you found it before the nuclear plant was built. The peace it will bring to the area for wildlife, marine life, the air, the earth and every beating heart will be astounding. It is time.

Thank you.

Sybil

Kara Woodruff
1101 Marsh Street
San Luis Obispo, CA 93401
karaslo@charter.net

December 1, 2021

Susan Strachan
Nuclear Power Plant Decommissioning Project Manager
San Luis Obispo County,
Department of Planning & Building
976 Osos Street #300
San Luis Obispo, CA 93408

Subject: Comments on CEQA Scoping Documents for the Decommissioning of the Diablo Canyon Power Plant

Dear Ms. Strachan:

Thank you for the opportunity to comment on the CEQA scoping documents for the decommissioning of the Diablo Canyon Power Plant. As a member of the Diablo Canyon Decommissioning Engagement Panel (Panel) since its inception, I have had the opportunity to learn about the decommissioning process from PG&E, the County of San Luis Obispo, state and federal agencies, community leaders, as well as from hundreds of comments made by members of the public during regular meetings of the Panel since 2018. Although the comments here are exclusively provided by me as an individual (and not as a representative of the Panel or otherwise), my experiences as a member of the Panel have informed my perspective on decommissioning issues as it relates to this CEQA process, as follows:

1. Environmental Impact Assessment. In the "Environmental Impact Assessment" topic at Section 3.3.4, it states that the assessment will evaluate potential impacts associated with Project activities, and in particular: (1) deconstructions and demolition activities occurring onsite at DCPP; and (2) the transportation of waste from structure demolition at DCPP. However, to adequately address impacts relating to the decommissioning process, **you should also directly address** those arising from impacts due to (3) retention of existing structures on site; and (4) construction of new structures under the Project Application.

   With respect to retention of existing structures, several activities fall within this category, including the 230 and 500 kv switchyards, raw water reservoirs, intake structure, some roads, and the east and west breakwaters. When these projects were constructed, there was every expectation that they would be removed upon plant closure and some permits even required that outcome. As a result of those projects staying on site, however, there may be impacts in the form of decreased public access to those sections of the coast. (Indeed, the scoping documents acknowledge this dynamic when discussing project alternatives.) The analysis for mitigating those impacts would be similar to the analysis undertaken in 2004 by the California Coastal Commission (CCC) when it considered the impacts of the ISFSI on public access to the

coastline; see the CCC report dated 05/26/2004, found at
https://documents.coastal.ca.gov/reports/2005/1/W5a-1-2005.pdf

With respect to the construction of new facilities under the Project Application, several significant projects fall within this category, including the Greater Than Class C Waste Storage Facility, Security Building, indoor firing range, heavy haul loading ramp, and cofferdam construction for the discharge cove. While there is language throughout the Project Application that acknowledges that these activities will have impacts, including significant impacts, these are not merely "deconstructions nor demolitions," and they should not be so characterized. Rather, they should be addressed and analyzed directly, and should include a detailed discussion of measures to mitigate the resulting impacts to terrestrial and marine resources, coastal access, and otherwise.

2. Project Setting. In the "Project Setting" there is a great deal of discussion about the location of the project and related issues. However, the document fails to consider the extensive public involvement in the decommissioning process thus far, as well as the considerable public discussion and input received regarding the conservation of and public access to the Diablo Canyon Lands. Since this information is critical in understanding the context for the decommissioning, I urge that the EIR include a thorough and thoughtful analysis of the community perspective. In particular I would suggest that two resources be more extensively reviewed and presented in the EIR as relevant background information: (a) the Strategic Vision of the Diablo Canyon Decommissioning Engagement Panel, found at https://diablocanyonpanel.org/panel-reports/strategic-vision-report/ and (b) the Conservation Framework adopted by the Friends of the Diablo Canyon Lands, found at www.diablocanyonlands.org (also attached as Appendix A). Also, the EIR should include reference to the 2000 DREAM Initiative, an advisory measure supported by 75% of SLO County residents, which called for the conservation of and public access to all of the Diablo Canyon Lands upon the plant's closure.

   Also, in the Project Setting there is a statement that the Diablo Canyon Lands are "jointly owned" by PG&E and Eureka Energy; this is not really the case and even contradicted by statements elsewhere in the scoping documents. As I understand it, North Ranch and the Parcel P lands north of Diablo Creek are owned by PG&E. The rest of Parcel P and South Ranch are owned by Eureka Energy and leased to PG&E. Wild Cherry Canyon (also part of the Diablo Canyon Lands) is owned by Eureka Energy and leased to HomeFed (which is currently under litigation). This distinction may be important, for example, when it comes to the future disposition of the Diablo Canyon Lands.

   Speaking of Wild Cherry Canyon, it is not mentioned in the Project Setting nor elsewhere in the scoping documents. This is odd, given the extensive history of this land and attempts to acquire it for public access and conservation. Indeed, discussions about the fate of Wild Cherry Canyon is what first led the California Public Utilities Commission (CPUC) and PG&E to create the Diablo Canyon Decommissioning Engagement Panel. And now as I understand it per the recent bankruptcy proceedings, the CPUC will require approval of any Diablo Canyon Lands being transferred away, including Wild Cherry Canyon, whether that is done by PG&E itself or via

Eureka Energy. A discussion of Wild Cherry Canyon is thus relevant context for the decommissioning process and should be included as background information in the EIR.

3. Project Mitigation. **The Project Description lacks a concise and detailed explanation of and legal basis for the land and public access mitigation measures for coastal development permits issued for projects serving the Diablo Canyon Power Plant**. The EIR should include a more detailed analysis of why PG&E was required to open the Pecho Coast Trail as mitigation for the Training/Simulator Building, open the Buchon Trail as mitigation for the ISFSI, set aside 1200 acres for conservation at Point San Luis as mitigation for the Steam Generator Replacement Project, and so on. Copies of the relevant Coastal Commission staff reports should be referenced in this analysis so that the legal rationale underlying the conditions is understood by decisionmakers and, importantly, documented for the decommissioning record.

   The key point of mitigation is this: Significant mitigation measures related to impacts to coastal public access were required by the Coastal Commission for the three Diablo Canyon projects noted above. These projects were significantly smaller in size, cost, complexity, and impacts than the (massive) decommissioning project before you, which includes not only vast deconstruction and debris removal activities but also the construction of significant new structures. I argue for the complete transfer of and public access to all the 12,000-acre Diablo Canyon Lands as fair, appropriate, and legally supportable mitigation for the decommissioning project – supported by precedent established by PG&E in its history of projects on Parcel P. For more on this perspective, please see the SLOLife Magazine article (page 54) here: https://www.yumpu.com/en/document/read/62860961/slo-life-magazine-oct-nov-2019 as well as the Conservation Framework attached as Appendix A.

   Finally, please note that PG&E has not yet recorded its 1200-acre deed restriction under the 2006 CDP E-06-011/A-3-SLO-06-017 as suggested by its letter dated March 26, 2021 (which was posted with the Project Application materials by SLO County). It's hard to fathom why the condition has not been satisfied even though over 15 years have passed since this permit condition was established. I implore the County of San Luis Obispo to do a better job of implementing mitigation measures at the time that permits are issued; otherwise, you will lose control of the process and the public's best interest will be undermined.

4. ISFSI and GTCC. Over the past few years, there has been discussion between PG&E staff and members of the Diablo Canyon Decommissioning Engagement Panel about the 2004 Coastal Development Permit and its conditions, related to the construction of the dry cask storage facility for spent nuclear fuel (aka the ISFSI). Under PG&E's view, the mitigation required by that permit (i.e., the Buchon Trail) fully mitigated that project, no matter how long the spent nuclear fuel is present onsite. But on a closer reading of the record, this view is debatable. There is language in the application and final permit itself that suggests that the permit was contemplated for a limited period of time only – that is, until a final or interim repository site was made available offsite. But now we know the prospects for such a repository are much slimer than expected when the permit was first issued – in fact, it may be decades or much (!) longer before these highly toxic, radioactive materials are removed to a non-coastal location. Also, there is conflicting language about whether the mitigation for all impacts (not just for

impairment of coastal access) is perpetual or just temporary. In any event, the EIR should include a careful analysis of this important issue.

The notion that Diablo Canyon's spent nuclear fuel may have to stay with this community, on the coast, and during these times of rising sea waters is a heavy burden for this and future generations to bear. We need an adequate, responsible approach for this very unfortunate outcome. The same is true for the proposed new Greater Than Class C Waste Storage Facility. This issue has been insufficiently addressed in the scoping documents and I implore you to give it the attention and consideration it deserves.

Along with many other members of the community, I appreciate the considerable work and effort done thus far on the scoping documents and the decommissioning process in general, and look forward to reviewing SLO County's draft EIR. Thank you for your consideration of the points made here.

Sincerely,

Kara Woodruff

Kara Woodruff
Volunteer Member
Diablo Canyon Decommissioning Engagement Panel

cc: Tom Jones, Strategic Initiatives Director, PG&E
Tom Luster, Senior Environmental Scientist, California Coastal Commission
Members of the Diablo Canyon Decommissioning Engagement Panel

A Conservation Framework for the Diablo Canyon Lands

(a plan for their conservation and sustainable public access)

by the
Friends of the Diablo Canyon Lands

May 14, 2021

Introduction

The Diablo Canyon Power Plant (DCPP), operated by Pacific Gas & Electric Company ("PG&E"), is located along the Diablo Coast in San Luis Obispo County. Surrounding the plant are the Diablo Canyon Lands -- more than 12,000, mostly undeveloped acres that have served as a buffer to the plant's nuclear operations for four decades. The lands are owned in part by PG&E and in part by its subsidiary, Eureka Energy.

The DCPP contains two nuclear reactors that will be shut down permanently by 2025. Upon the plant's closure and subsequent decommissioning, the Diablo Canyon Lands will no longer be needed by PG&E or Eureka Energy, and are thus expected to be transferred away by those entities.

There has been considerable community discussion and many questions asked about the future of the Diablo Canyon Lands. For example, who should own these lands after plant closure and decommissioning? How should they be managed? To what extent should these lands be accessible to the public? And how can we ensure the protection of the unique and fragile ecological, scenic, cultural, and other resources found on the lands and coast?

We formed the Friends of the Diablo Canyon Lands to attempt to answer the key questions about the future of the Diablo Canyon Lands. We are not the first group to attempt this, but we have taken the views of others into consideration in developing this plan and its Conservation Framework, which is described in detail in this report and attached as Appendix A.

Our **short-term goal** in preparing this report is to have our recommendations included in the 2021 PG&E Nuclear Decommissioning Cost Triennial Proceeding (NDCTP). The NDCTP is prepared every three years by PG&E and submitted to the California Public Utilities Commission (CPUC) for approval. It thereafter serves as a blueprint for plant decommissioning and the future of the lands. PG&E has specifically requested input on the Diablo Canyon Lands for the 2021 NDCTP and this report is in response to its request. (For more information about PG&E's outreach efforts on the Diablo Canyon Lands, visit: https://www.pge.com/en_US/safety/how-the-system-works/diablo-canyon-power-plant/diablo-canyon-power-plant/diablo-lands-conservation.page)

Our **long-term goal** in preparing this report is to see the recommendations contained in this report successfully implemented for the benefit of people and wildlife for generations to come.

Members of the Friends of the Diablo Canyon Lands

In presenting the recommendations and/or observations contained herein, we formed a group of individuals and organizations that share the common desire of conserving in-perpetuity the ecological, cultural, and scenic resources of the Diablo Canyon Lands, while providing for sustainable, managed public access. The Friends include environmental, conservation, and other non-profit organizations; potential land owners; recreational advocates including equestrians, mountain bikers, hikers, and other access proponents; various federal, state, and local entities/agencies; economic development proponents; and communities adjacent to the Diablo Canyon Lands. See Appendix B for the full list of the Friends of the Diablo Canyon Lands.

Resources of the Diablo Canyon Lands

The approximately 12,000-acre Diablo Canyon Lands are located in San Luis Obispo County, California. They are owned in part by PG&E and in part by its subsidiary, Eureka Energy. Other than the area where the Diablo Canyon Power Plant (and its ancillary facilities and structures) is located, the land is virtually undeveloped.

Ecological and Scenic Resources

The Diablo Canyon Lands stretch for fourteen miles along the coast. During PG&E's tenure, the lands have been managed for grazing, agriculture, erosion and weed control, reduction of fire hazards, public access (on the Pecho Coast and Point Buchon trails), and for the protection of ecological, scenic, and cultural resources, including endangered species.

Over the years, PG&E and its consultants have conducted numerous biological studies and surveys of the Diablo Canyon Lands. These studies, which describe the relatively undisturbed grasslands, coastal bluffs and terraces, coastal sage scrub, oak woodlands, and bishop pine forests, have revealed the diverse and largely undisturbed collection of natural resources. Sensitive species on the Diablo Canyon Lands are present and include several federally threatened species such as the California red-legged frog and the South-Central California coast steelhead trout. Fields of native coastal prairie grasslands such as purple needle grass and fescue create habitat for several species of special concern such as western burrowing owls, San Diego desert woodrat, and American badgers. The California Native Plant Society has documented many sensitive plants that are ranked as either rare or on a watch list under their rare plant ranking system. A sensitive resource study was conducted on the lands in 1996, and is attached as Appendix C.

PG&E has also engaged in extensive study of the Diablo Coast, including the intertidal zone and the areas adjacent to the utility's marina and the plant's once-through cooling intake and discharge areas. These studies have revealed the presence of a rich marine environment and unusually biodiverse and intact tide pools. For more information about the coastal and marine resources of the Diablo Coast, please visit: https://diablocanyonpanel.org/wp-content/uploads/2020/12/10-28-20-Meeting-Transcript.pdf

The Diablo Canyon Lands were ranked as a highest priority target for conservation by The Nature Conservancy in its 2000 report "Conserving the Landscapes of San Luis Obispo County." The lands (contained within the "Irish Hills" planning area) were so identified due to their outstanding natural and scenic resources; the fact that the area is large and sufficiently unfragmented to sustain the ecological resources over time; and the potential threat from unfettered residential and commercial development along this highly scenic stretch of the Central Coast (see Appendix D).

The conservation of the Diablo Canyon Lands is consistent with the Governor's Executive Order N-82-20, finding that "California's rich biodiversity is increasingly threatened by loss of habitat, spread of invasive species, decreasing water supplies, and increasingly frequent and severe climate impacts," and declaring that "it is the goal of the State to conserve at least 30 percent of California's land and coastal waters by 2030." And, further, "To advance efforts to conserve biodiversity, the California Natural Resources Agency is directed to...strategically prioritize investments in cooperative, high-priority actions that promote biodiversity protection, habitat restoration, wildfire-resilient, sustainably managed landscapes and other conservation outcomes."

Cultural Resources

In addition to their ecological and scenic resources, the Diablo Canyon Lands also contain highly significant and sacred cultural resources, including historic village sites, cultural landscapes, cultural material, cemeteries, and artifacts. The Diablo Canyon Lands are part of the ancestral homelands of the Northern Chumash, documented at over 10,000 years.

PG&E, its consultants, and others have made extensive studies of the cultural resources of the Diablo Canyon Lands, although most of that documentation is not public, in order to protect the resources from disturbance and degradation. It is also likely that unidentified cultural resources and places exist on the Diablo Canyon Lands. In the last few years, yak tityu tityu yak tiłhini Northern Chumash Tribe of San Luis Obispo County (ytt) in partnership with PG&E and Cal Poly have worked to preserve the ytt village site of tstyiwi on the Pecho Coast of the Diablo Canyon Lands (see Appendix E).

Modern History of the Diablo Canyon Lands

Through a series of land acquisitions beginning in the 1960s, the Diablo Canyon Lands were acquired by PG&E and Eureka Energy, to serve as the location for and buffer lands around the nuclear operations of the Diablo Canyon Power Plant, which went online in the mid-1980s. The power plant has operated continuously since then.

DREAM Initiative – Voter Support for Conservation of the Diablo Canyon Lands

In 2000, over 75 percent of the voters of San Luis Obispo County approved the DREAM (Diablo Resources Advisory Measure) Initiative. DREAM was an advisory ballot measure that called on county leaders and PG&E to set aside the Diablo Canyon Lands for habitat preservation, agriculture, and public use upon closure of the plant. The initiative was unanimously supported by the San Luis Obispo County Board of Supervisors, PG&E, and numerous community and environmental organizations. (For more information about the DREAM Initiative, see Appendix F.)

In 2016, PG&E announced plans to close the DCPP, and in 2018 those plans were approved by the California Public Utilities Commission. PG&E suspended its application before the Nuclear Regulatory Commission for an extension of its operating licenses and the plant will cease operation and close by 2025. Decommissioning activities will continue for a decade or more after closure.

Diablo Canyon Decommissioning Engagement Panel

In 2018, PG&E formed the Diablo Canyon Decommissioning Engagement Panel (Engagement Panel), a group to serve as liaison between PG&E and the communities affected by the plant's closure. (For more information about the Engagement Panel, visit: www.diablocanyonpanel.org)

Between 2018 and the present, the Engagement Panel held multiple public workshops and meetings regarding the Diablo Canyon Lands and their future. Hundreds of community residents and others attended those events, and thousands of public comments were received. The input and community sentiment were reflected in the Engagement Panel's Strategic Vision, which contains the following recommendations regarding the Diablo Canyon Lands:

- *The 12,000 acres of Diablo Canyon Lands surrounding the DCPP are a precious treasure and a spectacular natural resource that should be preserved in perpetuity for the public and future generations, in acknowledgement of the significant resource values.*

- *The public should be ensured access to the Diablo Canyon Lands to the greatest extent possible, while protecting and preserving sensitive habitats, cultural sites and other resources.*

- *The use of the Diablo Canyon Lands should include activities that are consistent with wildlife and resource protection and visitor enjoyment including multi-use trails for hiking, mountain biking, equestrian use and managed overnight camping.*

- *The preservation of sacred Native American sites should be assured.*

- *The request for land ownership by the local Native American community should be acknowledged and considered as a valid claim for historical reasons, while bearing* *in mind the overwhelming public testimony that the Diablo Canyon Lands be conserved and available to the public for managed use.*

- *The long-term protection of ecological, scenic, and cultural resources and the well-being of local communities should be a primary consideration in determining the appropriate level of public access to the Diablo Canyon Lands.*

- *The establishment of at least two multi-use trail extensions of the California Coastal Trail should be pursued which include both a trail along the coast and an interior trail through Wild Cherry Canyon and other protected Irish Hills properties.*

- *The coastal section of the Diablo Canyon Lands should be protected to a higher degree, as needed to ensure the conservation of the more fragile marine, tidal, and coastal environment.*

- *The interior sections of the Diablo Canyon Lands (including the lands associated with transmission lines) should allow for multiple compatible uses, including hiking, mountain biking, and equestrian use, and connections to the Irish Hills and Montana de Oro trail systems.*

- *The use of Diablo Canyon Lands for motorized vehicles (other than in parking areas, access roads and for maintenance and management activities) and night-time recreational use (other than camping as may be allowed) should be prohibited as inconsistent with resource protection.*

- *The use of Diablo of Diablo Canyon Lands for camping should be permitted only to the extent it is consistent with the safety of the community and the protection of cultural and environmental resources.*

- *The importance and legacy of the Native American community to the Diablo Canyon Lands, including methods to provide acquisition or access to those lands should be explored.*

- *The preservation of cultural and archeological sites and artifacts, including burial grounds should be ensured.*

- *The transfer, by easement or fee title, of a portion of the Diablo Canyon Lands for exclusive use by the Native American community should be considered, with protection by conservation easement or other such means that would allow limited development consistent with local zoning and the preservation of environmental and cultural resources in perpetuity.*

www.diablocanyonpanel.org/panel-reports/strategic-vision-report/

Tribal Lands Transfer Policy

In 2019, the California Public Utilities Commission (CPUC) passed the landmark Tribal Lands Transfer Policy. The purpose of the Policy is to protect sacred places and cultural resources and to ensure meaningful consideration of tribal interests and the return of lands within a tribe's ancestral territory to the appropriate tribe. (For more information about the CPUC's Tribal Lands Transfer Policy, visit: www.cpuc.ca.gov/tribal/)

Consistent with the Tribal Lands Transfer Policy, the CPUC will encourage and facilitate transfers of real property to California Native American tribes. The Policy creates an expectation that for any future disposition of real property owned by a utility, tribes will be offered a right of first refusal to purchase the property, prior to it being put on the general market. Thus, the section of the Diablo Canyon Lands that is owned by PG&E (i.e., North Ranch) will be subject to a right of first refusal by the tribe(s) whose ancestral territory includes the Diablo Canyon Lands.

Units of the Diablo Canyon Lands

For the purposes of this report, the 12,000-acre Diablo Canyon Lands are divided into three separate units.

North Ranch

North Ranch is approximately 4,600 acres. It is located directly south of Montana de Oro State Park and immediately north of Parcel P (the site of the power plant and its associated infrastructure). North Ranch contains some of the most spectacular tide pools and Northern Chumash cultural sites along this section of the California coastline. North Ranch already has managed public access via the Point Buchon Trail, a perpetual, deed-restricted area that was created as mitigation for PG&E's construction of its spent nuclear fuel storage facility. The Point Buchon Trail allows managed public access to a coastal bluff trail that extends 3.6 miles along the coast and allows 275 hikers per day, five days a week. (For more information about the Point Buchon Trail, visit: www.pge.com/en_US/residential/in-your-community/local-environment/diablo-canyon-trails/point-buchon-trail.page)

The North Ranch coastal terraces have been farmed and grazed since the late 1800's. Farming stopped in the mid-1980s, but a rotational grazing program continues. North Ranch is owned by PG&E and thus is subject to the CPUC Tribal Land Transfer Policy.

North Ranch, Diablo Canyon Lands

South Ranch

South Ranch is approximately 5,000 acres and is located directly south of Parcel P. This land is characterized by a broad and undeveloped coastal terrace extending to the foothills of the Irish Hills. It contains rich cultural resources including numerous historical village sites of the Northern Chumash. Public access to the South Ranch is limited to the Pecho Coast Trail, which is available by reservation only; docent-led hikes are offered a few days a week for limited group sizes to the Point San Luis Lighthouse (3.75 miles roundtrip) and to Rattlesnake Canyon (8 miles roundtrip). (For more information about the Pecho Coast Trail, visit: www.pge.com/en_US/residential/in-your-community/local-environment/diablo-canyon-trails/pecho-coast-trail.page)

South Ranch coastal terraces were farmed until the 2010 and rotational grazing continues. The southwestern most portion of South Ranch contains 1,200 acres that are permanently deed restricted to prevent development. This restriction was required as mitigation for PG&E's replacement of the steam generator for the power plant. South Ranch is owned by Eureka Energy and thus is not subject to the CPUC Tribal Land Transfer Policy.

South Ranch, Diablo Canyon Lands

Wild Cherry Canyon

Wild Cherry Canyon is approximately 2,400 acres and is adjacent to South Ranch, to the southeast. It has been the focus of multiple (and as of yet unsuccessful) conservation attempts over the years by The Nature Conservancy and the American Land Conservancy. These efforts were previously known as the Avila Ranch Project (see Appendix G). Wild Cherry Canyon is owned by Eureka Energy and thus is not subject to the CPUC Tribal Land Transfer Policy.

Wild Cherry Canyon is currently subject to litigation between Eureka Energy (which contends it has full ownership and use of the land) and various partnerships (which contend they have valid, long-term leases over the land that give them control over the property for decades to come). The outcome of the litigation will determine the opportunity for conservation and identify the parties with whom any potential purchasers would negotiate.

Wild Cherry Canyon, Diablo Canyon Lands

Parcel P

The other major land component associated with the Diablo Canyon Lands is known as Parcel P, which is owned by Eureka Energy. It is the approximately 600-acre area where the Diablo Canyon Power Plant and other facilities/structures are located, including the reactors, spent nuclear fuel cooling pools, and the spent nuclear fuel dry cask storage site. Parcel P is also the location of the Diablo Canyon marina, breakwaters, and nearby intake and discharge coves and structures.

A local economic development group, REACH, is collaborating with community organizations and individuals on the potential repurposing of the non-contaminated structures and facilities on Parcel P in an effort to boost the local economy and produce head-of-household jobs in light of Diablo Canyon's closure.

The future of Parcel P is a complex and challenging set of issues that is beyond the scope of this report. For more information about this process, visit: www.pge.com/en_US/safety/how-the-system-works/diablo-canyon-power-plant/diablo-canyon-power-plant/diablo-repurposing.page; for information about REACH, visit www.reachcentralcoast.org

Parcel P, Diablo Canyon Lands (including breakwaters)

Conservation Framework for the Diablo Canyon Lands

Based upon the community's input as reflected in the Diablo Canyon Decommissioning Engagement Panel's public process and resulting Strategic Vision document; the overwhelming popular vote of San Luis Obispo County residents in support of the 2000 DREAM Initiative; the Tribal Lands Transfer Policy; and the work of the Friends of the Diablo Canyon, we adopt the following framework for the conservation of the Diablo Canyon Lands:

Mutual Goals

- The ecological, scenic, and other natural resources of the Diablo Canyon Lands should be protected in perpetuity;
- The cultural resources of the Diablo Canyon Lands -- including burial sites, cultural artifacts, historic Northern Chumash village sites, and other sacred areas -- should be protected and preserved in perpetuity;
- A Diablo Canyon Lands managed public access program should be created to provide sustainable public access to both coastal and interior areas; and
- The ownership of the Diablo Canyon Lands should be transferred away from PG&E and Eureka Energy, to an appropriate entity or entities that can ensure the long-term conservation of and managed public access to the lands.

Key Elements/Recommendations

1. **Transfer ownership and management of the Diablo Canyon Lands** to an entity or entities (including possibly federal, state, tribal, local, or non-profit organization) in a manner that is **consistent with the DREAM Initiative, the Strategic Vision of the Diablo Canyon Lands Decommissioning Engagement Panel, and the Tribal Land Transfer Policy;**
2. **Transfer ownership and management of the Diablo Canyon Lands to an entity or entities that demonstrate(s) the ability to satisfy the following:**

   (a) Raise adequate funds to initially purchase the land interests;

   (b) Establish an adequate endowment or otherwise demonstrate the ability to perpetually maintain and manage the resources and public access program;

(c) Create and record perpetual conservation easements over the entire Diablo Canyon Lands, per Key Element 3 below, at the time of transfer of ownership; and

(d) Create a perpetual, sustainable, and appropriately sited, managed public access and use plan, per Key Element 4 below.

3. **Create and record a conservation easement over all Diablo Canyon Lands** (regardless of ownership or management) to accomplish the following:

   (a) ensure protection of ecological, scenic, cultural, and other natural resources;
   (b) prohibit commercial development (see Appendix H);
   (c) prohibit other development except for limited development necessary to achieve specified conservation goals in non-resource-sensitive areas or uses that do not undermine the conservation values of the land;
   (d) prohibit unmanaged public access; and
   (e) prohibit non-sustainable grazing or other non-sustainable agricultural activities.

   The conservation easement shall be held and managed in-perpetuity by a qualified governmental or non-profit entity that satisfies the following: (1) its mission is compatible with the long-term conservation of and managed public access to the Diablo Canyon Lands, and (2) it demonstrates the ability to perpetually monitor and enforce the terms of the conservation easement(s) through an endowment or other reliable and long-term funding mechanism.

4. **Create a perpetual, sustainable, and appropriately sited, managed public access and use plan,** to include the following:

   (a) **a managed public access program for multiple users/uses on Wild Cherry Canyon**, including public access (but very restricted vehicle access) for hiking, mountain biking, equestrian use, limited leashed-dog activity, and appropriately sited, low user cost/low impact overnight camping; and

   (b) **a public, non-motorized trail system** throughout the Diablo Canyon Lands, including:

      (i) a primary coastal (and where appropriate, bluff) hiking trail from Wild Cherry Canyon through South Ranch and North Ranch to Montana de Oro, and connecting the Point Buchon and Pecho Coast trails;

(ii) a primary interior trail for hiking, mountain biking, and equestrians from Wild Cherry Canyon to Montana de Oro, via protected properties within the Irish Hills;

(iii) possible secondary trails to connect the two primary trails with potential access by mountain bikers and equestrians to areas on or near the coastal trail, and for multiple uses/users on Wild Cherry Canyon; and

(c) In all cases, the trail systems shall be carefully sited, designed, and constructed in coordination with tribal representatives and cultural, biological, and other experts to avoid sensitive ecological, scenic, and cultural resources and to balance the experience of public users with the in-perpetuity conservation of the land.

Next Steps and Strategies

Adoption of the Conservation Framework

As noted above, the **short-term goal** in preparing this report is to have the recommendations (and specifically the Conservation Framework contained herein) included in the 2021 Nuclear Decommissioning Cost Triennial Proceeding (NDCTP). The first step will be achieved by the submission of and advocacy for this report to PG&E, the California Public Utilities Commission, key agencies engaged in the decommissioning process (including the County of San Luis Obispo, the California Coastal Commission, and the State Lands Commission), key potential land acquisition funding agencies (the California Coastal Conservancy, California State Parks, the California Wildlife Conservation Board, the Land and Water Conservation Fund, etc.), and local elected officials (Congressman Salud Carbajal, State Senator John Laird, State Assemblymember Jordan Cunningham, and the San Luis Obispo County Board of Supervisors.

Land Transfers

The **long-term goal** in preparing this report is to see the recommendations of this report successfully implemented to benefit people and wildlife, for generations to come. Specifically, the transfer of ownership and management of the Diablo Canyon Land Units as recommended, along with the establishment of conservation easements covering all Diablo Canyon Lands (regardless of ownership/management) and an appropriate managed public access program. This will require coordination with and between the current land owners (PG&E and Eureka Energy); state and other funding agencies (as listed above); the potential successor land owners; the potential conservation easement holders; and key stakeholders of the community, including members of the Friends of the Diablo Canyon Lands.

Timing of Lands Transfers

The transfer of lands away from PG&E and Eureka Energy will most likely need to be staged to reflect the needs of the utility and decommissioning activities. Wild Cherry Canyon could be the first to be transferred, because its use and management do not impact Diablo Canyon operations either before or after plant closure. However, any strategy to pursue the acquisition of Wild Cherry Canyon will not likely be possible until the litigation described above is resolved.

The transfer of North Ranch may be possible in the short to mid-term as it too is mostly unaffected by Diablo Canyon operations and decommissioning.

The transfer of South Ranch may be the last to occur, since Diablo Canyon's decommissioning activities (including massive numbers of trucks carrying decommissioning debris offsite) will use the primary road across South Ranch for years to come.

Land Transfer Mechanisms

There are two ways in which land transfers from PG&E or Eureka Energy might occur: (1) by purchase based on fair market value (or discounted value); or (2) as mitigation for permits that PG&E will need to decommission DCPP. Either approach, or a combination of the two, may occur with the transfer of the Diablo Canyon Lands.

Purchases based upon the fair market (or discounted) value of the land is the typical way in which land conservation occurs. For example, when American Land Conservancy attempted to purchase Wild Cherry Canyon years ago, an appraisal established the fair market value of the land at over $21 million. Funds for that purchase were raised from the state Wildlife Conservation Board, the California Coastal Conservancy, the California Transportation Commission, San Luis Obispo County and the SLO Council of Governments, the Central Coast Water Quality Control Board, and the private Hind Foundation. (Unfortunately, the last piece to come from California State Parks was delayed and the project stalled as a result; see Appendix I under "Grants Awarded"). Other notable Central Coast conservation projects have been achieved in this manner, including Pismo Preserve (by the Land Conservancy of San Luis Obispo County), Hearst Ranch (by American Land Conservancy), Cambria Coast Ranch (by The Nature Conservancy), and Estero Bluffs (by the Trust for Public Land). This purchase model could be used for the acquisition of any component of the Diablo Canyon Lands, assuming that the significant amount of money needed to purchase the land (estimated to be as much as $100 million total) could be raised.

The second way in which land conservation may be achieved is via mitigation for the multitude of permits that PG&E needs to decommission DCPP. There is significant precedent for conservation in this manner. For example, in exchange for permits to build its simulator/training building on Parcel P, PG&E agreed to establish and manage the South Ranch Pecho Coast trail system. As mitigation for the construction of the spent nuclear fuel dry cask storage facility, PG&E agreed to create and manage the North Ranch Point Buchon trail. Finally, as mitigation for the replacement of the DCPP steam generator, PG&E agreed to, among other things, restrict development in-perpetuity on 1200 acres within South Ranch adjacent to Wild Cherry Canyon. (At one point the California Coastal Commission considered the conservation of the entire 12,000 acres of the Diablo Canyon Lands as mitigation for prior, far less significant DCPP permits!) A compelling case can be (and has been) made for future Diablo Canyon Lands conservation through mitigation associated with the decommissioning process; for details, see this article:
https://www.yumpu.com/en/document/read/62860961/slo-life-magazine-oct-nov-2019/54

Conclusion

Ensuring the conservation of and managed public access to the Diablo Canyon Lands is a complex and challenging process that will require significant resources and a concerted and sustained effort by this community and its leadership. Nonetheless, we feel confident that we can succeed in the implementation of this Conservation Framework and can permanently protect and provide access to this unique, beautiful, and ecologically significant land, while honoring the rich legacy of the Northern Chumash.

APPENDIX A

Conservation Framework for the Diablo Canyon Lands

Based upon the community's input as reflected in the Diablo Canyon Decommissioning Engagement Panel's public process and resulting Strategic Vision document; the overwhelming popular vote of San Luis Obispo County residents in support of the 2000 DREAM Initiative; the Tribal Lands Transfer Policy; and the work of the Friends of the Diablo Canyon, we adopt the following framework for the conservation of the Diablo Canyon Lands:

Mutual Goals

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- The cultural resources of the Diablo Canyon Lands -- including burial sites, cultural artifacts, historic Northern Chumash village sites, and other sacred areas -- should be protected and preserved in perpetuity;
- A Diablo Canyon Lands managed public access program should be created to provide sustainable public access to both coastal and interior areas; and
- The ownership of the Diablo Canyon Lands should be transferred away from PG&E and Eureka Energy, to an appropriate entity or entities that can ensure the long-term conservation of and managed public access to the lands.

Key Elements/Recommendations

1. **Transfer ownership and management of the Diablo Canyon Lands** to an entity or entities (including possibly federal, state, tribal, local, or non-profit organization) in a manner that is **consistent with the DREAM Initiative, the Strategic Vision of the Diablo Canyon Lands Decommissioning Engagement Panel, and the Tribal Land Transfer Policy**;

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   (c) Create and record perpetual conservation easements over the entire Diablo Canyon Lands, per Key Element 3 below, at the time of transfer of ownership; and

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   (b) prohibit commercial development (see Appendix H);
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   (d) prohibit unmanaged public access; and
   (e) prohibit non-sustainable grazing or other non-sustainable agricultural activities.

   The conservation easement shall be held and managed in-perpetuity by a qualified governmental or non-profit entity that satisfies the following: (1) its mission is compatible with the long-term conservation of and managed public access to the Diablo Canyon Lands, and (2) it demonstrates the ability to perpetually monitor and enforce the terms of the conservation easement(s) through an endowment or other reliable and long-term funding mechanism.

4. **Create a perpetual, sustainable, and appropriately sited, managed public access and use plan**, to include the following:

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      (ii) a primary interior trail for hiking, mountain biking, and equestrians from Wild Cherry Canyon to Montana de Oro, via protected properties within the Irish Hills; and

      (iii) possible secondary trails to connect the two primary trails with potential access by mountain bikers and equestrians to areas on or near the coastal trail, and for multiple uses/users on Wild Cherry Canyon; and

   (c) In all cases, the trail systems shall be carefully sited, designed, and constructed in coordination with tribal representatives and cultural, biological, and other experts to avoid sensitive ecological, scenic, and cultural resources.

APPENDIX B

Friends of the Diablo Canyon Lands (as of May 14, 2021)

Participants:

Denise Allen, MD, Founder, **Friends of Wild Cherry Canyon**
Teah Anders, MA, Natural Resources Mgt.; Owner/Advocate, **Gentle Touch Pet Training**
Sam Blakeslee, Author, **DREAM Initiative**
Andrew Christie, Executive Director, **Sierra Club Santa Lucia Chapter**
Kaila Dettman, Executive Director, the **Land Conservancy of San Luis Obispo County**
Rachel Duchak, Principal, **Central Coast Foodie**
Dan Falat, District Superintendent, **California State Parks, San Luis Obispo Coast District**
Nick Franco, Director, **SLO County Parks Department; California State Parks District Superintendent** (retired)
Andrew Hackleman, Vice President, **REACH**
Susan Harvey, Conservation Committee Chair, **Sierra Club Santa Lucia Chapter**
Neil Havlik, Director, **Coastal San Luis Resource Conservation District**
Gordon Hensley, Executive Director, **San Luis Obispo Coastkeeper**
Stacey Hunt, CEO, **Ecologistics**
Melissa James, President/CEO, **REACH**
Jeff Jantos, Member/Advocate, **Central Coast Concerned Mountain Bikers**
Randall Knight, Professor Emeritus, Cal Poly; Trustee, **Land Conservancy of SLO County**
Sally Krenn, Senior **Terrestrial Biologist, PG&E** (retired)
Steve Lakowske, Engineer and **Multi-Use Trails advocate**
Jennifer Langford, Biologist, Founder, **Friends of Wild Cherry Canyon**
Kathy Longacre, Member/Advocate, **SLO Parks, Open Space, and Trails Foundation**
Steve McGrath, Harbor Manager, **Port San Luis Harbor District** (retired)
Jim Miers, Member/Advocate, **Surfrider Foundation San Luis Obispo Chapter**
Jeff Miller, Senior Conservation Advocate, **Center for Biological Diversity**
Christie O'Hara, President, **Central Coast Concerned Mountain Bikers**
Pam Reading, **Principal/Environmental Planner**
Kathy Redden, Member/Advocate, **Atascadero Horsemen's Club**
Ilona Shakibnia, Founder, **Friends of Oso Flaco Lake**
Herbert Smith, Board Member, **American Woodland Conservancy**
Kirk Sturm, JD/PhD, Lecturer, Cal Poly; **CA State Parks Director** (retired)
Martin Suits, Judge (retired); Advocate, **Avila Resident**
Sharon Suits, Teacher (retired); Advocate, **Avila Resident**
Doug Tait, Member/Advocate, **Morro Coast Audubon Society**
Jesse Trace, Farmer, **Regenerative Agriculture**
Steph Wald, Watersheds Projects Member, **Creek Lands Conservation**
Kyle Walsh, Conservation Director, the **Land Conservancy of San Luis Obispo County**
Kara Woodruff, Member, **Diablo Canyon Decommissioning Engagement Panel**

Observers:

Greg Haas, District Representative, **Congressman Salud Carbajal**
John Laird, **California State Senator**
Jordan Cunningham, **State Assemblymember**
Tim Duff, Project Manager, **California State Coastal Conservancy**
Dawn Ortiz-Legg, **SLO County Supervisor** (Third District)
Bruce Gibson, **SLO County Supervisor** (Second District)
Guy Savage, **SLO County Administrative Officer**
Trevor Keith, **SLO County Director of Planning and Building**
Susan Strachan, **SLO County Nuclear Power Plant Decommissioning Manager**
Bob Linscheid, Senior Advisor for Economic Development,
Office of the President, **Cal Poly SLO**
Staff, **The Nature Conservancy**

APPENDIX C

A SENSITIVE PLANT AND WILDLIFE RESOURCE INVENTORY OF DIABLO CANYON LANDS, VOLUME I:

SURVEY PROCEDURES AND A SUMMARY OF SURVEY RESULTS

Prepared by:

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303 Potrero Street, Suite 29-101
Santa Cruz, California 95060

and

Pacific Gas and Electric Company
Technical and Ecological Services
3400 Crow Canyon Road
San Ramon, California 94583

Prepared for:

Pacific Gas and Electric Company
Diablo Canyon Land Stewardship Committee
Diablo Canyon Power Plant
Avila Beach, California

Legal Notice

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EXECUTIVE SUMMARY

PG&E owns or controls through long-term lease agreements approximately 10,000 acres of ecologically diverse coastal lands surrounding Diablo Canyon Power Plant in San Luis Obispo County, California. Beginning in 1992, a comprehensive survey of these lands was undertaken to identify and describe all sensitive plant and wildlife resources not previously known that might occur there. Though not required by state or federal regulatory agencies, this voluntary effort is consistent with PG&E's Corporate Policy on Management of Company Real Property (Section 7, paragraphs a and d), as well as specific Best Management Practices identified by the Diablo Canyon Land Stewardship Program (PG&E 1993a).

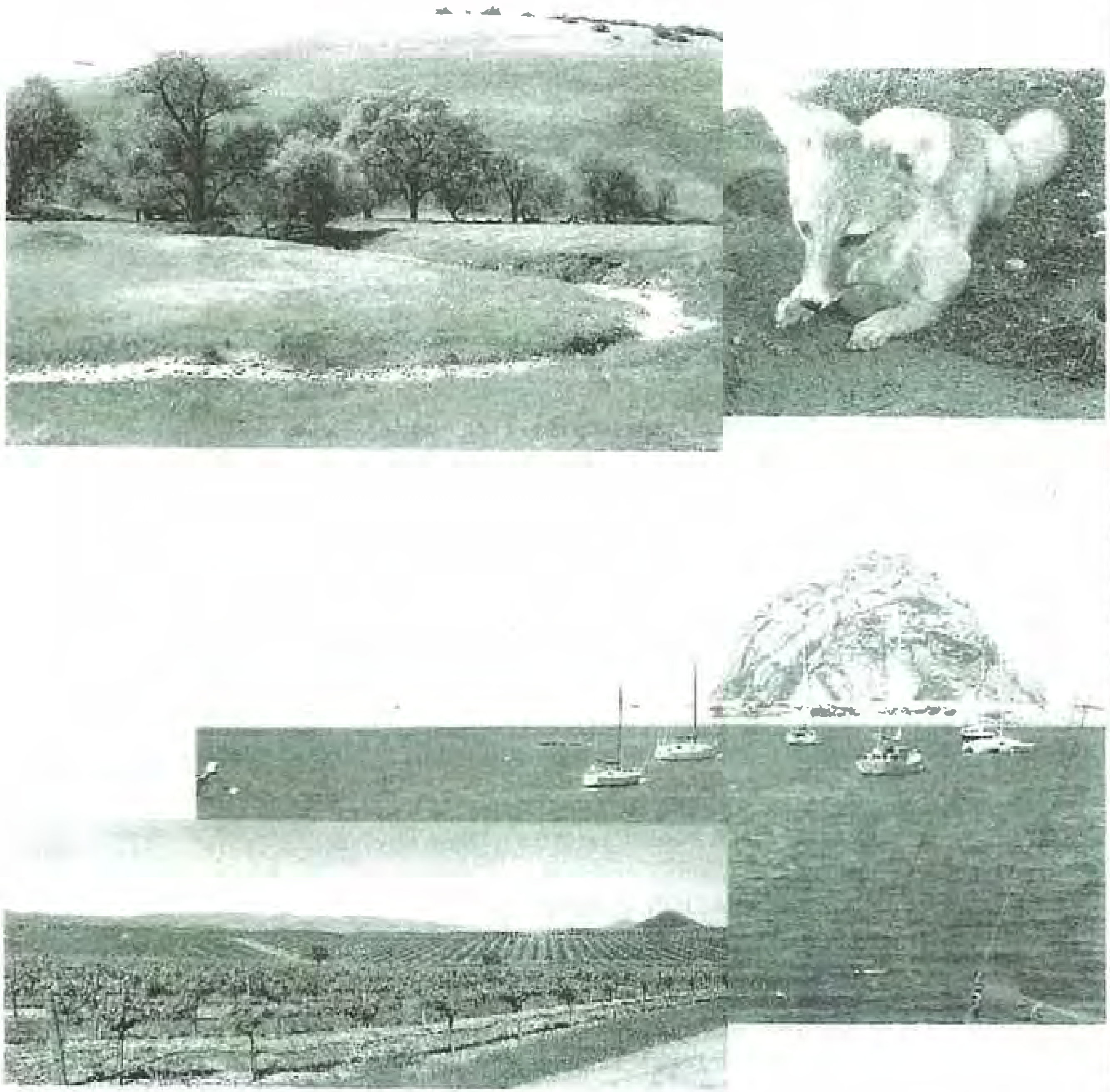
By the time field surveys were completed in 1994, biologists had identified and mapped the locations of 7 state recognized rare vegetation community types,[1] 4 rare plant species populations,[2] 1 sensitive insect,[3] 10 sensitive bird species,[4] and 2 sensitive mammal species[5] (see Tables 3-1 and 3-2 for detailed data). One additional species, the federally endangered plant Indian Knob mountainbalm, is strongly suspected to occur, though no populations have yet been found. The sensitive species identified on Diablo Canyon Lands during this survey effort include none currently listed as threatened or endangered under the state or federal Endangered Species Acts. However, all of the species and community types are classified under one or more official "Watch Lists" at the state or federal government level. These Watch List species and communities are felt to be declining, and it is often from these lists that new candidates are added to the growing number of threatened and endangered species in California. Several other sensitive species about which much information is already known from the Diablo Canyon area have not been included here. These are the American peregrine falcon, southern sea otter, brown pelican, northern elephant seal, and several species of whales that annually migrate along the Diablo coast.

Volumes I and II of this Diablo Canyon Land Stewardship Committee report serve to document the methods used in conducting the sensitive resource inventory and a detailed record of all survey results. Also identified are local endangerment factors that could threaten the resource and the direction that management should take to provide proper safeguards. Because Volume II contains specific map locations of sensitive species populations, we are treating it as confidential and available only on a need-to-know basis inside and outside of PG&E. Volume I, which contains a less specific summary of survey results, is suitable for broad distribution. It is our intention that this information be used to arrive at sound decisions for the management and conservation of Diablo Canyon Lands. Furthermore, it is our intention that this document be periodically updated as new information is acquired or changes occur in the status of sensitive resources.

[1] Central maritime chaparral, bishop pine forest, central coast riparian scrub, northern coastal bluff scrub, coastal terrace prairie/valley needlegrass grassland, and central coast live oak riparian forest.
[2] La Cruz manzanita, Pecho manzanita, Edna manzanita, and Coulter's saltbush.
[3] Monarch butterfly.
[4] Sharp-shinned hawk, Cooper's hawk, ferruginous hawk, golden eagle, merlin, burrowing owl, California horned lark, loggerhead shrike, yellow warbler, and tricolored blackbird.
[5] Pallid bat and San Diego desert woodrat.

APPENDIX D

Conserving the Landscapes of San Luis Obispo County



The Nature Conservancy
CALIFORNIA

Irish Hills

SETTING

The Irish Hills embrace the rugged, western portion of the San Luis Range, extending from the Pacific Ocean to Los Osos Valley, and from the town of Los Osos on the north to San Luis Obispo Creek on the south. The largely undisturbed and highly scenic site includes Montana de Oro State Park, the Hibberd Preserve, and scattered large private holdings, including PG&E properties surrounding the Diablo Canyon Nuclear Power Plant.

CONSERVATION RESOURCES

The Irish Hills support a diverse and largely undisturbed collection of natural resources. Its vast coastal bluffs and terraces support excellent examples of coastal scrub, coast live oak woodlands, wildflower fields, and grasslands, including some of the only known undisturbed stands of coastal terrace prairie remaining in the state. Inland, the Irish Hills host mixed evergreen and oak forests, as well as a bishop pine forest – one of the few such stands in the county. Other upland communities include chaparral and endemic serpentine habitats. Coastal creeks of the Irish Hills support healthy aquatic systems with native steelhead trout and the threatened California red-legged frog, as well as riparian forests rich in neotropical migratory birds.

Some of the county's most well-known scenic resources are found here. These include the Point San Luis Lightstation, the meandering Prefumo Canyon Road, and vistas of the hills from Avila Beach, Los Osos Valley Road, and the Highway 101 corridor. The quaint See Canyon is regionally famous for its apple orchards and rustic fruit stands. Archeological resources are found at Whale Cave at the southern tip of the site.

THREATS TO THE CONSERVATION RESOURCES

Due to its proximity to Highway 1 and existing development, lands around the eastern and southern perimeter of the Irish Hills are currently threatened by residential development. Larger inland parcels, including the PG&E properties now serving as buffer to the Diablo Canyon Nuclear Power Plant, will likely become threatened by development in later years as the plant is decommissioned, development pressures increase, and infrastructure improvements are made.

The conservation resources, particularly along the immediate coast, are further threatened by invasive non-native plant species, including ice plant, south African veldt grass, and eucalyptus trees.

Montana de Oro State Park is a critically important component of the Irish Hills conservation area. Increasing levels of urban encroachment on the east side of the Irish Hills along Highway 101 and Los Osos Valley may threaten scenic vistas and potentially impact serpentine systems.

CONSERVATION FEASIBILITY

Multiple factors enhance the potential for conservation of the Irish Hills. Much of the site is either in large ownerships or already protected. Protected properties include the 8,000-acre Montana de Oro State Park and the 1,500-acre Hibberd Preserve, which was acquired by The Nature Conservancy in the 1970s and recently transferred to the Land Conservancy of San Luis Obispo County. Approximately 14,000 coastal acres between these protected parcels are held by PG&E. When the plant is decommissioned in the future, an opportunity to protect the PG&E lands may arise, particularly in light of the county's recent passage of the "Dream" Initiative, an advisory measure requesting the county to adopt policies to protect the PG&E lands.

The inland properties between the State Park and the Hibberd Preserve consist of large, single ownership parcels, including a few hundred acres held by the Bureau of Land Management. Because these properties are currently isolated, their land values may be relatively low despite their coastal location and beauty.

Protecting vistas along Los Osos Valley Road is also achievable, in large part because the City of San Luis Obispo has required dedication of many of the foothill properties in exchange for development adjacent to existing urban areas. The City is presently negotiating the protection of remaining properties along the road.

The potential for conservation of the Irish Hills is augmented by the existence of national, state, and local organizations and agencies with demonstrated interest or ownership of properties within the site. These organizations include the California Department of Parks and Recreation, the Bureau of Land Management, The Nature Conservancy, the Bay Foundation, the Central Coast Natural History Association, the Land Conservancy of San Luis Obispo County, the California State Coastal Conservancy, and the City of San Luis Obispo.

CONSERVATION GOALS

The conservation goal for the Irish Hills is to preserve a large, diverse block of habitat contiguous with Montana de Oro State Park and ecologically linked to the adjacent Indian Knob and Morro Bay sites. Emphasis should be placed on protection of the biologically unique coastal terraces, coastal creeks, maritime chaparral, and key *linkages between protected lands. The site's unique scenic and agricultural resources should also be preserved.*

CONSERVATION STRATEGIES

Land Acquisition

To preserve a large, unfragmented block of coastal habitat extending from Montana de Oro State Park southeastward to the Hibberd Preserve, purchase a fee or conservation easement on the following properties: Sinsheimer, Read, Martin, Beachham, and Andre. Negotiate with PG&E regarding the disposition of its buffer lands prior to or upon decommission of the power plant. Eventually obtain fee title or a conservation easement on the property. Work with BLM to ensure its property remains with the federal agency or with another conservation entity. Extinguish leases and development rights on the PG&E/Leucadia property.

To preserve scenic parcels along Los Osos Valley Road and to assist in establishing a greenbelt around the City of San Luis Obispo, purchase a fee or conservation easement, or negotiate development on lower elevations of remaining private properties along the northeastern edge of the Irish Hills boundary.

Partnerships

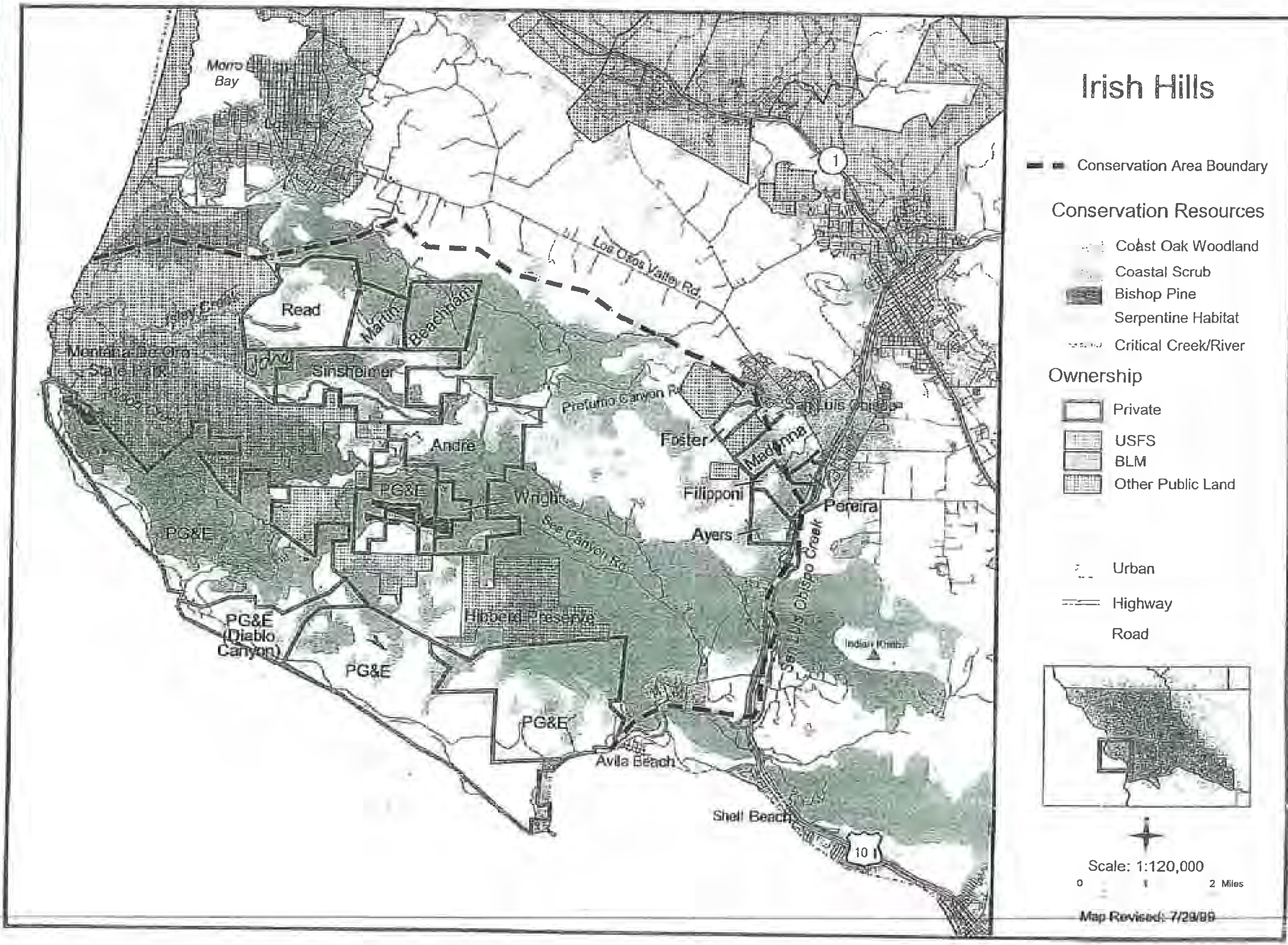
To further conservation efforts in the Irish Hills, coordinate and focus efforts of local, regional, and national conservation groups including State Parks, the Bureau of Land Management, the California State Coastal Conservancy, The Nature Conservancy, the City of San Luis Obispo, the Bay Foundation, and the Central Coast Natural History Association.

Further Evaluation

To further refine conservation goals and actions in the Irish Hills, identify and evaluate occurrences of rare plant communities (emphasizing endemic serpentine species) along the northeast boundary of the site. Follow-up with land acquisitions where appropriate and feasible.

Other Actions

To protect the scenic and historic Point San Luis Lightstation, restore the lighthouse and improve access roads to allow for increased public visitation.



Irish Hills
Conservation Area Boundary
Conservation Resources
Coast Oak Woodland
Coastal Scrub
Bishop Pine
Serpentine Habitat
Critical Creek/River
Ownership
Private
USFS
BLM
Other Public Land
Urban
Highway
Road
Scale: 1:120,000
0
1
2 Miles
Map Revised: 7/29/99
Morro Bay
Read
Martin
Beachman
Sinsheimer
Andre
PG&E
Wright
See Canyon Rd.
Prefumo Canyon Rd.
Los Osos Valley Rd.
Foster
Madonna
Filipponi
Ayers
Pereira
San Luis Obispo Creek
Hibberd Preserve
PG&E (Diablo Canyon)
Avila Beach
Shell Beach
1
10

APPENDIX E

Cal Poly, PG&E and the yak tityu tityu yak tilhini — Northern Chumash Tribe to Receive State Preservation History Award for Efforts to Restore Site of Native American Village Near Diablo Canyon

SAN LUIS OBISPO — A project to preserve the former site of a Native American village near Diablo Canyon Power Plant by a Cal Poly archaeology professor and his students, Pacific Gas and Electric, and the yak tit^{y}u tit^{y}u yak tiłhini — Northern Chumash Tribe will receive a 2018 Governor's Historic Preservation Award in November.

"It was very much a cooperative effort between all of us," said Terry Jones, an archaeologist and chair of Cal Poly's Social Sciences Department. "I was very pleased and honored to receive the recognition. We worked very hard on the materials from that particular site — both in the field and in laboratory analysis."

The annual awards individuals, organizations, companies and public agencies whose contributions demonstrate notable achievements in preserving the heritage of California. Six projects will receive awards this year.

Since 2009, PG&E has hosted a Cal Poly archaeological field class on the lands near the power plant in collaboration with the Northern Chumash Tribe. The field class focused on Native-affiliated sites with middens, old refuse heaps of domestic waste that have been affected by coastal erosion, public trail access and historic land uses.

In 2015, the class was held near Pecho Creek, a multi-component site listed on the National Register of Historic Places as a contributing element to the 10,300-acre Rancho Canada de los Osos y Pecho y Islay archaeological district. The restoration area (about 19 acres) corresponds to the former Northern Chumash village site of tst^{y}iwi, and later the site of a Rancho Period adobe — which represents "a microcosm of California history," according to an overview of the project.

The Chumash people's connection to the land is deep and long; tribal members used the lands around Diablo Canyon as hunting grounds for some 9,000 years.

The project site was occupied over several millennia and is unique regionally, representing the Pre-Contact, Mission and Rancho periods. It is the only site so-far reported from this region that correlates with an ethnographic village name — tst^{y}iwi — and the only one that illuminates life on the Central Coast both immediately before and after arrival of the Spanish. It reveals a history of resilience and adaptive change in the decades leading up to eventual colonial takeover.

The site was selected "because its integrity was being steadily compromised by cliff-face and creek bank erosion, aeolian erosion and disturbances related to agricultural uses (primarily plowing) dating back to circa 1844," according to the Governor's Office.

The collaboration between Cal Poly, PG&E and yak tit^{y}u tit^{y}u yak tiłhini -- Northern Chumash Tribe "is a perfect example of how historic preservation should operate," said Brian F. Codding, a University of Utah associate professor of anthropology, in his nomination letter for the project. "In addition to the remarkable research and restoration achieved through this project, it also provided invaluable opportunities to train (doctoral) students from the University of Utah over the 2015 field season. It was an honor to be involved in such an impressive effort."

The Cal Poly students, Northern Chumash monitors, tribal representatives, professional cultural resource management archaeologists, and visiting scholars worked at the under the direction of Dr. Jones.

In addition, Mike Taggart, PG&E cultural resource specialist for the Diablo Canyon lands, facilitated the Cal Poly fieldwork and development of the restoration project that allows students to come onto the plant property to explore a living classroom replete with rich natural and cultural resources.

Jones said about 40 students -- 25 students who participated in the field class and 15 others who were in three laboratory classes -- were involved in the on-site work that was done between 2015 and 2017.

"The artifacts that told us the site was a named Chumash village were Venetian glass trade beads that were given or traded to Native people by the Spanish," he said. "The site also produced arrow, dart and spearhead projectile points and Olivella shell beads."

Some of the project materials are on display at the PG&E Energy Education Center, 6588 Ontario Road in San Luis Obispo.

"Once we realized how important the site was, we shifted our priorities from excavation to conservation," Jones said. "PG&E then undertook a number of activities to eliminate impacts to the site and stabilize it. All of these things were undertaken in consultation and close coordination with the yak tit^{y}u tit^{y}u yak tilhini -- Northern Chumash Tribe of San Luis Obispo County and Region."

The project also played a key role in reuniting the Northern Chumash Tribe with a place imbued with cultural significance and affirming oral history.

"Personal and family connections between the tribe and tst^{y}iwi are profound with very deep roots," according to the Governor's Office. "The site retains tremendous significance to the Tribe as an element of their cultural patrimony. The project's far-reaching benefits include protection of Northern Chumash cultural materials, reuniting the Tribe with a culturally significant location, affirming tribal oral history, improved environmental conditions, and provision of a living classroom for community engagement and education."

Tribal officials are pleased with the results.

"Over the years, we have appreciated the chance to return to sensitive and culturally important places located on Diablo Lands and to stand where our families stood for thousands of years," said Mona Olivas Tucker, an Arroyo Grande resident and chair of yak tit^{y}u tit^{y}u yak tilhini – Northern Chumash Tribe.

"We're glad that environmental restoration is underway to further protect the site. We're also happy with our collaboration with Dr. Terry Jones of Cal Poly and PG&E Senior Archaeologist Mike Taggart that has resulted in the recognition and honoring of this amazing place."

No additional archaeological investigations are planned at the site, which has been stabilized after native grasses took root.

The Governor's Historic Preservation Awards will be presented Nov. 1 at the Florence Turton Clunie Memorial Center in Sacramento's McKinley Park.

About the Governor's Historic Preservation Awards Program

Established in 1986 by Gov. George Deukmejian, the Governor's Historic Preservation Awards are presented annually under the sponsorship of the California Office of Historic Preservation and California State Parks to projects, individuals and organizations whose contributions demonstrate significant achievements in preserving the heritage of California. The awards program is distinguished from other preservation awards in two important respects: it emphasizes involvement by community groups; and it recognizes a broad array of preservation activities, including building rehabilitation, archaeology, interpretation, and preservation planning. Since 1986, more than 200 organizations, individuals and agencies have been recognized for their outstanding work throughout the state on behalf of preservation.

Contact: Terry Jones
tljones@calpoly.edu; 805-756-2523

September 21, 2018

APPENDIX F

Sample

PROPOSITION 20
CALIFORNIA STATE LOTTERY. ALLOCATION FOR INSTRUCTIONAL MATERIALS. LEGISLATIVE INITIATIVE AMENDMENT. Provides one-half of any increase beyond the current amount allocated to public education from state lottery revenues be allocated for purchase of instructional materials. Fiscal Impact: In the near term, tens of millions of dollars in annual lottery revenues that go to public education would be earmarked for instructional materials, with unknown earmarked amounts in future years.

◯ YES

◯ NO

PROPOSITION 21
JUVENILE CRIME. INITIATIVE STATUTE. Increases punishment for gang-related felonies, home-invasion robbery, carjacking, witness intimidation and drive-by shootings; and creates crime of gang recruitment activities. Fiscal Impact: State costs of more than $330 million annually; one-time costs of $750 million. Potential local costs of up to more than $100 million annually, and one-time costs of $200 million to $300 million.

◯ YES

◯ NO

PROPOSITION 22
LIMIT ON MARRIAGES.INITIATIVE STATUTE. Adds a provision to the Family Code providing that only marriage between a man and a woman is valid or recognized in California. Fiscal Impact: Probably no fiscal effect on the state or local governments.

◯ YES

◯ NO

PROPOSITION 26
SCHOOL FACILITIES. LOCAL MAJORITY VOTE. BONDS, TAXES. INITIATIVE CONSTITUTIONAL AMENDMENT AND STATUTE. Authorizes local voter approval by majority vote, not current two-thirds, for school construction and improvement bonds and property taxes in excess of 1% to pay bonds. Fiscal Impact: Local school costs–potentially in the hundreds of millions of dollars annually statewide within a decade–depending on results of voter action on future local school bond issues. Potential state savings in the longer run.

◯ YES

◯ NO

PROPOSITION 27
ELECTIONS. TERM LIMIT DECLARATIONS. INITIATIVE STATUTE. Permits congressional candidates to voluntarily sign non-binding declaration of intention to serve no more than three terms in House of Representatives or two terms in the United States Senate. Requires placement of information on ballots and state-sponsored voter education materials when authorized by candidates. Candidates may appear on ballot without submitting declaration. Fiscal Impact: Unknown, but probably not significant, election costs to the state and counties.

◯ YES

◯ NO

PROPOSITION 31
INSURANCE CLAIMS PRACTICES. CIVIL REMEDY AMENDMENTS. REFERENDUM. A "Yes" vote approves, a "No" vote rejects statutory amendments limiting right of injured party to sue another's insurer for unfair claims practices and exempting specified insurers under certain circumstances. Fiscal Impact: This proposition would have a fiscal impact only if Proposition 30 is approved. In this case, the proposition would not significantly affect the state and local fiscal impacts of Proposition 30.

◯ YES

◯ NO

COUNTY

SAN LUIS OBISPO COUNTY
MEASURE A
ADVISORY VOTE ONLY
Shall the County Board of Supervisors recognize the Diablo Canyon Lands as an exceptionally precious coastal resource by adopting policies that promote habitat preservation, sustainable agricultural activities, and public use and enjoyment consistent with public safety and property rights once the lands are no longer needed as an emergency buffer for the Diablo Canyon Nuclear Plant after its remaining operating life?

◯ YES

◯ NO

Sample

IMPARTIAL ANALYSIS BY COUNTY COUNSEL MEASURE A-00

The Board of Supervisors has directed the County Clerk-Recorder to conduct an advisory election concerning an area within the County consisting of approximately 12,000 acres located between Point San Luis and Point Buchon, known as the Diablo Canyon Lands. Specifically, the advisory measure seeks to determine whether the County Board of Supervisors should recognize the Diablo Canyon Lands as an exceptionally precious coastal resource by adopting policies that promote habitat preservation, sustainable agricultural activities, and public use and enjoyment, consistent with public safety and property rights, once the lands are no longer needed as an emergency buffer for the Diablo Canyon Nuclear Plant after its remaining operating life.

The results of the advisory vote will not be controlling on the County Board of Supervisors.

A "Yes" vote is a vote in support of the County Board of Supervisors recognizing the Diablo Canyon Lands as an exceptionally precious coastal resource by adopting policies that promote habitat preservation, sustainable agricultural activities and public use and enjoyment, consistent with public safety and property rights, once the lands are no longer needed as an emergency buffer for the Diablo Canyon Nuclear Power Plant after its remaining operating life.

A "No" vote is a vote against the Board of Supervisors recognizing the Diablo Canyon Lands as an exceptionally precious coastal resource by adopting policies that promote habitat preservation, sustainable agricultural activities, and public use and enjoyment, consistent with public safety and property rights, once the lands are no longer needed as an emergency buffer for the Diablo Canyon Nuclear Power Plant after its remaining operating life.

s/ James B. Lindholm, Jr.
County Counsel

ARGUMENT IN FAVOR OF MEASURE A-00

San Luis Obispo County voters can create a legacy for their children and future generations. Vote "yes" on Diablo Resources Advisory Measure (DREAM) if you want to preserve some 14 miles - 12,000 acres - of the most pristine coastal land in California.

This is an unprecedented opportunity to keep a piece of San Luis Obispo County coastline the way it was 100 years ago. By voting "yes," voters can say they want to preserve for public use and habitat protection, the undeveloped coves, bluffs, terraces, hills, and valleys that surround the Diablo Canyon nuclear plant after it's decommissioned. And it's a way to protect the historic agricultural uses of this property.

As stated in a Tribune editorial, preserving this land would be "one of the great environmental achievements in the county's history."

All five county supervisors - Peg Pinard, Mike Ryan, Shirley Bianchi, Harry Ovitt and Katcho Achadjian - voted to place this measure on the ballot. They wouldn't have done this if they didn't believe its passage could have a lasting impact on our community.

Measure A-00 carries no risk of tax increases or bonded indebtedness. It proposes no new rules or regulations. It does not take PG&E's property or impede their ability to operate. What it does do is quite powerful: it establishes, as the county's official goal, the preservation of this stretch of coastline after the plant shuts down. By doing so it helps our community attract existing funding that is designated for those sorts of purposes.

This must happen, because if it doesn't, pressure to develop this land will someday be enormous. It will be almost impossible to stop the condos, resorts, golf courses and strips malls once development plans are drawn up.

Let's not let that happen. Let's dare to DREAM. Let's create a legacy for our children.

s/ Sam Blakeslee, Businessman
Chairman DREAM Committee

s/ Peg Pinard, County Supervisor
DREAM Co-Sponsor

NO ARGUMENT AGAINST THIS MEASURE WAS SUBMITTED

1027.0110

51642

IN THE BOARD OF SUPERVISORS

COUNTY OF SAN LUIS OBISPO, STATE OF CALIFORNIA

Tues day October 19, 19 99

PRESENT: Supervisors Shirley Bianchi, Peg Pinard, K.H. "Katcho" Achadjian, Michael P. Ryan, and Chairperson Harry L. Ovitt

ABSENT: None

RESOLUTION NO. 99-424

A RESOLUTION DIRECTING THE COUNTY CLERK TO PLACE AN ADVISORY VOTE ON THE MARCH 7, 2000 PRIMARY ELECTION REGARDING THE DIABLO CANYON LANDS

WHEREAS, the State of California has a varied coastline of sandy beaches, rocky shores, productive estuaries, marshes, tidal flats, urban areas and harbors; and

WHEREAS, the marine and coastal environment of San Luis Obispo County is one of the most valuable economic and environmental resources for recreation, tourism, commercial fishing, and aqua-culture; and

WHEREAS, the County of San Luis Obispo is home to a 12,000 acre, 14 mile stretch of coastline located between Point San Luis and Point Buchon (also known as the Diablo Canyon Lands) which contains rocky headland and intertidal zones that provide habitat for brown pelicans, sea otters, sea Lions, kelp forests, and a variety of seabirds; and

WHEREAS, the residents of San Luis Obispo County are strongly committed to the protection and management of the ecosystems that provide local communities with employment opportunities, recreational activities, and scenic beauty; and

WHEREAS, preserving coastal resources enables communities to appreciate and value the endowment of the coastal environment.

NOW, THEREFORE BE IT RESOLVED AND ORDERED, by the Board of Supervisors of the County of San Luis Obispo the following:

1. That an advisory election be conducted pursuant to section 9603 of the Elections Code.
2. That the County Clerk-Recorder is directed to place this measure on the March 7, 2000, Primary Election ballot and publish it in the election materials prepared for that ballot.
3. That the text of the ballot language for said measure shall read as follows:

ADVISORY VOTE ONLY

Shall the County Board of Supervisors recognize the Diablo Canyon Lands as an exceptionally precious coastal resource by adopting policies that promote habitat preservation, sustainable agricultural activities, and public use and enjoyment consistent with public safety and property rights once the lands are no longer needed as an emergency buffer for the Diablo Canyon Nuclear Plant after its remaining operating life?

Upon motion of Supervisor Pinard, seconded by Supervisor Ryan, and on the following roll call vote, to-wit:

AYES: Supervisors Pinard, Ryan, Bianchi, Achadjian, Chairperson Ovitt

NOES: None

ABSENT: None

ABSTAINING: None

the foregoing resolution is hereby adopted.

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D-5

Chairman of the Board of Supervisors

ATTEST:

Julie L. Rodewald
Clerk of the Board Supervisors
BY: Deputy Clerk
[SEAL]

APPROVED AS TO FORM AND LEGAL EFFECT:

JAMES B. LINDHOLM, JR.

By: ______________________
Deputy County Counsel

Dated: 10-8-99

STATE OF CALIFORNIA
COUNTY OF SAN LUIS OBISPO } ss

I, JULIE L. RODEWALD, County Clerk of the above entitled County, and Ex-Officio Clerk of the Board of Supervisors thereof, do hereby certify the foregoing to be a full, true and correct copy of an order entered in the minutes of said Board of Supervisors, and now remaining of record in my office.

Witness, my hand and seal of said Board of Supervisors this 25 day of Oct 19 99.

JULIE L. RODEWALD
County Clerk and Ex-Officio Clerk
of the Board of Supervisors

By ______________________ Deputy Clerk

1027.0110

IN THE BOARD OF SUPERVISORS
COUNTY OF SAN LUIS OBISPO, STATE OF CALIFORNIA

Tuesday, October 19, 1999

PRESENT: Supervisors Shirley Bianchi, Peg Pinard, K.H. 'Katcho' Achadjian, Michael P. Ryan and Chairperson Harry L. Ovitt

ABSENT: None

In the matter of Diablo resources Advisory Measure:

This is the time set for consideration of a proposed Diablo Resources Advisory Measure; 3rd District.

Supervisor Pinard: introduces Mr. Blakeslee who will speak about a project called the Diablo Resources Advisory Measure (DREAM).

Mr. Sam Blakeslee: Chairperson of DREAM, states this is an opportunity for the Board to make a decision that will affect the entire community for years to come; states this is a measure that seeks to preserve over 12,000 acres of coastal land that stretches between Point Buchon on up to Montanya De Oro; indicates the advisory group has met with a wide range of individuals and groups and PG &E regarding this measure; addresses some of the values that are in the measure; states this is an opportunity for the Board to create a legacy.

Ms. Missie Hobson: Representing PG&E, addresses PG&E's stewardship and management of Diablo Canyon land and explains why PG&E supports the measure.

Ms. C..lleen Ray: Executive Director for Central Coast Natural History Association, indicates they support the DREAM measure and its placement on the March 2000 ballot; states their organization of nearly 1,000 community members have supported environmental education, interpretation and conservation efforts in the five local State Parks for more than 20 years; feels the preservation of Diablo land is one of the most important decisions the community will face in coming years; urges the Board to place the measure on the ballot.

Mr. Jack Beigle: People for the Nipomo Dunes, states he agrees with what has been said this afternoon; states PG&E has a good land stewardship program and have protected the area; indicates the measure will ensure that continued level of protection after Diablo Canyon closes; requests this measure be placed on the March 2000 ballot.

Mr. Pat Veesart: ECOSLO, states he is here to indicate ECOSLO's support for placing this measure on the ballot; ECOSLO will continue to urge the Regional Board and other regulatory agencies to do whatever is necessary to stop any damage that is occurring at Diablo; feels this is a real opportunity to preserve the onshore environment.

Ms. Rochelle Becker: Mothers for Peace, states they are currently taking a neutral position on this measure; addresses several "red flags" regarding the measure; states her concern that the Board intends for this measure to be in place of any mitigation by the Regional Quality Board.

Supervisor Pinard: states this is an opportunity to do what we all say we want to do and that is to work at win - win solutions; indicates the goal is to preserve as much of the 13,000 acres as possible.

Matter is fully discussed and thereafter, on motion of Supervisor Pinard, seconded by Supervisor Ryan and on the following roll call vote:

AYES: Supervisors Pinard, Ryan, Bianchi, Achadjian, Chairperson Ovitt
NOES: None
ABSENT: None

RESOLUTION NO. 99-424, a resolution directing the County Clerk to place an advisory vote on the March 7, 2000 Primary Election regarding the Diablo Canyon Lands, adopted.

cc: Administration 2
Elections
Auditor
10/25/99 ola

STATE OF CALIFORNIA)
)ss.
County of San Luis Obispo)

I, JULIE L. RODEWALD, County Clerk-Recorder and Ex-Officio Clerk of the Board of Supervisors, in and for the County of San Luis Obispo, State of California, do hereby certify the foregoing to be a full, true and correct copy of an order made by the Board of Supervisors, as the same appears spread upon their minute book.

WITNESS my hand and the seal of the said Board of Supervisors, affixed this 25th day of October, 1999.

JULIE L. RODEWALD
(SEAL) County Clerk-Recorder and Ex-Officio Clerk of the Board of Supervisors

By [signature] Deputy Clerk

BOARD APPEARANCE REQUEST FORM
The San Luis Obispo County Board of Supervisors
Welcomes Your Comments

In the interest of time, three (3) minutes will be reserved for your presentation. Please submit this completed form to the Clerk of the Board prior to the item.

Public Comment remarks should be directed to the Chairman and the Board as a whole and not to any individual thereof. No person will be permitted to make slanderous, profane or personal remarks against any individual.

NAME: SAM BLAKESLEE
AGENDA ITEM: D1
ISSUE: DIABLO DREAM BALLOT MEASURE

SIGNATURE: [signature] DATE: 10/19/99

personal remarks against any individual.

NAME: Missie Hobson — (Will speak after Sam)
AGENDA ITEM: DREAM
ISSUE:

SIGNATURE: DATE: 10/19/99

NAME: Colleen Ray
AGENDA ITEM: D1
ISSUE: Diablo Resources Advisory Measure

SIGNATURE: Colleen Ray DATE: 10/19/99

NAME: JACK BEIGLE
AGENDA ITEM: D-1
ISSUE:

SIGNATURE: A.J. Beagle DATE: 10-19-99

NAME: PAT VEESART
AGENDA ITEM: D-1
ISSUE: DREAM

SIGNATURE: [signature] DATE: 10/19/99

BOARD APPEARANCE REQUEST FORM
The San Luis Obispo County Board of Supervisors
Welcomes Your Comments

In the interest of time, three (3) minutes will be reserved for your presentation. Please submit this completed form to the Clerk of the Board prior to the Item.

Public Comment remarks should be directed to the Chairman and the Board as a whole and not to any individual thereof. No person will be permitted to make slanderous, profane or personal remarks against any individual.

NAME: Rochelle Becker

AGENDA ITEM: D1

ISSUE: open space measure

SIGNATURE: Rochelle Becker DATE: 10/19/99

COUNTY OF SAN LUIS OBISPO BOARD OF SUPERVISORS
AGENDA ITEM TRANSMITTAL

(1) DEPARTMENT	(2) MEETING DATE	(3) CONTACT/PHONE
Board of Supervisors	October 19, 1999	Peg Pinard P.P. (805) 781-5450

(4) SUBJECT
Proposed Diablo Resources Advisory Measure (DREAM)

(5) SUMMARY OF REQUEST

Supervisor Pinard has been approached by the Central Coast Natural History Association (CCNHA), as well as many other members of the community, to request the Board to place an advisory ballot measure on the next available election. The CCNHA is a non-profit organization that supports environmental and conservation education programs. The advisory measure would ask the County voters to recognize the natural resource value of the Diablo Canyon Lands that extend from Avila Beach to Montana de Oro State Park. These lands include approximately 12,000 acres and 14 miles of coastline. The proposed measure would read as follows:

ADVISORY VOTE ONLY

Shall the County Board of Supervisors recognize the Diablo Canyon Lands as an exceptionally precious coastal resource by adopting policies that promote habitat preservation, sustainable agricultural activities, and public use and enjoyment consistent with public safety and property rights once the lands are no longer needed as an emergency planning buffer for the Diablo Canyon Nuclear Plant after its remaining operating life?

(6) RECOMMENDED ACTION
That your Board authorize the Chair to sign the attached resolution directing the County Clerk-Recorder to place the Diablo Resources Advisory Measure (DREAM) on the March 7, 2000 general election ballot.

(7) FUNDING SOURCE(S)	(8) CURRENT YEAR COST	(9) ANNUAL COST	(10) BUDGETED?
General Fund	$3,250-$6500	N/A	☑ YES ☐ N/A ☐ NO

(11) OTHER AGENCY/ADVISORY GROUP INVOLVEMENT (LIST):
County Clerk-Recorder, Department of Planning and Building and County Counsel.

(12) WILL REQUEST REQUIRE ADDITIONAL STAFF? ☑ No ☐ Yes, How Many? ______
☐ Permanent ____ ☐ Limited Term ____ ☐ Contract ____ ☐ Temporary Help ____

(13) ADMINISTRATIVE OFFICE REVIEW

(14) SUPERVISOR DISTRICT(S) 1st, 2nd, 3rd, 4th, 5th, All	(15) LOCATION MAP ☐ Attached ☐ N/A
(16) AGENDA PLACEMENT ☐ Consent ☐ Hearing (Time Est. 30) ☐ Presentation ☐ Board Business (Time Est.______).	(17) EXECUTED DOCUMENTS ☑ Resolutions (Orig + 4 copies) ☐ Contracts (Orig + 4 copies) ☐ Ordinances (Orig + 4 copies) ☐ N/A
(18) NEED EXTRA EXECUTED COPIES? ☐ Number: ☐ Attached ☑ N/A	(19) APPROPRIATION TRANSFER REQUIRED? ☐ Submitted ☐ 4/5th's Vote Required ☑ N/A

D 10/1/99

BOARD OF SUPERVISORS

COUNTY GOVERNMENT CENTER, Room 370 • SAN LUIS OBISPO, CALIFORNIA 93408-2040 • 805.781.5450

SUPERVISOR PEG PINARD
DISTRICT THREE

TO: Board of Supervisors

FROM: Peg Pinard, 3rd District Supervisor P.P.

DATE: October 19, 1999

SUBJECT: Proposed Diablo Resources Advisory Measure (DREAM)

RECOMMENDATION

That your Board authorize the Chair to sign the attached resolution directing the County Clerk-Recorder to place the Diablo Resources Advisory Measure (DREAM) on the March 7, 2000 general election ballot

DISCUSSION

I have been approached by the Central Coast Natural History Association (CCNHA), as well as many other members of the community, to request the Board to place an advisory ballot measure on the next available election. The CCNHA is a non-profit organization that supports environmental and conservation education programs. The advisory measure would ask the County voters to recognize the natural resource value of the Diablo Canyon Lands that extend from Avila Beach to Montana de Oro State Park. These lands include approximately 12,000 acres and 14 miles of coastline. The proposed measure would read as follows:

ADVISORY VOTE ONLY

Shall the County Board of Supervisors recognize the Diablo Canyon Lands as an exceptionally precious coastal resource by adopting policies that promote habitat preservation, sustainable agricultural activities, and public use and enjoyment consistent with public safety and property rights once the lands are no longer needed as an emergency planning buffer for the Diablo Canyon Nuclear Plant after its remaining operating life?

There appears to be community wide support for the concept of placing the advisory measure on the ballot. A public meeting to discuss the idea was conducted on October 4th by the CCNHA and attended by approximately 100 county residents. The measure was

Dz

discussed in detail during the meeting and presentations were made by Dream Committee members, as well as PG&E and the Nature Conservancy.

The topic of protecting the Diablo Canyon Lands was also discussed at the September 8th meeting of the Regional Water Quality Control Board. Research has been ongoing for more than 20 years at the nuclear power plant, both before and after it began operating in 1985, to determine the extent of the impacts relating to its operation. However, there is no consensus or agreement reached on the conclusions of this research. After listening to supportive testimony by many local residents, the Water Board unanimously voted to follow the staff recommendation to direct their staff to continue working with the operator on developing a plan by June of 2000 to permanently protect the coastal resources in this area. This advisory ballot measure would be a useful gauge of public opinion for the Water Board as they continue to work with the operator on resolving environmental impacts from the nuclear power plant.

Pursuant to the Elections Code section 9603, the results of an advisory vote will in no manner be controlling on the sponsoring legislative body. However, if it is approved in March, county staff would be able to consider including revised policies for this area as part of the ongoing update of the San Luis Bay Area Plan and Local Coastal Plan. We have existing information regarding the resources in this area, developed as part of earlier studies for the Central Coast National Marine Sanctuary and in our Local Oil Spill Plan, that could be incorporated into the updated area plan.

OTHER AGENCY INVOLVEMENT

County Clerk-Recorder, Department of Planning and Building and County Counsel.

FINANCIAL CONSIDERATIONS

The additional sample ballot printing for the advisory measure will not exceed $6,500. This is assuming arguments in support and opposition and rebuttals to those arguments are submitted. If there is only an impartial analysis and one argument, the information will be printed on one page and the cost will be $3,250.

Attachment A: Resolution directing the County Clerk-Recorder to place the DREAM measure on the March 7, 2000 election

Attachment B: Area Map

APPENDIX G

AVILA RANCH

A RARE CONSERVATION OPPORTUNITY

A conservation project by

AMERICAN LAND CONSERVANCY

in partnership with

The Land Conservancy of San Luis Obispo County

2,400 acres

Appraised Value: $24 million

San Luis Obispo County, CA

AVILA RANCH

A RARE CONSERVATION OPPORTUNITY

Avila Ranch comprises approximately 2,400 acres located on the Pacific Ocean along California's central coast. Recognized as one of California's outstanding conservation areas, it lies within San Luis Obispo County northwest of the town of Avila Beach and within the region known as the "Irish Hills."

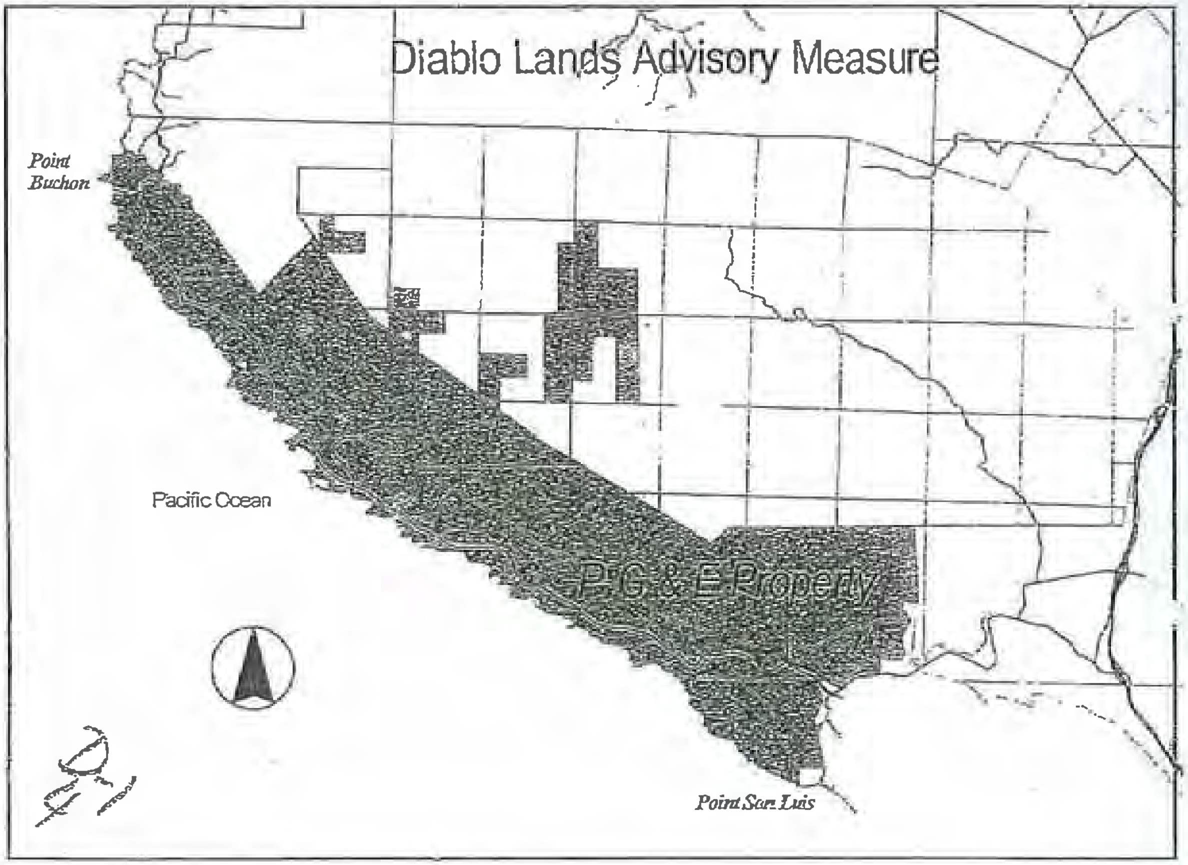
The American Land Conservancy (ALC) has an option to purchase the long term leases that control all uses of the land for the next approximately 165 years. A recent appraisal, commisioned by ALC has determined that the purchase price is $24 million. This reflects the relatively high development potential of the property, including its location mostly outside of the coastal zone.

ALC plans to acquire the Avila Ranch land interests and subsequently transfer those interests to the State for use as a new State park and recreation area. To do so, ALC has launched a campaign to raise the necessary funds from a variety of public and private sources. By working together with the local community, public agencies, businesses and partner organizations, we have an opportunity to preserve one of California's unique landscapes for future generations to use and enjoy.

The preservation value of Avila Ranch is increased by its location adjacent to the pristine and undeveloped Hibberd Preserve, owned by the Land Conservancy of San Luis Obispo County. ALC is in negotiations with the SLO Land Conservancy regarding the possible transfer of the Hibberd Preserve to the State in exchange for ALC payment to that organization for its holding and management costs since it acquired the property several years ago.

Together, Avila Ranch and Hibberd Preserve would create a new 4,000-acre State Park, accessible for public recreational activities and resource protection. In addition to augmenting the popular and nearby Montana de Oro State Park, the Avila Ranch transaction is essential to extending the California Coastal Trail through this area.

[1] The Irish Hills was an area identified in 2000 as an "Outstanding Conservation Area" in the report, Conserving the Landscapes of San Luis Obispo County, funded by the David and Lucile Packard Foundation


Diablo Lands Advisory Measure
Point Buchon
Pacific Ocean
P.G.& E Property
Point San Luis

AVILA RANCH

A RARE CONSERVATION OPPORTUNITY

AMERICAN LAND CONSERVANCY


California red-legged frog


Golden Eagle


Western pond turtle

Avila Ranch Resources

Avila Ranch is a spectacular stretch of undeveloped yet unprotected coastal property. It provides a relatively intact example of historic coastal California.

Scenic views from the Ranch stretch over 180 degrees from the San Luis Range inland, to sweeping vistas of the Pacific Ocean across San Luis Bay. Avila Beach, Olde Port Beach, and the San Luis Pier are among the sites visible from the property, as well as rugged woodland hills and serpentine outcroppings of the Ranch's interior.

Avila Ranch contains a diverse and largely undisturbed collection of natural resources. Its coastal bluffs, terraces, and inland areas support coastal scrub, coast live oak woodlands, wildflower fields, and maritime chaparral. Within the Ranch, the watersheds of Wild Cherry Canyon, upper Harford Canyon Creek, the headwaters of Rattlesnakes Canyon Creek and the eastern half of the Upper Pecho Creek, support aquatic species including the threatened California red-legged frog as well as riparian forests suspected to be rich in neotropical migratory birds.

*Special Status Species**

Western pond turtle	**Sharp-shinned hawk**	**California spotted owl**
Two-striped garter snake	**Bell's sage sparrow**	**Burrowing owl**
Coast Range newt	**Merlin**	**Long-eared owl**
Pallid bat	**Golden eagle**	**Yellow warbler**
Townsend's big eared bat	**California horned lark**	**Tricolored blackbird**
Cooper's hawk	**Yellow-breasted chat**	

*No information is available on presence of special status species, but based on the presence of suitable habitat, these species may occur on the property.

AVILA RANCH

A RARE CONSERVATION OPPORTUNITY

AMERICAN LAND CONSERVANCY

Recreational Opportunities

Avila Ranch would provide multiple recreation opportunities as a State Park. One of the most exciting possibilities is a 15 to 20 mile extension of the California Coastal Trail from Montana de Oro State Park. The trail would commence at Montana de Oro, and proceed through other protected, or soon to be protected, properties of the Irish Hills, past the Hibberd Preserve, and finally through Avila Ranch to its coast, where it would meet up with Avila Beach. An alternative route may one day be possible along bluff tops of the PG&E property surrounding the Diablo Canyon nuclear power plant. In either scenario, Avila Ranch is an essential and irreplaceable addition to the California Coastal Trail.

Acquisition of Avila Ranch would also complement existing recreation plans in San Luis Obispo County. First, the project is adjacent to the San Luis Lighthouse, where efforts are currently underway to make this historic resource more accessible to the public. Second, the Ranch is a natural extension of the Bob Jones City to the Sea Trail, a walking and biking trail stretching from the City of San Luis Obispo to Avila Beach.

With easy accessibility from San Luis Bay Drive and proximity to Highway 1, Highway 101 and the community of Avila Beach, the property would well-serve the growing number of Californians seeking to experience the beauty and open space of the Central Coast. The property is also suitable for a system of hiking trails, possible campsite locations, and other visitor amenities. At 4,000 acres (including Avila Ranch and Hibberd Preserve), the size of the project alone suggests many possible public uses.

AVILA RANCH

A RARE CONSERVATION OPPORTUNITY

AMERICAN LAND CONSERVANCY

Toward a Successful Conservation Conclusion

The time frame in which to seize the Avila Ranch opportunity is brief. ALC has until August 2008 (less than a year) to raise all of the funding necessary to secure this significant piece of California history and protect an essential component of the California Coastal Trail along the Central Coast.

We cannot do it without your help.

Contact Information

Kara W. Blakeslee
Conservation Committee Chair
Avila Ranch Project Director
American Land Conservancy
(805) 440-6650
karaslo@charter.net

Kerry O'Toole
President
American Land Conservancy
(415) 912-3665
kerry@alcnet.org

The mission of the AMERICAN LAND CONSERVANCY is to preserve our natural and outdoor heritage by conserving landscapes with outstanding ecological, scenic, and recreational values.

American Land Conservancy
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APPENDIX H

Chumash Council says there will be no casino built on Diablo Canyon lands

BY MONA TUCKER
OCTOBER 06, 2020 07:11 AM

Diablo Canyon nuclear power plant is slated to close in 2025.

The Diablo Canyon Power Plant is scheduled to be permanently shut down by 2025 and will then undergo the long process of decommissioning. With these events, Pacific Gas and Electric Co. (PG&E) will be working toward transferring ownership of 12,000 acres commonly referred to as the Diablo Lands. This includes the areas of Wild Cherry Canyon, South Ranch, North Ranch, and Parcel P (the site of the power plant).

All of the Diablo Lands are within the ancestral homelands of yak tityu tityu yak tiłhini Northern Chumash Tribe of San Luis Obispo County and Region, and were originally inhabited by our families at numerous village sites. However, the destructive ideologies of missionization, foreign diseases for which we had no immunity, the land grab of the Mexican rancho era and ongoing colonization killed many of us and displaced the rest. This land was taken from us without permission, agreement or compensation.

Village sites tstyɨwi , čanu, tsɨpxatu, petpatsu and wexetminu' are among those on this Pecho Coast. Currently, the village site of tstyɨwi is undergoing restoration to eradicate invasive grasses as well as revegetation using native plants. Our Tribe, in a joint effort with Cal Poly San Luis Obispo and PG&E, received a 2018 Governor's Historic Preservation Award for the Research and Collaboration for the Restoration of Tstyɨwi on the Pecho Coast.

Numerous important cultural areas and landscapes including village sites are among the reasons we are actively pursuing the reacquisition of the Diablo Lands — to continue the stewardship as we have done for more than 10,000 years.

We know of the Diablo Lands not only from early writings, but from our own family stories. These stories continue to teach us and reaffirms our goal to maintain what is so incredibly special about these Lands: a place on the coast of California that is mostly untouched, with an abundance of cultural and environmental resources that could not withstand, nor ever recover from large destructive projects.

We intend to care for the Diablo Lands in such a way that it can thrive and its deep history can be respected. It is clear that many others besides indigenous people feel the same way. Our strategies to achieve this goal include our successful partnering with the Land Conservancy of San Luis Obispo County, continuing our participation in on-going local discussions, and conferring with various government agencies.

As we have engaged in numerous forums on the disposition of these Lands over the past few years, we are often asked about our Tribe's stance regarding building a casino on the Diablo Lands. We have consistently responded that we would not ever be interested in doing so, but are aware there is still concern. To reassure the broader community, we are making the following statement:

On behalf of our Tribal Council, as chair, our Tribal position is that we have always been and will remain opposed to any gaming enterprise anywhere on the Diablo Lands. Any such use or the facilities that usually accompany a casino would be inappropriate for this spectacular place.

We've also been asked what happens if we change our minds? Our plan is to join the community in exploring conservation easements and/or deed restrictions to ensure that gaming enterprises are never allowed on any part of the Diablo Lands in perpetuity.

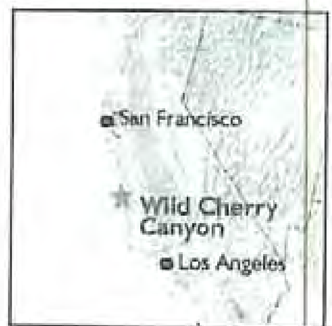
Planning the future of these Lands is a critical opportunity for us here today and for those yet to be born. It is an immense responsibility šumoqini (always).

APPENDIX I

WILD CHERRY CANYON

San Luis Obispo County

CALIFORNIA COAST



Located in one of the most pristine, remote, and outstanding natural resource areas in central California, the 2,400-acre **Wild Cherry Canyon** property is a rare, undeveloped coastal gem with sweeping ocean views, diverse habitat, and rich riparian resources. The property is a high priority conservation target in the ecologically rich Irish Hills and supports numerous plant and animal species, including the threatened California red-legged frog. Wild Cherry Canyon is one of the last remaining landscape-scale conservation opportunities on the central coast. ALC is working to protect this unique coastal treasure, which will be conveyed to the state to be added to nearby Montaña de Oro State Park, where it can be enjoyed for generations to come.

BENEFITS

- Combined with related projects that will be facilitated by this acquisition (including Hibberd Preserve), these acquisitions will add 5,500 acres to Montaña de Oro State Park, increasing it by 65% and making it one of the largest parks in the state
- No impact on the General Fund, provides opportunities for revenue generation
- Permanently protects habitat for fifteen special status species.
- Will add up to 20 miles to the California Coastal Trail
- Will extend the Bob Jones City to the Sea Trail, adjacent to the historic Port San Luis Lighthouse
- Protects riparian areas (property includes the watersheds of four creeks) as well as coastal scrub, coast live oak woodlands, wildflower fields, and maritime chaparral

LEASEHOLD INTEREST PURCHASE PRICE

$21,240,000

GRANTS AWARDED

• California State Parks	$6,900,000*
• Wildlife Conservation Board	$6,622,306
• California Coastal Conservancy	$4,737,305
• California Transportation Commission Environmental Enhancement & Mitigation Program	$1,030,389
• San Luis Obispo County & San Luis Obispo Council of Governments	$850,000
• Central Coast Regional Water Quality Control Board	$950,000
• Hind Foundation	$150,000
Total:	**$21,240,000**

*Awaiting Public Works Board Approval

The mission of the American Land Conservancy is to protect our natural heritage by conserving land for the benefit of people and wildlife.

For additional information:
Kerry O'Toole
415.912.3665 | kerry@alcnet.org

Email: Diablo Canyon Decommissioning Project Team

From: Lucy J Swanson <janeslo@icloud.com>
Sent: Saturday, December 4, 2021 12:18 PM
To: PL_Diablo <PL_Diablo@co.slo.ca.us>
Cc: janeslo_icloud.com <janeslo@icloud.com>
Subject: [EXT]Diablo Canyon Decommissioning Environmental Impact Report Scoping Comment

December 4, 2021

To Susan Strachan,

I offer the following comments and questions on the scope and content of the Environmental Impact Report for the decommissioning of the Diablo Canyon nuclear plant.

1. How will PG&E monitor the newly-designed canisters and casks it plans to use to store spent fuel rods in the new ISFSI?

2. How will the current and the new ISFSI be protected from the possibility of a terrorist attack?

3. How will workers and the pubic be protected from contamination during dismantlement of structures containing materials that are either radioactive or chemically contaminated?

4. Where will materials that are chemically contaminated be taken?

5. Where will materials that are radioactive below Class C be taken? How will workers and the public be protected from exposure as these materials are transported?

6. To what extent will decommissioning disrupt the customary functions and uses of Port San Luis and the Harbor District?

L. Jane Swanson
313 Presidio Place
San Luis Obispo, CA 93401
janeslo@icloud.com

Email: Diablo Canyon Decommissioning Project Team

From: Guy <gsharp1951@charter.net>
Sent: Saturday, December 4, 2021 5:26 PM
To: PL_Diablo <PL_Diablo@co.slo.ca.us>
Subject: [EXT]Why?

To Whom It May Concern,

Still don't understand, Why? Why is it that the Diablo Canyon nuclear facility is being torn down? In this day and age of concern for the environment, taking a prime source of clean energy out of service seems ludicrous, especially when doing so without an active plan for it's replacement which will push more cost burden down to the rate payers. We are doing more than our fair share to live within the restrictions our State has placed upon us all relative to utilizing energy efficient products. And rate hikes passed along to help manage the inefficient operation of our electrical utility provider.

With the further reliance on electrical energy, also due to phasing out certain gas appliances as well as fuel based vehicles, the additional usage of electricity will cause massive blackouts through out the State in the not too distant future.

Diablo Canyon has generated safe electrical power for many years. Over this time it has been online there have been not major issues at the facility. Again, Why is this necessary?

Sincerely,
Guy Sharp
338,21

Date: December 4, 2021

To: Susan Strachan, Diablo Decommissioning Project Manager
SLO County Planning & Building
diablo@co.slo.ca.us

From: Sherri Danoff
PO Box 2382. Avila Beach 93424
Sherri39@charter.net

Subject: EIR SCOPING INPUT

COMMENTS

- Non-radioactive demolished materials should maximally be retained on-site and mixed with on-site soils, to minimize truck trips through Avila for removing materials.

- Non-radioactive office buildings on Parcel P might be suitable for congregate housing with relatively minor modifications. They contain offices, bathrooms and some kitchen facilities. If the buildings will not be repurposed on Parcel P, PG&E should offer them to People's Self Help Housing for transport from Parcel P. PG&E also should notify the Homeless Oversight Services Council of the availability of these buildings.

- Existing dry casks are intended to remain stored at the Independent Spent Fuel Storage Installation (ISFSI) on Parcel P, without containment, where they are vulnerable to corrosive sea air and to sabotage. A climate-controlled containment alternative should be evaluated.

  Dry casks for storing future spent fuel will be of a different type than those in use, *presumably* less vulnerable to sea air. (PG&E's specifications for new casks contained in request for proposals are proprietary, so specifications are not known by the public at this time.) PG&E is not intending to transfer spent fuel from existing casks to the new ones.

  The reactor containment domes should be evaluated as potential for climate-controlled containment for the existing dry casks, and possibly some or all future ones also.

  The NRC license for the ISFSI is separate from the nuclear facility license. My recollection is that PG&E is in the process of seeking ISFSI renewal. At this time, it seems appropriate for the County to communicate to NRC its support for greater safety of stored spent fuel in dry casks. Storage of spent fuel on Parcel P could be in perpetuity.

- In considering potential future uses for Parcel P and associated open space lands, it is essential to evaluate generation of traffic that would affect Avila during warm weather weekends and holidays. At these times, beach and other traffic already often congests Avila's narrow, winding access road. Avila has one-way in and out and a cluster of hazards – multiple earthquake faults, very high fire hazard, tsunami potential, plus a nuclear facility.

Email: Diablo Canyon Decommissioning Project Team

From: Eric Greening <dancingsilverowl@gmail.com>
Sent: Sunday, December 5, 2021 8:17 AM
To: PL_Diablo <PL_Diablo@co.slo.ca.us>
Subject: [EXT]Eric Greening comments for the scoping process on the Diablo decommissioning EIR

Hello!

Thank you for the opportunity to comment! Having already made oral comments at online scoping meetings, as well as having asked questions, I will begin by following up on one I asked at the 6:00 pm session on Wednesday, December 1st. Given the rising advocacy for disregarding the decommissioning schedule on which this EIR is premised, and for somehow contriving to extend the license for some number of years, a position being heard from multiple levels including the federal (Secretary Granholm), state (a PUC spokesperson; Assemblymember Cunningham), and local (including Supervisor Ortiz-Legg), I pointed out the lack of a budget or timeline for the present EIR to go into the needed depth on the many impacts and hazards that would need to be thoroughly investigated and mitigated in the event such a license extension were to actually happen in the real world, and sought clarification that the task at hand for the present EIR is to remain focused on decommissioning. I received reassuring answers from Susan Strachan, speaking for the County, and Tom Jones, speaking for the project applicant, that decommissioning on the previously understood schedule remains the focus of this EIR process.

I would hope this question will also elicit clear statements to that effect from Aspen. Among the key issues would be a greater than anticipated volume of high-level waste, with pools likely running denser and hotter than is now contemplated, and with the need for containers and places to put them not currently anticipated in the project as it has been understood until now. Also of concern would be continued discharge of hot water into marine ecosystems if the waiver were to be extended, the possibility of fatigue or deterioration of materials making up key structures, and the retirement of so many people whose knowledge is essential to dealing with expected or unexpected events, with no clear path forward toward replacing their expertise, given the paucity of young people seeing a future in nuclear engineering and training for it. I am hoping for a clear statement from Aspen that any such license-extension project is completely outside the scope of this present EIR and would need a completely separate environmental review process as a stand-alone project.

The advocacy for license extension is premised on the need to deal with climate change, which some people consider worthy of formal declarations of emergency at various levels of government. Although I share these advocates' concerns about climate change, I am strongly opposed to formal declarations of emergency which would be effectively endless (the climate is not likely to return to "normal" anytime soon, if it ever does) and which could centralize power and decision-making in ways that could erode environmental scrutiny and mitigation, and prioritize haste over careful analysis of costs, impacts, and consequences of projects alleged to address the climate "emergency," including nuclear ones. I would welcome a clear statement from Aspen that it will not allow the integrity of this present EIR process to be attacked or abused even by those acting under color of emergency, but that it will be carried forward to its conclusion as an evaluation of DECOMMISSIONING, in keeping with Aspen's contract with the County.

For the sake of efficiency, let me state here that I share the concerns voiced in the comment letter of the Mothers for Peace, and it should be understood that although I won't repeat most of them here, the issues they reference are of significance to me, and that they questions they ask are questions to which I also would like to know the answers.

The Mothers for Peace have periodically sampled local sea water and had it sent to Woods Hole for detection of any unusual radioactive isotopes. What is not being done, and may detect more consequential concentrations, is sampling and analysis of top-of-the-food-chain marine organisms, who have the propensity to bioconcentrate pollutants. I would ask that such sampling be regularly conducted in the waters off Diablo Canyon for the duration of the decommissioning project.

I continue to urge Aspen and the County to explore the extent to which they can consider their ability to treat hazards inherent in high-level waste issues pre-empted by the Nuclear Regulatory Commission in the same way they treat hazards occasioned by earthquake faults: admitting they have no control over the source of the hazard, but nonetheless acknowledging their responsibility to study and understand the hazards, and to incorporate feasible mitigation measures into the project description to minimize the hazards.

The County is required by law to find Coastal Development Permits consistent with public health and safety. With most such projects, the option of denial exists for projects for which such findings cannot be made. In the case of Diablo decommissioning, denial is not an option that can reduce risk; the findings will have to be made under duress. Having the ability to add mitigation measures to deal with impacts over which we have no control is a way to minimize the risks inherent in that duress.

Many thanks, Eric Greening

Email: Diablo Canyon Decommissioning Project Team

From: zawalick@pobox.com <zawalick@pobox.com>
Sent: Sunday, December 5, 2021 10:40 AM
To: PL_Diablo <PL_Diablo@co.slo.ca.us>
Cc: ZAWALICK@POBOX.COM <ZAWALICK@POBOX.COM>; Zoe Wells <zoe@drzoe.com>; 'Benita Epstein' <benita@benitaepstein.com>
Subject: [EXT]Zawalick Comment on Pismo Beach

Hello,

Relative to the activities proposed in PG&E Letter DCL-21-045 and, in general, the Diablo Canyon Power Plant decommissioning activities and plans, I would like to make some comments:

1. The nature of the environment around the Pismo Beach Materials Handling Facility (PpBMHF) has chapnged dramatically over the years. Many residential homes have been constructed on all sides of this facility and it remains very near to the Judkins Middle School.

2. Using PBMHF for decommissioning activities is counter to the needs and wants of the local community and inconsistent with the residential nature of the area.

3. Traffic and access routs to the PBMHF are complex and crowded. Additional traffic is unwelcome, unsafe, and unwise.

4. We specifically ask that the PBMHF NOT be used or even considered as a contingency site for Diablo Canyon Power Plant decommissioning activities.

5. Table 3.10-1, State/Local Regulatory Policies for Land Use has the following statement for the PBMHF Policy LU-6b REMOVED: “The proposed uses and modifications would comply with applicable industrial regulations and standards.” I propose that this statement be returned as clearly PG&E would intend to comply with all applicable regulations and standards.

6. IF Diablo Canyon Power Plant decommissioning activities are, for some reason, required to be performed at PBMHF, the we request the following changes and restrictions:

    a. Lighting: Lighting at this facility has already been modified and expanded. During coastal fog events, the entire valley is brightly lit from the facility. This needs to stop. Lighting use should be restricted to no later than 9pm each night and not to resume prior to 6am. The letter states that "The PBMHF...facility would not create significant light or glare, as construction activities and facility operation will occur during normal business hours. Because no significant adverse impacts to visual resources due to substantial light or glare were identified, no mitigation measures are necessary." I'm identifying substantial EXISTING light and glare issue and requesting mitigation. This statement is disingenuous or ill-informed or both.

b. Noise: Pismo Beach General Noise Regulation 9.24.040 states: A. Notwithstanding any other provision of this chapter, and in addition thereto, it shall be unlawful for any person to willfully or negligently make or continue, or cause to be made or continued, or permit or allow to be made or continued any noise which disturbs the peace and quiet of any neighborhood or which causes any discomfort or annoyance to any reasonable person of normal sensitivity in the area. B.   No permit shall be issued for any activity that may violate this section. All activities should be restricted to 9am to 5pm, M-F.

c. Equipment: Reconstruction of the rail facility, re-purposing of the buildings, and movement of the actual materials related to Diablo Canyon Power Plant decommissioning activities will all result in noise, lighting, dust, and hazardous materials and emissions. All activities should be restricted to 9am to 5pm, M-F.

d. Dust: Reconstruction of the rail facility, re-purposing of the buildings, and movement of the actual materials related to Diablo Canyon Power Plant decommissioning activities will all result in dust and hazardous materials and emissions. All activities should be restricted to 9am to 5pm, M-F.

e. Hazardous and Radioactive Materials: Since this is now essentially a residential neighborhood, materials related to Diablo Canyon Power Plant decommissioning activities, including hazardous materials, should not be allowed.

f. Transportation: As noted earlier, transportation routes are extremely limited into or out of the PBMHF and traffic on Price Canyon road has increased of the years such that traffic jams are common. The additional traffic related to Diablo Canyon Power Plant decommissioning activities in this area is unwelcome, unsafe, and inconsistent with the needs and wants of residents and businesses in the area. All activities should be restricted to 9am to 5pm, M-F.

In summary, we are strongly against the use of the PBMHF for Diablo Canyon Power Plant decommissioning activities, even if those potential uses are listed as a contingency in the plan. Please remove PBMHF from the plan.

If PBMHF activities are necessary, then very restrictive requirements shall be placed upon operations, including zero storage or transport or handling of hazardous or radioactive materials, restrictions on hours of lighting use, and significant restrictions on the hours of operation.

Thank you,

Steven and Zoe Zawalick

Steven and Zoe Zawalick
212 Porterville Street
Pismo Beach, CA 93449
(805) 305-5587

Email: Diablo Canyon Decommissioning Project Team

From: Benita Epstein <benita@benitaepstein.com>
Sent: Sunday, December 5, 2021 3:07 PM
To: PL_Diablo <PL_Diablo@co.slo.ca.us>
Subject: [EXT]DCPP Decommissioning Project NOP Comments/Transportation Evaluation for EIR

Dear DCPP Decommissioning staff,

Transportation Evaluation for EIR:

Regarding Transportation and the Pismo Beach Railyard Facility Site

My concern is PGE using the Pismo Beach Railyard Facility Site as a contingency plan for possible transport of non-radiological and non-hazardous wastes via rail from that facility.

WILL THE EIR CONSIDER THE FOLLOWING?

1. The San Luis Obispo Board of Supervisors has recently allowed 31 more oil wells to be dug at the Arroyo Grande Oilfield located on east and west sides of Price Canyon (1821 Price Canyon Road).There already are many construction trucks driving north and south on Price Canyon Road. Has this been considered in the traffic study?

2. Price Canyon is crowded. People leave work in San Luis Obispo around 2:30 pm every weekday to get to Hwy 101 South.

3. The intersection of Price Street and Price Canyon is a bottleneck over the Bello Street bridge no matter what time of day.

4. Tourists come to Pismo Beach all week long, not just summer, weekends or during festivals. There is a lot of traffic in Pismo Beach.

5. Everyone living in Pismo Heights will be effected including parents dropping their children off at Judkins Middle School.

6. Are there considerations for PBFD fire, CalFire, police, ambulances, FedEx, UPS, USPS mail trucks, bicyclists turning onto Lemoore Street?

7. Is PGE prepared for firefighting if a decommissioning truck causes an accident or fire?

8. Who will be responsible for maintenance of Price Canyon? Pismo Beach or PGE?`

9. If PGE decides to use HWY 101 to get to the Pismo Beach Railyard Facility Site, the traffic could be dangerously backed up on the Exit for Price Street.

10. If trucks turn onto Five Cities Drive to get to James Way then to Price Street, that is a going to cause congestion at two exits.

Please consider theses points in the EIR and eliminate the Pismo Beach Railyard Facility Site as a contingency plan.

Sincerely,
Benita Epstein

Email: Diablo Canyon Decommissioning Project

From: Sheila Baker <thefunkyrake@gmail.com>
Sent: Monday, December 6, 2021 2:07 PM
To: PL_Diablo <PL_Diablo@co.slo.ca.us>
Subject: [EXT]Concerns regarding Diablo's radioactive waste

Dear Diablo Canyon EIR Panel,

Thank you for considering my concerns on Diablo's waste. Nuclear waste is considered a highly dangerous substance. The so called low level waste (Class a,b, and c) contain enough radionuclides to last thousands of years and contain highly carcinogenic radioactive materials. Studies have been made on people exposed to these materials and various cancers they suffered. Please consider the very best transportation and storage of the waste possible. Comparing radioactive waste to hospital or lab waste must stop. What you are handling is the most dangerous substance known to humankind.

Regarding transportation of radioactive waste, barge seems most preferable although still not desirable to our marine life. Rail and road transport are non starters. There are really no solutions to radioactive waste transport.

Finally it was said in your videos that you will not consider environmental justice. This is just not possible as radioactive waste effects not only San Luis Obispo County but other counties and states as well. Many years ago during a ceremony of the Colorado River Native Nations Alliance at their sacred place Ward Valley, Chumash elder Pilulaw Khus spoke on behalf of the Bear Clan of the Northern Chumash Council. During the ceremony Elder Pilulaw agreed to not push for Diablo's waste to be transported and stored at Ward Valley, only 22 miles from the Colorado River. This action and other selfless brave actions of the people of San Luis Obispo County show that keeping the waste and not transporting it beyond the boundary of the county is the best course of action for everyone and highly exemplifies environmental justice. In agreeing to steward Diablo's radioactive waste, the people of SLO county are therefore owed the very best and safest journey with this nightmare task.

Thank you for your consideration of this comment.

-Sheila Baker
210 Douglas Street
Petaluma, CA 94952
(707) 606-8450

Email: Diablo Canyon Decommissioning Project

From: Jill ZamEk <jzamek@gmail.com>
Sent: Monday, December 6, 2021 3:50 PM
To: PL_Diablo <PL_Diablo@co.slo.ca.us>
Subject: [EXT]Diablo Canyon Decommissioning EIR comments

Hello. I have been living downwind of Diablo Canyon for 37 years, and I look forward to its closure in 2024 and 2025. The scope of the EIR is a bit vague, as the NRC has much jurisdiction over the high level radioactive waste storage and decontamination standards. But here are just a few of my concerns.

1. There is much in the media currently by some who strive to keep Diablo Canyon operating beyond the planned closure dates. Any statements on that topic must be discarded in this current process.

2. PG&E is in the process of choosing a new dry cask storage system which will allow for more rapid transfer of the waste from the pools. Because this waste will likely remain on-site for a very long time, these casks and/or canisters must be robust. They must be able to withstand the impacts of routine aging, seismic risks, threats of terrorism, and impacts from the ocean environment. Will these casks be monitored for degradation and radiation leakage? Will there be a system on-site for repair?

3. I understand that the dismantled materials will be transported by truck, rail, and barge. What infrastructure modifications and/or enhancements will be required to roads, rails, and for barge loading? What roads will be used? What will be the impact on traffic? Is there potential for health impacts from hazardous and radiological materials due to accidental release? What destinations have been selected? What are the environmental justice impacts on disadvantaged communities along the routes?

4. Eventually the land will be restored and deemed safe by NRC standards for public access. We must reiterate our desire for the land to be used for the public good. The DREAM Initiative in 2000 was supported by over 75% of county voters - a clear message to set aside all the surrounding Diablo Canyon Lands for habitat preservation, agriculture, and passive public use upon closure of the plant. The surveys by the Diablo Canyon Decommissioning Engagement Panel found the same - protect and preserve the land and repurpose the existing non-contaminated facilities for the establishment of clean, green, renewable energy sources, education, and research.

Best regards,
Jill ZamEk
Arroyo Grande

Email: Diablo Canyon Decommissioning Project

From: Doug Tait <dougt1863@gmail.com>
Sent: Monday, December 6, 2021 4:13 PM
To: PL_Diablo <PL_Diablo@co.slo.ca.us>
Subject: [EXT]DCPP Decommissioning Project NOP Comments

Dear Ms. Strachan,

Thank you for the opportunity to provide written comments on the scope and content of the Draft EIR regarding the decommissioning of the Diablo Canyon Power Plant.

The EIR will evaluate many extremely important environmental issues. I would hope that it fully addresses three: 1) Biological Resources, 2) Cultural Resources, 3) Recreation and Public Access.

The entire 12,000 acres of Diablo Canyon Lands is extremely rich in natural and cultural resources that deserves to be conserved and protected in perpetuity. With that, these lands would provide invaluable opportunities for recreation through a managed public access program. I would suggest two resources to be reviewed and presented in the forthcoming EIR: 1) the Strategic Vision of the Diablo Canyon Decommissioning Panel, 2) the Conservation Framework adopted by the Friends of the Diablo Canyon Lands, found at www.diablocanyonlands.org.

Specifically, in Biological Resources, I would suggest the EIR look at the historical grazing practices on both the South and North Ranch, and continue the sustainable grazing practices currently in practice on the South Ranch that benefits not only the land, but also protects and encourages grassland birds. (See Audubon Conservation Ranching Initiative: www.ca.audubon.org/conservation/conservation-ranching.

Briefly on Project Mitigation. The forthcoming EIR should include a detailed analysis as to the reason PG&E was required to open the Pecho Coast Trail, the Pt. Buchon Trail, and set aside 1,200 acres for conservation at Point San Luis, all significant mitigation measures related to impacts to coastal public access that were required by the Coastal Commission. The community deserves fair, appropriate, and legally supportable mitigation for the decommissioning of Diablo Canyon Power Plant.

I thank you, and appreciate the considerable work and effort on your part, and look forward to being part of the continued conversation on this truly important matter.

Sincerely,
Doug Tait
Arroyo Grande, CA

Email: Diablo Canyon Decommissioning Project

From: Melissa Boggs <mboggs3@gmail.com>
Sent: Monday, December 6, 2021 4:49 PM
To: PL_Diablo <PL_Diablo@co.slo.ca.us>
Subject: [EXT]DCPP Decommissioning Project NOP Comments

Hello,

This is regarding the Diablo Canyon Power Plant Decommissioning Project NOP for the preparation of the Environmental Impact Report.

I have the following comments on the scoping information provided:

1) Under the main activities in Phase 2, it states site restoration monitoring will occur for up to 5 years. My comment is 5 years of monitoring does not seem sufficient and I believe additional years of monitoring should be required.

2) Regarding the Alternatives, I support the Intake Structure Removal Alternative. This alternative would include full removal of the intake structure back to the water tunnels, and tunnel entrances would be sealed with a concrete bulkhead. I also support the Breakwater Removal Alternative. This alternative would include full removal of the breakwaters around the Intake Cove and marine habitat restoration using imported rocks. I also support the Full Removal Alternative. All DCPP infrastructure would be completely removed (beyond the standard three feet minimum below adjacent grade), including the intake structure and breakwaters. Only the owner-controlled area and associated support facilities, such as utilities and roads would remain.

Thank you for the opportunity to provide comments.

Melissa Boggs

Email: Diablo Canyon Decommissioning Project

From: Sam Blakeslee <samslo33@gmail.com>
Sent: Monday, December 6, 2021 7:26 PM
To: PL_Diablo <PL_Diablo@co.slo.ca.us>
Subject: [EXT]Diablo Decommissioning Scoping Feedback

Susan Strachan
Power Plant Decommissioning Manager
County of San Luis Obispo Planning & Building

Subject: Feedback on Scoping of Decommissioning of Diablo Canyon Power Plant

Dear Ms Strachan:

It is critically important that mitigation for the host of environmental impacts associated with the decommissioning of the Diablo Canyon Power Plant include a guarantee of conservation and public access, in perpetuity, of the Diablo Canyon Lands.

Although some will argue for a range of other mitigation actions, many of which will entail less permanent environmental actions or financial remunerations, the most important action this County could take to provide meaningful and impactful mitigation is implementation of rigorous conservation easements that ensure protection of the diablo canyon lands as well as public access.

The impact of decommissioning on these lands will not be intermittent or temporary. There is every likelihood that roads and structures will be left in place as will nuclear waste as there is no permanent repository for spent fuel. As a result it is appropriate that mitigation be long-lasting, not temporary.

Over 20 years ago, in March of 2000, the public was asked what it wanted to see as the future of these lands in an advisory measure that was placed before the voters of San Luis Obispo County. That measure, known as the DREAM Initiative (Diablo Resource Advisory Measure), asked a salient question that is highly relevant to the Scoping of the Decommissioning of the Diablo Canyon Nuclear Power Plant. The language of the initiative that was placed before the voters was as follows:

Shall the County Board of Supervisors recognize the Diablo Canyon Lands as an exceptionally precious coastal resource by adopting policies that promote habitat preservation, sustainable agricultural activities, and public use and enjoyment *consistent with public safety and property rights once the lands are no longer needed as an emergency buffer for the Diablo Canyon Nuclear Plant after its remaining operating life?*

The measure was clear in what it asked the public to weigh in on; specifically, if the County should "adopt policies that promote habitat preservation, sustainable agricultural activities, and public use" of the Diablo Canyon Lands.

The measure was equally clear about when the County should adopt such policies; "once the lands are no longer needed as an emergency buffer for the Diablo Canyon Nuclear Power Plant after its remaining operating life".

The measure was placed on the ballot by a unanimous vote of all 5 supervisors, received bipartisan endorsements from the then Assemblyman, State Senator, and Congresswoman, and was supported by a broad range of business, civic, and environmental groups.

The result of the vote?

The public voted overwhelmingly (75% aye) to support this measure and send an unambiguous message to the San Luis Obispo County policy making agencies, that, when the time was right, these lands should be treated as an "exceptionally precious coastal resource" which should be protected.

This is that time. The plant is shutting down. Permits will require mitigation. The public has identified what it seeks as an outcome from county policy makers. This is the moment for county policy makers to demonstrate that it heard the electorate when it passed the DREAM Initiative. Utilization of thoughtfully designed conservation easements as a mitigation strategy for the issuance of permits is the appropriate means to realize the formally stated will of the community.

As author of the DREAM Initiative I urge the County to prioritize conservation and public access of the Diablo Canyon Lands as THE most important element in any portfolio of mitigation efforts crafted to offset the impacts of Decommissioning.

Respectfully,

Sam Blakeslee, Ph.D.
Dream Initiative Author
State Assemblyman and Senator (Former)

12/5/21 ①

To whom this may concern,
(which is ALL of us)

I am writing to make sure that when an Environmental Impact Report is done on the PG&E property where Diablo Canyon Nuclear Power Plant is located that several things are looked at and seriously taken into consideration.

First, so that people do not forget that Diablo Canyon daily spews out radioactive isotopes as it vents daily. Many of these are unknown isotopes - that are only monitored as they capture some of them at their monitoring stations. In 1992 as I went through their (PG&E's) liscence event reports I found that they reported that they found Cesium 137 in Pumpkin greens at Cal Poly SLO. They found Cesium 137 in Rock Cod in Avila Beach.

In other studys they found Strontium 90 in babies teeth that could only have entered through mothers milk. These are isotopes only come from one place and An independent monitoring group should be montoring what is in the grass, the trees the water in all surrounding areas of the Diablo Canyon Nuclear Power Plant. They should be montoring the ~~bioac~~ bio-accumulation of radioactive isotopes in the fish off the coast.

This land and water has been contaminated with radioactive isotopes for over 35 years now by Diablo Canyon Nuclear Power Plant. These isotopes don't just evaporate and disappear. They travel and land somewhere. The nuclear scientist that work at Diablo Canyon Nuclear Power plant don't even Know what isotopes are being released.

3

The Diablo Canyon Power Plant property is also a high level radioactive waste dump. This should not be a place where the public freely wander without concern of getting cancer. People need to understand that it only takes a minute amount of a radioactive substance to cause cancer. PG&E has been negligent in telling the truth in whats released into the air and water surrounding the power plant and beyond. Diablo Canyon Power Plant has been permitted to dump radioactive Tritium into the water since the day it went on line. Those that believe that the Nuclear Power Plant & PG&E have done anything environmental are mistaken and or ignorant. There is nothing enviromental about the Nuclear Power Plant. It continues to contaminate the enviroment and will do so far beyond its closure.

Those who think that Nuclear Power is ④
clean energy are blind. There is nothing clean about nuclear power. Just because you can't see the pollution with your eyes does not mean its not there. Nuclear Power does not help the carbon foot print in anyway. People who believe this are ignorant or uneducated.

PG&E should be paying for these studies out of their profits - not passing on all the costs of their ignorance and negligent actions to the public.

I'm not sure who is on the committee taking public input and who is going to do the EIR, but I hope they have a moral compass and ethics and that will make sure these things are done. ~~and~~ And I hope that things will not be whitewashed like PG&E has done with so many serious things over the years. They pretend to be our good neighbor with our money yet they pollute our community with their pollution causing many to get cancer. Thats not a good neighbor!

Sincerely,

Kathi DiPeri
P.O. Box 4204
San Luis Obispo, Ca.
93403

Appendix C

Major Federal and State Laws, Regulations, and Policies Potentially Applicable to the Proposed Project

This section identifies major federal and state laws, regulations, and policies (local or regional are presented in each issue area chapter) potentially applicable to the Proposed Project. The list of acronyms and abbreviations is provided on page App. C-40.

Multiple Environmental Issues

Multiple Environmental Issues (Federal)

Coastal Zone Management Act (42 U.S.C. § 4321 et seq.)

The Coastal Zone Management Act recognizes a national interest in coastal zone resources and in the importance of balancing competing uses of those resources, giving full consideration to aesthetic, cultural and historic, ecological, recreational, and other values as well as the needs for compatible economic development. Pursuant to the Act, coastal states develop and implement comprehensive coastal management programs, authorities and enforceable policies, and coastal zone boundaries, among other elements. The Act also gives state coastal management agencies regulatory control ("federal consistency" review authority) over federal activities and federally licensed, permitted or assisted activities, if the activity affects coastal resources; such activities include military projects at coastal locations and outer continental shelf oil and gas leasing, exploration and development. The California Coastal Commission (CCC) and San Francisco Bay Conservation and Development Commission (BCDC) coordinate California's federally approved coastal management programs and federal consistency reviews within their respective jurisdictions.

California Coastal National Monument Resource Management Plan

The California Coastal National Monument (CCNM) was established through Presidential Proclamation No. 7264 by President Clinton on January 11, 2000. The CCNM includes all public lands in the form of islands, rocks, exposed reefs, and pinnacles above mean high tide within 12 nautical miles of the California shoreline. These public lands are managed by the US Department of the Interior Bureau of Land Management (BLM) through the guidance, objectives, policies, and management actions established in the CCNM Resource Management Plan (RMP) (BLM, 2005).

The CCNM RMP describes the CCNM Planning Area as a larger geographic area that extends beyond the public lands that constitute the CCNM. However, the decisions in the CCNM RMP only apply to BLM-managed lands. Activities below mean high tide and in lands and waters surrounding the monuments are regulated by other agencies with appropriate jurisdiction, such as the California State Lands Commission and the California Coastal Commission.

Multiple Environmental Issues (State)

Senate Bill (SB) 846 Diablo Canyon Powerplant: Extension of Operations

Effective September 2, 2022, this bill invalidates the approval made by the California Public Utility Commission (CPUC) to retire DCPP Units 1 and 2 in 2025 and requires new retirement dates to be set, which are October 31, 2029, for Unit 1 and October 31, 2030, for Unit 2. The CPUC must act to allow PG&E to recover the cost of operation for each megawatt hour generated. To facilitate the extension of operations, the bill states the intent of the Legislature to loan $1.4 billion to the California Department of Water Resources (DWR) and establishes the Diablo Canyon Extension Fund in the State Treasury with a continuous appropriation of funds to put together the loan. This loan agreement with DWR requires PG&E by March 1, 2023, to report to the California Energy Commission (CEC) the available capacity of existing wet and dry spent fuel storage facilities and the forecasted amount of spent fuel to be generated by DCPP operations through the retirement dates for both units as of August 1, 2022, and November 1, 2029, for Unit 1, and November 1, 2030, for Unit 2. SB 846 amended § 8610.5 of the Government Code, added §§ 25233, 25233.2, and 25302.7 to Division 15 of the Public Resources Code, amended §§ 454.52 and 454.53 of, and added §§ 712.1 and 712.8 to the Public Utilities Code, and added § 13193.5 to the Water Code (California Legislative Information, 2022).

Under the following circumstances the previous retirement dates will be reestablished and/or closure of the two units could occur prior to the legislatively-adopted deadlines (California Legislative Information, 2022):

- By March 1, 2023, if the U.S. Department of Energy does not deem PG&E eligible for a federal funding program, or the earliest date set by the Department of Energy for determining eligibility
- If the State's electricity forecasts for 2023-2024 do not require DCPP to continue operations
- If the Independent Safety Committee for Diablo Canyon's reports or recommendations cause the CEC to determine that the costs of addressing seismic safety or issues of deferred maintenance are too costly to justify incurring
- If the conditions of the license renewal from the US Nuclear Regulatory Commission (NRC) require expenditures that are too high

California Environmental Quality Act (CEQA; Pub. Resources Code, § 21000 et seq.)

CEQA requires state and local agencies to identify significant environmental impacts of their actions and to avoid or mitigate those impacts, if feasible. A public agency must comply with CEQA when it undertakes an activity defined by CEQA as a "project" that must receive some discretionary approval (i.e., the agency has authority to deny the requested permit or approval) which may cause either a direct physical change, or a reasonably foreseeable indirect change, in the environment.

California Coastal Act (Pub. Resources Code, § 30000 et seq.) and California Federal Consistency Program

Pursuant to the Coastal Act, the CCC, in partnership with coastal cities and counties, plans and regulates the use of land and water in the coastal zone. The Coastal Act includes specific policies (see Chapter 3) that address issues such as shoreline public access and recreation, lower cost visitor accommodations, terrestrial and marine habitat protection, visual resources, landform alteration, agricultural lands, commercial fisheries, industrial uses, water quality, oil and gas development, transportation, development design, power plants, ports, and public works. Development activities in the coastal zone generally require a coastal permit from either the CCC or the local government: (1) the CCC retains jurisdiction over the immediate shoreline areas below the mean high tide line and offshore areas to the 3 nautical mile State water limit; and (2) following certification of county- and municipality-developed Local Coastal Programs, the CCC has delegated permit authority to many local governments for the portions of their jurisdictions within the coastal zone. The CCC also implements the Coastal Zone Management Act as it applies to federal activities (e.g., development projects, permits, and licenses) in the coastal zone by reviewing specified federal actions for consistency with the enforceable policies of Chapter 3 of the Coastal Act.

Aesthetics

Aesthetics (State)

California Scenic Highway Program (Sts. & Hy. Code, § 260 et seq.)

The purpose of California's Scenic Highway Program, which was created by the Legislature in 1963 and is managed by the California Department of Transportation (Caltrans), is to preserve and protect scenic highway corridors from change which would diminish the aesthetic value of lands adjacent to highways. State highways identified as scenic, or eligible for designation, are listed in Streets and Highways Code section 260 et seq. A highway's status changes from eligible to officially designated when a local governmental agency has implemented a corridor protection program for an eligible highway that meets the standards of an official scenic highway (Caltrans, 2008).

The US-101 segment that extends south from the City of Paso Robles to its junction with Highway 1 (near Gaviota State Park) is designated as an eligible State Scenic Highway under the State Scenic Highway Program (Caltrans, 2019a). Portions of this eligible State Scenic Highway would be used to transport waste from DCPP to the proposed rail sites.

Coastal Act Chapter 3 policies (see *Multiple Environmental Issues*)

The Coastal Act is concerned with protecting the public viewshed, including views from public areas, such as roads, beaches, coastal trails, and access ways. Section 30251 states: Permitted development shall be sited and designed to protect views to and along the ocean and scenic coastal areas, to minimize the alteration of natural landforms, to be visually compatible with the character of the surrounding area, and, where feasible, to restore and enhance visual quality in visually degraded areas. New development in highly scenic areas such as those designated in the California Coastline Preservation and Recreation Plan prepared by the Department of Parks and Recreation and by local government shall be subordinate to the character of its setting.

Section 30253 states: New development shall, where appropriate, protect special communities and neighborhoods that, because of their unique characteristics, are popular visitor destination points for recreational uses.

Air Quality

Air Quality (Federal)

Federal Clean Air Act (FCAA) (42 U.S.C. § 7401 et seq.)

The FCAA requires the USEPA to identify National Ambient Air Quality Standards (NAAQS) to protect public health and welfare. National standards are established for ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, particulate matter (PM10 and PM2.5), and lead. The FCAA mandates that states submit and implement a State Implementation Plan (SIP) for local areas not meeting those standards; plans must include pollution control measures that demonstrate how the standards would be met. Pursuant to the 1990 FCAA amendments, the USEPA also regulates hazardous air pollutants (HAPs), which are pollutants that result in harmful health effects, but are not specifically addressed through the establishment of NAAQS. HAPs require the use of the maximum or best available control technology to limit emissions. USEPA classifies air basins (or portions thereof) as in “attainment” or “nonattainment” for each criteria air pollutant by comparing monitoring data with State and Federal standards to determine if the NAAQS are achieved. Areas are classified for a pollutant as follows:

“Attainment” – the pollutant concentration is lower than the standard.
“Nonattainment” – the pollutant concentration exceeds the standard.
“Unclassified” – there are not enough data available for comparisons.

In 2007, the US Supreme Court ruled that carbon dioxide (CO_2) is an air pollutant as defined under the FCAA, and that the USEPA has authority to regulate greenhouse gas (GHG) emissions.

The FCAA allows delegation of the enforcement of many of the federal air quality regulations to the states. In California, the California Air Resources Board (CARB) is responsible for enforcing air pollution regulations in concert with regional air pollution control districts. In San Luis Obispo County, the San Luis Obispo Air Pollution Control District (APCD) has this responsibility, and in Santa Barbara County, the Santa Barbara APCD has this responsibility. In addition, these APCDs and the CARB are the responsible agencies for providing attainment plans and meeting attainment with the NAAQS; and the USEPA reviews and approves these plans and regulations, which are designed to attain and maintain attainment with the NAAQS.

Marine Diesel Engine Emission Standards

In March 2008, the USEPA adopted more stringent emission standards for locomotives and marine compression-ignition engines (73 Fed. Reg. 37096 (USEPA, 2008a)). To reduce emissions from Category 1 (at least 50 horsepower [hp] but less than 7 liters per cylinder displacement) and Category 2 (7 to 30 liters per cylinder displacement) marine diesel engines, the USEPA has established emission standards for new engines, referred to as Tier 2 marine engine standards. The Tier 2 standards were phased in from 2004 to 2007 (year of manufacture), depending on the engine size (USEPA, 1999). The 2008 final rule includes the first-ever national emission standards for existing marine diesel engines, applying to engines larger than 600 kilowatts (kW) when they are remanufactured. The rule also sets Tier 3 emissions standards for newly built engines that began implementation phase-in in 2009. Finally, the rule establishes Tier 4 standards for newly built commercial marine diesel engines above 600 kW, based on the application of high-efficiency catalytic after-treatment technology that began implementation in 2014.

The new diesel marine engine standards will reduce emissions of diesel particulate matter by 90 percent and emissions of NOx by 80 percent for engines meeting Tier 4 standards, in comparison with engines meeting the current Tier 2 standards. The USEPA's three-part program: (1) tightened standards for existing marine diesel engines when they are remanufactured, taking effect as certified remanufacture systems are available starting in 2008; (2) sets near-term emission standards, referred to as Tier 3 standards, for newly built locomotive and diesel marine engines, which reflect the application of currently available technologies to reduce engine-out PM and NOx emissions and phase-in starting in 2009; and (3) applies the final long-term Tier 4 emissions standards to marine diesel engines. These standards are based on the application of high-efficiency catalytic after-treatment technology and would be phased in beginning in 2014 for marine diesel engines. These marine Tier 4 engine standards apply only to commercial marine diesel engines above 600 kW (800 hp) (USEPA, 2008b).

Non-Road Diesel Engine Emission Standards

The USEPA has established a series of cleaner emission standards for new off-road diesel engines culminating in the Tier 4 Final Rule of June 2004 (USEPA, 2004a). The Tier 1, Tier 2, Tier 3, and Tier 4 standards require compliance with progressively more stringent emission standards. Tier 1 standards were phased in from 1996 to 2000 (year of manufacture), depending on the engine horsepower category. Tier 2 standards were phased in from 2001 to 2006, and the Tier 3 standards were phased in from 2006 to 2008. The Tier 4 standards complement the latest 2007 and later on-road heavy-duty engine standards by requiring 90 percent reductions in diesel particulate matter and NOx when compared against current emission levels. The Tier 4 standards were phased in starting with smaller engines in 2008 until all but the very largest diesel engines were to meet NOx and particulate matter (PM) standards in 2015.

Locomotive Emission Standards

In 1998, the USEPA adopted Tier 0 (1973-2001), Tier 1 (2002-2004), and Tier 2 (2005+) emission standards applicable to newly manufactured and remanufactured railroad locomotives and locomotive engines. These standards require compliance with progressively more stringent standards for emissions of VOC, CO, NOx, and diesel particulate matter.

On March 14, 2008, the USEPA adopted Tiers 3 and 4 emissions standards for all diesel line-haul, passenger, and switch locomotives that operate extensively within the US, including newly manufactured locomotives and remanufactured locomotives that were originally manufactured after 1972 (USEPA, 2008b). These standards would substantially reduce emissions from these sources, compared to the Tier 2 standards.

The finalized rule set Tier 3 emission standards for new engines starting in 2008, and for existing locomotives and large marine diesel engines when they are remanufactured, starting in 2009. It set Tier 4 standards, for newly built locomotives that reflect the application of high efficiency after treatment technology, with phase-in starting in 2015. The USEPA also finalized new idle reduction requirements for newly built and remanufactured locomotives.

On-Road Trucks Emission Standards

To reduce emissions from on-road, heavy-duty diesel trucks, the USEPA established a series of cleaner emission standards for new engines, starting in 1988. These emission standards regulations have been revised over time. The latest effective regulation, the 2007 Heavy-Duty Highway Rule, provides for reductions in PM, NOx, and non-methane hydrocarbon emissions that were phased in during the model years 2007 through 2010 (USEPA, 2000).

Non-Road Diesel Fuel Rule

In May 2004, the USEPA set sulfur limits for non-road diesel fuel, including locomotives but not marine fuel. Under this rule, diesel fuel used by line-haul locomotives began being limited to 500 ppm starting June 1, 2007, and 15 ppm starting January 1, 2012 (USEPA, 2004b), at which time it would be equivalent to sulfur content restrictions of the California Diesel Fuel Regulations.

Air Quality (State)

California Clean Air Act of 1988 (CCAA)

The CCAA requires all air districts in the State to endeavor to achieve and maintain State ambient air quality standards for ozone, carbon monoxide, sulfur dioxide, nitrogen dioxide, and particulate matter. CARB sets air quality standards for the State at levels to protect public health and welfare with an adequate margin of safety. The California Ambient Air Quality Standards (CAAQS) are generally stricter than national standards for the same pollutants; California also has standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles. The CAAQS describe adverse conditions (i.e., pollution levels must be below these standards before a basin can attain the standard). Air quality is considered in "attainment" if pollutant levels are continuously below or equal to the standards and violate the standards no more than once each year. The 1992 CCAA Amendments divide ozone nonattainment areas into four categories of pollutant levels (moderate, serious, severe, and extreme) to which progressively more stringent requirements apply. CARB also regulates toxic air contaminants (pollutants that result in harmful health effects, but are not specifically addressed by air quality standards) using air toxic control measures.

California Air Resources Board Programs, Regulations, and Standards

California Diesel Fuel Regulations (Cal. Code Regs., title 13, §§ 2281-2285; Cal. Code Regs., title 17, § 93114). In 2004, the CARB set limits on the sulfur content of diesel fuel sold in California for use in on-road and off-road motor vehicles. Harbor craft and intrastate locomotives were later included by a 2004 rule amendment (CARB, 2005). Under this rule, diesel fuel used in motor vehicles except harbor craft and intrastate locomotives has been limited to 500 ppm sulfur since 1993. The sulfur limit was reduced to 15 ppm beginning on September 1, 2006. Diesel fuel used in harbor craft in the South Coast Air Basin also was limited to 500 ppm sulfur starting January 1, 2006 and was lowered to 15 ppm sulfur on September 1, 2006. Diesel fuel used in intrastate locomotives (switch locomotives) was limited to 15 ppm sulfur starting on January 1, 2007.

California Diesel Risk Reduction Plan. CARB has adopted several regulations that are meant to reduce the health risk associated with on- and off-road and stationary diesel engine operation. This plan recommends many control measures with the goal of an 85 percent reduction in diesel particulate matter emissions by 2020. The regulations noted below, which may also serve to significantly reduce other pollutant emissions, are all part of this risk reduction plan.

Commercial Harbor Craft Regulation requires upgrades to Tier 2 or Tier 3 standards to reduce diesel particulate matter and NOx emissions from diesel engines used on commercial harbor craft (e.g., tugboats, crew and supply vessels, work boats, barges, dredges) operated in California Regulated Waters (internal waters, estuarine waters, ports and coastal waters within 24 nautical miles of the coast).

Emission Standards for On-Road and Off-Road Diesel Engines. Similar to the USEPA for on-road and off-road emissions described above, the CARB has established emission standards for new on-road and off-road diesel engines. These regulations have model year-based emissions standards for NOx, hydrocarbons, CO, and PM.

Heavy Duty Diesel Truck Idling Rule/Regulation. This CARB rule became effective February 1, 2005 and prohibits heavy-duty diesel trucks from idling for longer than 5 minutes at a time, unless they are queuing and provided the queue is located beyond 100 feet from any homes or schools (CARB, 2006).

In-Use Off-Road Vehicle Regulation (Cal. Code Regs., title 13, § 2449). The State has also enacted a regulation to reduce diesel particulate matter and criteria pollutant emissions from in-use off-road diesel-fueled vehicles. This regulation provides target emission rates for PM and NOx emissions from owners of fleets of diesel-fueled off-road vehicles, and applies to off-road equipment fleets of three specific sizes, as follows:

- Small Fleet – Fleet or municipality with equipment totaling less than or equal to 2,500 hp, or municipal fleet in lower population area, captive attainment fleet, or non-profit training center regardless of horsepower.
- Medium Fleet – Fleet with equipment totaling 2,501 to 5,000 hp.

- Large Fleet – Fleet with equipment totaling more than 5,000 hp, or all State and federal government fleets regardless of total hp.
- The target emission rates for these fleets are reduced over time. Specific regulation requirements:
  - Limit on idling, requiring a written idling policy, and disclosure when selling vehicles;
  - Require all vehicles to be reported to CARB (using the Diesel Off-Road Online Reporting System, DOORS) and labeled;
  - Restrict the adding of older vehicles into fleets starting on January 1, 2014; and
  - Require fleets to reduce their emissions by retiring, replacing, or repowering older engines, or installing Verified Diesel Emission Control Strategies (i.e., exhaust retrofits). (CARB, 2016)

Ocean-Going Vessels Fuel Standards. After January 1, 2014, ocean-going vessels within California Regulated Waters must use fuel with a maximum fuel sulfur content of 0.1 percent (using cleaner marine distillate fuels in larger ocean-going vessels reduces diesel particulate matter, NOx, and SOx emissions).

Off-Road Mobile Sources Emission Reduction Program. The CCAA mandates that CARB achieve the maximum degree of emission reductions from all off-road mobile sources (e.g., construction equipment, marine vessels, and harbor craft) to attain state ambient air quality standards. Tier 2, Tier 3, and Tier 4 exhaust emissions standards apply to off-road equipment. In addition, CARB fleet requirements specify how equipment that is already in use can be retrofitted to achieve lower emissions using the CARB-verified retrofit technologies. USEPA standards for marine compression-ignition engines address NOx and diesel particulate matter emissions, depending on engine size and year of manufacture. Tier 2 standards for marine engines were phased in for model years 2004 to 2007, and Tier 3 standards were phased in for currently available technologies to reduce NOx and PM, starting in 2009.

Statewide Portable Equipment Registration Program (PERP). The PERP establishes a uniform program to regulate portable engines and portable engine-driven equipment units (CARB, 2018). Once registered in the PERP, engines and equipment units may operate throughout California without the need to obtain individual permits from local air districts, if the equipment is located at a single location for no more than 12 consecutive months.

Statewide Bus and Truck Regulation. The Truck and Bus Regulation was adopted in 2008 and requires the installation of PM retrofits on all heavy-duty diesel trucks beginning in 2012 and replacement of older trucks starting in 2015. All vehicles must have 2010 model year engines or equivalent by 2023. This regulation applies primarily to on-road vehicles to be used during proposed facility closure activities such as hauling of debris and materials to and from the site (CARB, 2019).

Statewide Railyard Agreement. On June 30, 2005, CARB entered into a Statewide Railyard Agreement with Union Pacific Railroad and BNSF Railway Company. This agreement obligated the railroads to significantly reduce diesel emissions in and around rail yards in California. Among the most important elements of the agreement were provisions that significantly cleaned up the state's biggest rail yards: (1) a statewide idling-reduction program; (2) health risk assessments (HRAs) for all major rail yards; and (3) community and air district involvement in the preparation of risk assessments, enforcement of agreement provisions, and the evaluation and development of measures to further reduce impacts on local communities. The agreement also: (1) maximized the use of state and federal low sulfur diesel in locomotives fueled in California; (2) established a statewide visible emissions reduction and repair program; (3) provided a detailed evaluation of advanced control measures; and (4) included an assessment of remote sensing technology to identify high-emitting locomotives.

Health and Safety Code

§§ 25531-25543 set forth changes in four areas: (1) provides guidelines to identify a more realistic health risk; (2) requires high-risk facilities to submit an air toxic emission reduction plan; (3) holds air pollution control districts accountable for ensuring that plans achieve objectives; and (4) requires high-risk facilities to achieve their planned emission reductions.

The Air Toxics Hot Spots Information and Assessment Act (§ 44300 et seq.) provides for the regulation of over 200 toxic air contaminants. Under the act, local air districts may request that a facility account for its toxic air contaminant emissions. Local air districts then prioritize facilities based on emissions; high priority designated facilities must submit an HRA.

Coastal Act Chapter 3 policies (see *Multiple Environmental Issues*)

Section 30253, subdivision (c) requires that new development shall be consistent with requirements imposed by an air pollution control district or CARB as to each development.

Biological Resources

Biological Resources (Federal)

Federal Clean Water Act (CWA) (33 U.S.C. § 1251 et seq.) (see Hydrology and Water Quality)

Rivers and Harbors Act (33 U.S.C. § 401) (see Hydrology and Water Quality)

Federal Endangered Species Act (FESA) (7 U.S.C. § 136, 16 U.S.C. § 1531 et seq.)

The FESA, which is administered in California by the USFWS and National Marine Fisheries Service (NMFS), provides protection to species listed as threatened or endangered, or proposed for listing as threatened or endangered. When applicants propose projects with a federal nexus that "may affect" a federally listed or proposed species, the federal agency must (1) consult with the USFWS or NMFS, as appropriate, under Section 7, and (2) ensure that any actions authorized, funded, or carried out by the agency are not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of areas determined to be critical habitat. Section 9 prohibits the "take" of any member of a listed species.

Take – To harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct

Harass – An intentional or negligent act or omission that creates the likelihood of injury to a listed species by annoying it to such an extent as to significantly disrupt normal behavior patterns that include, but are not limited to, breeding, feeding, or sheltering

Harm – Significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering

Fish and Wildlife Coordination Act of 1958

This Act requires that whenever a body of water is proposed to be controlled or modified, the lead agency must consult with the state and federal agencies responsible for fish and wildlife management (e.g., USFWS, CDFW, and National Oceanic and Atmospheric Administration). The Act allows for recommendations addressing adverse impacts associated with a proposed project, and for mitigating or compensating for impacts on fish and wildlife.

Magnuson-Stevens Fishery Conservation and Management Act (MSA) (16 U.S.C. § 1801 et seq.)

The MSA governs marine fisheries management in Federal waters. The MSA was first enacted in 1976 and amended by the Sustainable Fisheries Act of 1996 and the Magnuson-Stevens Fishery Conservation and Management Reauthorization Act in 2007. Amendments require the identification of Essential Fish Habitat (EFH) for federally managed species and the implementation of measures to conserve and enhance this habitat. Any project requiring Federal authorization, such as a US Army Corps of Engineers permit, is required to complete and submit an EFH Assessment with the application and either show that no significant impacts to the essential habitat of managed species are expected or identify mitigations to reduce those impacts. Under the MSA, Congress defined EFH as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity" (16 U.S.C. § 1802(10)). The EFH provisions of the MSA offer resource managers a means to heighten consideration of fish habitat in resource management. Federal agencies shall consult with the NMFS regarding any action they authorize, fund, or undertake that might adversely affect EFH (§ 305(b)(2)).

Marine Mammal Protection Act (MMPA) (16 U.S.C. § 1361 et seq.)

The MMPA is designed to protect and conserve marine mammals and their habitats. It prohibits takes of all marine mammals in the US (including territorial seas) with few exceptions. The NMFS may issue a take permit under section 104 if activities are consistent with the purposes of the MMPA and applicable regulations at 50 CFR, Part 216. The NMFS must also find that the manner of taking is "humane" as defined in the MMPA. If lethal taking of a marine mammal is requested, the applicant must demonstrate that using a non-lethal method is not feasible.

Migratory Bird Treaty Act (MBTA) (16 U.S.C. §§ 703-712)

The MBTA prohibits the take, possession, import, export, transport, selling, purchase, barter, or offering for sale, purchase, or barter, of any migratory bird, their eggs, parts, and nests, except as authorized under a valid permit (50 CFR 21.11). The USFWS issues permits for take of migratory birds for activities such as scientific research, education, and depredation control, but does not issue permits for incidental take of migratory birds.

Bald and Golden Eagle Protection Act (BGEPA) (16 U.S.C. § 668-668c)

Bald and golden eagles are protected under the BGEPA, originally passed in 1940 and amended in 1962. The BGEPA prohibits the take, possession, sale, purchase, barter, offer to sell, transport, export, or import of any bald or golden eagle, alive or dead, including any part, nest, egg, unless allowed by permit (16 U.S.C. 668[a]; 50 CFR 22).

Federal Noxious Weed Act (7 U.S.C. §§ 2801 et seq.)

The Federal Noxious Weed was enacted in 1975 and established a federal program to control the spread of noxious weeds. This act:

- Defines a noxious weed as any living stage of a plant that can directly or indirectly injure crops, other useful plants, livestock, poultry, or other interests of agriculture including irrigation, navigation, the fish and wildlife resources of the United States, or public health.
- Regulates the sale, purchase, and transportation of noxious weeds into or through the United States.
- Regulates the inspection and quarantine of areas suspected of infestation and provides for the disposal or destruction of infested products, articles, means of conveyance, or noxious weeds.
- Provides fines of up to $5,000 or imprisonment of up to one year for violation of the regulation.
- Requires federal agencies to work with state and local agencies to develop and implement noxious weed management programs on federal lands.

National Invasive Species Act (NISA) (33 CFR, Part 151, Subpart D)

NISA was originally passed in 1990 as the Nonindigenous Aquatic Nuisance Prevention and Control Act [16 U.S.C. § 4701-4751] and reauthorized, renamed and expanded in 1996. Under its provisions, the US Coast Guard requires ballast water management (i.e., exchange) for vessels entering US waters from outside the 200-nautical-mile US Exclusive Economic Zone. The original Act was established to: (1) prevent unintentional introduction and dispersal of nonindigenous species into Waters of the US through ballast water management and other requirements; (2) coordinate and disseminate information on federally conducted, funded, or authorized research, on the prevention and control of the zebra mussel and other aquatic nuisance species; (3) develop and carry out control methods to prevent, monitor, and control unintentional introductions of nonindigenous species from pathways other than ballast water exchange; (4) understand and minimize economic and ecological impacts of established nonindigenous aquatic nuisance species; and (5) establish a program of research and technology development and assistance to states in the management and removal of zebra mussels.

Executive Orders (EO)

EO 11990 requires federal agencies to provide leadership and take action to minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands. Each agency, to the extent permitted by law, must (1) avoid undertaking or providing assistance for new construction located in wetlands unless the head of the agency finds there is no practical alternative to such construction or the proposed action includes all practical measures to minimize harm to wetlands that may result from such use; (2) take into account economic, environmental and other pertinent factors in making this finding; and (3) provide opportunity for early public review of any plans or proposals for new construction in wetlands.

EO 13112 requires federal agencies to use authorities to prevent introduction of invasive species, respond to and control invasions, and provide for restoration of native species and habitat conditions in invaded ecosystems; also established the Invasive Species Council, which prepares a National Invasive Species Management Plan that details and recommends performance-oriented goals and objectives and measures of success for federal agencies.

EO 13158 requires federal agencies to (1) identify actions that affect natural or cultural resources that are within a Marine Protected Area (MPA); and (2) in taking such actions, to avoid harm to the natural and cultural resources that are protected by a MPA.

EO 13186 sets forth responsibilities of federal agencies to protect migratory birds.

Other

Clean Water Act and Rivers and Harbors Act (see *Hydrology and Water Quality*)

Coastal Zone Management Act (see *Multiple Environmental Issues*)

Estuary Protection Act (16 U.S.C. § 1221-1226) authorizes federal agencies to assess the impacts of commercial and industrial developments on estuaries.

Biological Resources (State)

Porter-Cologne Water Quality Control Act (Wat. Code, § 13000 et seq.) (Porter-Cologne) (see *Hydrology and Water Quality*)

California Endangered Species Act (CESA) (Fish & Game Code, § 2050 et seq.)

The CESA provides for the protection of rare, threatened, and endangered plants and animals, as recognized by the CDFW, and prohibits the taking of such species without its authorization. Furthermore, the CESA provides protection for those species that are designated as candidates for threatened or endangered listings. Under the CESA, the CDFW has the responsibility for maintaining a list of threatened species and endangered species (Fish & Game Code, § 2070). The CDFW also maintains a list of candidate species, which are species that the CDFW has formally noticed as under review for addition to the threatened or endangered species lists. The CDFW also maintains lists of Species of Special Concern that serve as watch lists. Pursuant to CESA requirements, an agency reviewing a proposed project within its jurisdiction must determine whether any State-listed endangered or threatened species may be present in the project site and determine whether the proposed project will have a significant impact on such species. The CDFW encourages informal consultation on any proposed project that may affect a candidate species. The CESA also requires a permit to take a State-listed species through incidental or otherwise lawful activities (§ 2081, subd. (b)).

Lake and Streambed Alteration Program (Fish & Game Code, §§ 1600-1616)

These regulations require that the CDFW: be notified of activities that would interfere with the natural flow of, or substantially alter, the channel, bed, or bank of a lake, river, or stream; determines if the activity may substantially adversely affect an existing fish and wildlife resource; and issue a Streambed Alteration Agreement if applicable.

Marine Life Protection Act (MLPA) (Fish & Game Code, §§ 2850–2863)

Pursuant to this Act, the CDFW established and manages a network of MPAs to, among other goals, protect marine life and habitats and preserve ecosystem integrity. For the purposes of MPA planning, California was divided into five distinct regions (four coastal and San Francisco Bay) each of which had its own MPA planning process. The coastal portion of California's MPA network is now in effect statewide; options for a planning process in San Francisco Bay have been developed for consideration at a future date. The MLPA establishes clear policy guidance and a scientifically sound planning process for the siting and design of MPAs such as:

- State Marine Reserves (SMRs), which typically preclude all extractive activities (such as fishing or kelp harvesting)
- State Marine Parks (SMPs), which do not allow any commercial extraction
- State Marine Conservation Areas (SMCAs), which preclude some combination of commercial and/or recreational extraction

Other relevant California Fish and Game Code sections and Programs/Plans

§ 1900 et seq. (California Native Plant Protection Act) is intended to preserve, protect, and enhance endangered or rare native plants in California. Under section 1901, a species is endangered when its prospects for survival and reproduction are in immediate jeopardy from one or more causes. A species is rare when, although not threatened with immediate extinction, it is in such small numbers throughout its range that it may become endangered. The Act includes provisions that prohibit taking of listed rare or endangered plants from the wild and a salvage requirement for landowners.

§§ 3503 & 3503.5 prohibit take and possession of native birds' nests and eggs from all forms of needless take and provide that it is unlawful to take, possess, or destroy any birds in the orders Falconiformes or Strigiformes (birds-of-prey) or to take, possess, or destroy the nests or eggs of any such bird except as otherwise provided by this Code or any regulation adopted pursuant thereto.

§§ 3511 (birds), 4700 (mammals), 5050 (reptiles and amphibians), and 5515 (fish) designate certain species as "fully protected;" such species, or parts thereof, may not be taken or possessed at any time without permission by the CDFW.

§ 3513 prohibits the take or possession of "any migratory nongame bird as designated in the Migratory Bird Treaty Act or any part of such migratory nongame bird except as provided by rules and regulations adopted by the Secretary of the Interior under provisions of the Migratory Treaty Act."

California Aquatic Invasive Species Management Plan provides a framework for agency coordination and identifies actions to minimize harmful effects of aquatic invasive species.

Marine Invasive Species Act (MISA) (Pub. Resources Code, § 71200 et seq.) (AB 433; Stats. 2003, ch. 491)

Originally passed in 2003 and amended several times, the purpose of MISA is to move towards eliminating the discharge of nonindigenous species into waters of the state or waters that may impact waters of the state, based on the best available technology economically achievable. MISA requires mid-ocean exchange or retention of all ballast water and associated sediments for all vessels 300 gross registered tons or more, US and foreign, carrying ballast water into the waters of the state after operating outside state waters. For all vessels 300 gross register tons or more arriving at a California port or place carrying ballast water from another port or place within the Pacific Coast Region, the Act mandates near-coast exchange or retention of all ballast water. MISA also requires completion and submission of Ballast Water Reporting Form 24 hours in advance of each port of call in California, annual submittal of the Hull Husbandry Reporting Form, the keeping of a ballast management plan and logs, and the application of "Good Housekeeping" Practices designed to minimize the transfer and introduction of invasive species. Compliance with MISA is the responsibility of vessel owners/operators. The California State Lands Commission has regulatory authority to manage and enforce MISA.

Coastal Act Chapter 3 policies (see *Multiple Environmental Issues*)

§ 30230 – Marine resources shall be maintained, enhanced, and where feasible, restored. Special protection shall be given to areas and species of special biological or economic significance. Uses of the marine environment shall be carried out in a manner that will sustain the biological productivity of coastal waters and that will maintain healthy populations of all species of marine organisms adequate for long-term commercial, recreational, scientific, and educational purposes.

§ 30231 – The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of waste water discharges and entrainment, controlling runoff, preventing depletion of ground water supplies and substantial interference with surface water flow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.

§ 30232 – Protection against the spillage of crude oil, gas, petroleum products, or hazardous substances shall be provided in relation to any development or transportation of such materials. Effective containment and cleanup facilities and procedures shall be provided for accidental spills that do occur.

§ 30233 – applies in part to development activities within or affecting wetlands and other sensitive areas, identifies eight allowable uses, requires projects be the least environmentally damaging feasible alternative, and where applicable, requires feasible and appropriate mitigation.

§ 30240 – (a) Environmentally sensitive habitat areas shall be protected against any significant disruption of habitat values, and only uses dependent on those resources shall be allowed within those areas. (b) Development in areas adjacent to environmentally sensitive habitat areas and parks and recreation areas shall be sited and designed to prevent impacts which would significantly degrade those areas, and shall be compatible with the continuance of those habitat and recreation areas.

OTHER

California Department of Food and Agriculture's California Noxious and Invasive Weed Action Plan seeks to prevent and control noxious and invasive weeds.

Lempert-Keene-Seastrand Oil Spill Prevention and Response Act (see *Hazardous and Radiological Materials*)

Wetlands Conservation Policy – no net loss of wetland acreage; long-term gain in the quantity, quality, and permanence of California's wetlands.

Cultural Resources – Archaeology and Built Environment

Cultural Resources (Federal)

Archaeological and Historic Preservation Act (AHPA)

The AHPA provides for the preservation of historical and archaeological data that might be irreparably lost or destroyed as a result of (1) flooding, the building of access roads, the erection of workmen's communities, the relocation of railroads and highways, and other alterations of terrain caused by the construction of a dam by an agency of the US or by any private person or corporation holding a license issued by any such agency; or (2) any alteration of the terrain caused as a result of a federal construction project or federally licensed project, activity, or program. This Act requires federal agencies to notify the Secretary of the Interior when they find that any federally permitted activity or program may cause irreparable loss or destruction of significant scientific, prehistoric, historical, or archaeological data. The AHPA built upon national policy, set out in the Historic Sites Act of 1935, "...to provide for the preservation of historic American sites, buildings, objects, and antiquities of national significance...."

Archaeological Resources Protection Act of 1979 (ARPA) (P.L. 96-95; 93 Stat. 712)

The ARPA states that archaeological resources on public or Indian lands are an accessible and irreplaceable part of the nation's heritage and:

- Establishes protection for archaeological resources to prevent loss and destruction due to uncontrolled excavations and pillaging;
- Encourages increased cooperation and exchange of information between government authorities, the professional archaeological community, and private individuals having collections of archaeological resources prior to the enactment of this Act;
- Establishes permit procedures to permit excavation or removal of archaeological resources (and associated activities) located on public or Indian land; and

- Defines excavation, removal, damage, or other alteration or defacing of archaeological resources as a “prohibited act” and provides for criminal and monetary rewards to be paid to individuals furnishing information leading to the finding of a civil violation or conviction of a criminal violator.

An anti-trafficking provision prohibits interstate or international sale, purchase, or transport of any archaeological resource excavated or removed in violation of a state or local law, ordinance, or regulation. ARPA’s enforcement provision provides for criminal and civil penalties against violators of the Act. The ARPA's permitting component allows for recovery of certain artifacts consistent with NPS Federal Archaeology Program standards and requirements.

National Historic Preservation Act of 1966 (NHPA) (16 U.S.C. § 470 et seq. [recodified at 54 U.S.C. § 300101]) and implementing regulations (Protection of Historic Properties; 36 CFR 800) (applies only to federal undertakings)

Archaeological resources are protected through the NHPA and its implementing regulation (Protection of Historic Properties; 36 CFR 800), the AHPA, and the ARPA. This Act presents a general policy of supporting and encouraging the preservation of prehistoric and historic resources for present and future generations by directing federal agencies to assume responsibility for considering the historic resources in their activities. The State implements the NHPA through its statewide comprehensive cultural resource surveys and preservation programs coordinated by the California Office of Historic Preservation (OHP) in the State Department of Parks and Recreation, which also advises federal agencies regarding potential effects on historic properties.

The OHP also maintains the California Historic Resources Inventory. The State Historic Preservation Officer (SHPO) is an appointed official who implements historic preservation programs within the State’s jurisdictions, including commenting on Federal undertakings. Under the NHPA, historic properties include “any prehistoric or historic district, site, building, structure, or object included on, or eligible for inclusion on, the National Register, including artifacts, records, and material remains relating to the district, site, building, structure, or object” (54 U.S.C. § 300308).

Executive Order (EO) 13158

EO 13158 requires federal agencies to (1) identify actions that affect natural or cultural resources that are within an MPA; and (2) in taking such actions, to avoid harm to the natural and cultural resources that are protected by a MPA.

Cultural Resources (State)

California Register of Historical Resources (CRHR)

The CRHR is “an authoritative listing and guide to be used by state and local agencies, private groups, and citizens in identifying the existing historical resources of the State and to indicate which resources deserve to be protected, to the extent prudent and feasible, from substantial adverse change” (Pub. Resources Code, § 5024.1, subd. (a)). CRHR eligibility criteria are modeled after National Register of Historic Places (NRHP) criteria but focus on resources of statewide significance. Certain resources are determined by the statute to be automatically included in the CRHR, including California properties formally determined to be eligible for, or listed in, the NRHP. To be eligible for the CRHR, a prehistoric or historical period property must be significant at the local, state, or federal level under one or more of the following criteria (State CEQA Guidelines, § 15064.5, subd. (a)(3)):

- Is associated with events that have made a significant contribution to the broad patterns of California’s history and cultural heritage
- Is associated with the lives of persons important in California’s past
- Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values
- Has yielded, or may be likely to yield, information important in prehistory or history

A resource eligible for the CRHR must meet one of the criteria of significance above and retain enough of its historic character or appearance (integrity) to be recognizable as an historical resource and to convey the reason for its significance. An historic resource that may not retain sufficient integrity to meet the criteria for listing in the NRHP, may still be eligible for listing in the CRHR. Properties listed, or formally designated as eligible for listing, on the National Register are automatically listed on the CRHR, as are certain State Landmarks and Points of Interest. A lead agency is not precluded from determining that the resource may be an historical resource as defined in Public Resources Code sections 5020.1, subdivision (j), or 5024.1 (State CEQA Guidelines, § 15064.5, subd. (a)(4)).

CEQA (Pub. Resources Code, § 21000 et seq.)

CEQA section 21084.1 provides that a project that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment. An "historical resource" includes: (1) a resource listed in, or eligible for listing in, the California Register of Historic Resources; (2) a resource included in a local register of historical or identified as significant in an historical resource surveys; and (3) any resource that a lead agency determines to be historically significant for the purposes of CEQA, when supported by substantial evidence in light of the whole record. Historical resources may include archaeological resources. Mitigation measures for significant impacts to historical resources must be identified and implemented if feasible.

Coastal Act Chapter 3 policies (see *Multiple Environmental Issues*)

Section 30244 states: Where development would adversely impact archaeological or paleontological resources as identified by the State Historic Preservation Officer, reasonable mitigation measures shall be required.

Cultural Resources – Tribal Cultural Resources

Tribal Cultural Resources (Federal)

Native American Graves Protection and Repatriation Act of 1990 (P.L. 101-601; 104 Stat. 3049)

Assigns ownership or control of Native American human remains, funerary objects, sacred objects, and objects of cultural patrimony that are excavated or discovered on federal lands or tribal lands after passage of the act to lineal descendants or affiliated Indian tribes or Native Hawaiian organizations; establishes criminal penalties for trafficking in human remains or cultural objects; requires federal agencies and museums that receive federal funding to inventory Native American human remains and associated funerary objects in their possession or control and identify their cultural and geographical affiliations within 5 years, and prepare summaries of information about Native American unassociated funerary objects, sacred objects, or objects of cultural patrimony. This is to provide for repatriation of such items when lineal descendants, Indian tribes, or Native Hawaiian organizations request it.

Executive Order (EO) 13007, Indian Sacred Sites

EO 13007 requires federal agencies with administrative or legal responsibility to manage federal lands to accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners and avoid adversely affecting the physical integrity of such sites (to the extent practicable permitted by law and not clearly inconsistent with essential agency functions).

Tribal Cultural Resources (State)

CEQA (Pub. Resources Code, § 21073, 21074, 21080.3.1, 21080.3.2, 21082.3, 21083.09, 21084.2, and 21084.3) [AB 52 (Gatto, Stats. 2014, Ch. 532)]

The AB 52 (effective July 1, 2015) amendments to CEQA relate to consultation with California Native American tribes, consideration of tribal cultural resources, and confidentiality. The definition of tribal cultural resources considers tribal cultural values in addition to scientific and archaeological values when determining impacts and mitigation. AB 52 provides procedural and substantive requirements for lead agency consultation with California Native American tribes and consideration of effects on tribal cultural resources, as well as examples of mitigation measures to avoid or minimize impacts to tribal cultural resources. AB 52 establishes that if a project may cause a substantial adverse change in the significance of a tribal cultural resource, that project may have a significant effect on the environment. Lead agencies must avoid damaging effects to tribal cultural resources, when feasible, and shall keep information submitted by tribes confidential.

Health and Safety Code § 7050.5

This section provides for treatment of human remains exposed during construction; no further disturbance may occur until the County Coroner makes findings as to origin and disposition pursuant to Public Resources Code section 5097.98. The coroner has 24 hours to notify the Native American Heritage Commission (NAHC) if the remains are determined to be of Native American descent. The NAHC contacts most likely descendants about how to proceed.

Public Resources Code § 5097.98

This section provides (1) a protocol for notifying the most likely descendent from the deceased if human remains are determined to be Native American in origin and (2) mandated measures for appropriate treatment and disposition of exhumed remains.

Executive Order B-10-11

EO B-10-11 establishes as state policy that all agencies and departments shall encourage communication and consultation with California Indian Tribes and allow tribal governments to provide meaningful input into proposed decisions and policies that may affect tribal communities.

Energy

Energy (State)

2019 Building Energy Efficiency Standards (2019 Energy Code)

The 2019 Building Energy Efficiency Standards, in California Code of Regulations, Title 24, Part 6, establish a range of mandatory and prescriptive energy efficiency measures for newly constructed residential and nonresidential buildings, as well as additions and alterations to existing buildings, to reduce wasteful, uneconomical, and unnecessary uses of energy, thereby reducing the rate of growth of energy consumption, prudently conserving energy resources, and assuring that statewide environmental, public safety, and land use goals are met. The 2019 Energy Code initiated focus on the decarbonization of buildings with the introduction of solar PV system requirements for newly constructed low-rise residential buildings. It also introduced the recognition of battery storage systems and demand flexibility options in the form of compliance credits, encouraging the design and installation of systems that support the decarbonization of buildings and grid stability.

Geology, Soils, and Coastal Processes (includes Paleontology)

Geology, Soils, and Coastal Processes (Federal/International)

Uniform Building Code

The Uniform Building Code (1997 and earlier editions) designated and ranked regions of the US, according to their seismic hazard potential, as Seismic Zones 1 through 4, with Zone 1 having the least seismic potential and Zone 4 having the highest seismic potential.

International Building Code

The International Building Code (IBC) is published by the International Code Council. The scope of this code covers major aspects of construction and design of structures and buildings, except for three-story one- and two-family dwellings and town homes. The IBC has replaced the Uniform Building Code as the basis for the California Building Code and contains provisions for structural engineering design. The 2015 IBC addresses the design and installation of structures and building systems through requirements that emphasize performance. The IBC includes codes governing structural as well as fire- and life-safety provisions covering seismic, wind, accessibility, egress, occupancy, and roofs.

Federal Clean Water Act (CWA) (33 U.S.C. § 1251 et seq.) (see *Hydrology and Water Quality*)

Federal Earthquake Reduction Act

The Earthquake Hazards Reduction Act was passed by the United States Congress in 1977 to reduce the risks to life and property from future earthquakes through the establishment and maintenance of an effective earthquake hazards and reduction program. To accomplish this, the act established the National Earthquake Hazards Reduction Program (NEHRP). The agencies responsible for coordinating NEHRP are the Federal Emergency Management Agency (FEMA), the National Institute of Standards and Technology (NIST), the National Science Foundation (NSF); and the USGS. In 1990, NEHRP was amended by the National Earthquake Hazards Reduction Program Act (NEHRPA), which refined the description of the agency responsibilities, program goals, and objectives. The four goals of the NEHRP are: (1) develop effective practices and policies for earthquake loss-reduction and accelerate their implementation; (2) improve techniques to reduce seismic vulnerability of facilities and systems; (3) improve seismic hazards identification and risk-assessment methods and their use; and (4) improve the understanding of earthquakes and their effects.

Omnibus Public Land Management Act of 2009 - Public Law 111-11 (123 Stat. 991)

Public Law 111-011 at Title VI, subtitle D lays out statutory requirements for Paleontological Resources Preservation (PRP). PRP provides definitions but requires the definition of some terms, and uses other terms and concepts that need further definition or details to clarify intent or enforcement. PRP identifies management requirements, collection requirements, curation requirements, need for both criminal and civil penalties, rewards and forfeiture, and the need for confidentiality of some significant resource locations.

Antiquities Act of 1906

The Antiquities Act was the first law enacted to specifically establish that archaeological sites on public lands are important public resources, and it obligated federal agencies that manage public lands to preserve the scientific, commemorative, and cultural values of such sites. This act does not refer to paleontological resources specifically; however, the act does provide for the protection of “objects of antiquity” (understood to include paleontological resources) by various federal agencies not covered by the Omnibus Public Land Management Act-Paleontological Resources Preservation.

Geology, Soils, and Coastal Processes (State)

Alquist-Priolo Earthquake Fault Zoning Act (Pub. Resources Code, §§ 2621-2630)

This Act requires that “sufficiently active” and “well-defined” earthquake fault zones be delineated by the State Geologist and prohibits locating structures for human occupancy on active and potentially active surface faults. Historic and Holocene age faults are considered active, Late Quaternary and Quaternary age faults are considered potentially active, and pre-Quaternary age faults are considered inactive. These classifications are qualified by the conditions that a fault must be shown to be “sufficiently active” and “well defined” by detailed site-specific geologic explorations in order to determine whether building setbacks should be established. (Note that since only those potentially active faults that have a relatively high potential for ground rupture are identified as fault zones, not all potentially active faults are zoned under the Alquist-Priolo Earthquake Fault Zone, as designated by the State of California.)

California Building Code (Cal. Code Regs., Title 24)

The California Building Code provides a minimum standard for building design, which is based on the Uniform Building Code, but is modified for conditions unique to California. The Code, which is selectively adopted by local jurisdictions, based on local conditions, contains requirements pertaining to multiple activities, including: excavation, site demolition, foundations and retaining walls, grading activities including drainage and erosion control, and construction of pipelines alongside existing structures. Chapter 16 contains specific requirements for seismic safety. Chapter 18 regulates excavation, foundations, and retaining walls. Chapter 33 contains specific requirements pertaining to site demolition, excavation, and construction to protect people and property from hazards associated with excavation cave-ins and falling debris or construction materials. Chapter 70 regulates grading activities, including drainage and erosion. Construction activities are subject to occupational safety standards for excavation, shoring, and trenching, as specified in the State of California Division of Occupational Safety and Health (commonly called Cal/OSHA) regulations (Title 8 of the CCR) and in Section A33 of the California Building Code.

Seismic Hazards Mapping Act & Mapping Regs (Pub. Resources Code, § 2690; Cal. Code Regs., title 14, div. 2, ch. 8, art. 10).

These regulations were promulgated to promote public safety by protecting against the effects of strong ground shaking, liquefaction, landslides, other ground failures, or other hazards caused by earthquakes. The Act requires that site-specific geotechnical investigations be conducted identifying the hazard and formulating mitigation measures prior to permitting most developments designed for human occupancy. California Geological Survey (CGS) Special Publication 117A, Guidelines for Evaluating and Mitigating Seismic Hazards in California (CGS, 2008), constitutes the guidelines for evaluating seismic hazards other than surface fault-rupture, and for recommending mitigation measures as required by Public Resources Code section 2695, subdivision (a). The Act does not apply offshore as the California Geological Survey has not zoned offshore California under the Act.

Coastal Act Chapter 3 policies (see Multiple Environmental Issues)

With respect to geological resources, § 30253 requires, in part, that: New development shall: (a) Minimize risks to life and property in areas of high geologic, flood, and fire hazard; and (b) Assure stability and structural integrity, and neither create nor contribute significantly to erosion, geologic instability, or destruction of the site or surrounding area or in any way require the construction of protective devices that would substantially alter natural landforms along bluffs and cliffs. § 30243 also states in part that the long-term productivity of soils and timberlands shall be protected.

Other

Public Resources Code § 5097.5 prohibits excavation or removal of any “vertebrate paleontological site or historical feature, situated on public lands, except with the express permission of the public agency having jurisdiction over such lands.”

Penal Code § 622.5 sets the penalties for damage or removal of paleontological resources.

Penal Code § 623 provides for the protection of caves, including their natural, cultural, and paleontological contents. It specifies that no “material” (including all or any part of any paleontological item) will be removed from any natural geologically formed cavity or cave.

Greenhouse Gas Emissions

Greenhouse Gas Emissions (Federal/International)

Federal Clean Air Act (FCAA) (42 U.S.C. § 7401 et seq.)

In 2007, the US Supreme Court ruled that carbon dioxide (CO_2) is an air pollutant as defined under the FCAA, and that the USEPA has authority to regulate GHG emissions.

Mandatory Greenhouse Gas Reporting (74 Fed. Reg. 56260)

On September 22, 2009, the USEPA issued the Mandatory Reporting of Greenhouse Gases Rule, which requires reporting of GHG data and other relevant information from large sources (industrial facilities and power plants that emit more than 25,000 metric tons of carbon dioxide-equivalent (CO_2e) emissions per year) in the US The purpose of the Rule is to collect accurate and timely GHG data to inform future policy decisions. The Rule is referred to as 40 CFR Part 98 (Part 98). Gases covered by implementation of Part 98 (GHG Reporting Program) are: CO_2, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, and other fluorinated gases including nitrogen trifluoride and hydrofluorinated ethers.

Kyoto Protocol and Paris Climate Agreement

On March 21, 1994, the Kyoto Protocol, the first international agreement to regulate GHG emissions, was signed. The Kyoto Protocol was a treaty made under the United Nations Framework Convention on Climate Change. If the commitments outlined in the Kyoto Protocol are met, global GHG emissions would be reduced by 5 percent from 1990 levels during the commitment period of 2008 to 2012. The US was a signatory to the Kyoto Protocol; however, Congress has not ratified it and the US is not bound by the Protocol's commitments.

In December 2015, the Paris Climate Agreement was endorsed and adopted by 195 countries including the US (which has since withdrawn from the Agreement). The overarching goal was to reduce pollution levels so that the rise in global temperatures is limited to no more than 2^{o} Celsius (3.6^{o} Fahrenheit). The Agreement included voluntary commitments to cut or limit the growth of their GHG emissions and provide regular and transparent reporting of every country's carbon reductions.

Greenhouse Gas Emissions (State)

California Global Warming Solutions Act of 2006 (AB 32, Stats. 2006, ch. 488)

Under AB 32, CARB is responsible for monitoring and reducing GHG emissions in the State and for establishing a statewide GHG emissions cap for 2020 based on 1990 emissions levels. CARB has adopted the AB 32 Climate Change Scoping Plan (Scoping Plan), initially approved in 2008 and updated in 2014, which contains the main strategies for California to implement to reduce CO_2e emissions by 169 million metric tons (MMT) from the State's projected 2020 emissions level of 596 MMT CO_2e under a business-as-usual scenario. The Scoping Plan breaks down the amount of GHG emissions reductions CARB recommends for each emissions sector of the State's GHG inventory but does not directly discuss GHG emissions generated by construction activities.

SB 97 (Stats. 2007, ch. 185)

Pursuant to SB 97, the State Office of Planning and Research prepared, and the Natural Resources Agency adopted, amendments to the State CEQA Guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions. Effective as of March 2010, the revisions to the CEQA Environmental Checklist Form (Appendix G) and the Energy Conservation Appendix (Appendix F) provide a framework to address global climate change impacts in the CEQA process; State CEQA Guidelines § 15064.4 was also added to provide an approach to assessing impacts from GHGs.

As discussed in State CEQA Guidelines § 15064.4, the determination of the significance of GHG emissions calls for a careful judgment by the lead agency, consistent with the provisions in § 15064. § 15064.4 further provides that a lead agency should make a good-faith effort, to the extent possible, on scientific and factual data, to describe, calculate, or estimate the amount of GHG emissions resulting from a project. A lead agency shall have discretion to determine, in the context of a particular project, whether to:

- Use a model or methodology to quantify GHG emissions resulting from a project and determine which model or methodology to use. The lead agency has discretion to select the model or methodology it considers most appropriate provided it supports its decision with substantial evidence. The lead agency should explain the limitations of the particular model or methodology selected for use; and/or
- Rely on a qualitative analysis or performance-based standards.

§ 15064.4 also advises a lead agency to consider the following factors, among others, when assessing the significance of impacts from GHG emissions on the environment: the extent to which the project may increase or reduce GHG emissions as compared to the existing environmental setting; whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project; and the extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions.

Other Legislation

AB 1493 (Stats. 2002, ch. 200) required CARB to develop and implement regulations (stricter emissions standards) to reduce automobile and light truck GHG emissions beginning with model year 2009.

AB 2800 (Stats. 2016, ch. 580) requires, in part, that state agencies, until 2020, take into account current and future climate change impacts when planning, designing, building, operating, maintaining, and investing in infrastructure.

SB 375 (Stats. 2008, ch. 728; effective 2009) required CARB to develop regional GHG emission reduction targets in regions covered by California's 18 metropolitan planning organizations and required them to develop regional land use and transportation plans and demonstrate an ability to attain the proposed reduction targets by 2020 and 2035.

SB 350 (Stats. 2015, ch. 547) establishes renewable energy and GHG reduction objectives to be achieved by 2030, including: to increase the Renewable Portfolio Standard from 33 percent to 50 percent for the procurement of California's electricity from renewable sources, a target that was accelerated in 2018; and to double the energy efficiency savings in electricity and natural gas end uses by retail customers.

SB 1383 (Stats. 2016, ch. 395) requires CARB to approve and begin implementing its Short-Lived Climate Pollutant Reduction Strategy by January 1, 2018, to achieve a 40 percent reduction in methane, 40 percent reduction in hydrofluorocarbon gases, and 50 percent reduction in anthropogenic black carbon by 2030, relative to 2013 levels.

SB 1425 (Stats. 2016, ch. 596) requires the California Environmental Protection Agency to oversee the development of a registry of GHG emissions resulting from the use of water, such as pumping, treatment, heating, and conveyance (the water-energy nexus), using the best available data.

SB 32 (Stats. 2016, ch. 249) codifies the GHG emissions target to 40 percent below the 1990 level by 2030.

SB 100 (Stats. 2018, ch. 312) establishes the policy that eligible renewable energy resources and zero-carbon resources supply 100 percent of retail sales of electricity to California end-use customers by December 31, 2045.

Executive Orders (Eos)

EO B-55-18 (Governor Brown, 2018) establishes a statewide goal for California to achieve carbon neutrality by 2045.

EO B-30-15 (Governor Brown, 2015) established a new interim statewide GHG emission reduction target to reduce GHG emissions to 40 percent below 1990 levels by 2030 to ensure California meets its target to reduce GHG emissions to 80 percent below 1990 levels by 2050. State agencies with jurisdiction over sources of GHG emissions to implement measures were also directed pursuant to statutory authority, to achieve GHG emissions reductions to meet the 2030 and 2050 targets.

EO S-21-09 (Governor Schwarzenegger, 2009) directed CARB to adopt a regulation consistent with the goal of EO S-14-08.

EO S-14-08 (Governor Schwarzenegger, 2008) required all retail suppliers of electricity in California to serve 33 percent of their load with renewable energy by 2020.

EO S-13-08 (Governor Schwarzenegger, 2008) directed state agencies to take specified actions to assess and plan for impacts of global climate change, particularly sea-level rise.

EO S-01-07 (Governor Schwarzenegger, 2007) set a low carbon fuel standard for California, and directed the carbon intensity of California's transportations fuels to be reduced by at least 10 percent by 2020.

EO S-3-05 (Governor Schwarzenegger, 2005) directed reductions in GHG emissions to 2000 levels by 2010, 1990 levels by 2020, and 80 percent below 1990 levels by 2050.

Hazardous and Radiological Materials

Radiological Materials (Federal)

Nuclear Waste Policy Act of 1982, as Amended

Establishes the federal government's responsibility to provide a place for the permanent disposal of high-level radioactive waste and spent nuclear fuel, and the generators' responsibility to bear the costs of permanent disposal. Amendments to the Act have focused the federal government's efforts, through the US Department of Energy, regarding a possible site at Yucca Mountain, Nevada.

Atomic Energy Act of 1954, as Amended

This Act is the fundamental US law on both the civilian and the military uses of nuclear materials. On the civilian side, it provides for both the development and the regulation of the uses of nuclear materials and facilities in the US, declaring the policy that "the development, use, and control of atomic energy shall be directed so as to promote world peace, improve the general welfare, increase the standard of living, and strengthen free competition in private enterprise." The Act requires that civilian uses of nuclear materials and facilities be licensed, and it empowers the NRC to establish by rule or order, and to enforce, such standards to govern these uses as "the Commission may deem necessary or desirable to protect health and safety and minimize danger to life or property." Commission action under the Act must conform to the Act's procedural requirements, which provide an opportunity for hearings and federal judicial review in many instances.

Under § 274 of the Act, the NRC may enter into an agreement with a state for discontinuance of the NRC's regulatory authority over some materials licensed within the State. The State must first show that its regulatory program is compatible with the NRC's and adequate to protect public health and safety. The NRC retains authority over, among other things, nuclear power plants within the State and exports from the State.

A major amendment to the Act established compensation for, and limits on, licensee liability for injury to off-site persons or damage to property caused by nuclear accidents.

Energy Reorganization Act of 1974

This Act established the NRC. Under the Atomic Energy Act of 1954, a single agency, the Atomic Energy Commission, had responsibility for the development and production of nuclear weapons and for both the development and the safety regulation of the civilian uses of nuclear materials. The Act of 1974 split these functions, assigning to one agency, now the US Department of Energy, the responsibility for the development and production of nuclear weapons, promotion of nuclear power, and other energy-related work, and assigning regulatory work to the NRC, which does not include regulation of defense nuclear facilities. The Act of 1974 gave the NRC its structure and established its major offices. The later amendment to the Act also provided protections for employees who raise nuclear safety concerns.

Low-Level Radioactive Waste Policy Amendments Act of 1985

Gives states the responsibility to dispose of low-level radioactive waste generated within their borders and allows them to form compacts to locate facilities to serve a group of states. The Act provides that the facilities will be regulated by the NRC or by states that have entered into agreements with the NRC under § 274 of the Atomic Energy Act. The Act also requires the NRC to establish standards for determining when radionuclides are present in waste streams in sufficiently low concentrations or quantities as to be "below regulatory concern."

Reorganization Plans

Reorganization Plan No. 1 of 1980 strengthened the executive and administrative roles of the NRC Chairman, particularly in emergencies, transferring to the Chairman "all the functions vested in the Commission pertaining to an emergency concerning a particular facility or materials ... regulated by the Commission." This Reorganization Plan also provided that all policy formulation, policy-related rulemaking, and orders and adjudications would remain vested with the full Commission.

Reorganization Plan No. 3 of 1970 gave the US Environmental Protection Agency a role in establishing "generally applicable environmental standards for the protection of the general environment from radioactive material." See 40 CFR Part 190 – Environmental Radiation Protection Standards for Nuclear Power Operations.

Safe Drinking Water Act

The USEPA's authority under the Safe Drinking Water Act sets Federal limits for drinking water contaminants. Water suppliers must provide water that meets these standards, called maximum contaminant levels. Some states have adopted the USEPA's drinking water standards as legally enforceable groundwater protection standards. These standards are often used in assessing laboratory test results of water from private wells. The USEPA has set a dose-based drinking water standard of 4 millirem or mrem (mrem is one thousandth of a rem, which is a unit of measure for large doses of radiation) per year based on a maximum contaminant level of 20,000 picocuries per liter (pCi/L) for tritium. If other similar radioactive materials are also present in the drinking water, the annual dose from all the materials combined shall not exceed 4 mrem per year. In 1991, USEPA used improved calculations to conclude a tritium concentration of 60,900 pCi/L would yield a 4 mrem per year dose. USEPA kept the 20,000 pCi/L value for tritium in its latest regulations (NRC, 2019).

Code of Federal Regulations, Title 10

Regulations regarding the decommissioning of NRC-licensed plants appear in the Code of Federal Regulations (a codification of the general and permanent rules published in the Federal Register by the executive departments and agencies of the federal government). Regulations related to the decommissioning of power reactors are found in Title 10, Energy, Chapter I—Nuclear Regulatory Commission. For example:

- Part 20. Standards for Protection Against Radiation. Relevant subparts include: 20.1402, Radiological criteria for unrestricted use; 20.1403, Criteria for license termination under restricted conditions; 20.1404, Alternate criteria for license termination; 20.1405, Public notification and public participation; 20.1406, Minimization of contamination;
- Part 50. Domestic Licensing of Production and Utilization Facilities. Relevant regulations to decommissioning include 50.75, Reporting and record keeping for decommissioning planning; and 50.82, Termination of license;
- Part 51. Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions. Relevant subparts that have impact to decommissioning are 51.53, Post-construction environmental reports; and 51.95, Post-construction environmental impact statements. These regulations state the technical and financial criteria for decommissioning licensed nuclear facilities. They address decommissioning, planning needs, timing, funding methods, and environmental review requirements.
- Part 71. Packaging and Transportation of Radioactive Material. These regulations establish (1) requirements for packaging, preparation for shipment, and transportation of licensed material; and the (2) procedures and standards for NRC approval of packaging and shipping procedures for fissile material and for the larger quantities of other licensed material.
- Part 72. Licensing Requirements for the Independent Storage of Spent Nuclear Fuel, High-Level Radioactive Waste, and Reactor Related Greater than Class C. The regulations in this part establish requirements, procedures, and criteria for the issuance of licenses to receive, transfer, and possess power reactor spent fuel, power reactor-related Greater than Class C waste, and other radioactive materials associated with spent fuel storage in an independent spent fuel storage installation and the terms and conditions under which the NRC will issue these licenses.
- Part 100. Reactor Site Criteria. The purpose of this part is to establish approval requirements for proposed sites for stationary power and testing reactors subject to part 50 or part 52 of this chapter. Primary factors that determine public health and safety must be identified and include the reactor design, construction and operation. Radiological doses from normal operation and postulated accidents must be acceptably low. Natural phenomena and potential man-made hazards are accounted for in the design of the plant. Siting and physical characteristics must be such that adequate security measures to protect the plant can be developed and that any significant impediment to the development of emergency plans are identified. The NRC's position is

that siting away from densely populated centers is an important factor in evaluating applications for site approval.

Code of Federal Regulations, Title 40, Protection of Environment

An important regulation for operations (which includes decommissioning) is 40 CFR Part 190 – Environmental Radiation Protection Standards for Nuclear Power Operations. This regulation limits the radiation releases and doses to the public from the normal operations of nuclear power plants and other uranium fuel cycle facilities (i.e., the facilities involved in the manufacture and use of uranium fuel for generating electrical power). The regulation sets limits on the annual dose equivalent to any member of the public to 25 millirems to the whole body, 75 millirems to the thyroid, and 25 millirems to any other organ. In addition, it specifies limits on the quantity of radioactive materials entering the general environment per gigawatt-year of electricity produced.

Code of Federal Regulations, Title 49, Transportation

Regulations important to shipping of hazardous and radioactive waste are found in Title 49, Transportation, Parts 171-177, General information, regulations, and definitions; Hazardous materials table, special provisions, hazardous materials, communications, emergency response information, and training requirements; Shippers–general requirements for shipments and packaging; Carriage by rail; Carriage by aircraft; Carriage by vessel; and Carriage by public highway.

Hazardous and Hazardous Materials (Federal)

California Toxics Rule (40 CFR 131)

In 2000, the USEPA promulgated numeric water quality criteria for priority toxic pollutants and other water quality standards provisions to be applied to waters in California to protect human health and the environment. Under Clean Water Act §303(c)(2)(B), the USEPA requires states to adopt numeric water quality criteria for priority toxic pollutants for which the USEPA has issued criteria guidance, and the presence or discharge of which could reasonably be expected to interfere with maintaining designated uses. These federal criteria are legally applicable in California for inland surface waters, enclosed bays, and estuaries.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (42 U.S.C., Ch. 103)

CERCLA, commonly known as Superfund, provides broad federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment. CERCLA establishes requirements concerning closed and abandoned hazardous waste sites, provides for liability of persons responsible for releases of hazardous waste at these sites, and establishes a trust fund to provide for cleanup when no responsible party could be identified. CERCLA was amended by the Superfund Amendments and Reauthorization Act on October 17, 1986.

National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (40 CFR 300)

Authorized under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA: 42 U.S.C. § 9605), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA: Pub. L. 99-499); and by Clean Water Act section 311(d), as amended by the Oil Pollution Act (Pub. L. 101-380), the NCP outlines requirements for responding to oil spills and hazardous substance releases. It specifies compliance, but does not require preparation of a written plan, and provides a comprehensive system for reporting, spill containment, and cleanup. Per 40 CFR 300.175 and 40 CFR 300.120, the US Coast Guard has responsibility for oversight of regional response for oil spills in “coastal zones.”

Occupational Safety and Health Act of 1970

Congress created the Occupational Safety and Health Administration (OSHA) to assure safe and healthful working conditions for working men and women by setting and enforcing standards and by providing training, outreach, education and assistance. OSHA has entered into an agreement with California under which California regulations cover all private sector places of employment within the state with certain exceptions; however, the safe decommissioning of nuclear power plants is covered. OSHA has authority to regulate employee exposures from all radiation sources not regulated by the NRC.

Oil Pollution Act (OPA) of 1990 (33 U.S.C. § 2712 et seq.)

The OPA requires owners and operators of facilities that could cause substantial harm to the environment to prepare and submit, and maintain up to date, plans for responding to worst-case discharges of oil and hazardous substances and for facilities and vessels to demonstrate that they have sufficient response equipment under contract to respond to and clean up a worst-case spill. The passage of the OPA motivated California to pass a more stringent spill response and recovery regulation and the creation of the Office of Spill Prevention and Response to review and regulate oil spill plans and contracts. The OPA includes provisions to expand prevention and preparedness activities, improve response capabilities, provide funding for natural resource damage assessments, ensure that shippers and oil companies pay the costs of spills that do occur, and establish an expanded research and development program. Pursuant to a Memorandum of Understanding established to divide areas of responsibility, the US Coast Guard is responsible for tank vessels and marine terminals, the USEPA for tank farms, and the Research and Special Programs Administration for pipelines; each of these agencies has developed regulations for its area of responsibility. In addition, the Secretary of Interior is responsible for spill prevention, oil spill contingency plans, oil spill containment and clean-up equipment, financial responsibility certification, and civil penalties for offshore facilities and associated pipelines in all federal and state waters.

Resource Conservation and Recovery Act (RCRA) (42 U.S.C. § 6901 et seq.)

The RCRA authorizes the USEPA to control hazardous waste from “cradle-to-grave” (generation, transportation, treatment, storage, and disposal). RCRA Hazardous and Solid Waste Amendments from 1984 include waste minimization, phasing out land disposal of hazardous waste, and corrective action for releases. The Department of Toxic Substances Control is the lead state agency for corrective action associated with RCRA facility investigations and remediation.

Toxic Substances Control Act (TSCA) (15 U.S.C. §§ 2601–2692)

The TSCA authorizes the USEPA to require reporting, record-keeping, testing requirements, and restrictions related to chemical substances and/or mixtures. It also addresses production, importation, use, and disposal of specific chemicals, such as polychlorinated biphenyls (PCBs), asbestos-containing materials, lead-based paint, and petroleum.

Other Relevant Laws, Regulations, and Recognized National Codes and Standards

33 CFR, Navigation and Navigable Waters regulates aids to navigation, vessel operations, anchorages, bridges, security of vessels, waterfront facilities, marine pollution financial responsibility and compensation, prevention and control of releases of materials (including oil spills) from vessels, ports and waterways safety, boating safety, and deep-water ports.

40 CFR Parts 109, 110, 112, 113, and 114 – The Spill Prevention Countermeasures and Control (SPCC) plans covered in these regulatory programs apply to oil storage and transportation facilities and terminals, tank farms, bulk plants, oil refineries, and production facilities, and bulk oil consumers (e.g., apartment houses, office buildings, schools, hospitals, government facilities). These regulations include minimum criteria for developing oil-removal contingency plans, prohibit discharge of oil such that applicable water quality standards would be violated, and address oil spill prevention and preparation of SPCC plans. They also establish financial liability limits and provide civil penalties for violations of the oil spill regulations.

46 CFR parts 1 through 599 and Inspection and Regulation of Vessels (46 U.S.C. Subtitle II Part B) provide that all commercial (e.g., passengers for hire, transport of cargoes, hazardous materials, and bulk solids) vessels operating offshore on specified routes (inland, near coastal, and oceans), including those under foreign registration, are subject to requirements applicable to vessel construction, condition, and operation. These regulations also allow for inspections to verify that vessels comply with applicable international conventions and US laws and regulations.

Act of 1980 to Prevent Pollution from Ships requires ships in US waters, and all US ships to comply with International Convention for the Prevention of Pollution from Ships (MARPOL).

Clean Water Act (see *Hydrology and Water Quality*)

Convention on the International Regulations for Preventing Collisions at Sea establishes "rules of the road" such as rights-of-way, safe speed, actions to avoid collision, and procedures to observe in narrow channels and restricted visibility.

Hazardous Materials Transportation Act (see *Transportation*)

Safety and Corrosion Prevention Requirements — ASME, National Association of Corrosion Engineers (NACE), ANSI

Hazardous and Radiological Materials (State)

Nuclear Power Plants

AB 361 (Stats. 2015, ch. 399) requires the Office of Emergency Services to convene through August 26, 2025, an independent peer review panel to conduct a review of enhanced seismic studies and surveys of the Diablo Canyon Units 1 and 2 power plant, including the surrounding areas of the facility and areas of nuclear waste storage.

Assembly Joint Resolution (AJR) 29 (Stats. 2016, ch. 112) urged Congress to pass the Interim Consolidated Storage Act of 2015 (H.R. 3643), and the US Department of Energy to implement the prompt and safe relocation of spent nuclear fuel from SONGS to a licensed and regulated interim consolidated storage facility.

Clean Coast Act of 2005 (SB 771; Stats. 2005, ch. 588)

This Act (effective January 1, 2006) includes requirements to reduce pollution of California waters from large vessels, such as by: prohibiting and reporting of discharges of hazardous wastes, other wastes, or oily bilge water into California waters or a marine sanctuary; and prohibiting and reporting discharges of grey water and sewage into California waters from vessels with sufficient holding-tank capacity or vessels capable of discharging grey water or sewage to available shore-side reception facilities.

Coastal Act Chapter 3 policies (see *Multiple Environmental Issues*)

Section 30232 of the Coastal Act addresses hazardous materials spills and states that "Protection against the spillage of crude oil, gas, petroleum products, or hazardous substances shall be provided in relation to any development or transportation of such materials. Effective containment and cleanup facilities and procedures shall be provided for accidental spills that do occur."

Lempert-Keene-Seastrand Oil Spill Prevention and Response Act (OSPRA) (Gov. Code, § 8670.1 et seq., Pub. Resources Code, § 8750 et seq., and Rev. & Tax. Code, § 46001 et seq.)

The OSPRA and its implementing regulations seek to protect state waters from oil pollution and to plan for the effective and immediate response, removal, abatement, and cleanup in the event of an oil spill. The Act requires applicable operators to prepare and implement marine oil spill contingency plans and to demonstrate financial responsibility, and requires immediate cleanup of spills, following the approved contingency plans, and fully mitigating impacts on wildlife. The Act assigns primary authority to the Office of Spill Prevention and Response (OSPR) within the CDFW to direct prevention, removal, abatement, response, containment, and cleanup efforts with regard to all aspects of any oil spill in the marine waters of the State; the California State Lands Commission is also provided with authority for oil spill prevention from and inspection of marine facilities and assists OSPR with spill investigations and response. Notification is required to the State Office of Emergency Services, which in turn notifies the response agencies, of all oil spills in the marine environment, regardless of size. The Act also created the Oil Spill Prevention and Administration Fund and the Oil Spill Response Trust Fund. Pipeline operators pay fees into the first of these funds for pipelines transporting oil into California across, under, or through marine waters.

OTHER

Hazardous Waste Control Act (Health & Saf. Code, ch. 6.5 & Cal. Code Regs., title 22 and 26) establishes criteria for defining hazardous waste and its safe handling, storage, treatment, and disposal (law is designed to provide cradle-to-grave management of hazardous wastes and reduce the occurrence and severity of hazardous materials releases).

Hazardous Material Release Response Plans and Inventory Law (Health & Saf. Code, ch. 6.95) is designed to reduce the occurrence and severity of hazardous materials releases. This State law requires businesses to develop a Release Response Plan for hazardous materials emergencies if they handle more than 500 pounds, 55 gallons, or 200 cubic feet of hazardous materials. In addition, the business must prepare a Hazardous Materials Inventory of all hazardous materials stored or handled at the facility over the above thresholds, and all hazardous materials must be stored in a safe manner.

California Code of Regulations, Title 8, Division 1 sets forth the Permissible Exposure Limit, the exposure, inhalation or dermal permissible exposure limit for numerous chemicals. Included are chemicals, mixture of chemicals, or pathogens for which there is statistically significant evidence, based on at least one study conducted in accordance with established scientific principles, that acute or chronic health effects may occur in exposed employees. Title 8 §§ 5191 and 5194 require a Hazard Communication Plan to ensure both employers and employees understand how to identify potentially hazardous substances in the workplace, understand the associated health hazards, and follow safe work practices.

California Code of Regulations, Title 19, Division 2 establishes minimum statewide standards for Hazardous Materials Business Plans.

California Code of Regulations, Title 22, Division 4.5 regulates hazardous wastes and materials by implementation of a Unified Program to ensure consistency throughout the state in administration requirements, permits, inspections, and enforcement by Certified Unified Program Agencies (CUPAs).

California Code of Regulations, Title 24, Part 9 (Fire Code regulations) – states hazardous materials should be used and storage in compliance with the state fire codes.

Porter-Cologne Water Quality Control Act (see *Hydrology and Water Quality*)

Seismic Hazards Mapping Act/Regulations (see *Geology, Soils, and Coastal Processes*)

California Executive Order (EO) D-62-02

EO D-62-02 (Governor Davis, September 2002) requires that the Water Boards shall, as soon as possible, take all steps necessary to impose a moratorium on the disposal of decommissioned materials into Class III landfills and unclassified waste management units, as described in Title 27, §§ 20260 and 20230, of the California Code of Regulations. Decommissioned materials are defined as materials with low residual levels of radioactivity that, upon decommissioning of a licensed site, may presently be released with no restrictions upon their use.

Hydrology and Water Quality

Hydrology and Water Quality (Federal)

Nuclear Energy Institute Industry Ground Water Protection Initiative (Nuclear Energy Institute 2007)

Under the Industry Ground Water Protection Initiative, each member company operating or decommissioning a nuclear power plant is required to develop and implement a site-specific/company ground water protection program to assure timely and effective management of situations involving inadvertent releases of licensed material to ground water and to implement voluntary communication programs The Industry Ground Water Protection Initiative guidance identifies actions necessary to achieve these goals, specifies objectives to accomplish each action, and specifies the acceptance criteria to demonstrate that the objectives have been met as identified in site procedures.

Federal Clean Water Act (CWA) (33 U.S.C. § 1251 et seq.)

The CWA is comprehensive legislation (it generally includes the Federal Water Pollution Control Act of 1972, its supplementation by the CWA of 1977, and amendments in 1981, 1987, and 1993) that seeks to protect the nation’s water from pollution by setting water quality standards for surface water and by limiting the discharge of effluents into waters of the US These water quality standards are promulgated by the USEPA and enforced in California by the State Water Resources Control Board (SWRCB) and nine Regional Water Quality Control Boards (RWQCBs). CWA sections include the following:

Section 303(d) (33 U.S.C. § 1313) requires states to list waters that are not attaining water quality standards, which is known as the 303(d) List of impaired waters. These requirements have led to the development of total maximum daily load (TMDL) guidance at the state level through the SWRCB and various RWQCBs.

Section 305(b) (33 U.S.C. § 1315) requires states to assess and report on the water quality status of waters within the states.

Section 316(b) (33 U.S.C. § 1326) was implemented by the SWRCB regulating the entrainment and impingement of marine life related to power generating facility intake structures. The policy establishes technology-based standards to reduce the harmful effects associated with ocean cooling water intake structures on marine and estuarine life. The policy applies to existing power plants that can withdraw from State coastal and estuarine waters using a single-pass system (“once-through cooling”). Closed-cycle wet cooling has been selected as best technology available. Permittees must either reduce intake flow and velocity or reduce impacts to aquatic life comparably by other means.

Section 401 (33 U.S.C. § 1341) specifies that any applicant for a federal permit or license to conduct any activity which may result in any discharge into the navigable waters of the US to obtain a certification or waiver thereof from the state in which the discharge originates that such a discharge will comply with established state effluent limitations and water quality standards. US Army Corps of Engineers projects are required to obtain this certification.

Section 402 (33 U.S.C. § 1342) establishes conditions and permitting for discharges of pollutants under the National Pollutant Discharge Elimination System) (NPDES). Under the NPDES Program, states establish standards specific to water bodies and designate the types of pollutants to be regulated, including total suspended solids and oil; all point sources that discharge directly into waterways are required to obtain a permit regulating their discharge. NPDES permits fall under the jurisdiction of the SWRCB or RWQCBs when the discharge occurs within state waters (out to 3 nautical miles).

Section 403 (33 U.S.C. § 1343) provides permit issuance guidelines for ocean discharge. Section 403 provides that point source discharges to the territorial seas, contiguous zone, and oceans are subject to regulatory requirements in addition to the technology – or water quality-based requirements applicable to typical discharges. These requirements are intended to ensure that no unreasonable degradation of the marine environment will occur as a result of the discharge and to ensure that sensitive ecological communities are protected.

Section 404 (33 U.S.C. § 1344) authorizes the US Army Corps of Engineers to issue permits for the discharge of dredged or fill material into waters of the US, including wetlands, streams, rivers, lakes, coastal waters or other water bodies or aquatic areas that qualify as waters of the US.

PG&E maintains NPDES Permit CA0003751, Order 90-09 for the DCPP (Central Coast RWQCB, 1990). This NPDES Permit and Order authorize discharge of brine and treated wastewater through dilution into the auxiliary cooling water system, which discharges approximately 2.55 billion gallons of water per day to the Pacific Ocean. These discharges must be tested for pollutants and other water quality parameters to achieve compliance with the regulations, and all discharges must be logged and reported to the local RWQCB. Discharges not authorized by this permit are considered a violation of NPDES and the Clean Water Act and are subject to penalties by the appropriate RWQCB.

Rivers and Harbors Act (33 U.S.C. § 401)

This Act governs specified activities in “navigable waters” (waters subject to the ebb and flow of the tide or that are presently used, have been used in the past, or may be susceptible for use to transport interstate or foreign commerce). § 10 provides that construction of any structure in or over any navigable water of the US, or the accomplishment of any other work affecting the course, location, condition, or physical capacity of such waters, is unlawful unless the US Army Corps of Engineers approves the work and issues a Rivers and Harbors Act section 10 Permit (which may occur concurrently with Clean Water Act § 404 permits).

National Flood Insurance Program

The National Flood Insurance Program, administered by the Federal Emergency Management Agency (FEMA), requires that local governments covered by federal flood insurance pass and enforce a floodplain management ordinance that specifies minimum requirements for any construction within the 100-year flood zone (FEMA, 2021). FEMA is responsible for preparing maps delineating these areas.

California Toxics Rule (40 CFR 131) (see *Hazardous and Radiological Materials*)

Coastal Zone Management Act (see *Multiple Environmental Issues*)

OTHER

Marine Plastic Pollution Research and Control Act prohibits the discharge of plastic, garbage, and floating wood scraps within 3 nautical miles of land. Beyond 3 nautical miles, garbage must be ground to less than 1 inch, but discharge of plastic and floating wood scraps is still restricted. This Act requires manned offshore platforms, drilling rigs, and support vessels operating under a federal oil and gas lease to develop waste management plans.

Navigation and Navigable Waters (33 CFR) regulations include requirements pertaining to prevention and control of releases of materials from vessels (e.g., oil spills), traffic control, and restricted areas, and general ports and waterways safety.

Oil Pollution Act (OPA) (see *Hazardous and Radiological Materials*)

Hydrology and Water Quality (State)

Porter-Cologne Water Quality Control Act (Wat. Code, § 13000 et seq.) (Porter-Cologne)

Porter-Cologne is the principal law governing water quality in California. The Act established the SWRCB and nine RWQCBs, which have primary responsibility for protecting water quality and beneficial uses of state waters. Porter-Cologne also implements many provisions of the federal Clean Water Act, such as the NPDES permitting program. Pursuant to Clean Water Act section 401, applicants for a federal license or permit for activities that may result in any discharge to waters of the US must seek a Water Quality Certification from the state in which the discharge originates; such Certification is based on a finding that the discharge will meet water quality standards and other appropriate requirements of state law. In California, RWQCBs issue or deny certification for discharges within their jurisdiction. The SWRCB has this responsibility where projects or activities affect waters in more than one RWQCB's jurisdiction. If the SWRCB or a RWQCB imposes a condition on its Certification, those conditions must be included in the federal permit or license. Plans that contain enforceable standards for the various waters they address include the following:

Basin Plan. Porter-Cologne (see § 13240) requires each RWQCB to formulate and adopt a Basin Plan for all areas within the region. Each RWQCB must establish water quality objectives to ensure the reasonable protection of beneficial uses, and an implementation program for achieving water quality objectives within the basin plan. In California, the beneficial uses and water quality objectives are the state's water quality standards. The Central Coast RWQCB Basin Plan designates beneficial uses for surface and groundwater, sets narrative and numeric water quality objectives, and establishes implementation programs for the Central Coast Region (Central Coast RWQCB, 2019).

California Ocean Plan (see § 13170.2) establishes water quality objectives for California's ocean waters and provides the basis for regulating wastes discharged into ocean and coastal waters. The plan applies to point and non-point sources. In addition, the Ocean Plan identifies applicable beneficial uses of marine waters and sets narrative and numerical water quality objectives to protect beneficial uses. The SWRCB first adopted this plan in 1972, and it reviews the plan at least every 3 years to ensure that current standards are adequate and are not allowing degradation to indigenous marine species or posing a threat to human health. In 2015, an amendment to the Ocean Plan was adopted to address effects associated with construction and operation of desalination facilities (SWRCB, 2015). The amendment allows for use of ocean water as a supplement to traditional water supplies while protecting marine life and water quality. The amendment provides a consistent process for permitting desalination facilities statewide, direction for regional water boards when permitting new or expanded facilities, and specific implementation and monitoring and reporting requirements.

Other: Water Quality Control Plan for Enclosed Bays and Estuaries of California; and Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California (Thermal Plan).

RWQCBs also oversee on-site treatment of "California Designated, Non-Hazardous Waste" and enforces water quality thresholds and standards set forth in the Basin Plan. Applicants may be required to obtain a General Construction Activities Storm Water Permit under the NPDES program, and develop and implement a Storm Water Pollution Prevention Plan (SWPPP) that includes best management practices to control erosion, siltation, turbidity, and other contaminants associated with construction activities. The SWPPP would include best management practices to control or prevent the release of non-storm water discharges, such as crude oil, in storm water runoff.

Coastal Act Chapter 3 policies (see Multiple Environmental Issues)

§ 30231 states that the biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of waste water discharges and entrainment, controlling runoff, preventing depletion of ground water supplies and substantial interference with surface water flow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.

Harbors and Navigation Code §§ 650-674

This code specifies a state policy to "promote safety for persons and property in and connected with the use and equipment of vessels," and includes laws concerning marine navigation that are implemented by local city and county governments. This Code also regulates discharges from vessels within territorial waters of the State of California to prevent adverse impacts on the marine environment. This code regulates oil discharges and imposes civil penalties and liability for cleanup costs when oil is intentionally or negligently discharged to the waters of the State of California.

California Fish and Game Code (CFGC)

§5650 prohibits discharge of harmful materials to waters of the state (CFGC, 2021). It is unlawful to deposit in, permit to pass into, or place where it can pass into California waters, any petroleum, acid, coal or oil tar, lampblack, aniline, asphalt, bitumen, or residuary product of petroleum; any carbonaceous material or substance; any refuse, liquid or solid, from a refinery, gas house, tannery, distillery, chemical works, mill, or factory of any kind; any sawdust, shavings, slabs, or edgings; any factory refuse, lime, or slag; any *cocculus indicus*;[1] or any substance or material deleterious to fish, plant, mammal, or bird life. CFGC § 5655 requires that parties responsible for polluting waters of the state pay for removal costs and environmental damages.

§§ 1600 to 1607 require CDFW notification for any activity that could affect the bank or bed of any stream that has value to fish and wildlife (CFCG, 2021). After notification, the CDFW has the responsibility for preparation of a Streambed Alteration Agreement, in consultation with the project proponent. The CDFW does not currently employ a formal definition of watercourses under its jurisdiction. The CDFW has jurisdiction over alterations to any channel with a definable bank and bed that is capable of accommodating water flow. Wetlands need not be present to establish CDFW jurisdiction. CDFW jurisdiction generally extends to work conducted within the 100-year floodplain.

Construction General Permit

In September 2009, the SWRCB adopted the *General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities*, Order No. 2009-009-DWQ, as amended by Order No. 2010-

[1] *Cocculus indicus* is prohibited based on the practice of grinding up the roots of certain *Cocculus* plants (most commonly Yucca plants) and spreading them in the water to "stun" fish for collection.

0014-DWQ and Order No. 2012-006-DWQ (Construction General Permit), which regulates stormwater from construction sites (SWRCB, 2012). Dischargers whose projects disturb 1 or more acres of soil or disturb less than 1 acre but are part of a larger common plan of development that in total disturbs one or more acres, are required to obtain coverage under the Construction General Permit. Construction activity subject to this permit includes clearing, grading and disturbances to the ground such as stockpiling. The permit requires development and implementation of a SWPPP. Typical best management practices contained in SWPPPs are designed to minimize erosion during construction, control sediment and pollutants from construction materials, and stabilize construction areas.

Industrial General Permit

In April 2014, the SWRCB adopted the *Statewide General Permit for Stormwater Discharges Associated with Industrial Activities*, Order No. 2014-0057-DWQ, as amended by Order No. 2015-0122-DWQ (Industrial General Permit), which regulates industrial storm water discharges and authorized non-storm water discharges from industrial facilities in California (SWRCB, 2018). Under the permit, facilities must meet effluent and receiving water limitations, develop and implement a SWPPP, and develop and implement a monitoring program to demonstrate compliance. DCPP currently operates under Industrial General Permit Waste Discharge Identification (WDID) No. 3 40I018248, which authorizes discharges of industrial stormwater to waters of the United States.

Sustainable Groundwater Management Act

The Sustainable Groundwater Management Act (SGMA), passed in 2014, created a framework for sustainable, local groundwater management in California called the California Department of Water Resources (2021). SGMA directed the California Department of Water Resources to identify groundwater basins for implementing the SGMA. Only high and medium priority basins are currently subject to SGMA requirements, including the requirement of Groundwater Sustainability Agencies to develop and implement Groundwater Sustainability Plans.

Marine Managed Areas Improvement Act.

This Act established the California Marine Managed Areas System, extended State Parks' management jurisdiction into the marine environment, and gives priority to MPAs adjacent to protected terrestrial lands. For example, more than 25 percent of the California coastline is within the State Park System.

OTHER

Clean Coast Act of 2005 (see *Hazardous and Radiological Materials*)

Lake and Streambed Alteration Program (Fish & Game Code, §§ 1600-1616) (see *Biological Resources*)

Water Code § 8710 requires that a reclamation board permit be obtained prior to the start of any work, including excavation and construction activities, if projects are located within floodways or levee sections. Structures for human habitation are not permitted within designated floodways.

Water Code § 13142.5 provides marine water quality policies stating that wastewater discharges shall be treated to protect present and future beneficial uses, and, where feasible, to restore past beneficial uses of the receiving waters. The highest priority is given to improving or eliminating discharges that adversely affect wetlands, estuaries, and other biologically sensitive sites; areas important for water contact sports; areas that produce shellfish for human consumption; and ocean areas subject to massive waste discharge.

Land Use and Planning (includes Agricultural Resources)

Land Use and Planning (Federal)

Coastal Zone Management Act (see *Multiple Environmental Issues*)

Land Use and Planning (State)

Submerged Lands Act

The State of California owns tide and submerged lands waterward of the ordinary high watermark. State law gives primary responsibility for determination of the precise boundary between these public tidelands and private lands, and administrative responsibility over state tidelands, to the CSLC. Access and use of state shoreline areas can be obtained through purchase or lease agreements.

Coastal Act Chapter 3 policies (see *Multiple Environmental Issues*)

California Coastal Act. The California Coastal Act establishes a comprehensive approach to govern land use planning along the entire California coast. The coastal zone is defined in Section 30103 of the Coastal Act as the following:

(a) "Coastal zone" means that land and water area of the State of California from the Oregon border to the border of the Republic of Mexico…extending seaward to the state's outer limit of jurisdiction, including all offshore islands, and extending inland generally 1,000 yards from the mean high tide line of the sea. In significant coastal estuarine, habitat, and recreational areas it extends inland to the first major ridgeline paralleling the sea or five miles from the mean high tide line of the sea, whichever is less, and in developed urban areas the zone generally extends inland less than 1,000 yards.

§ 30106. Construction and operation of DCPP required a Coastal Development Permit from the CCC, and its decommissioning will as well.

§ 30220 – Coastal areas suited for water-oriented recreational activities that cannot readily be provided at inland water areas shall be protected for such uses.

§ 30221 – Oceanfront land suitable for recreational use shall be protected for recreational use and development unless present and foreseeable future demand for public or commercial recreational activities that could be accommodated on the property is already adequately provided for in the area.

§ 30222 – The use of private lands suitable for visitor-serving commercial recreational facilities designed to enhance public opportunities for coastal recreation shall have priority over private residential, general industrial, or general commercial development, but not over agriculture or coastal-dependent industry.

§ 30223 – Upland areas necessary to support coastal recreational uses shall be reserved for such uses, where feasible.

§ 30224 – Increased recreational boating use of coastal waters shall be encouraged, in accordance with this division, by developing dry storage areas, increasing public launching facilities, providing additional berthing space in existing harbors, limiting non-water-dependent land uses that congest access corridors and preclude boating support facilities, providing harbors of refuge, and by providing for new boating facilities in natural harbors, new protected water areas, and in areas dredged from dry land.

Mineral Resources

Mineral Resources (Federal)

CFR, Titles 10, 18, and 30

10 CFR addresses energy consumption and the Department of Energy

18 CFR addresses the Federal Energy Regulatory Commission (FERC)

30 CFR establishes the Bureau of Ocean Energy Management, which manages energy resources in the Outer Continental Shelf

Mineral Resources (State)

Surface Mining and Reclamation Act (SMARA) (Pub. Resources Code, §§ 2710-2796).

The California Department of Conservation is the primary agency with regard to mineral resource protection. The Department, which is charged with conserving earth resources (Pub. Resources Code, §§ 600-690), has five program divisions: California Geological Survey (CGS); Division of Oil, Gas, and Geothermal Resources; Division of Land Resource Protection; State Mining and Geology Board (SMGB); and Division of Mine Reclamation. SMGB develops policy direction regarding the development and conservation of mineral resources and reclamation of mined lands. In accordance with SMARA, CGS classifies the regional significance of mineral resources and assists in designating lands containing significant aggregate resources. Four Mineral Resource Zones (MRZs) are designated to indicate the significance of mineral deposits.

MRZ-1 – Areas where adequate information indicates that no significant mineral deposits are present or where it is judged that little likelihood exists for their presence

MRZ-2 – Areas where adequate information indicates significant mineral deposits are present, or where it is judged that a high likelihood exists for their presence

MRZ-3 – Areas containing mineral deposits the significance of which cannot be evaluated from available data

MRZ-4 – Areas where available information is inadequate for assignment to any other MRZ

The Warren-Alquist Act

This act was adopted in 1974 to encourage conservation of non-renewable energy resources.

Noise

Noise (Federal)

Noise Control Act (42 U.S.C. § 4910) and NTIS 550\9-74-004, 1974

The Noise Control Act required the USEPA to establish noise emission criteria and noise testing methods (40 CFR Chapter 1, Subpart Q). These criteria generally apply to interstate rail carriers and to some types of construction and transportation equipment. In 1974, the USEPA provided guidance in NTIS 550\9-74-004, *Information on Levels of Environmental Noise Requisite to Protect Health and Welfare with an Adequate Margin of Safety* (see below).

NTIS 550\9-74-004, 1974

NTIS 550\9-74-004, *Information on Levels of Environmental Noise Requisite to Protect Health and Welfare with an Adequate Margin of Safety* (USEPA, 1974), commonly referenced as the "Levels Document," establishes an Ldn of 55 dBA as the requisite level, with an adequate margin of safety, for areas of outdoor uses including residences and recreation areas. The USEPA recommendations contain a factor of safety and do not consider technical or economic feasibility (i.e., the document identifies safe levels of environmental noise exposure without consideration for achieving these levels or other potentially relevant considerations), and therefore should not be construed as standards or regulations. These levels are not enforceable standards or regulations. They are provided in order to protect the public health and welfare, and to provide guidelines for the creation and implementation of local noise standards.

FHWA (Federal Highway Administration) Noise Standard 23 CFR 772 (23 U.S.C. 109(h))

The FHWA noise abatement criteria establish absolute exterior noise levels for varying land use categories where an impact is triggered. The noise abatement criteria require maintenance of Leq for noise levels emitted in lands classified categories "A" (lands for which serenity and quietness are significant), "B" (lands near sensitive receptors, defined as picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals) as 67 dBA, and "C" (developed lands, properties, or activities not included in categories "A" or "B") as 72 dBA.

Federal Transit Administration – Transit Noise and Vibration Impact Assessment Manual

This manual provides guidelines on allowable increases in cumulative noise levels due to high-speed rail projects. This guideline is not applicable to utility construction projects but indicates the increase in noise exposure that would have no impact, moderate impact, and severe impact based on the category of land use.

US Fish and Wildlife Endangered Species Act (ESA)

Under the ESA, "endangered" indicates that a species is at risk of extinction throughout at least a substantial portion of its geographic range. A species is considered to be 'threatened' when it is probable to become endangered within the foreseeable future. In accordance with this act the US Fish and Wildlife Service will identify potential impacts to federally endangered and threatened species and will determine whether an Incidental Take Authorization permit is required.

National Oceanic Atmospheric Administration (NOAA) – Fish under ESA and marine mammals under Marine Mammal Protection Act (MMPA)

The MMPA passed in 1972. This Act protects all marine mammals and makes it illegal to "take" any marine mammal without a permit, with "take" meaning to "harass, hunt, capture, kill, or attempt to harass, hunt, capture, or kill" (NOAA, 1972). The original MMPA did not include a definition of harassment, but the 1994 amendment included the definition as "any act of pursuit, torment, or annoyance," with two level of harassment defined based on National Research Council recommendations (NOAA, 1994).

- Level A harassment can potentially injure wild marine mammals or stocks.
- Level B harassment can potentially disturb wild marine mammals or stocks by disturbing behaviors, including sheltering, feeding, migrations, nursing, or breathing (NOAA, 1994).

National Research Council – Recommended Values for Level A and Level B Marine Mammal Acoustic Harassment (National Research Council, 2000)

The MMPA does not describe specific noise levels, which would be considered take or harassment.

However, the National Research Council has published recommended values for Level A and Level B marine mammal acoustic harassment.

- Level A: Level A acoustic harassment is recommended to be defined as sounds that result in a TTS (Temporary Threshold Shift) for the target marine mammal group. The preliminary criterion is that a TTS of 10 decibels (dB) or less, separated by 24-hour episodes of no exposure (i.e., to allow recovery), is not considered Level A acoustic harassment. Any exposure greater than these levels meets Level A harassment.
- Level B: Level B acoustic harassment is recommended to be defined as "the potential to disturb a marine mammal or marine mammal stock in the wild by causing meaningful disruption of biologically significant activities, including but not limited to, migration, breeding, care of young, predator avoidance or defense, and feeding". The NRC does not state a sound level criterion for the above disruptions and instead have proposed that the criteria used to determine whether species are undergoing Level B acoustic harassment should be the number of individuals or percent of the population potentially impacted and the risk to those individuals. Determining risk should also include the consideration of the proximity of critical habitat and the sensitivity of marine mammals.

Noise (State)

California Noise Control Act California Health and Safety Code §§ 46000 - 46080

The California Noise Control Act states that excessive noise is a serious hazard to public health and welfare. It declares that exposure to certain levels of noise can result in damage, whether it be psychological, physiological, or even economic. This act declares that the State of California is responsible for protecting the health and welfare of its citizens, and must control, prevent, and abate hazardous noise.

Noise Element Guidelines (referenced by the California Noise Control Act above and contained in updated General Plan Guidelines- Appendix D) as established by the Office of Noise Control in the State Department of Health Services

The state outlines acceptable community noise exposure levers for different land use categories and encourages local municipalities to adopt and apply community noise ordinances based on the acceptability of the CNELs (Community Noise Exposure Level).

For residences, an exterior noise level of 60 to 65 dBA CNEL is considered "normally acceptable;" a noise level of greater than 75 dBA CNEL is considered "clearly unacceptable."

For transient Lodging, an exterior noise level of 65 dBA CNEL is considered "normally acceptable;" a noise level of greater than 80 dBA CNEL is considered "clearly unacceptable."

For schools, libraries, churches, hospitals, and nursing homes, an exterior noise level of 70 dBA CNEL is considered "normally acceptable;" a noise level of greater than 80 dBA CNEL is considered "clearly unacceptable."

For auditoriums, concert halls, and amphitheaters, an exterior noise level of 70 dBA CNEL is considered "conditionally acceptable.”

For sports arenas, outdoor spectator sports, an exterior noise level of 75 dBA CNEL is considered "conditionally acceptable.”

For playgrounds and neighborhood parks, an exterior noise level of 70 dBA CNEL is considered "normally acceptable;" a noise level of greater than 72 dBA CNEL is considered "clearly unacceptable."

For golf courses, riding stables, water recreations, and cemeteries, an exterior noise level of 70 dBA CNEL is considered "normally acceptable;" a noise level of greater than 72 dBA CNEL is considered "clearly unacceptable."

For office buildings, an exterior noise level of 70 dBA CNEL is considered "normally acceptable;" a noise level of greater than 75 dBA CNEL is considered "normally unacceptable."

For industrial, manufacturing, utilities, and agriculture, an exterior noise level of 75 dBA CNEL is considered "normally acceptable;" a noise level of greater than 75 dBA CNEL is considered "normally unacceptable."

California Department of Transportation Construction-Induced Vibration Guidance

This guidance provides practical methodologies on addressing vibration issues associated with construction, operation, and maintenance of Caltrans projects. Continuous/frequent intermittent vibration sources are significant when the peak particle velocity (PPV) exceeds 0.1 inch per second.

OTHER

California Code of Regulations, Title 24 establishes CNEL 45 dBA as the maximum allowable indoor noise level resulting from exterior noise sources for multi-family residences.

California Code of Regulations, Title 21 applies to airports operating under permit from the Caltrans Division of Aeronautics, defines a noise-impacted zone as any residential or other noise-sensitive use with CNEL 65 and above.

Population and Housing

There are no major federal or State laws, regulations, and policies potentially applicable to the proposed Project.

Public Services and Utilities

Public Services and Utilities (Federal)

CFR Title 10, Part 73.55

10 CFR 73.55 outlines requirements that each nuclear power reactor licensee shall implement for the physical protection nuclear power reactors. Licensees must develop security plans that address site-specific conditions and maintain onsite physical protection. Vehicles inside the protected area must be operated by an individual authorized unescorted access to the area or must be escorted by an individual. Vehicle use inside the protected area must be limited to plant functions or emergencies, and keys must be removed, or the vehicle otherwise disabled, when not in use. Vehicles transporting hazardous materials inside the protected area must be escorted by an armed member of the security organization.

CFR Title 29

Under 29 CFR 1910.38, when required by an Occupational Safety and Health Administration (OSHA) standard, an employer must have an Emergency Action Plan that must be in writing, kept in the workplace, and available to employees for review. An employer with 10 or fewer employees may communicate the plan orally to employees. Minimum elements of an emergency action plan include the following procedures: Reporting a fire or other emergency; emergency evacuation, including type of evacuation and exit route assignments; employees who remain to operate critical plant operations before they evacuate; account for all employees after evacuation; and employees performing rescue or medical duties.

Under 29 CFR 1910.39, an employer must have a Fire Prevention Plan (FPP). A FPP must be in writing, be kept in the workplace, and be made available to employees for review; an employer with 10 or fewer employees may communicate the plan orally to employees.

Under 29 CFR 1910.155, Subpart L, Fire Protection, employers are required to place and keep in proper working order fire safety equipment within facilities.

Public Services and Utilities (State)

California Integrated Waste Management Act (AB 939; Stats. 1989, ch. 1095)

AB 939 mandates management of non-hazardous solid waste throughout California. Its purpose includes: reduce, recycle, and reuse solid waste generated in the state to the maximum extent feasible; improve regulation of existing solid waste landfills; ensure that new solid waste landfills are environmentally sound; streamline permitting procedures for solid waste management facilities; and specify local government responsibilities to develop and implement integrated waste management programs. AB 939 policies preferred waste management practices include the following. The highest priority is to reduce the amount of waste generated at its source (source reduction). Second is to reuse, by extending the life of existing products and recycling those wastes that can be reused as components or feed stock for the manufacture of new products, and by composting organic materials. Source reduction, reuse, recycling and composting are jointly referred to as waste diversion methods because they divert waste from disposal. Third is disposal by environmentally safe transformation in a landfill. All local jurisdictions, cities, and counties must divert 50 percent of the total waste stream from landfill disposal by the year 2000 and each year thereafter (with 1990 as the base year).

California Code of Regulations, Title 19 (Public Safety)

Title 19 sets standards for the prevention of fire and protection of property and life by the Seismic Safety Commission, Office of Emergency Services, and Office of the Fire Marshall. It also contains guidelines and standards for general fire, construction, explosives, emergency management, earthquakes, and fire.

Coastal Act Chapter 3 policies (see *Multiple Environmental Issues*)

§ 30250 – (a) New residential, commercial, or industrial development, except as otherwise provided in this division, shall be located within, contiguous with, or in close proximity to, existing developed areas able to accommodate it or, where such areas are not able to accommodate it, in other areas with adequate public services and where it will not have significant adverse effects, either individually or cumulatively, on coastal resources. In addition, land divisions, other than leases for agricultural uses, outside existing developed areas shall be permitted only where 50 percent of the usable parcels in the area have been developed and the created parcels would be no smaller than the average size of surrounding parcels.

(b) Where feasible, new hazardous industrial development shall be located away from existing developed areas.

(c) Visitor-serving facilities that cannot feasibly be located in existing developed areas shall be located in existing isolated developments or at selected points of attraction for visitors.

§ 30253 – New development shall do all of the following:

(a) Minimize risks to life and property in areas of high geologic, flood, and fire hazard.
(b) Assure stability and structural integrity, and neither create nor contribute significantly to erosion, geologic instability, or destruction of the site or surrounding area or in any way require the construction of protective devices that would substantially alter natural landforms along bluffs and cliffs.
(c) Be consistent with requirements imposed by an air pollution control district or the State Air Resources Board as to each particular development.
(d) Minimize energy consumption and vehicle miles traveled.
(e) Where appropriate, protect special communities and neighborhoods that, because of their unique characteristics, are popular visitor destination points for recreational uses.

§ 30254 – New or expanded public works facilities shall be designed and limited to accommodate needs generated by development or uses permitted consistent with the provisions of this division; provided, however, that it is the intent of the Legislature that State Highway Route 1 in rural areas of the coastal zone remain a scenic two-lane road. Special districts shall not be formed or expanded except where assessment for, and provision of, the service would not induce new development inconsistent with this division. Where existing or planned public works facilities can accommodate only a limited amount of new development, services to coastal-dependent land use, essential public services and basic industries vital to the economic health of the region, state, or nation, public recreation, commercial recreation, and visitor-serving land uses shall not be precluded by other development.

§ 30254.5 – Notwithstanding any other provision of law, the commission may not impose any term or condition on the development of any sewage treatment plant which is applicable to any future development that the commission finds can be accommodated by that plant consistent with this division.

Government Code, title 1, div. 5, ch. 3.1, Protection of Underground Infrastructure

Requires an excavator to contact a regional notification center at least 2 days prior to excavation of any subsurface installation. Any utility provider seeking to begin a project that may damage underground infrastructure can call Underground Service Alert, the regional notification center, which will notify utilities that may have buried lines within 1,000 feet of the project. Utility representatives are required to mark the specific location of their facilities within the work area prior to the start of project activities in the area.

California Executive Order (EO) D-62-02 (see *Hazardous and Radiological Materials*)

Recreation and Public Access

Recreation and Public Access (State)

Coastal Act Chapter 3 policies (see *Multiple Environmental Issues*)

§ 30210 – In carrying out the requirement of Section 4 of Article X of the California Constitution, maximum access, which shall be conspicuously posted, and recreational opportunities shall be provided for all the people consistent with public safety needs and the need to protect public rights, rights of private property owners, and natural resource areas from overuse.

§ 30211 – Development shall not interfere with the public's right of access to the sea where acquired through use or legislative authorization, including, but not limited to, the use of dry sand and rocky coastal beaches to the first line of terrestrial vegetation.

§ 30212 – (a) Public access from the nearest public roadway to the shoreline and along the coast shall be provided in new development projects except where: (1) it is inconsistent with public safety, military security needs, or the protection of fragile coastal resources, (2) adequate access exists nearby, or, (3) agriculture would be adversely affected. Dedicated accessway shall not be required to be opened to public use until a public agency or private association agrees to accept responsibility for maintenance and liability of the accessway. (…)

§ 30212.5 – Wherever appropriate and feasible, public facilities, including parking areas or facilities, shall be distributed throughout an area so as to mitigate against the impacts, social and otherwise, of overcrowding or overuse by the public of any single area.

§ 30213 – Lower cost visitor and recreational facilities shall be protected, encouraged, and, where feasible, provided. Developments providing public recreational opportunities are preferred. The commission shall not: (1) require that overnight room rentals be fixed at an amount certain for any privately owned and operated hotel, motel, or other similar visitor-serving facility located on either public or private lands; or (2) establish or approve any method for the identification of low or moderate income persons for the purpose of determining eligibility for overnight room rentals in any such facilities.

§30214 – (a) The public access policies of this article shall be implemented in a manner that takes into account the need to regulate the time, place, and manner of public access depending on the facts and circumstances in each case including, but not limited to, the following: (1) Topographic and geologic site characteristics. (2) The capacity of the site to sustain use and at what level of intensity. (3) The appropriateness of limiting public access to the right to pass and repass depending on such factors as the fragility of the natural resources in the area and the proximity of the access area to adjacent residential uses. (4) The need to provide for the management of access areas so as to protect the privacy of adjacent property owners and to protect the aesthetic values of the area by providing for the collection of litter. (b) It is the intent of the Legislature that the public access policies of this article be carried out in a reasonable manner that considers the equities and that balances the rights of the individual property owner with the public's constitutional right of access pursuant to Section 4 of Article X of the California Constitution. Nothing in this section or any amendment thereto shall be construed as a limitation on the rights guaranteed to the public under Section 4 of Article X of the California Constitution. (c) In carrying out the public access policies of this article, the commission and any other responsible public agency shall consider and encourage the utilization of innovative access management techniques, including, but not limited to, agreements with private organizations which would minimize management costs and encourage the use of volunteer programs.

§ 30220 – Coastal areas suited for water-oriented recreational activities that cannot readily be provided at inland water areas shall be protected for such uses.

§ 30221 – Oceanfront land suitable for recreational use shall be protected for recreational use and development unless present and foreseeable future demand for public or commercial recreational activities that could be accommodated on the property is already adequately provided for in the area.

§ 30222 – The use of private lands suitable for visitor-serving commercial recreational facilities designed to enhance public opportunities for coastal recreation shall have priority over private residential, general industrial, or general commercial development, but not over agriculture or coastal-dependent industry.

§ 30222.5 – Oceanfront land that is suitable for coastal dependent aquaculture shall be protected for that use, and proposals for aquaculture facilities located on those sites shall be given priority, except over other coastal dependent developments or uses.

§ 30223 – Upland areas necessary to support coastal recreational uses shall be reserved for such uses, where feasible.

Transportation

Transportation (Federal)

Hazardous Materials Transportation Act (HMTA) (49 U.S.C. § 5901)

The HMTA delegates authority to the US Department of Transportation to develop and implement regulations pertaining to the transport of hazardous materials and hazardous wastes by all modes of transportation. The USEPA's Hazardous Waste Manifest System is a set of forms, reports, and procedures for tracking hazardous waste from a generator's site to the disposal site. Applicable regulations are contained primarily in CFR Titles 40 and 49.

Ports and Waterways Safety Act

This Act provides the authority for the US Coast Guard to increase vessel safety and protect the marine environment in ports, harbors, waterfront areas, and navigable waters, including by authorizing the Vessel Traffic Service, controlling vessel movement, and establishing requirements for vessel operation.

American with Disabilities Act (ADA)

The ADA (1990) is a wide-ranging civil rights law that prohibits, under certain circumstances, discrimination based on disability. Pedestrian facility design must comply with the accessibility standards identified in the ADA, which applies to all projects involving new or altered pedestrian facilities. The scoping and technical provisions for new construction and alterations identified in the ADA Accessibility Guidelines (Sections 4.3, 4.7 and 4.8) can be used to help design pedestrian facilities that are ADA compliant. For example, Title II-6.600 of the Technical Assistance Manual states, "When streets, roads, or highways are newly built or altered, they must have ramps or sloped areas whenever there are curbs or other barriers to entry from a sidewalk or path." Certain facilities, such as historic buildings, may be exempt from ADA requirements.

Title 23 (Highways), CFR, §450.220

Requires each state to carry out a continuing, comprehensive, and intermodal statewide transportation planning process. This planning process must include the development of a statewide transportation plan and transportation improvement program that facilitates the efficient, economic movement of people and goods in all areas of the state.

Transportation (State)

California Vehicle Code

Chapter 2, article 3 defines the powers and duties of the California Highway Patrol, which enforces vehicle operation and highway use in the State. Caltrans is responsible for the design, construction, maintenance, and operation of the California State Highway System and the portion of the Interstate Highway System within State boundaries.

Caltrans has the discretionary authority to issue special permits for the use of California State highways for other than normal transportation purposes. Caltrans also reviews all requests from utility companies, developers, volunteers, nonprofit organizations, and others desiring to conduct various activities within the California Highway right of way. The Caltrans Highway Design Manual, prepared by the Office of Geometric Design Standards (Caltrans, 2019b), establishes uniform policies and procedures to carry out the state highway design functions of Caltrans. Caltrans has also prepared a Guide for the Preparation of Traffic Impact Studies (Caltrans, 2002). Objectives for the preparation of this guide include providing consistency and uniformity in the identification of traffic impacts generated by local land use proposals.

Harbors and Navigation Code §§ 650-674

This code specifies a policy to "promote safety for persons and property in and connected with the use and equipment of vessels," and includes laws concerning marine navigation that are implemented by local city and county governments. This Code also regulates discharges from vessels within territorial waters of the State of California to prevent adverse impacts on the marine environment. This code regulates oil discharges and imposes civil penalties and liability for cleanup costs when oil is intentionally or negligently discharged to state waters.

SB 730 (Stats. 2015, ch. 283)

Prohibits a freight train from operating in California unless it has a crew of at least two individuals.

Wildfire

Wildfire (Federal)

Federal Energy Regulatory Commission

The Federal Energy Regulatory Commission (FERC) requires utilities to adopt and maintain minimum clearance standards between vegetation and transmission voltage power lines. These clearances vary depending on voltage. In most cases, however, the minimum clearances required in state regulations (California Public Utilities Commission General Order 95) are greater than the federal requirement.

Federal Wildland Fire Management Policy

The Federal Wildland Fire Management Policy was developed in 1995 and updated in 2001 by the National Wildfire Coordinating Group, a federal multi-agency group that establishes consistent and coordinated fire management policy across multiple federal jurisdictions. An important component of the Federal Wildland Fire Management Policy is the acknowledgement of the essential role of fire in maintaining natural ecosystems.

National Fire Plan

The National Fire Plan is a Presidential Directive passed in 2000 as a response to severe wildland fires that had burned throughout the United States. The National Fire Plan focuses on reducing fire impacts on rural communities and assurance for sufficient firefighting capacity in the future. The plan is a long-term commitment based on cooperation and communication among federal agencies, states, local governments, tribes, and interested publics. There are five key areas addressed under the National Fire Plan including firefighting and preparedness, rehabilitation and restoration, hazardous fuels reduction, community assistance, and accountability.

International Fire Code

Created by the International Code Council, the International Fire Code addresses a wide array of conditions hazardous to life and property including fire, explosions, and hazardous materials handling or usage. The International Fire Code places an emphasis on prescriptive and performance-based approaches to fire prevention and fire protection systems. Updated every 3 years, the International Fire Code uses a hazards classification system to determine the appropriate measures to be incorporated to protect life and property (often these measures include construction standards and specialized equipment). The International Fire Code uses a permit system (based on hazard classification) to ensure that required measures are instituted.

North American Electric Reliability Corporation (NERC) Standards

The NERC is a nonprofit corporation comprising 10 regional reliability councils. The overarching goal of NERC is to ensure the reliability of the bulk power system in North America. To achieve its goal, the NERC develops and enforces reliability standards, monitors the bulk power systems, and educates, trains, and certifies industry personnel. NERC developed a transmission vegetation management program that is applicable to all transmission lines operated at 200 kV and above to lower voltage lines designated by the Regional Reliability Organization as critical to the reliability of the electric system in the region. The plan, which became effective on April 7, 2006, establishes requirements of the formal transmission vegetation management program, which include identifying and documenting clearances between vegetation and any overhead, ungrounded supply conductors, while taking into consideration transmission line voltage, the effects of ambient temperature on conductor sag under maximum design loading, fire risk, line terrain and elevation, and the effects of wind velocities on conductor sway.

Institute of Electrical and Electronics Engineers Standard 516-2003

The Institute of Electrical and Electronics Engineers is a leading authority in setting standards for the electric power industry. Standard 516-2003, Guide for Maintenance Methods on Energized Power Lines, establishes minimum vegetation-to-conductor clearances to maintain electrical integrity of the electrical system.

Wildfire (State)

California Fire Code

The California Fire Code is contained within Chapter 9 of Title 24 of the California Code of Regulations. The California Fire Code regulates the use, handling, and storage requirements for hazardous materials at fixed facilities. Similar to the International Fire Code, the California Fire Code and the California Building Code use a hazards classification system to determine the appropriate measures to incorporate to protect life and property.

California Health and Safety Code

State fire regulations are established in § 13000 of the California Health and Safety Code. This section establishes building standards, fire protection device equipment standards, high-rise building and child-care facility standards, interagency support protocols, and emergency procedures. Also, § 13027 states that the state fire marshal shall notify industrial establishments and property owners having equipment for fire protective purposes of the changes necessary to bring their equipment into conformity with and shall render them such assistance as may be available in converting their equipment to, standard requirements.

California Fire Plan

The California Fire Plan is the statewide plan for reducing the risk of wildfire by placing emphasis on fire prevention through means such as fuel reduction, zoning restrictions, and fire safety requirements. The Fire Plan seeks to reduce firefighting costs and property losses, increase firefighter safety, and contribute to ecosystem health.

California Public Utilities Commission (CPUC) General Order 95: Rules for Overhead Electric Line Construction

General Order (GO) 95 is the key standard governing the design, construction, operation, and maintenance of overhead electric lines in the State. It was adopted in 1941 and updated most recently in 2006. GO 95 includes safety standards for overhead electric lines, including minimum distances for conductor spacing, minimum conductor ground clearance, standards for calculating maximum sag, electric line inspection requirements, and vegetation clearance requirements.

Rule 31.2, Inspection of Lines, requires that lines be inspected frequently and thoroughly for the purpose of ensuring that they are in good condition, and that lines temporarily out of service be inspected and maintained in such condition as not to create a hazard.

Public Resources Code § 4291

Public Resources Code § 4291 provides that a person who owns, leases, controls, operates, or maintains a building or structure in, upon, or adjoining a mountainous area, forest-covered lands, brush-covered lands, grass-covered lands, or land that is covered with flammable material, shall at all times maintain defensible space of 100 feet from each side and from the front and rear of the structure, but not beyond the property line. The intensity of fuels management may vary within the 100-foot perimeter of the structure, with more intense fuel reductions being utilized between 5 and 30 feet around the structure, and the ember-resistant zone is required within 5 feet of the structure. Maintenance of fuels focuses primarily on removal of dead or dying woody vegetation and vegetative materials/debris.

California Code of Regulations Title 14, § 1299.03

§ 1299.03 of the California Code of Regulations cites Public Resources Code § 4291 (above) to define requirements for each defensible space "Zone" as follows: "Zone 1" extends 30 feet out from each building or structure, or to the property line, whichever comes first; "Zone 2" extends from 30 feet to 100 feet from each building or structure, but not beyond the property line. The vegetation treatment requirements for Zone 1 include removal of all dead or dying grass, plants, shrubs, trees, branches, leaves, weeds, and pine needles; removal of dead tree or shrub branches adjacent or overhanging buildings or structures; relocation of exposed firewood piles outside of Zone 1 unless they are completely covered in fire-resistant material; and removal of flammable vegetation and items adjacent or under combustible decks, balconies, and stairs. Vegetation treatment requirements for Zone 2 require creation of horizontal and vertical spacing among shrubs and trees; removal of dead and dying woody fuels; cutting of annual grasses and forbs; and requiring a minimum of 10 feet of clearance for all exposed wood piles.

California Department of Forestry and Fire Protection (CAL FIRE)

CAL FIRE is responsible for reducing wildfire-related impacts and enhancing California's resources. CAL FIRE responds to all types of emergencies including wildland fires and residential/commercial structure fires. This agency is responsible for the protection of approximately 31 million acres of private land within the state and, at the local level, is responsible for inspecting defensible space around private residences. CAL FIRE is the responsible agency for enforcing California fire safety codes included in the California Code of Regulations and California Public Resources Codes.

Coastal Act Chapter 3 Policies

Chapter 3, Article 6, § 30253 requires that new development shall minimize risks to life and property in areas of high geologic, flood, and fire hazard.

FREQUENTLY USED ACRONYMS AND ABBREVIATIONS

(see also List of Acronyms and Abbreviations in the Table of Contents)

§	Section
AB	Assembly Bill
ADA	American with Disabilities Act
AHPA	Archaeological and Historic Preservation Act
APCD	Air Pollution Control District
ARPA	Archaeological Resources Protection Act
BCDC	San Francisco Bay Conservation and Development Commission
BGEPA	Bald and Golden Eagle Protection Act
CAAQS	California Ambient Air Quality Standards
Cal. Code Regs.	California Code of Regulations
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CCAA	California Clean Air Act
CCC	California Coastal Commission
CCNM	California Coastal National Monument
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CESA	California Endangered Species Act
CFGC	California Fish and Game Code
CFR	Code of Federal Regulations
CGS	California Geologic Survey
CNEL	Community Noise Exposure Level
CO, CO_2, CO_2e	carbon monoxide, carbon dioxide, carbon dioxide equivalent
CPUC	California Public Utilities Commission
CRHR	California Register of Historical Resources
CSLC	California State Lands Commission
CWA	Clean Water Act
dB, dBA	decibels; A-weighted decibels
DCPP	Diablo Canyon Power Plant
EFH	Essential Fish Habitat
EO	Executive Order
ESA	Endangered Species Ace
FCAA	Federal Clean Air Act
Fed. Reg.	Federal Register
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FESA	Federal Endangered Species Act
FHWA	Federal Highway Administration
FPP	Fire Prevention Plan
FTA	Federal Transit Administration
GHG	greenhouse gas
GO	General Order
HAPs	hazardous air pollutants
HMTA	Hazardous Material Transportation Act
hp	horsepower

HRAs	health risk assessments
IBC	International Building Code
Ldn	Day/Night Average Noise Level
MARPOL	International Convention for the Prevention of Pollution from Ships
MBTA	Migratory Bird Treaty Act
MISA	Marine Invasive Species Act
MLPA	Marine Life Protection Act
MMPA	Marine Mammal Protection Act
MMT	million metric tons
MOTEMS	Marine Oil Terminal Engineering and Maintenance Standards
MOU	Memorandum of Understanding
MPA	Marine Protected Area
MRZ	Mineral Resource Zones
MSA	Magnuson-Stevens Fishery Conservation and Management Act
NAAQS	National Ambient Air Quality Standards
NACE	National Association of Corrosion Engineers
NAHC	Native American Heritage Commission
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NEHRP	National Earthquake Hazards Reduction Program
NEHRPA	National Earthquake Hazards Reduction Program Act
NERC	North American Electric Reliability Corporation
NHPA	National Historic Preservation Act
NISA	National Invasive Species Act
NIST	National Institute of Standards and Technology
NMFS	National Marine Fisheries Service
NOAA	National Oceanic Atmospheric Administration
NOx	Nitrogen Oxide
NPDES	National Pollutant Discharge Elimination System
NRC	US Nuclear Regulatory Commission
NRHP	National Register of Historic Places
OPA	Oil Pollution Act
OSHA	Occupational Safety and Health Administration
OSPR	Office of Spill Prevention and Response
OSPRA	Oil Spill Prevention and Response Act
pCi/L	picocuries per liter
PERP	Portable Equipment Registration Program
PM10, PM2.5	particulate matter 10 microns, 2.5 microns (or smaller)
P.L.	Public Law
ppm	parts per million
PPV	peak particle velocity
PRP	Paleontological Resources Preservation
Pub. Resources Code	Public Resources Code
RCRA	Resource Conservation and Recovery Act
RPS	Renewable Portfolio Standard
RWQCB	Regional Water Quality Control Board
SB	Senate Bill
SGMA	Sustainable Groundwater Management Act
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan

SMARA	Surface Mining and Reclamation Act
SMCAs	State Marine Conservation Areas
SMGB	State Mining and Geology Board
SMPs	State Marine Parks
SMRs	State Marine Reserves
SPCC	Spill Prevention Countermeasures and Control
SWPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TMDL	total maximum daily load
TSCA	Toxic Substances Control Act
TTS	Temporary Threshold Shift
U.S.C.	United States Code
USEPA	US Environmental Protection Agency
USFWS	US Fish and Wildlife Service
VOC	Volatile Organic Compounds
WDID	Waste Discharge Identification

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Appendix D

Air Quality Appendix

D1 Proposed Project AQ and GHG Emissions Phase 1

D2 Proposed Project AQ and GHG Emissions Phase 2

D3 CSLC Full Removal Alternative AQ and GHG Emissions

Appendix D1

Proposed Project AQ and GHG Emissions Phase 1

Appendix D1.1

Phase 1 Summary AQ and GHG Emissions

Annual and Maximum Quarterly Emissions Summary - SLOAPCD

Appendix for Phase 1 calcluations from PG&E, 2022A

Table 1.1 Annual Project Emissions Summary - SLOAPCD

	NOx	ROG	PM10	PM2.5	CO	SOx
	ton/year					
Total Project Emissions	26.27	2.51	2.80	1.18	51.41	0.10
	pounds/day					
Daily Maximum Emissions (Mitigated)	341.50	28.96	28.50	13.61	463.37	82.21

Table 1.2 Maximum Estimated Quarterly and Daily Emissions - SLOAPCD

Emission Source	ROG+NOx	Exhaust PM10	Fugitive PM10		ROG+NOx	Exhaust PM10
	tons/quarter				lb/day	
DCPP Decommissioning	8.5	0.07	0.52		214	5
DCPP Harbor Tugboat	0.3	0.01	0		13	0.4
Waste Transportation	3.1	0.01	3.38E-03		144	4
Total	**11.9**	**0.09**	**0.52**		**370**	**10**

Annual and Maximum Daily Emissions Summary - SBCAPCD

Table 1.3 Annual Project Emissions Summary - SBCAPD

	NOx	ROG	PM10	PM2.5	CO	SOx
	ton/year					
Total Project Emissions	0.64	0.09	0.02	0.02	3.03	0.01

Table 1.4 Maximum Estimated Daily Emissions Summary - SBCPACD

	NOx	ROG	PM10	PM2.5	CO	SOx
	pounds/day					
Total Project Emissions	6.32	0.76	0.24	0.17	24.30	0.06

Annual Project Emissions Summary - Other Districts

Table 1.5 Annual Project Emissions Summary - Other Air Districts

Air District	NOx	ROG	PM10	PM2.4	CO	SOx	NO_x + ROG
	ton/year						
VCAPCD	0.034	0.001	0.001	0.001	0.012	0.000	0.035
SCAQMD	0.143	0.003	0.005	0.003	0.034	0.001	0.146
SJVAPCD	0.054	0.001	0.003	0.001	0.008	0.000	0.055
MDAQMD	0.191	0.006	0.005	0.004	0.058	0.000	0.197

Total Project GHG Emissions in SLO County

Table 2.1 GHG Emissions by Project Year

Year	Activity Level	SLOCAPCD DCPP Onsite Decommissioning[1]	SLOCAPCD Waste Transportation[3]	SBCAPCD SMVRR Activities	SBCAPCD Waste Transportation	SJVAPCD Waste Transportation	SCAQMD Waste Transportation	VCAPCD Waste Transportation	MDAQMD Waste Transportation	Intl. Waste Transportation[6]		
		MT/yr										
2024	0.2%	132	322	659	10	25	36	4	47	1062		
2025	5.9%	3888	322	659	10	25	36	4	47	1062		
2026	9.7%	6392	322	659	10	25	36	4	47	1062		
2027	10.1%	6656	322	659	10	25	36	4	47	1062		
2028	6.7%	4415	322	659	10	25	36	4	47	1062		
2029	9.9%	6524	322	659	10	25	36	4	47	1062		
2030	7.8%	5140	322	659	10	25	36	4	47	1062		
2031	9.5%	6261	322	659	10	25	36	4	47	1062		
2032	11.1%	7315	322	659	10	25	36	4	47	1062		
2033	12.5%	8238	322	659	10	25	36	4	47	1062	10402	
2034	9.7%	6392	322	659	10	25	36	4	47	1062		
2035	6.7%	4415	322	659	10	25	36	4	47	1062		
		MT										
Total GHG Emissions by Activity		65770	3868	7904	116	296	437	51	563	12740	Total Project Amortized GHG Emissions (MT/yr)	91744
Total GHG Emissions by Activity Amortized Over Project Life		2631	155	316	5	12	17	2	23	510	3,670	

Notes:
1. DCPP Onsite Decommissioning GHG emissions were calculated by scaling the worst-case year for GHG emissions (2033) emissions based on activity level.
2. SLOAPCD Handbook calculation guidance for GHG calculations calls for amortizing GHG emissions over the length of the project life, which is prescribed as 25 years for industrial projects.
3. Waste transportation GHG emissions in SLOAPCD include truck travel, tugboat emissions along the barge route within SLO County, and tug maneuvering in DCPP harbor.
4. Waste transportation throughout each air district will not be of the same magnitude throughout the entire project. To present a conservative estimate, it has been assumed that the annual emissions calculated for each air district will be emitted during each year of the Project.
5. Total Project Amortized GHG emissions includes subtraction of baseline GHG emission values as shown in Table 12.1
6. Waste transportation GHG Emissions from barge to OR.

Baseline Onsite GHG Emissions Estimate

Table 2.2 Baseline GHG Emission Summary

Source	Annual Emissions Mobile	Annual Emissions Stationary	Annual Emissions Total
	MT CO2e/yr		
Mobile Source	4,728	613	**5,341**

Table 2.3 Baseline Mobile Source GHG Emissions

				Daily Emissions (g/day) CO2	CH4	N2O	CO2e	Annual CO2e
	trips/day	miles/trip	daily miles	1	28	298	<-- GWP	MTCO2e/year
Worker Trips	2800	20	56000	12883151	94	224	12952655	4727.72

Table 2.4 Baseline Stationary Source GHG Emissions

	Year	Gallons of Diesel fuel burned	Average gallons burned /year	MT CO2e / year
Diesel fuel burne	2021	60,217	60,079	613.19
	2020	43,027		
	2019	76,992		

Sidebar: Energy Consumption Equivalent, Phase 1 Barrels of Oil

MT CO2e/year	Gallons of oil	Barrels of oil	Barrels of oil per year (8 years)
91,744	8,994,476	214,154	26,769

	LDA	LDT1	LDT2
CH4_RUNEX	0.00167	0.003702	0.003358
CO2_RUNEX	230.056263	278.928466	298.12304
N20_RUNEX	0.004008	0.005987	0.006359

Units
g/mile RUNEX

Conversions
73.96 kgCO2e/mmBtu of diesel
0.138 mmBtu/gallon of diesel
1000 kg/ton
* Conversions from from 40 CFR 98 - https://www.ecfr.gov/current/title-40/part-98/subpart-C/appendix-Table%20C-1%20to%20Subpart%20C%20of%20Part%2098

DCPP Construction Emissions

Table 3.1 DCPP Unmitigated Construction Emissions for Both Worst-Case Years (2026 and 2033)

Year	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	CO2e	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	CO2e
	tons/yr										MT/yr	pounds/day										
2026	3.32	20.47	26.57	0.07	2.00	0.75	2.75	0.47	0.71	1.19	6371	43.62	282.94	357.08	0.83	19.04	10.39	29.44	4.48	9.89	14.64	78646.55
2033	3.94	16.37	34.35	0.09	1.37	0.37	1.73	0.30	0.37	0.68	8238	41.02	191.48	364.18	0.94	13.27	3.86	17.14	2.95	4.86	8.09	92663.21

Table 3.2 DCPP Mitigated Construction Emissions for Both Worst-Case Years (2026 and 2033)

Year	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	CO2e	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	CO2e
	tons/yr										MT/yr	pounds/day										
2026	1.34	12.49	35.13	0.07	2.00	0.27	2.27	0.47	0.27	0.75	6371	16.02	197.98	426.67	0.83	19.04	4.22	23.26	4.48	4.21	8.97	78646.55
2033	1.22	13.72	43.93	0.09	1.37	0.36	1.73	0.30	0.36	0.67	8238	12.99	177.92	456.99	0.94	13.27	4.70	17.98	2.95	4.70	7.93	10663.21

Notes:

1. Source of information - CalEEMod outputs for each respective model run. Daily emissions (pounds/day) are the maximum of the summer and winter CalEEMod runs. Plus scraper emissions calculated in Table 3.7
2. 9 hour working days to account for breaks and start up/shut down time for equipment
3. 2026 emissions - mixed Tier 3 and Tier 4 Final to account for different tiered engines coming into fleet mix by 2026.
   - For equipment with HP < 100: assumed Tier 4 Interim designation
   - For equipment with HP > 100: assumed Tier 4 Final designation
   - Tractors/Loaders/Backhoes had pieces of equipment with HP greater than and less than 100HP; used Tier 3 designation for all pieces of equipment in this category to be conservative.
4. 2033 emissions - mixed Tier 4 Interim and Tier 4 Final to account for different tiered engines coming into fleet mix by 2033.
   - For equipment with HP < 50: assumed Tier 4 Interim designation
   - For equipment with HP > 50: assumed Tier 4 Final designation

Table 3.3 DCPP Maximum Quarterly Emissions - Outputs from CalEEMod Plus Scraper Emissions

Year	Quarter	Max Unmitigated ROG + NOx	Max Mitigated ROG + NOx
		tons/qtr	tons/qtr
2026	1	10.913	5.509
2026	2	9.689	4.950
2026	3	12.564	7.621
2026	4	13.168	8.484
2033	1	9.882	7.108
2033	2	9.571	7.429
2033	3	10.285	7.684
2033	4	9.843	6.603

Notes:

1. Underlined values are maximum quarterly emissions for each modeled year. Highest occurring value used as conservative estimate of construction-related ROG+NOx emissions for impact analysis.

Table 3.4 DCPP Maximum Quarterly Emissions - Calculated PM Emissions

Year	Unmitigated Exhaust PM	Unmitigated Fugitive PM10	Mitigated Exhaust PM	Mitigated Fugitive PM10
	tons/qtr			
2026	0.188	0.501	0.068	0.500
2033	0.092	0.341	0.090	0.341

Notes:
1. Calculated based on annual CalEEMod outputs for unmitigated and mitigated exhaust PM10 and fugitive PM10 in Tables 3.1 and 3.2
2. Underlined values are estimated maximum quarterly emissions for each modeled year. Highest occurring value used as conservative estimate of construction related exhaust PM and fugitive PM10 emissions for impact analysis.

Table 3.5 DCPP Fugitive Dust Emissions from Material Loading/Handling

	Material Amount		Emission Factors		Daily Emissions		Quarterly Emissions		Annual Emissions	
			PM10	PM2.5	PM10	PM2.5	PM10	PM2.5	PM10	PM2.5
	ton/day	ton/year	lb/ton	lb/ton	lb/day	lb/day	ton/qtr	ton/qtr	ton/yr	ton/yr
Material unloading	1,042	216,686	0.00015	0.000022	1.51E-01	2.29E-02	3.94E-03	5.96E-04	1.57E-02	2.38E-03

Notes:
1. Calculation methodology source: AP-42 p. 13.2.4-3
2. Represents dust from materials handling for cut and fill balance of grading
3. Emission factor (lb/ton) = (k)(0.0032)[(U/5)^1.3]/[(M/2)^1.4]
    k = Particle size constant (0.35 for PM10 and 0.053 for PM2.5)
    U = average wind speed = 3.2 m/s for SLO County (7.158 miles/hour [mph]) (CalEEMod default)
    M = moisture content = 12% (CalEEMod default)
4. Parameters

Material to be Lifted and Dropped Across the Site

Source	Cubic yards	
Material for Cut and Fill across Site	943,966	
Materials for Filling Tunnels	196,000	
Material for Filling Discharge Structure	18,740	
Estimated Total Material	1,158,706	
Assumed Material Handling Quantity for Fugitive Dust Emissions	**1,200,000**	For conservative estimate, rounded estimated total material up to nearest one hundred thousand.

Item	Value	Unit	
Material to be used for cut and fill balance of grading	1,200,000	CY	
Material density	1.26	ton/CY	
Duration of material handling activities	7.00	years	Material handling period 2027-2034
Estimated annual material handling quantity	216,686	ton/yr	
Estimated daily material handling quantity	1,042	ton/day	Based on 4 days/week, 52 weeks/yr

Table 3.6 DCPP Fugitive Dust Emissions from Grading

	Disturbed Area Onsite[1]	Acreage Graded/day[2]	Number of Days to Grade Site[3]	Grader VMT		Emission Factors		Daily Emissions		Quarterly Emissions		Annual Emissions	
						PM10	PM2.5	PM10	PM2.5	PM10	PM2.5	PM10	PM2.5
	acres	acres/day	days	miles/day	miles/yr	lb/VMT	lb/VMT	lb/day	lb/day	ton/qtr	ton/qtr	ton/yr	ton/yr
Grading	101	0.5	202	0.34	69.4375	1.54	0.17	5.30E-01	5.73E-02	1.34E-02	1.45E-03	5.36E-02	5.78E-03

Notes:
1. Disturbed area onsite based on Grading Plan.
2. Acreage graded per day assumes grader for equipment type per CalEEMod User Guide, Appendix A, Section 4.3.
3. Number of days to grade the site assumes grader is operated continuously until estimated disturbed area is graded. This results in a conservative annual estimate because grading activities are anticipated to occur over 2027-2034 (7 years) during material handling activities.
4. Calculation methodology source: AP-42 p. 11.9-5 as cited by CalEEMod User Guide, Appendix A, section 4.3
5. Grader Emission factors calculated as follows:
    EF (PM10) = (0.6)*(0.051)*S^2
    EF (PM2.5) = (0.031)*(0.04)*S^2.5

Where:
    EF = emission factor (lb/VMT)
    S = mean vehicle speed (mph). AP-42 default is 7.1 mph
    F (PM2.5) = PM2.5 scaling factor = 0.031 (AP-42 default)
    F (PM10) = PM10 scaling factor = 0.6 (AP-42 default)

6. Grader VMT calculated based on:
    VMT = As/Wb*43,560 (sqft/acres) / 5,280 (ft/mile)

Where:
    VMT = vehicle miles traveled (miles)
    As = the acreage of the grading site (acres)
    Wb = blade width = 12 ft (CalEEMod default)

5. Scraper Emission factors calculated as follows:

Table 3.7 DCPP Emissions from Scraping

				Scraper Emission Factors								
		Scaper Load Fac	0.48	ROG	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	
		scraper hp	367	g/bhp-hr								
		Scapers	2024[4]	0.25	2.48	1.92	0.01	0.10	0.09	472.85	0.15	
				Scraper Emissions								
				ROG	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	CO2e
	Disturbed Area Onsite[1]	Acreage Graded/day[2]	Number of Days to Grade Site[3]	pounds/day								
				0.76	7.70	5.97	0.02	0.30	0.28	1469.10	0.48	1482.406
	acres	acres/day	days	tons/year								
Scraping	101	1	101	0.04	0.39	0.30	0.00	0.02	0.01	74.19	0.02	74.86153

Notes:
1. Disturbed area onsite based on Grading Plan.
2. Material graded per day assumes scraper for equipment type per CalEEMod User Guide, Appendix A, Section 4.3.
3. Number of days to grade the site assumes grader is operated continuously until estimated disturbed area is graded. This results in a conservative annual estimate because grading activities are anticipated to occur over 2027-2034 (7 years) during material handling activities.
4. Used 2024 Emission Factor Values from CalEEMod 2020.4.0 Appendix D

Gram to Pound
0.00220462
pounds to tons
0.0005

Table 3.8 DCPP Unmitigated Construction Emissions for Both Worst-Case Years (2026 and 2033) CalEEMod Output

Year	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	CO2e	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	CO2e
	tons/yr										MT/yr	pounds/day										
2026	3.28	20.08	26.27	0.07	1.99	0.75	2.74	0.47	0.71	1.18	6296	42.85	275.24	351.12	0.82	18.74	10.39	29.13	4.48	9.89	14.37	77164
2033	3.90	15.98	34.05	0.09	1.35	0.37	1.72	0.30	0.37	0.67	8163	40.26	183.79	358.21	0.93	12.97	3.86	16.83	2.95	4.86	7.81	91181

Table 3.9 DCPP Mitigated Construction Emissions for Both Worst-Case Years (2026 and 2033) CalEEMod Output

Year	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	CO2e	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	CO2e
	tons/yr										MT/yr	pounds/day										
2026	1.30	12.10	34.82	0.07	1.99	0.27	2.26	0.47	0.27	0.74	6296	15.26	190.28	420.71	0.82	18.74	4.22	22.96	4.48	4.21	8.69	77164
2033	1.18	13.33	43.63	0.09	1.35	0.36	1.71	0.30	0.36	0.66	8163	12.23	170.22	451.02	0.93	12.97	4.70	17.67	2.95	4.70	7.65	9181

Notes:

1. Source of information - CalEEMod outputs for each respective model run. Daily emissions (pounds/day) are the maximum of the summer and winter CalEEMod runs.
2. 9 hour working days to account for breaks and start up/shut down time for equipment
3. 2026 emissions - mixed Tier 3 and Tier 4 Final to account for different tiered engines coming into fleet mix by 2026.
    For equipment with HP < 100: assumed Tier 4 Interim designation
    For equipment with HP > 100: assumed Tier 4 Final designation
    Tractors/Loaders/Backhoes had pieces of equipment with HP greater than and less than 100HP; used Tier 3 designation for all pieces of equipment in this category to be conservative.
4. 2033 emissions - mixed Tier 4 Interim and Tier 4 Final to account for different tiered engines coming into fleet mix by 2033.
    For equipment with HP < 50: assumed Tier 4 Interim designation
    For equipment with HP > 50: assumed Tier 4 Final designation
5. Tables 3.8 and 3.9 do not include scraper emissions

Table 3.3 DCPP Maximum Quarterly Emissions - Outputs from CalEEMod

Year	Quarter	Max Unmitigated ROG + NOx	Max Mitigated ROG + NOx
		tons/qtr	tons/qtr
2026	1	5.072	2.160
2026	2	3.849	1.600
2026	3	6.724	4.271
2026	4	7.327	5.135
2033	1	4.911	3.481
2033	2	4.601	3.802
2033	3	5.315	4.057
2033	4	4.872	2.976

Santa Barbara County Emissions

Table 4.1 Emissions in Santa Barbara County via Betteravia Railyard

Emission Source	NOx	ROG	PM10	PM2.5	CO	SO2	NOx	ROG	PM10	PM2.5	CO	SO2
	tons/year						pounds/day					
Onsite Equipment	4.04E-01	7.28E-02	1.36E-02	1.58E-02	2.69E+00	5.73E-03	3.10	0.56	0.17	0.12	20.63	0.04
Railcar Mover	1.70E-01	1.44E-02	2.56E-03	2.48E-03	3.12E-01	1.08E-03	1.63	0.14	0.02	0.02	2.99	0.01
Truck Transport	2.75E-03	9.37E-05	9.60E-05	4.59E-05	1.29E-03	1.15E-05	0.95	0.033	0.031	0.014	0.453	0.0040
Rail Transport	6.70E-02	2.48E-03	1.45E-03	1.41E-03	2.41E-02	8.69E-05	0.64	0.02	0.01	0.01	0.23	0.001
Total	**0.6439**	**0.0897**	**0.0177**	**0.0197**	**3.0270**	**0.0069**	**6.3**	**0.8**	**0.2**	**0.2**	**24.3**	**0.1**

SMVRR Onsite Equipment Emissions

Table 4.2 SMVRR Mitigated Daily Emissions from Onsite Equipment

Year	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	CO2e
	pounds/day										
2024	**5.61E-01**	**3.10E+00**	**2.06E+01**	**4.40E-02**	**6.32E-02**	**1.04E-01**	**1.68E-01**	**1.68E-02**	**1.04E-01**	**1.21E-01**	**4.68E+03**
2025	5.60E-01	3.09E+00	2.06E+01	4.40E-02	6.32E-02	1.04E-01	1.68E-01	1.68E-02	1.04E-01	1.21E-01	4.68E+03
2026	5.58E-01	3.09E+00	2.06E+01	4.40E-02	6.32E-02	1.04E-01	1.68E-01	1.68E-02	1.04E-01	1.21E-01	4.68E+03
2027	5.57E-01	3.09E+00	2.06E+01	4.40E-02	6.32E-01	1.04E-01	1.68E-01	1.68E-02	1.04E-01	1.21E-01	4.68E+03
2028	5.56E-01	3.09E+00	2.06E+01	4.39E-02	6.32E-02	1.04E-01	1.68E-01	1.68E-02	1.04E-01	1.21E-01	4.67E+03

Note:
1. Taken from SMVRR Winter CalEEMod run (see CalEEMod Outputs tab)
2. Maximum emissions are denoted in **bold underline.**

Table 4.3 SMVRR Mitigated Annual Emissions from Onsite Equipment

Year	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	CO2e
	tons/year										MT/year
2024	6.17E-03	4.08E-03	2.27E-01	4.80E+00	6.80E-04	1.15E-03	1.88E-03	8.00E-05	1.15E-03	1.34E-03	4.67E+01
2025	**7.28E-02**	**4.04E-01**	**2.69E+00**	**5.73E-03**	**8.06E-03**	**1.36E-02**	**1.36E-02**	**2.14E-03**	**1.36E-02**	**1.58E-02**	**5.54E+02**
2026	7.26E-02	4.04E-01	2.69E+00	5.73E-03	8.06E-03	1.36E-02	2.17E-02	2.14E-03	1.37E-02	1.58E-02	5.54E+02
2027	7.24E-02	4.03E-01	2.69E+00	5.73E-03	8.06E-03	1.36E-02	2.17E-02	2.14E-03	1.36E-02	1.58E-02	5.54E+02
2028	7.06E-02	3.94E-01	2.62E+00	5.60E-03	7.87E-03	1.33E-02	2.12E-02	2.09E-03	1.33E-02	1.54E-02	5.41E+02

Notes:
1. Based on equipment in Equipment Assumptions tab. Emissions resulting from the use of only one railyard is presented here.
2. Rail transport scheduled to occur 2024-2029; this schedule is included in the CalEEMod inputs.
3. Source of information - SMVRR Generators_Annual.pdf
4. Assumes 4 hours/day operating schedule based on potential number of trucks that will need to be unloaded per day using the gantry lift system that the generators will power.
5. Mitigated emissions account for Tier 4 final for equipment >100 hp and Tier 4 interim for equipment <100 hp.
6. Maximum emissions are denoted in **bold underline.**

SMVRR Railcar Mover Emissions

Table 4.4 SMVRR Railcar Mover Estimated Annual Emissions

Railyard	Annual Emissions							Maximum Daily Emissions						
	NOx	ROG	PM10	PM2.5	CO	SOx	CO2e	NOx	ROG	PM10	PM2.5	CO	SOx	CO2e
	ton/year						MT/year	pounds/day						
Betteravia	0.170	0.014	0.003	0.002	0.312	0.001	104.742	1.634	0.138	0.025	0.024	2.990	0.010	1107.137

Notes:
1. Assumes 3 hours per day and 4 days per week throughout Period 1 (2024-2029) of waste transport when waste is anticipated to be shipped to SMVRR for transport by rail.
2. Assumes fuel consumption of 15 gal/hr based on comparable equipment. https://www.petersonpower.com/sites/power/files/paragraphs/document/C7.1%20200kW%20TSS%20LEHE1585-00.pdf
3. See Rail Emissions for further information.

Appendix D1.2

Phase 1 Truck Emissions SLO County

Emission Summary

Table 5.1a Annual Truck Emissions SLO County Summary

	Annual Emissions						
	NOx	ROG	PM10	PM2.5	CO	SO2	CO_2e
	ton/year						MT/year
Direct Truck (maximum)	0.30	0.0044	0.014	0.01	0.05	0.00	166.81
Truck to SMVR	0.29	0.0042	0.013	0.01	0.05	0.00	159.52

Notes:
1. Maximum includes all truck emissions occurring in the same year. Not actually the case because some routes/destinations are in Period 1 vs Period 2.

Table 5.1b Daily Truck Emissions SLO County Summary

	Daily Emissions						
	NOx	ROG	PM10	PM2.5	CO	SO2	CO_2e
	lb/day						
Direct Truck (maximum)	9.26	0.14	0.43	0.19	1.58	0.05	5667.53
Truck to SMVR	7.23	0.13	0.32	0.14	1.52	0.04	4307.46

Truck Trip Information

Table 5.2 Long Haul Trucks

Trip Number	Truck Type	Waste Type	Waste Route[1]	Number of Shipments	Weight per Shipment	Total Weight
				no. trips	tons/shipment	tons
1	Long Haul Truck	Hazardous/Regulated	Nevada	277	20	5519
2	Long Haul Truck	Radioactive waste (Class B&C)	Andrews, TX (WCS)	10	37	370
3a	Long Haul Truck	Large Component Class A	Clive, UT	20	125	2503
3b	Long Haul Truck	Large Component Class A	Andrews, TX (WCS)	20	125	2503
3c.1	Long Haul Truck	Large Component Class A	SMVRR - Betteravia	20	125	2503
4a	Crawler truck	Large Component Class A	Clive, UT	126	125	5257
4b	Crawler truck	Large Component Class A	Andrews, TX (WCS)	126	125	5257
4c.1	Crawler truck	Large Component Class A	SMVRR - Betteravia	126	125	5257
5a	Long Haul Truck	RPV/RVI Class A/B/C	Clive, UT	58	9	517
5b	Long Haul Truck	RPV/RVI Class A/B/C	Andrews, TX (WCS)	58	9	517
6a.1	Long Haul Truck	RPV/RVI Class A/B/C	SMVRR - Betteravia	37	14	513
6b	Long Haul Truck	RPV/RVI Class A/B/C	Andrews, TX (WCS)	37	14	513
8	Long Haul Truck	Recyclable Materials	Port of Long Beach	42	20	823
9	Long Haul Truck	Class A Waste	Clive, UT	4	3056	12223
10	Long Haul Truck	Topsoil Import	DCPP	1760	0	0
11	Long Haul Truck	Clean debris and soil	Arizona	60	20	1184
14	Long Haul Truck	Concrete	DCPP	142	0	0

Notes:
1. Waste routes are assumed to be direct routes from DCPP to the final destination listed.
2. Assumed 1760 trips to import topsoil.
3. Weight not included for Trip 10 and 14 because it does not factor into the emissions calculation.

Crawler Prime Mover Assumptions

Route	Waste Type	Number of Prime Movers
SMVRR	Legacy components	24

Routes and Trip Counts

Table 5.3 Trip Counts SLO County

Truck Type	Period	Trip Number	Waste Type	Waste Route[1]	Number of Round Trips per Year	Miles per Round Trip per Vehicle	Total Miles per Year	Number of Round Trips per Day	Miles per Day
					trips/year	VMT/RT/Vehicle	VMT/year	trips/day	VMT/day
Long Haul Truck	Period 1+2	1	Hazardous/Regulated	Nevada	39	158.2	6191.5	1.00	158.24
Long Haul Truck	Period 1	2	Radioactive waste (Class B&C)	Andrews, TX (WCS)	2	158.2	311.4	1.00	158.24
Long Haul Truck	Period 1	3a	Large Component Class A	Clive, UT	4	158.2	622.7	1.00	158.24
Long Haul Truck	Period 1	3b	Large Component Class A	Andrews, TX (WCS)	4	158.2	622.7	1.00	158.24
Long Haul Truck	Period 1	3c.1	Large Component Class A	SMVRR - Betteravia	4	64.5	253.7	2.00	128.92
Crawler truck	Period 1	4a	Large Component Class A	Clive, UT	25	158.2	3923.1	1.00	158.24
Crawler truck	Period 1	4b	Large Component Class A	Andrews, TX (WCS)	25	158.2	3923.1	1.00	158.24
Crawler truck	Period 1	4c.1	Large Component Class A	SMVRR - Betteravia	25	64.5	1598.1	2.00	128.92
Long Haul Truck	Period 1	5a	RPV/RVI Class A/B/C	Clive, UT	11	158.2	1805.9	1.00	158.24
Long Haul Truck	Period 1	5b	RPV/RVI Class A/B/C	Andrews, TX (WCS)	11	158.2	1805.9	1.00	158.24
Long Haul Truck	Period 1	6a.1	RPV/RVI Class A/B/C	SMVRR - Betteravia	7	64.5	469.3	2.00	128.92
Long Haul Truck	Period 1	6b	RPV/RVI Class A/B/C	Andrews, TX (WCS)	7	158.2	1152.0	1.00	158.24
Long Haul Truck	Period 2	8	Recyclable Materials	Port of Long Beach	21	158.2	3327.6	1.00	158.24
Long Haul Truck	Period 1b	9	Class A Waste	Clive, UT	1	158.2	158.2	1.00	158.24
Long Haul Truck	Period 1b	10	Topsoil Import	DCPP	440	154.2	67848.0	2.00	308.40
Long Haul Truck	Period 2	11	Clean debris and soil	Andrews, TX (WCS)	30	158.2	4753.7	1.00	158.24
Long Haul Truck	Cofferdam	14	Concrete	DCPP	142	154.2	21896.4	1.00	154.20

Notes:
1. Scenario/Period specified to reference time assumptions included below.
2. Assumed 77.1 miles one-way travel to import topsoil that is sourced from a location furthest from the site in San Luis Obispo County, at a TBD location. Also assumes maximum of 2 trips per day over Period 2 (2030-2033).
3. Updated maximum number of trucks per day to SMVR sites to 2 trucks per day per SBCAPCD comments in May 2022.
4. For trips aside from those to SMVR (1, 2, 3a/b, 4a/b, 5a/b, 6b, 8, 19, 11, 14), estimated number of trips per day, when calculated based on trips per year, is less than 1. To conservatively represent a maximum number of trips per day, these are rounded to 1.

Time Assumptions

Period	Start Date	End Date	Days	Years
Period 1	12/2/2024	12/31/2029	1855	5.082
Period 1b	1/1/2030	12/31/2033	1460	4.000
Period 2	1/1/2034	12/31/2035	729	1.997
Period 1+2			2584	7.079
Cofferdam	1/1/2027	1/1/2028	365	1.000

Emission Factors

Table 5.4 Total EFs (Diesel and Tire Wear Emission Factors)

Vehicle Type	Emission Factor	Emission Factor Description	Unit	NOx	ROG	PM10	PM2.5	CO	SO_2	CO_2e
Long Haul Truck	EF1	Running exhaust, tire and brake wear particulate emissions	g/mile	2.2288	0.0216	0.1128	0.0498	0.1963	0.0132	1458
Crawler Truck	EF1	Running exhaust, tire and brake wear particulate emissions	g/mile	2.1603	0.0190	0.1243	0.0609	0.1711	0.0119	1315
Long Haul Truck	EF2	Start exhaust tailpipe	g/trip	3.5424	--	--	--	--	--	--
Crawler Truck	EF2	Start exhaust tailpipe	g/trip	1.8520	--	--	--	--	--	--
Long Haul Truck	EF3	Idle exhaust, diurnal evaporative HC emissions, resting evaporative losses	g/vehicle/day	25.8760	2.1642	0.0100	0.0096	31.9093	0.0515	5706
Crawler Truck	EF3	Idle exhaust, diurnal evaporative HC emissions, resting evaporative losses	g/vehicle/day	22.2530	1.8744	0.0082	0.0078	27.6688	0.0434	4811

Source: EMFAC 2017. See EMFAC tab

Greenhouse Gas Global Warming Potentials

Pollutant	GWP
CO2	1
CH4	25
N2O	298

Table 5.5 DPM Emission Factors

Vehicle Type	Emission Factor Descrip	Unit	PM10	PM2.5
Long Haul Truck	Running exhaust PM10 a	g/mile	0.0150	0.0144
Crawler Truck	Running exhaust PM10 a	g/mile	0.0266	0.0254

Emission Calculations

Table 5.6.1 Annual Emission Calculations

Truck Type	Trip Number	Classification	Final Destination	Annual Emissions NOx	ROG	PM10	PM2.5	CO	SO2	CO_2e
				ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	MT/year
Long Haul Truck	1	Hazardous/Regulated	Nevada	1.65E-02	2.41E-04	7.70E-04	3.40E-04	2.72E-03	9.20E-05	9.25E+00
Long Haul Truck	2	Radioactive waste (Class B&C)	Andrews, TX (WCS)	8.29E-04	1.21E-05	3.87E-05	1.71E-05	1.37E-04	4.63E-06	4.65E-01
Long Haul Truck	3a	Large Component Class A	Clive, UT	1.66E-03	2.42E-05	7.74E-05	3.42E-05	2.73E-04	9.25E-06	9.30E-01
Long Haul Truck	3b	Large Component Class A	Andrews, TX (WCS)	1.66E-03	2.42E-05	7.74E-05	3.42E-05	2.73E-04	9.25E-06	9.30E-01
Long Haul Truck	3c.1	Large Component Class A	SMVRR - Betteravia	7.51E-04	1.54E-05	3.16E-05	1.40E-05	1.93E-04	3.90E-06	3.92E-01
Crawler truck	4a	Large Component Class A	Clive, UT	1.00E-02	1.33E-04	5.38E-04	2.64E-04	1.50E-03	5.25E-05	5.28E+00
Crawler truck	4b	Large Component Class A	Andrews, TX (WCS)	1.00E-02	1.33E-04	5.38E-04	2.64E-04	1.50E-03	5.25E-05	5.28E+00
Crawler truck	4c.1	Large Component Class A	SMVRR - Betteravia	4.46E-03	8.47E-05	2.19E-04	1.08E-04	1.06E-03	2.21E-05	2.22E+00
Long Haul Truck	5a	RPV/RVI Class A/B/C	Clive, UT	4.81E-03	7.02E-05	2.25E-04	9.93E-05	7.92E-04	2.68E-05	2.70E+00
Long Haul Truck	5b	RPV/RVI Class A/B/C	Andrews, TX (WCS)	4.81E-03	7.02E-05	2.25E-04	9.93E-05	7.92E-04	2.68E-05	2.70E+00
Long Haul Truck	6a.1	RPV/RVI Class A/B/C	SMVRR - Betteravia	1.39E-03	2.85E-05	5.84E-05	2.59E-05	3.58E-04	7.22E-06	7.26E-01
Long Haul Truck	6b	RPV/RVI Class A/B/C	Andrews, TX (WCS)	3.07E-03	4.48E-05	1.43E-04	6.34E-05	5.05E-04	1.71E-05	1.72E+00
Long Haul Truck	8	Recyclable Materials	Port of Long Beach	8.86E-03	1.29E-04	4.14E-04	1.83E-04	1.46E-03	4.95E-05	4.97E+00
Long Haul Truck	9	Class A Waste	Clive, UT	4.21E-04	6.15E-06	1.97E-05	8.70E-06	6.94E-05	2.35E-06	2.36E-01
Long Haul Truck	10	Topsoil Import	DCPP	1.81E-01	2.67E-03	8.44E-03	3.73E-03	3.02E-02	1.01E-03	1.01E+02
Long Haul Truck	11	Clean debris and soil	Arizona	1.27E-02	1.85E-04	5.91E-04	2.61E-04	2.09E-03	7.06E-05	7.10E+00
Long Haul Truck	14	Concrete	DCPP	5.84E-02	8.60E-04	2.72E-03	1.20E-03	9.73E-03	3.26E-04	3.27E+01

Table 5.6.2 Daily Emission Calculations

Truck Type	Trip Number	Classification	Final Destination	Annual Emissions NOx	ROG	PM10	PM2.5	CO	SO2	CO_2e
				lb/day						
Long Haul Truck	1	Hazardous/Regulated	Nevada	8.42E-01	1.23E-02	3.94E-02	1.74E-02	1.39E-01	4.70E-03	5.21E+02
Long Haul Truck	2	Radioactive waste (Class B&C)	Andrews, TX (WCS)	8.42E-01	1.23E-02	3.94E-02	1.74E-02	1.39E-01	4.70E-03	5.21E+02
Long Haul Truck	3a	Large Component Class A	Clive, UT	8.42E-01	1.23E-02	3.94E-02	1.74E-02	1.39E-01	4.70E-03	5.21E+02
Long Haul Truck	3b	Large Component Class A	Andrews, TX (WCS)	8.42E-01	1.23E-02	3.94E-02	1.74E-02	1.39E-01	4.70E-03	5.21E+02
Long Haul Truck	3c.1	Large Component Class A	SMVRR - Betteravia	4.46E-01	1.26E-02	1.61E-02	7.12E-03	1.69E-01	2.10E-03	2.32E+02
Crawler truck	4a	Large Component Class A	Clive, UT	8.07E-01	1.08E-02	4.34E-02	2.13E-02	1.21E-01	4.24E-03	4.69E+02
Crawler truck	4b	Large Component Class A	Andrews, TX (WCS)	8.07E-01	1.08E-02	4.34E-02	2.13E-02	1.21E-01	4.24E-03	4.69E+02
Crawler truck	4c.1	Large Component Class A	SMVRR - Betteravia	4.13E-01	1.10E-02	1.77E-02	8.69E-03	1.46E-01	1.88E-03	2.08E+02
Long Haul Truck	5a	RPV/RVI Class A/B/C	Clive, UT	8.42E-01	1.23E-02	3.94E-02	1.74E-02	1.39E-01	4.70E-03	5.21E+02
Long Haul Truck	5b	RPV/RVI Class A/B/C	Andrews, TX (WCS)	8.42E-01	1.23E-02	3.94E-02	1.74E-02	1.39E-01	4.70E-03	5.21E+02
Long Haul Truck	6a.1	RPV/RVI Class A/B/C	SMVRR - Betteravia	4.46E-01	1.26E-02	1.61E-02	7.12E-03	1.69E-01	2.10E-03	2.32E+02
Long Haul Truck	6b	RPV/RVI Class A/B/C	Andrews, TX (WCS)	8.42E-01	1.23E-02	3.94E-02	1.74E-02	1.39E-01	4.70E-03	5.21E+02
Long Haul Truck	8	Recyclable Materials	Port of Long Beach	8.42E-01	1.23E-02	3.94E-02	1.74E-02	1.39E-01	4.70E-03	5.21E+02
Long Haul Truck	9	Class A Waste	Clive, UT	8.42E-01	1.23E-02	3.94E-02	1.74E-02	1.39E-01	4.70E-03	5.21E+02
Long Haul Truck	10	Topsoil Import	DCPP	8.87E-01	1.69E-02	3.84E-02	1.70E-02	2.07E-01	4.70E-03	5.21E+02
Long Haul Truck	11	Clean debris and soil	Arizona	8.42E-01	1.23E-02	3.94E-02	1.74E-02	1.39E-01	4.70E-03	5.21E+02
Long Haul Truck	14	Concrete	DCPP	8.23E-01	1.21E-02	3.84E-02	1.70E-02	1.37E-01	4.59E-03	5.08E+02

Conversions for Emission Calculations

Annual Emission Factor Look-up for formulas		Annual	Daily
First Sum	EF1	= miles/year * g/mile * tons/grams	= miles/day * g/mile * tons/grams
Second Sum	EF2	= trips/year * g/trip * tons/grams	= trips/day * g/trip * tons/grams
Third Sum	EF3	= trips/year * g/vehicle/day * tons/grams	= trips/day * g/vehicle/day * tons/grams

Conversions

453.592	grams/lb
2000	lb/ton
907184	grams/ton
2204.62	lb/metric ton

DPM Emissions - Used for HRA

Table 5.7 DPM Emissions Only

Truck Type	Trip Number	Classification	Final Destination	Annual Emissions PM10 ton/year	Daily Emissions PM10 lb/day
Long Haul Truck	1	Hazardous/Regulated	Nevada	1.02E-04	5.24E-03
Long Haul Truck	2	Radioactive waste (Class B&C)	Andrews, TX (WCS)	5.15E-06	5.24E-03
Long Haul Truck	3a	Large Component Class A	Clive, UT	1.03E-05	5.24E-03
Long Haul Truck	3b	Large Component Class A	Andrews, TX (WCS)	1.03E-05	5.24E-03
Long Haul Truck	3c.1	Large Component Class A	SMVRR - Betteravia	4.20E-06	4.27E-03
[redacted]					
Crawler truck	4a	Large Component Class A	Clive, UT	1.15E-04	9.28E-03
Crawler truck	4b	Large Component Class A	Andrews, TX (WCS)	1.15E-04	9.28E-03
Crawler truck	4c.1	Large Component Class A	SMVRR - Betteravia	4.69E-05	7.56E-03
[redacted]					
Long Haul Truck	5a	RPV/RVI Class A/B/C	Clive, UT	2.99E-05	5.24E-03
Long Haul Truck	5b	RPV/RVI Class A/B/C	Andrews, TX (WCS)	2.99E-05	5.24E-03
Long Haul Truck	6a.1	RPV/RVI Class A/B/C	SMVRR - Betteravia	7.77E-06	4.27E-03
[redacted]					
Long Haul Truck	6b	RPV/RVI Class A/B/C	Andrews, TX (WCS)	1.91E-05	5.24E-03
Long Haul Truck	8	Recyclable Materials	Port of Long Beach	5.51E-05	5.24E-03
Long Haul Truck	9	Class A Waste	Clive, UT	2.62E-06	5.24E-03
Long Haul Truck	10	Topsoil Import	DCPP	1.12E-03	1.02E-02
Long Haul Truck	11	Clean debris and soil	Arizona	7.87E-05	5.24E-03
Long Haul Truck	14	Concrete	DCPP	3.62E-04	5.10E-03

Scenario Analysis

Scenario Combinations

1. Trip Numbers 1, 2, ~~6~~, 8, 9, 10, 11, 14 constant
2. Routes within SLO County to either Utah or Texas (3a vs 3b, 4a vs 4b, 5a vs 5b) Result in the same emissions. The routes are over a further distance than if everything was transported to SMVRR.
3. Routes to the 2 SMVR sites (3c.1/3c.2, 4c.1/4c.2, 6a.1/6a.2) result in the same emissions in SLO county because the truck travel distance is the same.

Scenario 1 - direct truck everything	Scenario 2 - everything to SMVRR
3a/3b (same)	3c.1/3c.2 (same)
4a/4b (same)	4c.1/4c.1 (same)
5a/5b (same)	6a.1/6a.2 (same)
6b	

Table 5.8 Annual

Maximum Scenario	Annual Emissions						
	NOx	ROG	PM10	PM2.5	CO	SO2	CO_2e
	ton/year						MT/year
Constant (1,2,8,9,10,11,14)	2.79E-01	4.10E-03	1.30E-02	5.75E-03	4.64E-02	1.55E-03	1.56E+02
Scenario 1	1.95E-02	2.73E-04	9.83E-04	4.61E-04	3.07E-03	1.06E-04	1.06E+01
Scenario 2	6.60E-03	1.29E-04	3.09E-04	1.47E-04	1.61E-03	3.32E-05	3.34E+00
Scenario 1 + Constant	**2.98E-01**	**4.37E-03**	**1.40E-02**	**6.21E-03**	**4.94E-02**	**1.66E-03**	**1.67E+02**
Scenario 2 + Constant	2.85E-01	4.23E-03	1.33E-02	5.89E-03	4.80E-02	1.59E-03	1.60E+02
Max Emissions (Scenario 1)	**2.98E-01**	**4.37E-03**	**1.40E-02**	**6.21E-03**	**4.94E-02**	**1.66E-03**	**1.67E+02**

Table 5.9 Daily

Maximum Scenario	Annual Emissions						
	NOx	ROG	PM10	PM2.5	CO	SO2	CO_2e
	lb/day						
Constant (1,2,8,9,10,11,14)	5.92E+00	9.05E-02	2.74E-01	1.21E-01	1.04E+00	3.28E-02	3.63E+03
Scenario 1	3.33E+00	4.77E-02	1.61E-01	7.35E-02	5.37E-01	1.83E-02	2.03E+03
Scenario 2	1.31E+00	3.62E-02	4.98E-02	2.29E-02	4.84E-01	6.07E-03	6.73E+02
Scenario 1 + Constant	**9.26E+00**	**1.38E-01**	**4.35E-01**	**1.94E-01**	**1.58E+00**	**5.11E-02**	**5.67E+03**
Scenario 2 + Constant	7.23E+00	1.27E-01	3.23E-01	1.44E-01	1.52E+00	3.89E-02	4.31E+03
Max Emissions (Scenario 1)	**9.26E+00**	**1.38E-01**	**4.35E-01**	**1.94E-01**	**1.58E+00**	**5.11E-02**	**5.67E+03**

Table 5.10 DPM

Scenario	Annual Emissions	Annual Emissions
	PM10 (DPM)	PM10
	tons/yr	lb/day
Constant (1,2,8,9,10,11,14)	1.73E-03	4.15E-02
Scenario 1	1.74E-04	2.50E-02
Scenario 2	5.88E-05	1.61E-02
Scenario 1 + Constant	**1.90E-03**	**6.65E-02**
Scenario 2 + Constant	1.79E-03	5.76E-02
Max DPM Emissions (Scenario 1)	**1.90E-03**	**6.65E-02**

Appendix D1.3

Phase 1 Marine Emissions SLO County

Emission Summary

Table 6.1 Long Haul Route Emission Summary

Route Segment	Annual Emissions							Daily Emissions						
	NOx	ROG	PM10	PM2.5	CO	SOx	CO_2e	NOx	ROG	PM10	PM2.5	CO	SOx	CO_2e
	ton/yr						MT/yr	lb/day						
Barge within SLO County	0.86	0.08	0.03	0.03	0.51	0.00	63.08	123.07	11.49	4.39	4.06	4.39	72.87	0.07
Barge for Remainder of Route OR	9.86	0.92	0.35	0.32	5.83	0.01	723.64	1411.74	131.79	50.40	46.53	50.40	835.85	0.77
Oregon-Entire Route	10.71	1.00	0.38	0.35	6.34	0.01	786.73	1534.81	143.28	54.79	50.58	54.79	908.71	0.84
Discharge Fill	0.00	0.00	0.00	0.00	0.00	0.00	0.99	0.99	3.29	0.30	0.12	0.12	0.12	2.93
Cofferdam Backfill	0.38	0.04	0.01	0.01	0.22	0.00	109.40	109.40	100.51	9.39	3.58	3.30	3.58	58.53
Barge for Remainder of Route SoCal+ OR	11.01	1.03	0.39	0.36	6.51	0.01	1061.69	1749.78	449.68	80.07	57.88	60.87	847.20	188.98

Table 6.2 DCPP Harbor

Route Segment	Annual Emissions							Daily Emissions						
	NOx	ROG	PM10	PM2.5	CO	SOx	CO_2e	NOx	ROG	PM10	PM2.5	CO	SOx	CO_2e
	ton/yr						MT/yr	lb/day						
DCPP Harbor	1.16	0.14	0.04	0.04	0.87	0.00	92.44	11.20	1.30	0.41	0.39	0.41	8.36	979.74

DPM Emissions Summary

Table 6.3 DPM Emissions Summary

Route Segment	Exhaust PM10 (DPM)	Exhaust PM10 (DPM)
	tons/year	lb/day
Barge within SLO County	0.031	4.393
Barge for Remainder of Route	0.352	50.396
Boardman, OR - Entire Route	0.382	54.789
DCPP Harbor	0.043	0.415
Fill Trips	0.013	3.705

Barge Trip Information

Table 6.4 Long Haul Route

Trip Number	Route Segment	Number of Trips	Weight per Shipment	Total Weight	One Way Miles	Round Trip Miles	Activity Time	Main Engine HP-hr	Auxiliary Engine HP-hr	Trips per Day
		no. trips	tons	tons	miles	miles/RT	hours/RT	hp-hr/RT	hp-hr/RT	trips/day
7	Barge within SLO County	28	4	124	94.9	189.70	10.99	23826.08	1527.59	0.50
7	Barge for Remainder of Route	28	4	124	1088.0	2176.10	126.06	273308.87	17523.03	0.50
7	Oregon-Entire Route	28	4	124.24975	1182.9	2365.80	137.05	297134.95	19050.63	0.50
12	Discharge Fill	3	--	--	80	160.00	9.27	20095.36	1288.40	0.50
13	Cofferdam Gravel	15	--	--	80	160.00	9.27	20095.36	1288.40	0.50
12+13	Barge for Remainder of Route in SoCal	18	--	--	245	490.00	28.39	61542.03	3945.73	0.50

Mileage multiplier for whole SoCal trip length 3.0625

Notes: 1. Assumes all barge transportation occurs in Period 2 of waste transportation activities.
2. Weight per shipment is based on average calculation using data from the UCLA transportation study for LARW waste being transported to Boardman, OR.
3. Assumes 1 ocean tugboat used per barge.
4. Average ocean tugboat horsepower taken from Tables 3.4 and 3.5 in the 2019 Port of Long Beach Air Emissions Inventory (Starcrest, 2020)
Auxiliary 139 hp
Propulsion 2168 hp
5. Average speed of tugboat assumed to be: 15 knots
Speed conversion used 1 knot
1.15078 mph
6. Assumes the auxiliary engine is operated for 100% of the time the main propulsion engine is operating.
7. SLO County barge route as measured in modeling file: 500819 ft
Feet to miles conversion: 5280 ft/mile
8. Trip numbers 12 and 13 assumed to travel maximum measured distance from DCPP to M-5 Marine Highway (approx 60 miles west), and then travelling south to border of SLO County (approx 20 miles SE).
9. Discharge fill (Trip 12) estimated to occur within 1 year. Assumes 4 days/week and 52 weeks/year.
10. Cofferdam backfill (Trip 12) anticipated to occur over 2 years. Conservatively assume trips travel within 1 year.

Table 6.5 DCPP Harbor Loading Activity

Area	Activity Time	Main Engine HP-hr	Auxiliary Engine HP-hr
	hours/day	hp-hr/day	hp-hr/day
DCPP Harbor	4	3616	332

Notes:
1. Assumes 1 ocean tugboat operates in harbor for 4 hours per day.
2. Average harbor tugboat horsepower taken from Tables 3.4 and 3.5 in the 2019 Port of Long Beach Air Emissions Inventory (Starcrest, 2020)

Auxiliary	83	hp
Propulsion	904	hp

Emission Factors

Table 6.6 Tugboat Emission Factors

Harbor Craft Type	Engine Type	NOx	VOC	PM10	PM2.5	DPM	CO	SOx	CO_2e
		g/hp-hr							
Harbor Tugboat	Auxiliary	3.61	0.56	0.14	0.14	0.14	2.78	0.00	331.36
Harbor Tugboat	Propulsion	2.15	0.23	0.08	0.07	0.08	1.59	0.00	184.95
Ocean Tugboat	Auxiliary	2.32	0.21	0.09	0.09	0.09	2.06	0.00	255.16
Ocean Tugboat	Propulsion	4.54	0.42	0.16	0.15	0.16	2.64	0.00	362.92

Emission Calculations

Table 6.7 Long Haul Route

Waste Route Destination	Harbor Craft Type	Engine Type	Annual Emissions								Annual Emissions							
			NOx	VOC	PM10	PM2.5	DPM	CO	SOx	CO_2e	NOx	VOC	PM10	PM2.5	DPM	CO	SOx	CO_2e
			ton/yr							MT/yr	lb/day							
Barge within SLO County	Ocean tugboat	Auxiliary	0.027	0.003	0.001	0.001	0.001	0.024	0.000	2.721	3.905	0.362	0.145	0.145	0.145	3.471	0.000	429.664
Barge within SLO County	Ocean tugboat	Propulsion	0.832	0.078	0.030	0.027	0.030	0.484	0.000	60.364	119.165	11.127	4.249	3.911	4.249	69.395	0.067	9531.751
Barge for Remainder of Route	Ocean tugboat	Auxiliary	0.313	0.029	0.012	0.012	0.012	0.278	0.000	31.213	44.795	4.148	1.659	1.659	1.659	39.818	0.000	4928.673
Barge for Remainder of Route	Ocean tugboat	Propulsion	9.542	0.891	0.340	0.313	0.340	5.557	0.005	692.430	1366.943	127.643	48.737	44.869	48.737	796.030	0.774	109338.680
Oregon-Entire Route	Ocean tugboat	Auxiliary	0.340	0.031	0.013	0.013	0.013	0.302	0.000	33.934	48.700	4.509	1.804	1.804	1.804	43.289	0.000	5358.336
Oregon-Entire Route	Ocean tugboat	Propulsion	10.374	0.969	0.370	0.341	0.370	6.041	0.006	752.793	1486.108	138.771	52.985	48.780	52.985	865.425	0.841	118870.431
Discharge Fill	Ocean tugboat	Auxiliary	0.002	0.000	0.000	0.000	0.000	0.002	0.000	0.986	3.294	0.305	0.122	0.122	0.122	2.928	0.000	362.386
Cofferdam Gravel	Ocean tugboat	Propulsion	0.376	0.035	0.013	0.012	0.013	0.219	0.000	109.396	100.506	9.385	3.583	3.299	3.583	58.529	0.057	8039.255

Table 6.8 DCPP Tugboat

Area	Harbor Craft Type	Engine Type	Annual Emissions								Daily Emissions							
			NOx	VOC	PM10	PM2.5	DPM	CO	SOx	CO_2e	NOx	VOC	PM10	PM2.5	DPM	CO	SOx	CO_2e
			ton/yr							MT/yr	lb/day							
DCPP Harbor	Harbor tugboat	Auxiliary	0.275	0.042	0.011	0.011	0.011	0.211	0.000	22.882	2.642	0.407	0.102	0.102	0.102	2.033	0.000	242.531
DCPP Harbor	Harbor tugboat	Propulsion	0.890	0.093	0.033	0.030	0.033	0.658	0.000	69.554	8.555	0.897	0.313	0.292	0.313	6.323	0.000	737.213

Notes:
1. Assumes tugboats are used in the harbor over a 4 year period.
2. Assumes tugboats operate 4 days per week, similar to construction schedule
3. Assumes the propulsion engine is operated for 50% of the time the main propulsion engine is operating.

Mass Conversion	
453.592	grams/lb
2000	lb/ton
0.90719	metric ton/ton
1000000	g/metric ton (MT)
Time Assumptions for Period 2 (Jan 2030 - Dec 2033)	
4	years
209	weeks
834	days

Appendix D1.4

Phase 1 Waste SLO County

Table 7.1 Waste Transport Amounts

1	Hazardous/Regulated	Period 1+2	Long haul truck	Nevada	277	20	5,519
2	Radioactive waste (Class B&C)	Period 1	Long haul truck	Andrews, TX (WCS)	10	37	370
3a	Large Component Class A	Period 1	Long haul truck	Clive, UT	20	125	2503
3b	Large Component Class A	Period 1	Long haul truck	Andrews, TX (WCS)	20	125	2503
3c.1	Large Component Class A	Period 1	Long haul truck	SMVRR - Betteravia	20	125	2503
3c.2	Large Component Class A	Period 1	Long haul truck	SMVRR - Osburn	20	125	2503
4a	Large Component Class A	Period 1	Crawler truck	Clive, UT	42	125	5257
4b	Large Component Class A	Period 1	Crawler truck	Andrews, TX (WCS)	42	125	5257
4c.1	Large Component Class A	Period 1	Crawler truck	SMVRR - Betteravia	42	125	5257
[redacted]							
5a	RPV/RVI Class A/B/C	Period 1	Long haul truck	Clive, UT	58	9	517
5b	RPV/RVI Class A/B/C	Period 1	Long haul truck	Andrews, TX (WCS)	58	9	517
6a.1	RPV/RVI Class A/B/C	Period 1	Long haul truck	SMVRR - Betteravia	37	14	513
[redacted]							
6b	RPV/RVI Class A/B/C	Period 1	Long haul truck	Andrews, TX (WCS)	37	14	513
7	Various Waste Types	Period 2	Barge	Oregon-Entire Route	56	8875	496,999
8	Recyclable Materials	Period 3	Long haul truck	Port of Long Beach	42	20	823
9	Class A Waste	Period 2	Long haul truck	Clive, UT	4	3056	12223
10	Topsoil Import	Period 1+2	Long haul truck	DCPP	1760	--	--
11	Clean debris and soil	Period 3	Long haul truck	Arizona	60	20	1,184
12	Discharge Fill	Cofferdam	Barge	DCPP	3	--	--
13	Cofferdam Backfill	Cofferdam	Barge	DCPP	15	--	--
14	Concrete	Cofferdam	Long haul truck	DCPP	142	--	--

Outside SLO

1	Truck	Nevada
2	Truck	Andrews, TX (WCS)
3a	Truck	Clive, UT
3b	Truck	Andrews, TX (WCS)
3c.1	Rail	Utah or Texas
3c.2	Rail	Utah or Texas
4a	Truck	Clive, UT
4b	Truck	Andrews, TX (WCS)
4c.1	Rail	Utah or Texas
4c.2	Rail	Utah or Texas
5a	Truck	Clive, UT
5b	Truck	Andrews, TX (WCS)
6a.1	Rail	Utah or Texas
6a.2	Rail	Utah or Texas
6b	Truck	Andrews, TX (WCS)
7	Barge	N/A
8	Truck	POLB
9	Truck	Clive, UT
10	Truck	DCPP
11	Truck	Arizona
12	Barge	N/A
13	Barge	N/A
14	Truck	DCPP

Notes:
1. Based on RFI provided by PG&E on May 11, 2021.
2. Number of shipments is one-way.

1140 ft^3 total Class B&C waste
74000 pounds/cask
61.8125 inches in diameter
74.875 inches tall
8-120B cask calculated information
37 tons/cask
224688 cubic inches internal storage cavity
130 cubic feet internal storage cavity

Appendix D1.5

Phase 1 Truck Emissions SB County

Emission Summary

Table 8.1 Santa Barbara County Annual Truck Emissions

Railyard	Annual Emissions						
	NOx	ROG	PM10	PM2.5	CO	SO2	CO_2e
	ton/year						MT/year
To Betteravia Railyard	2.75E-03	9.37E-05	9.60E-05	4.59E-05	1.29E-03	1.15E-05	1.1606

Note:
1. Each line item assumes 100% of the truck traffic planned to travel to SMVRR goes to one of the two facilities.

Table 8.2 Santa Barbara County Daily Truck Emissions

Railyard	Daily Emissions						
	NOx	ROG	PM10	PM2.5	CO	SO2	CO_2e
	pounds/day						
To Betteravia Railyard	0.9483	0.0328	0.0309	0.0143	0.4530	0.0040	443.9777

Note:
1. Each line item assumes 100% of the truck traffic planned to travel to SMVRR goes to one of the two facilities.
2. Daily Emissions include a safety factor of 1.25 to account for a potential maximum day.

Truck Trip Information

Table 8.3 Long Haul Trucks

Trip Number	Truck Type	Waste Type	Waste Route[1]	Number of Shipments	Weight per Shipment	Total Weight
				no. trips	tons/shipment	tons
3c.1	Long Haul Truck	Large Component Class A	SMVRR - Betteravia	20	125	2503
4c.1	Crawler truck	Large Component Class A	SMVRR - Betteravia	126	125	5257
6a.1	Long Haul Truck	RPV/RVI Class A/B/C	SMVRR - Betteravia	37	14	513

Notes:
1. Waste routes are assumed to be direct routes from DCPP to the final destination listed.

Crawler Prime Mover Assumptions

Route	Waste Type	Number of Prime Movers
SMVRR	Legacy components	24

Routes and Trip Counts

Table 8.4 Santa Barbara County to SMVRR Trip Counts

Truck Type	Period	Trip Number	Waste Type	Waste Route[1]	Number of Round Trips per Year	Miles per Round Trip per Vehicle	Total Miles per Year	Number of Round Trips per Day	Miles per Day
					trips/year	VMT/RT/Vehicle	VMT/year	trips/day	VMT/day
Long Haul Truck	Period 1	3c.1	Large Component Class A	SMVRR - Betteravia	4	20.0	79	2.0	39.9
Crawler truck	Period 1	4c.1	Large Component Class A	SMVRR - Betteravia	25	20.0	495	2.0	39.9
Long Haul Truck	Period 1	6a.1	RPV/RVI Class A/B/C	SMVRR - Betteravia	7	20.0	145	2.0	39.9

Time Assumptions

Period	Start Date	End Date	Days	Years
Period 1	12/2/2024	12/31/2029	1855	5.082
Period 2	1/1/2030	12/31/2033	1460	4.000
Period 3	1/1/2034	12/31/2035	729	1.997

Notes:
1. No truck trips during Period 2
2. Trip Numbers 1 through 6 occur in Period 1
3. Trip Numbers 8 and 9 occur in Period 3

Emission Factors

Table 8.5 Total EFs (Diesel and Tire Wear Emission Factors)

Vehicle Type	Emission Factor	Emission Factor Description	Unit	NOx	ROG	PM10	PM2.5	CO	SO_2	CO_2e
Long Haul Truck	EF1	Running exhaust, tire and brake wear particulate emissions	g/mile	2.2288	0.0216	0.1128	0.0498	0.1963	0.0132	1458
Crawler Truck	EF1	Running exhaust, tire and brake wear particulate emissions	g/mile	2.1603	0.0190	0.1243	0.0609	0.1711	0.0119	1315
Long Haul Truck	EF2	Start exhaust tailpipe	g/trip	3.5424	--	--	--	--	--	--
Crawler Truck	EF2	Start exhaust tailpipe	g/trip	1.8520	--	--	--	--	--	--
Long Haul Truck	EF3	Idle exhaust, diurnal evaporative HC emissions, resting evaporative losses	g/vehicle/day	25.8760	2.1642	0.0100	0.0096	31.9093	0.0515	5706
Crawler Truck	EF3	Idle exhaust, diurnal evaporative HC emissions, resting evaporative losses	g/vehicle/day	22.2530	1.8744	0.0082	0.0078	27.6688	0.0434	4811

Source: EMFAC 2017. See EMFAC tab

Greenhouse Gas Global Warming Potentials

Pollutant	GWP
CO2	1
CH4	25
N2O	298

Table 8.6 DPM Emission Factors

Vehicle Type	Emission Factor Descrip	Unit	PM10	PM2.5
Long Haul Truck	Running exhaust PM10 a	g/mile	0.0150	0.0144
Crawler Truck	Running exhaust PM10 a	g/mile	0.0266	0.0254

Emission Calculations

Table 8.7 Santa Barbara County to Betteravia Railyard - Annual Emissions

Truck Type	Trip Number	Waste Type	Waste Route[1]	Annual Emissions						
				NOx	ROG	PM10	PM2.5	CO	SO2	CO_2e
				ton/year						MT/year
Long Haul Truck	3c.1	Large Component Class A	SMVRR - Betteravia	3.21E-04	1.13E-05	9.81E-06	4.36E-06	1.55E-04	1.36E-06	0.1370
Crawler truck	4c.1	Large Component Class A	SMVRR - Betteravia	1.84E-03	6.16E-05	6.81E-05	3.34E-05	8.50E-04	7.66E-06	0.7701
Long Haul Truck	6a.1	RPV/RVI Class A/B/C	SMVRR - Betteravia	5.93E-04	2.08E-05	1.81E-05	8.06E-06	2.88E-04	2.52E-06	0.2535

Note:
1. Assumes 100% of truck traffic to the SMVRR goes to Betteravia.

Table 8.8 Santa Barbara County to Betteravia Railyard - Daily Emissions

Truck Type	Trip Number	Waste Type	Waste Route[1]	Daily Emissions						
				NOx	ROG	PM10	PM2.5	CO	SO2	CO_2e
				pounds/day						
Long Haul Truck	3c.1	Large Component Class A	SMVRR - Betteravia	3.26E-01	1.14E-02	9.97E-03	4.43E-03	1.58E-01	1.39E-03	1.54E+02
Crawler truck	4c.1	Large Component Class A	SMVRR - Betteravia	2.96E-01	9.94E-03	1.10E-02	5.40E-03	1.37E-01	1.24E-03	1.37E+02
Long Haul Truck	6a.1	RPV/RVI Class A/B/C	SMVRR - Betteravia	3.26E-01	1.14E-02	9.97E-03	4.43E-03	1.58E-01	1.39E-03	1.54E+02

Notes:
1. Daily emissions based on estimated maximum number of trucks per day to Betteravia railyard.

Daily Emission Calculation Assumptions

4	days/week
52	weeks/year

Conversions for Emission Calculations

Emission Factor Look-up for formulas		Annual
First Sum	EF1	= miles/year * g/mile * tons/grams
Second Sum	EF2	= trips/year * g/trip * tons/grams
Third Sum	EF3	= trips/year * g/vehicle/day * tons/grams

Conversions

453.592	grams/lb
2000	lb/ton
907184	grams/ton
2204.62	lb/metric ton

DPM Emissions - Used for HRA

Table 8.9 SB to Betteravia DPM Emissions Only

Truck Type	Trip Number	Classification	Final Destination	Annual Emissions PM10 ton/year
Long Haul Truck	3c.1	Large Component Class A	SMVRR - Betteravia	1.30E-06
Crawler truck	4c.1	Large Component Class A	SMVRR - Betteravia	1.45E-05
Long Haul Truck	6a.1	RPV/RVI Class A/B/C	SMVRR - Betteravia	2.41E-06

Note:
1. Assumes 100% of truck traffic to the SMVRR goes to Betteravia.

Appendix D1.6

Phase 1 Rail Emissions SB County

Emissions Summary

Table 9.1 Annual Locomotive Emissions

Railyard	Annual Emissions						
	NOx	ROG	PM10	PM2.5	CO	SOx	CO_2e
	ton/year						MT/year
From Betteravia Railyard	0.07	0.0025	0.0014	0.00	0.02	0.00	8.47

Note:
1. Each line item assumes 100% of the rail transport planned to travel from SMVRR originates from one of the two facilities.

Table 9.2 Daily Locomotive Emissions

Railyard	Daily Emissions						
	NOx	ROG	PM10	PM2.5	CO	SOx	CO_2e
	pounds/day						
From Betteravia Railyard	0.645	0.024	0.014	0.014	0.232	0.001	81.396

Note:
1. Each line item assumes 100% of the rail transport planned to travel from SMVRR originates from one of the two facilities.
2. Maximum Daily Emissions include a safety factor of 1.25.

Trip Information

Table 9.3.1 Waste Shipment Information

Waste Type	Trip Number	Waste Route	Railyard[1]	Number of Originating Truckloads[1]	Total Tons from Truckloads	Number of Trucks per Railcar	Number Railcars	Number of Trains	Load of each Railcar to UPRR	Average Train Load[4]
				no. trucks to railyard	tons	no. trucks/railcar	no. rail cars	no. trains	tons/railcar	tons/train/RT
Large Component Class A	3c.2	Utah or Texas	Betteravia	20	2503	5	4	1	626	1412
Large Component Class A	4c.2	Utah or Texas	Betteravia	42	5257	1	42	2	125	2154
RPV/RVI Class A/B/C	6a.2	Utah or Texas	Betteravia	37	513	1	37	2	14	868

Notes:
1. Number of originating truckloads assumes 100% to Betteravia. Values are rounded up to produce whole truckload values. The "Total" railyard line is used for the air districts outside of Santa Barbara because the route distance in these air districts is the same no matter the originating railyard.
2. Number of railcars for each waste type/railyard destination is based on typical expected number of truckloads in a railcar, according to estimates below by waste type:

Waste Type	Trucks/Railcar
Large Component Class A, Trip 3	5
Large Component Class A, Trip 4	1
RPV/RVI Class A/B/C, Trip 6	1

3a. When considering potential load of railcar - number of rail cars is based on an estimate of 110 tons per rail car. This value was determined based on first round of transportation emission calculations.
110 tons/rail car
3b. When considering potential load of railcar - Number of trains assumes a maximum of 30 rail cars per train. Also determined in first round of calcs based on UCLA Transportation study.
30 rail cars/train
3c. When considering potential load of railcar -Train load calculation assumptions 80000
40 ton/car Empty rail car https://www.up.com/customers/all/equipment/descriptions/flatcars/index.htm
110 average tons waste/rail car
150 total tons/rail car Loaded flat rail car
95 tons/rail car Average rail car load for one RT (assumes loaded on way there and unloaded on way back)
2850 total tons/train
4. Average train load is based on the assumption that the train is fully loaded on the way to the waste disposal facility, and unloaded (only empty rail cars) on the way back to SMVRR. The average weight of the train is used for the average round trip load.

Table 9.3.2 Waste Shipment Information between Railyards and UPRR Main Connection

Waste Type	Trip Number	Waste Route	Railyard[1]	Number of Originating Truckloads	Number of Trucks per Railcar	Estimated Number of Railcars	Number of Railcars per Trip to UPRR Line	Number of Trips to UPRR Line	Total Tons from Truckloads	Load of each Railcar to UPRR	Load of Trip to UPRR
				no. trucks to railyard	no. trucks/railcar	no. railcars	no. railcars/trip	no. trips	tons	tons/railcar	tons/RT
Large Component Class A	3c.2	Utah or Texas	Betteravia	20	5	4	1	4	2503	626	353
Large Component Class A	4c.2	Utah or Texas	Betteravia	42	1	42	2	21	5257	125	205
RPV/RVI Class A/B/C	6a.2	Utah or Texas	Betteravia	37	1	37	6	6	513	14	282

Notes:
1. This table was added to calculate the train load for trips between the railyards and the UPRR main line connection based on estimated railcar trips agreed on between ERM and PG&E.
2. The load of trip to UPRR is based on the average of the weight of the loaded railcar and empty railcar to account for a loaded railcar on the way to UPRR and an empty railcar on return trip to SVMR site.

Table 9.4.1 Rail Route Information from UPRR to County Border

Waste Type	Trip Number	Air District	Railyard	One Way Miles	Round Trip Miles	Total ton-miles	Total ton-mile/yr
				VMT	VMT/RT	ton-miles	ton-mile/yr
Large Component Class A	3c.2	SBCAPCD	Betteravia	108	215	303703	59758
Large Component Class A	4c.2	SBCAPCD	Betteravia	108	215	926934	182389
RPV/RVI Class A/B/C	6a.2	SBCAPCD	Betteravia	108	215	373602	73512

Notes:
1. Ton-miles are calculated for Santa Barbara County air district based on trains originating the Betteravia railyards
2. One-way miles are the distance along the UPRR mainline to the SB county border (same for each railyard). Emissions from the railyards to the UPRR main line connection have been added below.
3. Total ton-miles = # trips * tons/trip * VMT/RT
4. Time assumptions

Period	Start Date	End Date	Number of Days	Number of Years
Period 1	12/2/2024	12/31/2029	1855	5.1

Table 9.4.2 Rail Route Information from Railyards to UPRR

Waste Type	Trip Number	Air District	Railyard	One Way Miles	Round Trip Miles	Total ton-miles	Total ton-mile/yr
				VMT	VMT/RT	ton-miles	ton-mile/yr
Large Component Class A	3c.2	SBCAPCD	Betteravia	4	9	12552	2470
Large Component Class A	4c.2	SBCAPCD	Betteravia	4	9	38311	7538
RPV/RVI Class A/B/C	6a.2	SBCAPCD	Betteravia	4	9	15441	3038

Notes:
1. This table has been added to quantify the updated emissions of transport trips between the railyards and the UPRR main line connection.
2. One-way miles are the distance from the specified SMVR site to the UPRR line.

Emission Factors

Table 9.5 Locomotive Emission Factors

Engine Type	Unit	NOx	ROG	PM10	PM2.5	CO	SOx	CO_2e
Large Line Haul	g/gal	74.00	2.74	1.60	1.55	26.62	0.10	10301.30
Large Line Haul	g/ton-mile	0.19	0.01	0.00	0.00	0.07	0.00	25.75
Railcar Mover	g/bhp-hr	1.00	0.08	0.02	0.01	1.83	--	--
Railcar Mover	g/gal	15.20	1.28	0.23	0.22	27.82	0.10	10301.30

Notes:

Large Line Haul Notes

1. NOx, PM10, ROG, and PM2.5 emission factors give the expected fleet average emission factors by calendar year. The year 2025 is used as the worst-case year for rail transportation emissions.
2. NOx and PM10 emission factors taken from Tables 5 and 6 of EPA document EPA-420-F-09-025.

Railcar Mover Trackmobile Notes

1. NOx, PM10, and CO emission factors taken from Table 2 of EPA 420-F-09-025 assuming Tier 4 engine as provided by Trackmobile technical specification sheet.

General Notes

1. Source of NOx, PM10, PM2.5, ROG, CO, and SO2 emission factors and derivations: EPA document Emission Factors for Locomotives (EPA-420-F-09-025) https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100500B.pdf
2. ROG emission factors were calculated by multiplying the HC emission factors found in Table 7 of the EPA document EPA-420-F-09-025 by a factor of 1.053 according to guidance in the document.
3. CO emission factors were calculated based on the CO emission factor in Tables 1 and 2 for large line and switching, respectively, and the conversion factors in Table 3 of the EPA document EPA-420-F-09-025. The CO emission factor was developed in the context of adopting new emission standards, which for CO, were intended to cap CO emissions at pre-control levels and resulted in a projection of CO emission factors remaining the same for all tiers of emission standards. Recent testing also suggests that emission controls designed to reduce PM and HC emissions are also reducing CO emissions, according to the EPA document EPA-420-F-09-025. As such, the CO emission factor presents a conservative estimate to use for calculating CO emissions.

4. PM2.5 emission factors were calculated by multiplying PM10 emissions by a factor of 0.97, following guidance in EPA-420-F-09-025.
5. SO2 emission factors were calculated with the below conversions/assumptions (calculation method in EPA document, derived from NONROAD Technical Document NR-009c). The assumption of 100% conversion of sulfur in fuel to SO2 is a conservative estimate, as the actual fraction of fuel sulfur emitted as SO2 may be as low as 95 percent, according to EPA document EPA-420-F-09-025.

7.05	Fuel density (lb/gal)
453.592	g/lb
100%	sulfur in fuel to SO2 conversion
2	g SO2/ g S
15	sulfur content (ppm) - ultra low sulfur fuel

Equation: SO2 (g/gal) = (fuel density [lb/gal]) x (conversion factor [g/lb]) x (64 g SO2/32 g S) x (S content of fuel [ppm])

6. CO2, CH4, N2O emission factors were derived from 2018 EPA Emission Factors for Greenhouse Gas Inventories https://www.epa.gov/sites/production/files/2018-03/documents/emission-factors_mar_2018_0.pdf

CO2 from Table 2, Diesel Fuel	10210	g CO2/gallon fuel
CH4 from Table 5, Diesel Locomotives	0.8	g CO2/gallon fuel
N2O from Table 5, Diesel Locomotives	0.26	g CO2/gallon fuel

7. CO2e calculated using global warming potentials (GWP) below, taken from IPCC Fifth Assessment Report 2014, Working Group 1 Climate Change 2013: The Physical Science Basis (Chapter 8)

CO2	1
CH4	28
N2O	265

8. Conversion from g/gal to g/ton-mile is 400 ton-miles/gal as indicated in EPA-420-F-09-025.

Emission Calculations

Table 9.6.1 Long Line Haul Annual Emissions from UPRR to SB County Border

Waste Type	Trip Number	Air District	Railyard	Annual Emissions						
				NOx	ROG	PM10	PM2.5	CO	SOx	CO_2e
				ton/year						MT/year
Large Component Class A	3c.2	SBCAPCD	Betteravia	1.22E-02	4.51E-04	2.63E-04	2.56E-04	4.38E-03	1.58E-05	1.539
Large Component Class A	4c.2	SBCAPCD	Betteravia	3.72E-02	1.38E-03	8.04E-04	7.80E-04	1.34E-02	4.82E-05	4.697
RPV/RVI Class A/B/C	6a.2	SBCAPCD	Betteravia	1.50E-02	5.55E-04	3.24E-04	3.14E-04	5.39E-03	1.94E-05	1.893

Table 9.6.2 Long Line Haul Annual Emissions between Railyards and UPRR

Waste Type	Trip Number	Air District	Railyard	Annual Emissions						
				NOx	ROG	PM10	PM2.5	CO	SOx	CO_2e
				ton/year						MT/year
Large Component Class A	3c.2	SBCAPCD	Betteravia	5.04E-04	1.86E-05	1.09E-05	1.06E-05	1.81E-04	6.53E-07	0.064
Large Component Class A	4c.2	SBCAPCD	Betteravia	1.54E-03	5.69E-05	3.32E-05	3.22E-05	5.53E-04	1.99E-06	0.194
RPV/RVI Class A/B/C	6a.2	SBCAPCD	Betteravia	6.20E-04	2.29E-05	1.34E-05	1.30E-05	2.23E-04	8.03E-07	0.078

Notes:
1. This table was added to calculate the emissions from railcars being transported between the SMVR railyards and the UPRR main line connection.

Annual Emission Calculation Assumptions

453.592	g/lb
2000	lb/ton
907184	g/ton
1000000	g/metric ton (MT)

Table 9.7.1 Long Line Haul Daily Emissions from UPRR to SB County Border

Waste Type	Trip Number	Air District	Railyard	Daily Emissions						
				NOx	ROG	PM10	PM2.5	CO	SOx	CO_2e
				pounds/day						
Large Component Class A	3c.2	SBCAPCD	Betteravia	1.17E-01	4.34E-03	2.53E-03	2.46E-03	4.22E-02	1.52E-04	14.798
Large Component Class A	4c.2	SBCAPCD	Betteravia	3.58E-01	1.32E-02	7.73E-03	7.50E-03	1.29E-01	4.64E-04	45.164
RPV/RVI Class A/B/C	6a.2	SBCAPCD	Betteravia	1.44E-01	5.33E-03	3.12E-03	3.02E-03	5.19E-02	1.87E-04	18.204

Table 9.7.2 Long Line Haul Daily Emissions between Railyards and UPRR

Waste Type	Trip Number	Air District	Railyard	Daily Emissions						
				NOx	ROG	PM10	PM2.5	CO	SOx	CO_2e
				pounds/day						
Large Component Class A	3c.2	SBCAPCD	Betteravia	4.84E-03	1.79E-04	1.05E-04	1.02E-04	1.74E-03	6.28E-06	0.612
Large Component Class A	4c.2	SBCAPCD	Betteravia	1.48E-02	5.47E-04	3.20E-04	3.10E-04	5.32E-03	1.92E-05	1.867
RPV/RVI Class A/B/C	6a.2	SBCAPCD	Betteravia	5.96E-03	2.20E-04	1.29E-04	1.25E-04	2.14E-03	7.72E-06	0.752

Notes:
1. This table was added to calculate the emissions from railcars being transported between the SMVR railyards and the UPRR main line connection.

Daily Emission Calculation Assumptions

4	days/week
52	weeks/year

Table 9.8 Railcar Mover - Annual Emissions

Air District	Railyard	Annual Emissions						
		NOx	ROG	PM10	PM2.5	CO	SOx	CO_2e
		ton/year						MT/year
SBCAPCD	Betteravia	0.170	0.014	0.003	0.002	0.312	0.001	104.742

Table 9.9 Railcar Mover - Daily Emissions

Air District	Railyard	Daily Emissions						
		NOx	ROG	PM10	PM2.5	CO	SOx	CO_2e
		pounds/day						
SBCAPCD	Betteravia	1.634	0.138	0.025	0.024	2.990	0.010	1107.137

Notes:
1. Operating time and fuel consumption for Railcar Mover

	3	hr/day at each raily	From PG&E equipment usage data		
	15	gal/hr	Estimate based on comparable equipr		https://www.petersonpower.com/sites/power/files/paragraphs/document/C7.1%20200kW%20TSS%20LEHE1585-00.pdf
	48.75	gal/day			
Period 1	1060		10168	gal/yr	Trackmobile specified in PG&E equipment list; looked on Trackmobile website and the new models all have Tier 4 Cummins diesel engines but no fuel consumption info for any of them. Used a comparable Caterpillar diesel engine (from a generator set) and fuel consumption.
	5.08	years			

Appendix D1.7

Phase 1 Truck Emissions Outside SLO/SB

Emission Summary

Table 10.1 Other Counties Truck Emissions Summary

District	Annual Emissions						
	NOx	ROG	PM10	PM2.5	CO	SO2	CO_2e
	ton/year						MT/year
SCAQMD	4.85E-02	6.33E-04	2.32E-03	1.03E-03	6.81E-03	2.76E-04	27.707
SJVAPCD	4.33E-02	5.82E-04	2.06E-03	9.12E-04	6.35E-03	2.45E-04	24.632
MDAQMD	5.05E-02	6.17E-04	2.45E-03	1.08E-03	6.43E-03	2.90E-04	29.131

Notes:
1. Maximum includes all truck emissions occurring in the same year. Not actually the case because some routes/destinations are in Period 1 vs Period 2.
2. Emission estimates included in summary include routes that travel directly out of state with one disposal location, and truck routes to SMVRR for further transport by rail.

Trip Information

Table 10.2 Long Haul Trucks

Trip Number	Truck Type	Waste Type	Waste Route[1]	Number of Shipments
				no. trips
1	Long Haul Truck	Hazardous/Regulated	Nevada	277
2	Long Haul Truck	Radioactive waste (Class B&C)	Andrews, TX (WCS)	10
3a	Long Haul Truck	Large Component Class A	Clive, UT	20
3b	Long Haul Truck	Large Component Class A	Andrews, TX (WCS)	20
4a	Crawler truck	Large Component Class A	Clive, UT	126
4b	Crawler truck	Large Component Class A	Andrews, TX (WCS)	126
5a	Long Haul Truck	RPV/RVI Class A/B/C	Clive, UT	58
5b	Long Haul Truck	RPV/RVI Class A/B/C	Andrews, TX (WCS)	58
6b	Long Haul Truck	RPV/RVI Class A/B/C	Andrews, TX (WCS)	37
8	Long Haul Truck	Recyclable Materials	Port of Long Beach	42
9	Long Haul Truck	Class A Waste	Clive, UT	4
11	Long Haul Truck	Clean debris and soil	Arizona	60

Notes:
1. Waste routes are assumed to be direct routes from DCPP to the final destination listed.
2. All truck transport leaving DCPP occurs in Period 1 of waste transportation activities.

Crawler Prime Mover Assumptions

Route	Waste Type	Number of Prime Movers
SMVRR	Legacy components	24

Routes and Trip Counts

Table 10.3 Outside SLO Trip Counts

Truck Type	Period	Trip Number	Waste Type	Waste Route[1]	County	Number of Round Trips per Year	Miles per Round Trip per Vehicle	Total Miles per Year
						trips/year	VMT/RT/Vehicle	VMT/year
Long Haul Truck	Period 1	1	Hazardous/Regulate	Nevada	SCAQMD	55	245.9	13403.6
Long Haul Truck	Period 1	1	Hazardous/Regulate	Nevada	SJVAPCD	55	211.3	11517.7
Long Haul Truck	Period 1	1	Hazardous/Regulate	Nevada	MDAQMD	55	330.1	17994.0
Long Haul Truck	Period 1	2	Radioactive waste (C	Andrews, TX (WCS)	SCAQMD	2	535.3	1053.4
Long Haul Truck	Period 1	2	Radioactive waste (C	Andrews, TX (WCS)	SJVAPCD	2	211.3	415.8
Long Haul Truck	Period 1	2	Radioactive waste (C	Andrews, TX (WCS)	MDAQMD	2	60.4	118.8
Long Haul Truck	Period 1	3a	Large Component Cl	Clive, UT	SCAQMD	4	245.9	967.8
Long Haul Truck	Period 1	3a	Large Component Cl	Clive, UT	SJVAPCD	4	211.3	831.6
Long Haul Truck	Period 1	3a	Large Component Cl	Clive, UT	MDAQMD	4	330.1	1299.2
Long Haul Truck	Period 1	3b	Large Component Cl	Andrews, TX (WCS)	SCAQMD	4	535.3	2106.7
Long Haul Truck	Period 1	3b	Large Component Cl	Andrews, TX (WCS)	SJVAPCD	4	211.3	831.6
Long Haul Truck	Period 1	3b	Large Component Cl	Andrews, TX (WCS)	MDAQMD	4	60.4	237.5
Crawler truck	Period 1	4a	Large Component Cl	Clive, UT	SCAQMD	25	245.9	6097.0
Crawler truck	Period 1	4a	Large Component Cl	Clive, UT	SJVAPCD	25	211.3	5239.1
Crawler truck	Period 1	4a	Large Component Cl	Clive, UT	MDAQMD	25	330.1	8185.0
Crawler truck	Period 1	4b	Large Component Cl	Andrews, TX (WCS)	SCAQMD	25	535.3	13272.2
Crawler truck	Period 1	4b	Large Component Cl	Andrews, TX (WCS)	SJVAPCD	25	211.3	5239.1
Crawler truck	Period 1	4b	Large Component Cl	Andrews, TX (WCS)	MDAQMD	25	60.4	1496.3
Long Haul Truck	Period 1	5a	RPV/RVI Class A/B/C	Clive, UT	SCAQMD	11	245.9	2806.5
Long Haul Truck	Period 1	5a	RPV/RVI Class A/B/C	Clive, UT	SJVAPCD	11	211.3	2411.7
Long Haul Truck	Period 1	5a	RPV/RVI Class A/B/C	Clive, UT	MDAQMD	11	330.1	3767.7
Long Haul Truck	Period 1	5b	RPV/RVI Class A/B/C	Andrews, TX (WCS)	SCAQMD	11	535.3	6109.4
Long Haul Truck	Period 1	5b	RPV/RVI Class A/B/C	Andrews, TX (WCS)	SJVAPCD	11	211.3	2411.7
Long Haul Truck	Period 1	5b	RPV/RVI Class A/B/C	Andrews, TX (WCS)	MDAQMD	11	60.4	688.8
Long Haul Truck	Period 1	6b	RPV/RVI Class A/B/C	Andrews, TX (WCS)	SCAQMD	7	535.3	3897.4
Long Haul Truck	Period 1	6b	RPV/RVI Class A/B/C	Andrews, TX (WCS)	SJVAPCD	7	211.3	1538.5
Long Haul Truck	Period 1	6b	RPV/RVI Class A/B/C	Andrews, TX (WCS)	MDAQMD	7	60.4	439.4
Long Haul Truck	Period 3	8	Recyclable Materials	Port of Long Beach	SJVAPCD	21	211.3	4443.8
Long Haul Truck	Period 3	8	Recyclable Materials	Port of Long Beach	SCAQMD	21	190.0	3995.5
Long Haul Truck	Period 2	9	Class A Waste	Clive, UT	SCAQMD	1	245.9	245.9
Long Haul Truck	Period 2	9	Class A Waste	Clive, UT	SJVAPCD	1	211.3	211.3
Long Haul Truck	Period 2	9	Class A Waste	Clive, UT	MDAQMD	1	330.1	330.1
Long Haul Truck	Period 1	11	Clean debris and soil	Arizona	SCAQMD	12	535.3	6320.1
Long Haul Truck	Period 1	11	Clean debris and soil	Arizona	SJVAPCD	12	211.3	2494.8
Long Haul Truck	Period 1	11	Clean debris and soil	Arizona	MDAQMD	12	60.4	712.5

Notes:
1. No truck trips during Period 2
2. Trip Numbers 1 through 6 occur in Period 1
3. Trip Numbers 8 and 9 occur in Period 3

Time Assumptions

Period	Start Date	End Date	Days	Years
Period 1	12/2/2024	12/31/2029	1855	5.082
Period 2	1/1/2030	12/31/2033	1460	4.000
Period 3	1/1/2034	12/31/2035	729	1.997

Emission Factors

Table 10.4 Total EFs (Diesel and Tire Wear Emission Factors)

Vehicle Type	Emission Factor	Emission Factor Description	Unit	NOx	ROG	PM10	PM2.5	CO	SO_2	CO_2e
Long Haul Truck	EF1	Running exhaust, tire and brake wear particulate emissions	g/mile	2.2288	0.0216	0.1128	0.0498	0.1963	0.0132	1458
Crawler Truck	EF1	Running exhaust, tire and brake wear particulate emissions	g/mile	2.1603	0.0190	0.1243	0.0609	0.1711	0.0119	1315
Long Haul Truck	EF2	Start exhaust tailpipe	g/trip	3.5424	--	--	--	--	--	--
Crawler Truck	EF2	Start exhaust tailpipe	g/trip	1.8520	--	--	--	--	--	--
Long Haul Truck	EF3	Idle exhaust, diurnal evaporative HC emissions, resting evaporative losses	g/vehicle/day	25.8760	2.1642	0.0100	0.0096	31.9093	0.0515	5706
Crawler Truck	EF3	Idle exhaust, diurnal evaporative HC emissions, resting evaporative losses	g/vehicle/day	22.2530	1.8744	0.0082	0.0078	27.6688	0.0434	4811

Source: EMFAC 2017. See EMFAC tab

Greenhouse Gas Global Warming Potentials

Pollutant	GWP
CO2	1
CH4	25
N2O	298

Table 10.5 DPM Emission Factors

Vehicle Type	Emission Factor Des	Unit	PM10	PM2.5
Long Haul Truck	Running exhaust PM10 and PM2.5	g/mile	0.0150	0.0144
Crawler Truck	Running exhaust PM10 and PM2.5	g/mile	0.0266	0.0254

Emission Calculations

Table 10.6 Emission Calculations

Truck Type	Trip Number	Classification	Final Destination	County	Annual Emissions						
					NOx	ROG	PM10	PM2.5	CO	SO2	CO_2e
					ton/year						MT/year
Long Haul Truck	1	Hazardous/Regulated	Nevada	SCAQMD	3.47E-02	4.49E-04	1.67E-03	7.37E-04	4.82E-03	1.97E-04	1.99E+01
Long Haul Truck	1	Hazardous/Regulated	Nevada	SJVAPCD	3.01E-02	4.04E-04	1.43E-03	6.33E-04	4.41E-03	1.70E-04	1.71E+01
Long Haul Truck	1	Hazardous/Regulated	Nevada	MDAQMD	4.60E-02	5.59E-04	2.24E-03	9.89E-04	5.81E-03	2.64E-04	2.65E+01
Long Haul Truck	2	Radioactive waste (Class B&C)	Andrews, TX (WCS)	SCAQMD	2.65E-03	2.98E-05	1.31E-04	5.79E-05	2.97E-04	1.54E-05	1.55E+00
Long Haul Truck	2	Radioactive waste (Class B&C)	Andrews, TX (WCS)	SJVAPCD	1.09E-03	1.46E-05	5.17E-05	2.29E-05	1.59E-04	6.14E-06	6.17E-01
Long Haul Truck	2	Radioactive waste (Class B&C)	Andrews, TX (WCS)	MDAQMD	3.56E-04	7.52E-06	1.48E-05	6.54E-06	9.49E-05	1.83E-06	1.84E-01
Long Haul Truck	3a	Large Component Class A	Clive, UT	SCAQMD	2.51E-03	3.24E-05	1.20E-04	5.32E-05	3.48E-04	1.43E-05	1.43E+00
Long Haul Truck	3a	Large Component Class A	Clive, UT	SJVAPCD	2.17E-03	2.92E-05	1.03E-04	4.57E-05	3.18E-04	1.23E-05	1.23E+00
Long Haul Truck	3a	Large Component Class A	Clive, UT	MDAQMD	3.32E-03	4.03E-05	1.62E-04	7.14E-05	4.20E-04	1.91E-05	1.92E+00
Long Haul Truck	3b	Large Component Class A	Andrews, TX (WCS)	SCAQMD	5.30E-03	5.96E-05	2.62E-04	1.16E-04	5.94E-04	3.08E-05	3.09E+00
Long Haul Truck	3b	Large Component Class A	Andrews, TX (WCS)	SJVAPCD	2.17E-03	2.92E-05	1.03E-04	4.57E-05	3.18E-04	1.23E-05	1.23E+00
Long Haul Truck	3b	Large Component Class A	Andrews, TX (WCS)	MDAQMD	7.11E-04	1.50E-05	2.96E-05	1.31E-05	1.90E-04	3.67E-06	3.69E-01
Crawler truck	4a	Large Component Class A	Clive, UT	SCAQMD	1.52E-02	1.79E-04	8.36E-04	4.10E-04	1.91E-03	8.09E-05	8.14E+00
Crawler truck	4a	Large Component Class A	Clive, UT	SJVAPCD	1.31E-02	1.61E-04	7.18E-04	3.52E-04	1.74E-03	6.97E-05	7.01E+00
Crawler truck	4a	Large Component Class A	Clive, UT	MDAQMD	2.01E-02	2.23E-04	1.12E-03	5.50E-04	2.30E-03	1.08E-04	1.09E+01
Crawler truck	4b	Large Component Class A	Andrews, TX (WCS)	SCAQMD	3.23E-02	3.29E-04	1.82E-03	8.91E-04	3.26E-03	1.75E-04	1.76E+01
Crawler truck	4b	Large Component Class A	Andrews, TX (WCS)	SJVAPCD	1.31E-02	1.61E-04	7.18E-04	3.52E-04	1.74E-03	6.97E-05	7.01E+00
Crawler truck	4b	Large Component Class A	Andrews, TX (WCS)	MDAQMD	4.22E-03	8.26E-05	2.05E-04	1.01E-04	1.04E-03	2.08E-05	2.09E+00
Long Haul Truck	5a	RPV/RVI Class A/B/C	Clive, UT	SCAQMD	7.27E-03	9.41E-05	3.49E-04	1.54E-04	1.01E-03	4.13E-05	4.16E+00
Long Haul Truck	5a	RPV/RVI Class A/B/C	Clive, UT	SJVAPCD	6.30E-03	8.47E-05	3.00E-04	1.33E-04	9.23E-04	3.56E-05	3.58E+00
Long Haul Truck	5a	RPV/RVI Class A/B/C	Clive, UT	MDAQMD	9.63E-03	1.17E-04	4.68E-04	2.07E-04	1.22E-03	5.53E-05	5.56E+00
Long Haul Truck	5b	RPV/RVI Class A/B/C	Andrews, TX (WCS)	SCAQMD	1.54E-02	1.73E-04	7.59E-04	3.36E-04	1.72E-03	8.93E-05	8.97E+00
Long Haul Truck	5b	RPV/RVI Class A/B/C	Andrews, TX (WCS)	SJVAPCD	6.30E-03	8.47E-05	3.00E-04	1.33E-04	9.23E-04	3.56E-05	3.58E+00
Long Haul Truck	5b	RPV/RVI Class A/B/C	Andrews, TX (WCS)	MDAQMD	2.06E-03	4.36E-05	8.57E-05	3.80E-05	5.50E-04	1.06E-05	1.07E+00
Long Haul Truck	6b	RPV/RVI Class A/B/C	Andrews, TX (WCS)	SCAQMD	9.81E-03	1.10E-04	4.84E-04	2.14E-04	1.10E-03	5.69E-05	5.72E+00
Long Haul Truck	6b	RPV/RVI Class A/B/C	Andrews, TX (WCS)	SJVAPCD	4.02E-03	5.40E-05	1.91E-04	8.46E-05	5.89E-04	2.27E-05	2.28E+00
Long Haul Truck	6b	RPV/RVI Class A/B/C	Andrews, TX (WCS)	MDAQMD	1.32E-03	2.78E-05	5.47E-05	2.42E-05	3.51E-04	6.79E-06	6.82E-01
Long Haul Truck	8	Recyclable Materials	Port of Long Beach	SJVAPCD	1.16E-02	1.56E-04	5.53E-04	2.44E-04	1.70E-03	6.56E-05	6.60E+00
Long Haul Truck	8	Recyclable Materials	Port of Long Beach	SCAQMD	1.05E-02	1.45E-04	4.97E-04	2.20E-04	1.60E-03	5.91E-05	5.94E+00
Long Haul Truck	9	Class A Waste	Clive, UT	SCAQMD	6.37E-04	8.24E-06	3.06E-05	1.35E-05	8.84E-05	3.62E-06	3.64E-01
Long Haul Truck	9	Class A Waste	Clive, UT	SJVAPCD	5.52E-04	7.42E-06	2.63E-05	1.16E-05	8.09E-05	3.12E-06	3.14E-01
Long Haul Truck	9	Class A Waste	Clive, UT	MDAQMD	8.44E-04	1.02E-05	4.10E-05	1.81E-05	1.07E-04	4.84E-06	4.87E-01
Long Haul Truck	11	Clean debris and soil	Arizona	SCAQMD	1.59E-02	1.79E-04	7.86E-04	3.47E-04	1.78E-03	9.23E-05	9.28E+00
Long Haul Truck	11	Clean debris and soil	Arizona	SJVAPCD	6.51E-03	8.76E-05	3.10E-04	1.37E-04	9.55E-04	3.69E-05	3.70E+00
Long Haul Truck	11	Clean debris and soil	Arizona	MDAQMD	2.13E-03	4.51E-05	8.87E-05	3.93E-05	5.69E-04	1.10E-05	1.11E+00

Emission Factor Look-up for formulas		Annual
First Sum	EF1	= miles/year * g/mile * tons/grams
Second Sum	EF2	= trips/year * g/trip * tons/grams
Third Sum	EF3	= trips/year * g/vehicle/day * tons/grams

Conversions

453.592	grams/lb
2000	lb/ton
907184	grams/ton
2204.62	lb/metric ton

Scenario Analysis

Scenario Combinations - Truck Only

1. Trip Numbers 1, 2, 8, 9, 11, 6b constant

Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7	Scenario 8
3a	3b	3b	3a	3a	3b	3b	3a
4a	4a	4b	4b	4a	4a	4b	4b
5a	5a	5a	5b	5b	5b	5b	5a

2. Scenario 7 includes all routes to Texas, which has the greatest total mileage within California.
3. All 8 Scenarios include *only* truck routes. No routes to SMVRR are considered in this Scenario analysis

Scenario	Annual Emissions						
	NOx	**ROG**	**PM10**	**PM2.5**	**CO**	**SO2**	**CO_2e**
	ton/year						MT/year
Constant (1,2,8,9,11,6b)	1.79E-01	1.79E-01	1.79E-01	1.79E-01	1.79E-01	1.79E-01	1.79E-01
Scenario 1	7.96E-02	9.60E-04	4.18E-03	1.98E-03	1.02E-02	4.37E-04	4.39E+01
Scenario 2	7.98E-02	9.62E-04	4.19E-03	1.98E-03	1.02E-02	4.38E-04	4.40E+01
Scenario 3	8.10E-02	9.72E-04	4.26E-03	2.01E-03	1.03E-02	4.44E-04	4.47E+01
Scenario 4	8.14E-02	9.76E-04	4.27E-03	2.02E-03	1.03E-02	4.46E-04	4.49E+01
Scenario 5	8.02E-02	9.66E-04	4.21E-03	1.99E-03	1.02E-02	4.40E-04	4.42E+01
Scenario 6	8.04E-02	9.67E-04	4.22E-03	1.99E-03	1.03E-02	4.41E-04	4.43E+01
Scenario 7	8.15E-02	9.78E-04	4.28E-03	2.02E-03	1.03E-02	4.47E-04	4.50E+01
Scenario 8	8.08E-02	9.70E-04	4.25E-03	2.01E-03	1.03E-02	4.43E-04	4.45E+01
Scenario 1 + Constant	2.58E-01	1.80E-01	1.83E-01	1.81E-01	1.89E-01	1.79E-01	4.41E+01
Scenario 2 + Constant	2.58E-01	1.80E-01	1.83E-01	1.81E-01	1.89E-01	1.79E-01	4.42E+01
Scenario 3 + Constant	2.60E-01	1.80E-01	1.83E-01	1.81E-01	1.89E-01	1.79E-01	4.48E+01
Scenario 4 + Constant	2.60E-01	1.80E-01	1.83E-01	1.81E-01	1.89E-01	1.79E-01	4.50E+01
Scenario 5 + Constant	2.59E-01	1.80E-01	1.83E-01	1.81E-01	1.89E-01	1.79E-01	4.44E+01
Scenario 6 + Constant	2.59E-01	1.80E-01	1.83E-01	1.81E-01	1.89E-01	1.79E-01	4.45E+01
Scenario 7 + Constant	**2.60E-01**	**1.80E-01**	**1.83E-01**	**1.81E-01**	**1.89E-01**	**1.79E-01**	**4.52E+01**
Scenario 8 + Constant	2.59E-01	1.80E-01	1.83E-01	1.81E-01	1.89E-01	1.79E-01	4.47E+01
Max Emissions (Scenario 7)	**0.2602**	**0.1796**	**0.1829**	**0.1807**	**0.1890**	**0.1791**	**45.1624**

Constant 1,2,8,9,11,6b by District

Air District	**NOx**	**ROG**	**PM10**	**PM2.5**	**CO**	**SO2**	**CO_2e**
	ton/year						MT/year
SCAQMD	7.42E-02	9.21E-04	3.60E-03	1.59E-03	9.69E-03	4.25E-04	4.27E+01
SJVAPCD	5.38E-02	7.24E-04	2.56E-03	1.13E-03	7.90E-03	3.05E-04	3.06E+01
MDAQMD	5.06E-02	6.49E-04	2.44E-03	1.08E-03	6.93E-03	2.89E-04	2.90E+01

Table 10.7 DPM Emissions Only

Truck Type	Trip Number	Classification	Final Destination	County	Annual Emissions PM10	Annual Emissions PM2.5
					ton/year	
Long Haul Truck	1	Hazardous/Regulated	Nevada	SCAQMD	2.22E-04	2.12E-04
Long Haul Truck	1	Hazardous/Regulated	Nevada	SJVAPCD	1.91E-04	1.82E-04
Long Haul Truck	1	Hazardous/Regulated	Nevada	MDAQMD	2.98E-04	2.85E-04
Long Haul Truck	2	Radioactive waste (Class B&C)	Andrews, TX (WCS)	SCAQMD	1.74E-05	1.67E-05
Long Haul Truck	2	Radioactive waste (Class B&C)	Andrews, TX (WCS)	SJVAPCD	6.88E-06	6.58E-06
Long Haul Truck	2	Radioactive waste (Class B&C)	Andrews, TX (WCS)	MDAQMD	1.97E-06	1.88E-06
Long Haul Truck	3a	Large Component Class A	Clive, UT	SCAQMD	1.60E-05	1.53E-05
Long Haul Truck	3a	Large Component Class A	Clive, UT	SJVAPCD	1.38E-05	1.32E-05
Long Haul Truck	3a	Large Component Class A	Clive, UT	MDAQMD	2.15E-05	2.06E-05
Long Haul Truck	3b	Large Component Class A	Andrews, TX (WCS)	SCAQMD	3.49E-05	3.34E-05
Long Haul Truck	3b	Large Component Class A	Andrews, TX (WCS)	SJVAPCD	1.38E-05	1.32E-05
Long Haul Truck	3b	Large Component Class A	Andrews, TX (WCS)	MDAQMD	3.93E-06	3.76E-06
Crawler truck	4a	Large Component Class A	Clive, UT	SCAQMD	1.79E-04	1.71E-04
Crawler truck	4a	Large Component Class A	Clive, UT	SJVAPCD	1.54E-04	1.47E-04
Crawler truck	4a	Large Component Class A	Clive, UT	MDAQMD	2.40E-04	2.30E-04
Crawler truck	4b	Large Component Class A	Andrews, TX (WCS)	SCAQMD	3.89E-04	3.72E-04
Crawler truck	4b	Large Component Class A	Andrews, TX (WCS)	SJVAPCD	1.54E-04	1.47E-04
Crawler truck	4b	Large Component Class A	Andrews, TX (WCS)	MDAQMD	4.39E-05	4.20E-05
Long Haul Truck	5a	RPV/RVI Class A/B/C	Clive, UT	SCAQMD	4.65E-05	4.44E-05
Long Haul Truck	5a	RPV/RVI Class A/B/C	Clive, UT	SJVAPCD	3.99E-05	3.82E-05
Long Haul Truck	5a	RPV/RVI Class A/B/C	Clive, UT	MDAQMD	6.24E-05	5.97E-05
Long Haul Truck	5b	RPV/RVI Class A/B/C	Andrews, TX (WCS)	SCAQMD	1.01E-04	9.68E-05
Long Haul Truck	5b	RPV/RVI Class A/B/C	Andrews, TX (WCS)	SJVAPCD	3.99E-05	3.82E-05
Long Haul Truck	5b	RPV/RVI Class A/B/C	Andrews, TX (WCS)	MDAQMD	1.14E-05	1.09E-05
Long Haul Truck	6b	RPV/RVI Class A/B/C	Andrews, TX (WCS)	SCAQMD	6.45E-05	6.17E-05
Long Haul Truck	6b	RPV/RVI Class A/B/C	Andrews, TX (WCS)	SJVAPCD	2.55E-05	2.44E-05
Long Haul Truck	6b	RPV/RVI Class A/B/C	Andrews, TX (WCS)	MDAQMD	7.27E-06	6.96E-06
Long Haul Truck	8	Recyclable Materials	Port of Long Beach	SJVAPCD	7.36E-05	7.04E-05
Long Haul Truck	8	Recyclable Materials	Port of Long Beach	SCAQMD	6.61E-05	6.33E-05
Long Haul Truck	9	Class A Waste	Clive, UT	SCAQMD	4.07E-06	3.89E-06
Long Haul Truck	9	Class A Waste	Clive, UT	SJVAPCD	3.50E-06	3.35E-06
Long Haul Truck	9	Class A Waste	Clive, UT	MDAQMD	5.46E-06	5.23E-06
Long Haul Truck	11	Clean debris and soil	Arizona	SCAQMD	1.05E-04	1.00E-04
Long Haul Truck	11	Clean debris and soil	Arizona	SJVAPCD	4.13E-05	3.95E-05
Long Haul Truck	11	Clean debris and soil	Arizona	MDAQMD	1.18E-05	1.13E-05

Appendix D1.8

Phase 1 Rail Emissions Outside SLO/SB

Emissions Summary

Table 11.1 Other Districts Locomotive Emissions Summary

Air District	Annual Emissions						
	NOx	ROG	PM10	PM2.5	CO	SOx	CO_2e
	ton/year						MT/year
VCAPCD	3.35E-02	1.24E-03	7.25E-04	7.03E-04	1.21E-02	4.35E-05	4.234
SCAQMD	6.88E-02	2.55E-03	1.49E-03	1.44E-03	2.48E-02	8.92E-05	8.692
MDAQMD	1.41E-01	5.21E-03	3.05E-03	2.95E-03	5.07E-02	1.83E-04	17.786

Notes:
1. SBCAPCD includes rail transport by long line haul and the operation of rail car movers at the SMVRR sites.
2. Maximum Daily emissions are based on the average daily emissions multiplied by a scaling factor of 1.25 to calculate a conservative maximum.

Trip Information

Table 11.2 Waste Shipment Information

Waste Type	Trip Number	Waste Route	Railyard[1]	Number of Originating Truckloads[1]	Total Tons from Truckloads	Number Railcars	Number of Trains	Average Train Load[4]
				no. trucks to railyard	tons	no. rail cars	no. trains	tons/train/RT
Large Component Class A	Total_3	Utah or Texas	Total	20	2503	23	1	2185
Large Component Class A	Total_4	Utah or Texas	Total	42	5257	48	2	2280
RPV/RVI Class A/B/C	Total_6	Utah or Texas	Total	37	513	5	1	475

Notes:
1. Number of originating truckloads assumes 100% to Betteravia. Values are rounded up to produce whole truckload values. The "Total" railyard line is used for the air districts outside of Santa Barbara because the route distance in these air districts is the same no matter the originating railyard.
2. Number of rail cars is based on an estimate of 110 tons per rail car. This value was determined based on first round of transportation emission calculations.

110 tons/rail car

3. Number of trains assumes a maximum of 30 rail cars per train. Also determined in first round of calcs based on UCLA Transportation study.

30 rail cars/train

4. Train load calculation assumptions

40	ton/car	Empty rail car	https://www.up.com/customers/all/equipment/descriptions/flatcars/index.htm
110	average tons waste/rail car		
150	total tons/rail car	Loaded flat rail car	
95	tons/rail car	Average rail car load for one RT (assumes loaded on way there and unloaded on way back)	
2850	total tons/train		

Average train load is based on the assumption that the train is fully loaded on the way to the waste disposal facility, and unloaded (only empty rail cars) on the way back to SMVRR. The average weight of the train is used for the average round trip load.

Table 11.3 Route Information

Waste Type	Trip Number	Air District	Railyard	One Way Miles	Round Trip Miles	Total ton-miles	Total ton-mile/yr
				VMT	VMT/RT	ton-miles	ton-mile/yr
Large Component Class A	Total_3	VCAPCD	Total	58	116	252855	49753
Large Component Class A	Total_3	SCAQMD	Total	119	238	519076	102136
Large Component Class A	Total_3	MDAQMD	Total	243	486	1062228	209010
Large Component Class A	Total_4	VCAPCD	Total	58	116	527698	103833
Large Component Class A	Total_4	SCAQMD	Total	119	238	1083289	213154
Large Component Class A	Total_4	MDAQMD	Total	243	486	2216824	436194
RPV/RVI Class A/B/C	Total_6	VCAPCD	Total	58	116	54968	10816
RPV/RVI Class A/B/C	Total_6	SCAQMD	Total	119	238	112843	22204
RPV/RVI Class A/B/C	Total_6	MDAQMD	Total	243	486	230919	45437

Notes:
1. Ton-miles are calculated for Santa Barbara County air district based on trains originating from the Betteravia railyards. The other railyards are calculated based on the total rail travel through that air district, regardless of the originating railyard.
2. Total ton-miles = # trains * tons/train/RT * VMT/RT
3. Time assumptions

Period	Start Date	End Date	Number of Days	Number of Years
Period 1	12/2/2024	12/31/2029	1855	5.1

4. Route within California to Texas is longer so using that as worst-case analysis.

Emission Factors

Table 11.4 Locomotive Emission Factors

Engine Type	Unit	NOx	ROG	PM10	PM2.5	CO	SOx	CO_2e
Large Line Haul	g/gal	74.00	2.74	1.60	1.55	26.62	0.10	10301.30
Large Line Haul	g/ton-mile	0.19	0.01	0.00	0.00	0.07	0.00	25.75
Railcar Mover	g/bhp-hr	1.00	0.08	0.02	0.01	1.83	--	--
Railcar Mover	g/gal	15.20	1.28	0.23	0.22	27.82	0.10	10301.30

Notes:

Large Line Haul Notes

1. NOx, PM10, ROG, and PM2.5 emission factors give the expected fleet average emission factors by calendar year. The year 2025 is used as the worst-case year for rail transportation emissions.
2. NOx and PM10 emission factors taken from Tables 5 and 6 of EPA document EPA-420-F-09-025.

Railcar Mover Trackmobile Notes

1. NOx, PM10, and CO emission factors taken from Table 2 of EPA 420-F-09-025 assuming Tier 4 engine as provided by Trackmobile technical specification sheet.

General Notes

1. Source of NOx, PM10, PM2.5, ROG, CO, and SO2 emission factors and derivations: EPA document Emission Factors for Locomotives (EPA-420-F-09-025) https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100500B.pdf
2. ROG emission factors were calculated by multiplying the HC emission factors found in Table 7 of the EPA document EPA-420-F-09-025 by a factor of 1.053 according to guidance in the document.
3. CO emission factors were calculated based on the CO emission factor in Tables 1 and 2 for large line and switching, respectively, and the conversion factors in Table 3 of the EPA document EPA-420-F-09-025. The CO emission factor was developed in the context of adopting new emission standards, which for CO, were intended to cap CO emissions at pre-control levels and resulted in a projection of CO emission factors remaining the same for all tiers of emission standards. Recent testing also suggests that emission controls designed to reduce PM and HC emissions are also reducing CO emissions, according to the EPA document EPA-420-F-09-025. As such, the CO emission factor presents a conservative estimate to use for calculating CO emissions.

4. PM2.5 emission factors were calculated by multiplying PM10 emissions by a factor of 0.97, following guidance in EPA-420-F-09-025.
5. SO2 emission factors were calculated with the below conversions/assumptions (calculation method in EPA document, derived from NONROAD Technical Document NR-009c). The assumption of 100% conversion of sulfur in fuel to SO2 is a conservative estimate, as the actual fraction of fuel sulfur emitted as SO2 may be as low as 95 percent, according to EPA document EPA-420-F-09-025.

7.05	Fuel density (lb/gal)
453.592	g/lb
100%	sulfur in fuel to SO2 conversion
2	g SO2/ g S
15	sulfur content (ppm) - ultra low sulfur fuel

Equation: SO2 (g/gal) = (fuel density [lb/gal]) x (conversion factor [g/lb]) x (64 g SO2/32 g S) x (S content of fuel [ppm])

6. CO2, CH4, N2O emission factors were derived from 2018 EPA Emission Factors for Greenhouse Gas Inventories https://www.epa.gov/sites/production/files/2018-03/documents/emission-factors_mar_2018_0.pdf

CO2 from Table 2, Diesel Fuel	10210	g CO2/gallon fuel
CH4 from Table 5, Diesel Locomotiv	0.8	g CO2/gallon fuel
N2O from Table 5, Diesel Locomoti	0.26	g CO2/gallon fuel

7. CO2e calculated using global warming potentials (GWP) below, taken from IPCC Fifth Assessment Report 2014, Working Group 1 Climate Change 2013: The Physical Science Basis (Chapter 8)

CO2	1
CH4	28
N2O	265

8. Conversion from g/gal to g/ton-mile is 400 ton-miles/gal as indicated in EPA-420-F-09-025.

Emission Calculations

Table 11.5 Large Line Haul Emission Calculations

Waste Type	Trip Number	Air District	Railyard	Annual Emissions NOx	ROG	PM10	PM2.5	CO	SOx	CO_2e
				ton/year						MT/year
Large Component Class A	Total_3	VCAPCD	Total	1.01E-02	3.75E-04	2.19E-04	2.13E-04	3.65E-03	1.32E-05	1.281
	Total_3	SCAQMD	Total	2.08E-02	7.71E-04	4.50E-04	4.37E-04	7.49E-03	2.70E-05	2.630
	Total_3	MDAQMD	Total	4.26E-02	1.58E-03	9.22E-04	8.94E-04	1.53E-02	5.53E-05	5.383
Large Component Class A	Total_4	VCAPCD	Total	2.12E-02	7.83E-04	4.58E-04	4.44E-04	7.62E-03	2.75E-05	2.674
	Total_4	SCAQMD	Total	4.35E-02	1.61E-03	9.40E-04	9.12E-04	1.56E-02	5.64E-05	5.489
	Total_4	MDAQMD	Total	8.90E-02	3.29E-03	1.92E-03	1.87E-03	3.20E-02	1.15E-04	11.233
RPV/RVI Class A/B/C	Total_6	VCAPCD	Total	2.21E-03	8.16E-05	4.77E-05	4.63E-05	7.94E-04	2.86E-06	0.279
	Total_6	SCAQMD	Total	4.53E-03	1.68E-04	9.79E-05	9.50E-05	1.63E-03	5.87E-06	0.572
	Total_6	MDAQMD	Total	9.27E-03	3.43E-04	2.00E-04	1.94E-04	3.33E-03	1.20E-05	1.170

Notes:
1. Weight conversions

453.592	g/lb
2000	lb/ton
907184	g/ton
1000000	g/metric ton (MT)

2. Maximum Daily Emissions calculated by multiplying average daily emissions over life of project by safety factor of 1.25

Appendix D1.9

Phase 1 CalEEMod SLO County

DCPP Decommissioning

San Luis Obispo County APCD Air District, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Heavy Industry	0.00	1000sqft	585.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	3.2	**Precipitation Freq (Days)**	44
Climate Zone	4			**Operational Year**	2027
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Total lot acreage.

Construction Phase - 20 working days per month based on 4 day work week and 5 weeks per month.

Off-road Equipment - Data from PG&E equipment list for 2026.

Off-road Equipment - Data from PG&E equipment list for 2026.

Off-road Equipment - Data from PG&E equipment list for 2026.

Off-road Equipment - Data from PG&E equipment list for 2026.

Off-road Equipment - Data from PG&E equipment list for 2026.

Off-road Equipment - Data from PG&E equipment list for 2026.

Off-road Equipment - Data from PG&E equipment list for 2026.

Off-road Equipment - Data from PG&E equipment list for 2026.

Off-road Equipment - Data from PG&E equipment list for 2026.

Off-road Equipment - Data from PG&E equipment list for 2026.

Off-road Equipment - Data from PG&E equipment list for 2026.

Off-road Equipment - Data from PG&E equipment list for 2026.

Trips and VMT - Data from PG&E employee totals. Assumed 22 miles from downtown SLO to DCPP.

Demolition -

Grading -

Construction Off-road Equipment Mitigation - Scenario 2: Tier 4 Final for equipment HP>100, Tier 4 Interim for equipment HP<100. Put all tractors/loaders at Tier 3 to be conservative because the equipment has both HP less than and greater than 100.

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tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	74.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	14.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	52.00

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	27.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	17.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	259.00
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tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
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tblTripsAndVMT	WorkerTripNumber	153.00	758.00
tblTripsAndVMT	WorkerTripNumber	150.00	722.00
tblTripsAndVMT	WorkerTripNumber	145.00	724.00
tblTripsAndVMT	WorkerTripNumber	173.00	755.00
tblTripsAndVMT	WorkerTripNumber	120.00	740.00
tblTripsAndVMT	WorkerTripNumber	305.00	725.00
tblTripsAndVMT	WorkerTripNumber	360.00	756.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2026	42.8539	275.2442	349.3865	0.8136	18.7385	10.3934	29.1319	4.4772	9.8881	14.3653	0.0000	76,253.6953	76,253.6953	20.8220	0.0000	76,663.5227
2027	29.5148	176.7760	242.3911	0.5415	17.9692	6.5321	24.5014	4.2732	6.2700	10.5432	0.0000	50,370.5401	50,370.5401	9.3575	0.0000	50,604.4769
Maximum	**42.8539**	**275.2442**	**349.3865**	**0.8136**	**18.7385**	**10.3934**	**29.1319**	**4.4772**	**9.8881**	**14.3653**	**0.0000**	**76,253.6953**	**76,253.6953**	**20.8220**	**0.0000**	**76,663.5227**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2026	15.2634	190.2830	418.9761	0.8136	18.7385	4.2181	22.9567	4.4772	4.2122	8.6894	0.0000	76,253.6953	76,253.6953	20.8220	0.0000	76,663.5226
2027	10.9312	136.5399	277.1218	0.5415	17.9692	3.1680	21.1373	4.2732	3.1627	7.4359	0.0000	50,370.5401	50,370.5401	9.3575	0.0000	50,604.4769
Maximum	**15.2634**	**190.2830**	**418.9761**	**0.8136**	**18.7385**	**4.2181**	**22.9567**	**4.4772**	**4.2122**	**8.6894**	**0.0000**	**76,253.6953**	**76,253.6953**	**20.8220**	**0.0000**	**76,663.5226**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**63.80**	**27.70**	**-17.63**	**0.00**	**0.00**	**56.36**	**17.79**	**0.00**	**54.36**	**35.26**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Jan-26	Demolition	1/1/2026	1/28/2026	5	20	
2	Feb-26	Demolition	2/1/2026	2/28/2026	5	20	
3	Mar-26	Demolition	3/1/2026	3/27/2026	5	20	
4	Apr-26	Demolition	4/1/2026	4/28/2026	5	20	
5	May-26	Demolition	5/1/2026	5/28/2026	5	20	
6	Jun-26	Demolition	6/1/2026	6/26/2026	5	20	
7	Jul-26	Demolition	7/1/2026	7/28/2026	5	20	
8	Aug-26	Demolition	8/1/2026	8/28/2026	5	20	
9	Sep-26	Demolition	9/1/2026	9/28/2026	5	20	
10	Oct-26	Demolition	10/1/2026	10/28/2026	5	20	
11	Nov-26	Demolition	11/1/2026	11/27/2026	5	20	
12	Dec-26	Demolition	12/7/2026	1/1/2027	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Jan-26	Aerial Lifts	3	9.00	63	0.31
Jan-26	Aerial Lifts	1	3.60	63	0.31
Jan-26	Aerial Lifts	1	9.00	63	0.31
Jan-26	Cranes	4	9.00	231	0.29
Jan-26	Cranes	1	3.60	231	0.29
Jan-26	Crushing/Proc. Equipment	2	9.00	85	0.78
Jan-26	Excavators	1	9.00	158	0.38
Jan-26	Excavators	4	9.00	158	0.38
Jan-26	Excavators	1	1.80	158	0.38
Jan-26	Forklifts	1	9.00	89	0.20
Jan-26	Forklifts	1	9.00	89	0.20
Jan-26	Graders	1	1.80	199	0.41
Jan-26	Off-Highway Trucks	8	9.00	402	0.38
Jan-26	Off-Highway Trucks	1	7.10	402	0.38
Jan-26	Off-Highway Trucks	1	10.30	402	0.38
Jan-26	Off-Highway Trucks	2	9.00	402	0.38
Jan-26	Off-Highway Trucks	2	9.00	402	0.38
Jan-26	Off-Highway Trucks	1	3.60	402	0.38
Jan-26	Off-Highway Trucks	2	9.00	199	0.38
Jan-26	Off-Highway Trucks	2	9.00	402	0.38
Jan-26	Off-Highway Trucks	1	9.00	402	0.38
Jan-26	Off-Highway Trucks	1	9.00	402	0.38
Jan-26	Off-Highway Trucks	1	9.00	402	0.38
Jan-26	Other Construction Equipment	4	9.00	6	0.42
Jan-26	Other Construction Equipment	2	9.00	6	0.42

Jan-26	Other Construction Equipment	2	9.00	20	0.38
Jan-26	Plate Compactors	1	9.00	8	0.43
Jan-26	Rollers	1	1.80	80	0.38
Jan-26	Rollers	1	9.00	80	0.38
Jan-26	Skid Steer Loaders	4	9.00	65	0.37
Jan-26	Tractors/Loaders/Backhoes	1	0.20	224	0.37
Jan-26	Tractors/Loaders/Backhoes	4	9.00	349	0.37
Jan-26	Tractors/Loaders/Backhoes	1	9.00	59	0.37
Jan-26	Tractors/Loaders/Backhoes	4	9.00	97	0.37
Jan-26	Tractors/Loaders/Backhoes	1	3.70	97	0.37
Jan-26	Tractors/Loaders/Backhoes	1	9.00	97	0.37
Feb-26	Aerial Lifts	4	9.00	63	0.31
Feb-26	Aerial Lifts	1	4.50	63	0.31
Feb-26	Aerial Lifts	2	9.00	63	0.31
Feb-26	Aerial Lifts	1	9.00	63	0.31
Feb-26	Air Compressors	5	9.00	78	0.48
Feb-26	Cranes	4	9.00	231	0.29
Feb-26	Cranes	3	9.00	231	0.29
Feb-26	Cranes	1	4.50	231	0.29
Feb-26	Crushing/Proc. Equipment	1	9.00	85	0.78
Feb-26	Excavators	2	9.00	158	0.38
Feb-26	Excavators	1	9.00	158	0.38
Feb-26	Forklifts	1	9.00	89	0.20
Feb-26	Forklifts	1	9.00	89	0.20
Feb-26	Graders	1	1.80	199	0.41
Feb-26	Off-Highway Trucks	4	9.00	402	0.38
Feb-26	Off-Highway Trucks	4	9.00	402	0.38

Feb-26	Off-Highway Trucks	1	7.10	402	0.38
Feb-26	Off-Highway Trucks	1	9.00	402	0.38
Feb-26	Off-Highway Trucks	1	9.00	402	0.38
Feb-26	Off-Highway Trucks	16	9.00	402	0.38
Feb-26	Off-Highway Trucks	2	9.00	402	0.38
Feb-26	Off-Highway Trucks	1	9.00	199	0.38
Feb-26	Off-Highway Trucks	2	9.00	402	0.38
Feb-26	Off-Highway Trucks	1	9.00	402	0.38
Feb-26	Off-Highway Trucks	1	9.00	402	0.38
Feb-26	Off-Highway Trucks	1	9.00	402	0.38
Feb-26	Off-Highway Trucks	1	5.70	402	0.38
Feb-26	Other Construction Equipment	2	9.00	6	0.42
Feb-26	Other Construction Equipment	2	9.00	6	0.42
Feb-26	Other Construction Equipment	2	9.00	20	0.42
Feb-26	Plate Compactors	1	9.00	8	0.43
Feb-26	Rollers	1	1.80	80	0.38
Feb-26	Skid Steer Loaders	2	9.00	65	0.37
Feb-26	Tractors/Loaders/Backhoes	1	1.10	224	0.37
Feb-26	Tractors/Loaders/Backhoes	2	9.00	349	0.37
Feb-26	Tractors/Loaders/Backhoes	1	9.00	59	0.37
Feb-26	Tractors/Loaders/Backhoes	2	9.00	97	0.37
Feb-26	Tractors/Loaders/Backhoes	1	3.70	97	0.37
Feb-26	Tractors/Loaders/Backhoes	1	9.00	97	0.37
Feb-26	Welders	3	9.00	46	0.45
Mar-26	Aerial Lifts	2	9.00	63	0.31
Mar-26	Aerial Lifts	1	9.00	63	0.31
Mar-26	Bore/Drill Rigs	1	0.50	221	0.50

Mar-26	Bore/Drill Rigs	1	1.80	221	0.50
Mar-26	Cranes	4	9.00	231	0.29
Mar-26	Cranes	1	4.50	231	0.29
Mar-26	Crushing/Proc. Equipment	1	9.00	85	0.78
Mar-26	Excavators	2	9.00	158	0.38
Mar-26	Excavators	1	9.00	158	0.38
Mar-26	Graders	1	1.80	199	0.41
Mar-26	Off-Highway Trucks	4	9.00	402	0.38
Mar-26	Off-Highway Trucks	2	9.00	402	0.38
Mar-26	Off-Highway Trucks	5	9.00	402	0.38
Mar-26	Off-Highway Trucks	1	2.60	402	0.38
Mar-26	Off-Highway Trucks	1	1.80	402	0.38
Mar-26	Off-Highway Trucks	1	9.00	402	0.38
Mar-26	Off-Highway Trucks	1	9.00	402	0.38
Mar-26	Off-Highway Trucks	1	0.20	402	0.38
Mar-26	Off-Highway Trucks	4	9.00	402	0.38
Mar-26	Off-Highway Trucks	1	7.20	402	0.38
Mar-26	Off-Highway Trucks	1	9.00	199	0.38
Mar-26	Off-Highway Trucks	2	9.00	402	0.38
Mar-26	Off-Highway Trucks	1	9.00	402	0.38
Mar-26	Off-Highway Trucks	1	9.00	402	0.38
Mar-26	Off-Highway Trucks	1	9.00	402	0.38
Mar-26	Off-Highway Trucks	1	1.30	402	0.38
Mar-26	Other Construction Equipment	2	9.00	6	0.42
Mar-26	Other Construction Equipment	2	9.00	6	0.42
Mar-26	Other Construction Equipment	2	9.00	20	0.42
Mar-26	Plate Compactors	1	9.00	8	0.43

Mar-26	Rollers	1	1.80	80	0.38
Mar-26	Skid Steer Loaders	2	9.00	65	0.37
Mar-26	Tractors/Loaders/Backhoes	1	1.20	224	0.37
Mar-26	Tractors/Loaders/Backhoes	2	9.00	349	0.37
Mar-26	Tractors/Loaders/Backhoes	1	9.00	59	0.37
Mar-26	Tractors/Loaders/Backhoes	2	9.00	97	0.37
Mar-26	Tractors/Loaders/Backhoes	1	3.70	97	0.37
Mar-26	Tractors/Loaders/Backhoes	1	9.00	97	0.37
Apr-26	Aerial Lifts	1	9.00	63	0.31
Apr-26	Aerial Lifts	1	9.00	63	0.31
Apr-26	Bore/Drill Rigs	1	0.50	221	0.50
Apr-26	Bore/Drill Rigs	1	1.80	221	0.50
Apr-26	Cranes	4	9.00	231	0.29
Apr-26	Cranes	1	3.60	231	0.29
Apr-26	Cranes	1	4.50	231	0.29
Apr-26	Crushing/Proc. Equipment	1	9.00	85	0.78
Apr-26	Crushing/Proc. Equipment	1	0.90	85	0.78
Apr-26	Excavators	2	9.00	158	0.38
Apr-26	Excavators	1	1.80	158	0.38
Apr-26	Graders	1	1.80	199	0.41
Apr-26	Off-Highway Trucks	4	9.00	402	0.38
Apr-26	Off-Highway Trucks	1	3.60	402	0.38
Apr-26	Off-Highway Trucks	2	9.00	402	0.38
Apr-26	Off-Highway Trucks	1	9.00	402	0.38
Apr-26	Off-Highway Trucks	1	1.80	402	0.38
Apr-26	Off-Highway Trucks	1	5.80	402	0.38
Apr-26	Off-Highway Trucks	1	9.00	402	0.38

Apr-26	Off-Highway Trucks	1	0.20	402	0.38
Apr-26	Off-Highway Trucks	4	9.00	402	0.38
Apr-26	Off-Highway Trucks	1	7.20	402	0.38
Apr-26	Off-Highway Trucks	1	9.00	199	0.38
Apr-26	Off-Highway Trucks	2	9.00	402	0.38
Apr-26	Off-Highway Trucks	1	7.10	402	0.38
Apr-26	Off-Highway Trucks	1	0.90	402	0.38
Apr-26	Off-Highway Trucks	1	0.90	199	0.38
Apr-26	Other Construction Equipment	2	9.00	6	0.42
Apr-26	Other Construction Equipment	2	9.00	6	0.42
Apr-26	Other Construction Equipment	2	9.00	20	0.42
Apr-26	Other Construction Equipment	1	1.80	6	0.42
Apr-26	Rollers	1	1.80	80	0.38
Apr-26	Skid Steer Loaders	2	9.00	65	0.37
Apr-26	Skid Steer Loaders	1	4.50	65	0.37
Apr-26	Skid Steer Loaders	1	1.80	65	0.37
Apr-26	Tractors/Loaders/Backhoes	1	1.10	224	0.37
Apr-26	Tractors/Loaders/Backhoes	2	9.00	349	0.37
Apr-26	Tractors/Loaders/Backhoes	1	9.00	59	0.37
Apr-26	Tractors/Loaders/Backhoes	2	9.00	97	0.37
Apr-26	Tractors/Loaders/Backhoes	1	3.70	97	0.37
Apr-26	Tractors/Loaders/Backhoes	1	1.80	349	0.37
Apr-26	Tractors/Loaders/Backhoes	1	1.80	97	0.37
May-26	Aerial Lifts	1	9.00	63	0.31
May-26	Bore/Drill Rigs	1	0.50	221	0.50
May-26	Bore/Drill Rigs	1	1.80	221	0.50
May-26	Cranes	4	9.00	231	0.29

May-26	Cranes	1	3.60	231	0.29
May-26	Crushing/Proc. Equipment	1	9.00	85	0.78
May-26	Crushing/Proc. Equipment	1	0.90	85	0.78
May-26	Excavators	2	9.00	158	0.38
May-26	Excavators	1	1.80	158	0.38
May-26	Graders	1	1.80	199	0.41
May-26	Off-Highway Trucks	4	9.00	402	0.38
May-26	Off-Highway Trucks	1	3.60	402	0.38
May-26	Off-Highway Trucks	2	9.00	402	0.38
May-26	Off-Highway Trucks	1	9.00	402	0.38
May-26	Off-Highway Trucks	1	1.80	402	0.38
May-26	Off-Highway Trucks	1	5.80	402	0.38
May-26	Off-Highway Trucks	1	9.00	402	0.38
May-26	Off-Highway Trucks	1	0.20	402	0.38
May-26	Off-Highway Trucks	4	9.00	402	0.38
May-26	Off-Highway Trucks	1	7.20	402	0.38
May-26	Off-Highway Trucks	1	9.00	199	0.38
May-26	Off-Highway Trucks	2	9.00	402	0.38
May-26	Off-Highway Trucks	1	7.10	402	0.38
May-26	Off-Highway Trucks	1	0.90	402	0.38
May-26	Off-Highway Trucks	1	0.90	199	0.38
May-26	Other Construction Equipment	2	9.00	6	0.42
May-26	Other Construction Equipment	2	9.00	6	0.42
May-26	Other Construction Equipment	2	9.00	20	0.42
May-26	Other Construction Equipment	1	1.80	6	0.42
May-26	Rollers	1	1.80	80	0.38
May-26	Skid Steer Loaders	2	9.00	65	0.37

May-26	Skid Steer Loaders	1	4.50	65	0.37
May-26	Skid Steer Loaders	1	1.80	65	0.37
May-26	Tractors/Loaders/Backhoes	1	1.10	224	0.37
May-26	Tractors/Loaders/Backhoes	2	9.00	349	0.37
May-26	Tractors/Loaders/Backhoes	1	9.00	59	0.37
May-26	Tractors/Loaders/Backhoes	2	9.00	97	0.37
May-26	Tractors/Loaders/Backhoes	1	3.70	97	0.37
May-26	Tractors/Loaders/Backhoes	1	1.80	349	0.37
May-26	Tractors/Loaders/Backhoes	1	1.80	97	0.37
Jun-26	Aerial Lifts	1	9.00	63	0.31
Jun-26	Bore/Drill Rigs	1	0.50	221	0.50
Jun-26	Bore/Drill Rigs	1	1.80	221	0.50
Jun-26	Cranes	1	9.00	231	0.29
Jun-26	Cranes	4	9.00	231	0.29
Jun-26	Cranes	1	5.40	231	0.29
Jun-26	Crushing/Proc. Equipment	2	9.00	85	0.78
Jun-26	Excavators	4	9.00	158	0.38
Jun-26	Graders	1	1.80	199	0.41
Jun-26	Off-Highway Trucks	8	9.00	402	0.38
Jun-26	Off-Highway Trucks	4	9.00	402	0.38
Jun-26	Off-Highway Trucks	1	9.00	402	0.38
Jun-26	Off-Highway Trucks	1	1.80	402	0.38
Jun-26	Off-Highway Trucks	1	5.80	402	0.38
Jun-26	Off-Highway Trucks	2	9.00	402	0.38
Jun-26	Off-Highway Trucks	1	0.50	402	0.38
Jun-26	Off-Highway Trucks	4	9.00	402	0.38
Jun-26	Off-Highway Trucks	1	7.20	402	0.38

Jun-26	Off-Highway Trucks	2	9.00	199	0.38
Jun-26	Off-Highway Trucks	2	9.00	402	0.38
Jun-26	Off-Highway Trucks	1	2.60	402	0.38
Jun-26	Other Construction Equipment	4	9.00	6	0.42
Jun-26	Other Construction Equipment	2	9.00	6	0.42
Jun-26	Other Construction Equipment	2	9.00	20	0.42
Jun-26	Rollers	1	1.80	80	0.38
Jun-26	Skid Steer Loaders	4	9.00	65	0.37
Jun-26	Skid Steer Loaders	1	4.50	65	0.37
Jun-26	Tractors/Loaders/Backhoes	1	1.10	224	0.37
Jun-26	Tractors/Loaders/Backhoes	4	9.00	349	0.37
Jun-26	Tractors/Loaders/Backhoes	1	9.00	59	0.37
Jun-26	Tractors/Loaders/Backhoes	4	9.00	97	0.37
Jun-26	Tractors/Loaders/Backhoes	1	3.70	97	0.37
Jul-26	Bore/Drill Rigs	1	0.50	221	0.50
Jul-26	Bore/Drill Rigs	1	1.80	221	0.50
Jul-26	Cranes	1	9.00	231	0.29
Jul-26	Cranes	4	9.00	231	0.29
Jul-26	Cranes	1	5.40	231	0.29
Jul-26	Crushing/Proc. Equipment	1	9.00	85	0.78
Jul-26	Excavators	2	9.00	158	0.38
Jul-26	Graders	1	1.80	199	0.41
Jul-26	Off-Highway Trucks	4	9.00	402	0.38
Jul-26	Off-Highway Trucks	2	9.00	402	0.38
Jul-26	Off-Highway Trucks	1	7.10	402	0.38
Jul-26	Off-Highway Trucks	1	9.00	402	0.38
Jul-26	Off-Highway Trucks	1	9.00	402	0.38

Jul-26	Off-Highway Trucks	1	0.20	402	0.38
Jul-26	Off-Highway Trucks	4	9.00	402	0.38
Jul-26	Off-Highway Trucks	1	9.00	199	0.38
Jul-26	Off-Highway Trucks	2	9.00	402	0.38
Jul-26	Off-Highway Trucks	1	5.80	402	0.38
Jul-26	Other Construction Equipment	2	9.00	6	0.42
Jul-26	Other Construction Equipment	2	9.00	6	0.42
Jul-26	Pumps	1	9.00	84	0.74
Jul-26	Pumps	1	0.60	84	0.74
Jul-26	Rollers	1	1.80	80	0.38
Jul-26	Skid Steer Loaders	2	9.00	65	0.37
Jul-26	Skid Steer Loaders	1	4.50	65	0.37
Jul-26	Tractors/Loaders/Backhoes	1	1.10	224	0.37
Jul-26	Tractors/Loaders/Backhoes	1	4.50	249	0.37
Jul-26	Tractors/Loaders/Backhoes	2	9.00	349	0.37
Jul-26	Tractors/Loaders/Backhoes	1	9.00	59	0.37
Jul-26	Tractors/Loaders/Backhoes	2	9.00	97	0.37
Jul-26	Tractors/Loaders/Backhoes	1	3.70	97	0.37
Aug-26	Aerial Lifts	1	9.00	63	0.31
Aug-26	Air Compressors	13	9.00	78	0.48
Aug-26	Air Compressors	1	1.80	78	0.48
Aug-26	Air Compressors	1	2.30	78	0.48
Aug-26	Cranes	1	9.00	231	0.29
Aug-26	Cranes	4	9.00	231	0.29
Aug-26	Cranes	1	1.80	231	0.29
Aug-26	Cranes	1	7.60	231	0.29
Aug-26	Crushing/Proc. Equipment	1	9.00	85	0.78

Aug-26	Excavators	2	9.00	158	0.38
Aug-26	Forklifts	1	0.40	89	0.20
Aug-26	Graders	1	4.40	199	0.41
Aug-26	Graders	1	9.00	249	0.41
Aug-26	Off-Highway Trucks	1	0.10	402	0.38
Aug-26	Off-Highway Trucks	4	9.00	402	0.38
Aug-26	Off-Highway Trucks	3	9.00	402	0.38
Aug-26	Off-Highway Trucks	1	9.00	402	0.38
Aug-26	Off-Highway Trucks	1	9.00	402	0.38
Aug-26	Off-Highway Trucks	4	9.00	402	0.38
Aug-26	Off-Highway Trucks	1	9.00	199	0.38
Aug-26	Off-Highway Trucks	1	0.70	402	0.38
Aug-26	Off-Highway Trucks	1	5.80	402	0.38
Aug-26	Other Construction Equipment	2	9.00	6	0.42
Aug-26	Pumps	1	9.00	84	0.74
Aug-26	Pumps	1	0.60	84	0.74
Aug-26	Rollers	1	1.80	80	0.38
Aug-26	Rollers	1	9.00	80	0.38
Aug-26	Rubber Tired Dozers	1	9.00	247	0.40
Aug-26	Skid Steer Loaders	2	9.00	65	0.37
Aug-26	Skid Steer Loaders	1	4.50	65	0.37
Aug-26	Tractors/Loaders/Backhoes	1	1.10	224	0.37
Aug-26	Tractors/Loaders/Backhoes	1	4.50	249	0.37
Aug-26	Tractors/Loaders/Backhoes	2	9.00	349	0.37
Aug-26	Tractors/Loaders/Backhoes	1	9.00	59	0.37
Aug-26	Tractors/Loaders/Backhoes	2	9.00	97	0.37
Aug-26	Tractors/Loaders/Backhoes	2	9.00	97	0.37

Aug-26	Welders	55	9.00	46	0.45
Aug-26	Welders	1	7.20	46	0.45
Aug-26	Welders	1	0.50	46	0.45
Sep-26	Aerial Lifts	1	9.00	63	0.31
Sep-26	Air Compressors	13	9.00	78	0.48
Sep-26	Air Compressors	1	1.80	78	0.48
Sep-26	Cranes	1	9.00	231	0.29
Sep-26	Cranes	1	4.50	231	0.29
Sep-26	Cranes	4	9.00	231	0.29
Sep-26	Cranes	1	7.20	231	0.29
Sep-26	Cranes	1	5.40	231	0.29
Sep-26	Crushing/Proc. Equipment	1	9.00	85	0.78
Sep-26	Excavators	1	0.20	158	0.38
Sep-26	Excavators	4	9.00	158	0.38
Sep-26	Excavators	2	9.00	158	0.38
Sep-26	Excavators	1	9.00	158	0.38
Sep-26	Forklifts	1	9.00	89	0.20
Sep-26	Forklifts	1	1.90	89	0.20
Sep-26	Forklifts	1	0.70	89	0.20
Sep-26	Forklifts	1	9.00	89	0.20
Sep-26	Forklifts	1	1.80	89	0.20
Sep-26	Graders	1	6.90	199	0.41
Sep-26	Graders	1	9.00	249	0.41
Sep-26	Graders	1	9.00	169	0.41
Sep-26	Off-Highway Trucks	1	0.10	402	0.38
Sep-26	Off-Highway Trucks	4	9.00	402	0.38
Sep-26	Off-Highway Trucks	4	9.00	402	0.38

Sep-26	Off-Highway Trucks	1	5.20	402	0.38
Sep-26	Off-Highway Trucks	3	9.00	402	0.38
Sep-26	Off-Highway Trucks	1	4.10	402	0.38
Sep-26	Off-Highway Trucks	1	9.00	402	0.38
Sep-26	Off-Highway Trucks	1	9.00	402	0.38
Sep-26	Off-Highway Trucks	1	9.00	199	0.38
Sep-26	Off-Highway Trucks	1	5.80	402	0.38
Sep-26	Other Construction Equipment	2	9.00	6	0.42
Sep-26	Paving Equipment	1	0.60	132	0.36
Sep-26	Pumps	1	9.00	84	0.74
Sep-26	Pumps	1	0.60	84	0.74
Sep-26	Rollers	4	9.00	80	0.38
Sep-26	Rollers	1	0.70	80	0.38
Sep-26	Rollers	1	1.80	80	0.38
Sep-26	Rubber Tired Dozers	3	9.00	247	0.40
Sep-26	Skid Steer Loaders	2	9.00	65	0.37
Sep-26	Tractors/Loaders/Backhoes	1	0.20	224	0.37
Sep-26	Tractors/Loaders/Backhoes	1	4.50	249	0.37
Sep-26	Tractors/Loaders/Backhoes	2	9.00	349	0.37
Sep-26	Tractors/Loaders/Backhoes	1	9.00	59	0.37
Sep-26	Tractors/Loaders/Backhoes	2	9.00	97	0.37
Sep-26	Tractors/Loaders/Backhoes	2	9.00	97	0.37
Sep-26	Welders	55	9.00	46	0.45
Sep-26	Welders	1	7.20	46	0.45
Sep-26	Welders	2	9.00	46	0.45
Sep-26	Welders	1	2.60	46	0.45
Sep-26	Welders	1	1.80	46	0.45

Sep-26	Welders	1	1.80	46	0.45
Oct-26	Aerial Lifts	1	9.00	63	0.31
Oct-26	Aerial Lifts	1	4.50	63	0.31
Oct-26	Air Compressors	14	9.00	78	0.48
Oct-26	Air Compressors	1	6.70	78	0.48
Oct-26	Cranes	1	9.00	231	0.29
Oct-26	Cranes	1	4.50	231	0.29
Oct-26	Cranes	4	9.00	231	0.29
Oct-26	Cranes	1	7.20	231	0.29
Oct-26	Cranes	1	5.40	231	0.29
Oct-26	Crushing/Proc. Equipment	1	9.00	85	0.78
Oct-26	Excavators	1	0.20	158	0.38
Oct-26	Excavators	4	9.00	158	0.38
Oct-26	Excavators	2	9.00	158	0.38
Oct-26	Excavators	1	9.00	158	0.38
Oct-26	Forklifts	1	9.00	89	0.20
Oct-26	Forklifts	1	0.70	89	0.20
Oct-26	Forklifts	1	9.00	89	0.20
Oct-26	Forklifts	1	1.80	89	0.20
Oct-26	Forklifts	1	1.80	89	0.20
Oct-26	Graders	1	6.90	199	0.41
Oct-26	Graders	1	9.00	249	0.41
Oct-26	Graders	1	9.00	169	0.41
Oct-26	Off-Highway Trucks	4	9.00	402	0.38
Oct-26	Off-Highway Trucks	5	9.00	402	0.38
Oct-26	Off-Highway Trucks	1	0.70	402	0.38
Oct-26	Off-Highway Trucks	3	9.00	402	0.38

Oct-26	Off-Highway Trucks	1	4.10	402	0.38
Oct-26	Off-Highway Trucks	1	9.00	402	0.38
Oct-26	Off-Highway Trucks	1	4.10	402	0.38
Oct-26	Off-Highway Trucks	1	9.00	402	0.38
Oct-26	Off-Highway Trucks	1	9.00	199	0.38
Oct-26	Off-Highway Trucks	1	5.80	402	0.38
Oct-26	Other Construction Equipment	2	9.00	6	0.42
Oct-26	Paving Equipment	2	9.00	132	0.36
Oct-26	Paving Equipment	1	7.20	132	0.36
Oct-26	Paving Equipment	1	0.60	132	0.36
Oct-26	Pumps	1	9.00	84	0.74
Oct-26	Pumps	1	0.60	84	0.74
Oct-26	Rollers	5	9.00	80	0.38
Oct-26	Rollers	1	0.60	80	0.38
Oct-26	Rollers	1	5.90	80	0.38
Oct-26	Rubber Tired Dozers	3	9.00	247	0.40
Oct-26	Skid Steer Loaders	2	9.00	65	0.37
Oct-26	Tractors/Loaders/Backhoes	1	0.20	224	0.37
Oct-26	Tractors/Loaders/Backhoes	2	9.00	349	0.37
Oct-26	Tractors/Loaders/Backhoes	1	9.00	59	0.37
Oct-26	Tractors/Loaders/Backhoes	2	9.00	97	0.37
Oct-26	Tractors/Loaders/Backhoes	2	9.00	97	0.37
Oct-26	Tractors/Loaders/Backhoes	1	4.40	97	0.37
Oct-26	Welders	55	9.00	46	0.45
Oct-26	Welders	1	7.70	46	0.45
Oct-26	Welders	2	9.00	46	0.45
Oct-26	Welders	1	2.60	46	0.45

Oct-26	Welders	1	1.80	46	0.45
Oct-26	Welders	1	1.40	46	0.45
Nov-26	Aerial Lifts	1	4.50	63	0.31
Nov-26	Air Compressors	14	9.00	78	0.48
Nov-26	Air Compressors	1	6.60	78	0.48
Nov-26	Cranes	1	9.00	231	0.29
Nov-26	Cranes	1	5.40	231	0.29
Nov-26	Cranes	1	4.50	231	0.29
Nov-26	Cranes	1	7.20	231	0.29
Nov-26	Excavators	1	5.70	158	0.38
Nov-26	Excavators	1	0.20	158	0.38
Nov-26	Excavators	1	9.00	158	0.38
Nov-26	Excavators	1	0.10	158	0.38
Nov-26	Excavators	1	9.00	158	0.38
Nov-26	Forklifts	1	9.00	89	0.20
Nov-26	Forklifts	1	1.90	89	0.20
Nov-26	Forklifts	1	0.70	89	0.20
Nov-26	Forklifts	1	3.90	89	0.20
Nov-26	Forklifts	1	9.00	89	0.20
Nov-26	Forklifts	1	1.90	89	0.20
Nov-26	Generator Sets	1	0.10	84	0.74
Nov-26	Graders	1	5.70	199	0.41
Nov-26	Off-Highway Trucks	1	0.10	402	0.38
Nov-26	Off-Highway Trucks	2	9.00	402	0.38
Nov-26	Off-Highway Trucks	1	7.10	402	0.38
Nov-26	Off-Highway Trucks	3	9.00	402	0.38
Nov-26	Off-Highway Trucks	1	0.60	402	0.38

Nov-26	Off-Highway Trucks	2	9.00	402	0.38
Nov-26	Off-Highway Trucks	1	4.10	402	0.38
Nov-26	Off-Highway Trucks	1	9.00	402	0.38
Nov-26	Off-Highway Trucks	1	5.80	402	0.38
Nov-26	Pavers	1	9.00	130	0.42
Nov-26	Pavers	1	4.50	130	0.42
Nov-26	Pavers	1	6.20	130	0.42
Nov-26	Pavers	1	0.20	130	0.42
Nov-26	Paving Equipment	1	1.90	132	0.36
Nov-26	Paving Equipment	4	9.00	132	0.36
Nov-26	Paving Equipment	1	2.70	132	0.36
Nov-26	Paving Equipment	1	0.10	132	0.36
Nov-26	Paving Equipment	1	6.20	132	0.36
Nov-26	Rollers	1	12.60	80	0.38
Nov-26	Rollers	1	5.90	80	0.38
Nov-26	Rough Terrain Forklifts	1	0.10	100	0.40
Nov-26	Rubber Tired Dozers	1	5.10	247	0.40
Nov-26	Tractors/Loaders/Backhoes	1	1.00	224	0.37
Nov-26	Tractors/Loaders/Backhoes	1	9.00	249	0.37
Nov-26	Tractors/Loaders/Backhoes	1	7.60	97	0.37
Nov-26	Welders	55	9.00	46	0.45
Nov-26	Welders	1	7.70	46	0.45
Nov-26	Welders	1	1.80	46	0.45
Nov-26	Welders	4	9.00	46	0.45
Nov-26	Welders	1	5.40	46	0.45
Nov-26	Welders	1	0.40	46	0.45
Nov-26	Welders	1	9.00	46	0.45

Nov-26	Welders	1	7.60	46	0.45
Nov-26	Welders	1	1.80	46	0.45
Dec-26	Aerial Lifts	1	9.00	63	0.31
Dec-26	Air Compressors	11	9.00	78	0.48
Dec-26	Air Compressors	1	2.30	78	0.48
Dec-26	Cranes	1	9.00	231	0.29
Dec-26	Cranes	1	5.40	231	0.29
Dec-26	Cranes	1	4.50	231	0.29
Dec-26	Cranes	1	9.00	231	0.29
Dec-26	Cranes	1	9.00	231	0.29
Dec-26	Cranes	1	3.60	231	0.29
Dec-26	Excavators	1	5.70	158	0.38
Dec-26	Excavators	1	0.30	158	0.38
Dec-26	Excavators	1	9.00	158	0.38
Dec-26	Excavators	1	0.10	158	0.38
Dec-26	Excavators	1	9.00	158	0.38
Dec-26	Forklifts	1	9.00	89	0.20
Dec-26	Forklifts	1	1.90	89	0.20
Dec-26	Forklifts	1	4.50	89	0.20
Dec-26	Forklifts	1	3.90	89	0.20
Dec-26	Forklifts	1	9.00	89	0.20
Dec-26	Forklifts	1	1.90	89	0.20
Dec-26	Generator Sets	1	0.10	84	0.74
Dec-26	Graders	1	5.70	199	0.41
Dec-26	Off-Highway Trucks	1	0.20	402	0.38
Dec-26	Off-Highway Trucks	1	0.10	402	0.38
Dec-26	Off-Highway Trucks	2	9.00	402	0.38

Dec-26	Off-Highway Trucks	1	7.10	402	0.38
Dec-26	Off-Highway Trucks	3	9.00	402	0.38
Dec-26	Off-Highway Trucks	1	0.60	402	0.38
Dec-26	Off-Highway Trucks	1	9.00	402	0.38
Dec-26	Off-Highway Trucks	1	4.10	402	0.38
Dec-26	Off-Highway Trucks	1	9.00	402	0.38
Dec-26	Off-Highway Trucks	1	5.80	402	0.38
Dec-26	Off-Highway Trucks	1	2.10	402	0.38
Dec-26	Pavers	1	9.00	130	0.42
Dec-26	Pavers	1	4.50	130	0.42
Dec-26	Pavers	1	6.20	130	0.42
Dec-26	Pavers	1	0.20	130	0.42
Dec-26	Paving Equipment	1	1.90	132	0.36
Dec-26	Paving Equipment	4	9.00	132	0.36
Dec-26	Paving Equipment	1	2.70	132	0.36
Dec-26	Paving Equipment	1	0.10	132	0.36
Dec-26	Paving Equipment	1	6.20	132	0.36
Dec-26	Pumps	1	9.00	84	0.74
Dec-26	Pumps	1	1.40	84	0.74
Dec-26	Rollers	1	9.00	80	0.38
Dec-26	Rollers	1	3.60	80	0.38
Dec-26	Rollers	1	5.90	80	0.38
Dec-26	Rough Terrain Forklifts	1	0.10	100	0.40
Dec-26	Rubber Tired Dozers	1	5.10	247	0.40
Dec-26	Tractors/Loaders/Backhoes	1	1.00	224	0.37
Dec-26	Tractors/Loaders/Backhoes	1	9.00	97	0.37
Dec-26	Tractors/Loaders/Backhoes	1	7.60	97	0.37

Dec-26	Welders	42	9.00	46	0.45
Dec-26	Welders	1	5.40	46	0.45
Dec-26	Welders	1	1.80	46	0.45
Dec-26	Welders	4	9.00	46	0.45
Dec-26	Welders	1	5.40	46	0.45
Dec-26	Welders	1	0.40	46	0.45
Dec-26	Welders	1	9.00	46	0.45
Dec-26	Welders	1	3.10	46	0.45
Dec-26	Welders	1	1.80	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Jan-26	70	692.00	0.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Feb-26	85	658.00	0.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Mar-26	61	758.00	0.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Apr-26	60	722.00	0.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
May-26	58	724.00	0.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Jun-26	69	755.00	0.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Jul-26	48	740.00	0.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Aug-26	122	725.00	0.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Sep-26	144	756.00	0.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Oct-26	151	862.00	0.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Nov-26	131	810.00	0.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Dec-26	121	816.00	0.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

3.2 Jan-26 - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.3228	0.0000	4.3228	0.6546	0.0000	0.6546			0.0000			0.0000
Off-Road	18.1470	127.9014	158.2942	0.4779		4.9433	4.9433		4.5687	4.5687		46,211.3525	46,211.3525	14.5352		46,574.7313
Total	**18.1470**	**127.9014**	**158.2942**	**0.4779**	**4.3228**	**4.9433**	**9.2661**	**0.6546**	**4.5687**	**5.2233**		**46,211.3525**	**46,211.3525**	**14.5352**		**46,574.7313**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	3.7171	2.4315	22.2970	0.0815	11.5727	0.0601	11.6328	3.0687	0.0553	3.1240		8,125.9878	8,125.9878	0.1684		8,130.1975
Total	**3.7171**	**2.4315**	**22.2970**	**0.0815**	**11.5727**	**0.0601**	**11.6328**	**3.0687**	**0.0553**	**3.1240**		**8,125.9878**	**8,125.9878**	**0.1684**		**8,130.1975**

3.2 Jan-26 - 2026

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.3228	0.0000	4.3228	0.6546	0.0000	0.6546			0.0000			0.0000
Off-Road	6.6171	60.5249	243.0185	0.4779		1.1906	1.1906		1.1906	1.1906	0.0000	46,211.35 24	46,211.35 24	14.5352		46,574.73 13
Total	**6.6171**	**60.5249**	**243.0185**	**0.4779**	**4.3228**	**1.1906**	**5.5134**	**0.6546**	**1.1906**	**1.8452**	**0.0000**	**46,211.35 24**	**46,211.35 24**	**14.5352**		**46,574.73 13**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	3.7171	2.4315	22.2970	0.0815	11.5727	0.0601	11.6328	3.0687	0.0553	3.1240		8,125.987 8	8,125.987 8	0.1684		8,130.197 5
Total	**3.7171**	**2.4315**	**22.2970**	**0.0815**	**11.5727**	**0.0601**	**11.6328**	**3.0687**	**0.0553**	**3.1240**		**8,125.987 8**	**8,125.987 8**	**0.1684**		**8,130.197 5**

3.3 Feb-26 - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.3228	0.0000	4.3228	0.6546	0.0000	0.6546			0.0000			0.0000
Off-Road	26.9908	183.0031	209.9597	0.6922		6.8995	6.8995		6.4004	6.4004		66,782.8533	66,782.8533	20.6619		67,299.4013
Total	**26.9908**	**183.0031**	**209.9597**	**0.6922**	**4.3228**	**6.8995**	**11.2223**	**0.6546**	**6.4004**	**7.0550**		**66,782.8533**	**66,782.8533**	**20.6619**		**67,299.4013**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	3.5345	2.3120	21.2015	0.0775	11.0041	0.0571	11.0612	2.9179	0.0526	2.9705		7,726.7341	7,726.7341	0.1601		7,730.7370
Total	**3.5345**	**2.3120**	**21.2015**	**0.0775**	**11.0041**	**0.0571**	**11.0612**	**2.9179**	**0.0526**	**2.9705**		**7,726.7341**	**7,726.7341**	**0.1601**		**7,730.7370**

3.3 Feb-26 - 2026

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.3228	0.0000	4.3228	0.6546	0.0000	0.6546			0.0000			0.0000
Off-Road	9.1827	73.0952	334.1455	0.6922		1.7051	1.7051		1.7051	1.7051	0.0000	66,782.8533	66,782.8533	20.6619		67,299.4012
Total	**9.1827**	**73.0952**	**334.1455**	**0.6922**	**4.3228**	**1.7051**	**6.0279**	**0.6546**	**1.7051**	**2.3597**	**0.0000**	**66,782.8533**	**66,782.8533**	**20.6619**		**67,299.4012**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	3.5345	2.3120	21.2015	0.0775	11.0041	0.0571	11.0612	2.9179	0.0526	2.9705		7,726.7341	7,726.7341	0.1601		7,730.7370
Total	**3.5345**	**2.3120**	**21.2015**	**0.0775**	**11.0041**	**0.0571**	**11.0612**	**2.9179**	**0.0526**	**2.9705**		**7,726.7341**	**7,726.7341**	**0.1601**		**7,730.7370**

3.4 Mar-26 - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.3228	0.0000	4.3228	0.6546	0.0000	0.6546			0.0000			0.0000
Off-Road	17.7149	119.9130	138.1878	0.4695		4.5317	4.5317		4.1801	4.1801		45,413.6973	45,413.6973	14.4782		45,775.6519
Total	**17.7149**	**119.9130**	**138.1878**	**0.4695**	**4.3228**	**4.5317**	**8.8546**	**0.6546**	**4.1801**	**4.8347**		**45,413.6973**	**45,413.6973**	**14.4782**		**45,775.6519**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	4.0716	2.6634	24.4236	0.0892	12.6765	0.0658	12.7422	3.3614	0.0606	3.4220		8,901.0098	8,901.0098	0.1845		8,905.6210
Total	**4.0716**	**2.6634**	**24.4236**	**0.0892**	**12.6765**	**0.0658**	**12.7422**	**3.3614**	**0.0606**	**3.4220**		**8,901.0098**	**8,901.0098**	**0.1845**		**8,905.6210**

3.4 Mar-26 - 2026

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.3228	0.0000	4.3228	0.6546	0.0000	0.6546			0.0000			0.0000
Off-Road	6.1407	43.7407	225.6645	0.4695		1.0235	1.0235		1.0235	1.0235	0.0000	45,413.6972	45,413.6972	14.4782		45,775.6518
Total	**6.1407**	**43.7407**	**225.6645**	**0.4695**	**4.3228**	**1.0235**	**5.3464**	**0.6546**	**1.0235**	**1.6782**	**0.0000**	**45,413.6972**	**45,413.6972**	**14.4782**		**45,775.6518**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	4.0716	2.6634	24.4236	0.0892	12.6765	0.0658	12.7422	3.3614	0.0606	3.4220		8,901.0098	8,901.0098	0.1845		8,905.6210
Total	**4.0716**	**2.6634**	**24.4236**	**0.0892**	**12.6765**	**0.0658**	**12.7422**	**3.3614**	**0.0606**	**3.4220**		**8,901.0098**	**8,901.0098**	**0.1845**		**8,905.6210**

3.5 Apr-26 - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.3228	0.0000	4.3228	0.6546	0.0000	0.6546			0.0000			0.0000
Off-Road	14.2092	98.8565	111.6854	0.3712		3.7796	3.7796		3.4882	3.4882		35,904.6729	35,904.6729	11.3912		36,189.4527
Total	**14.2092**	**98.8565**	**111.6854**	**0.3712**	**4.3228**	**3.7796**	**8.1024**	**0.6546**	**3.4882**	**4.1428**		**35,904.6729**	**35,904.6729**	**11.3912**		**36,189.4527**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	3.8783	2.5369	23.2636	0.0850	12.0744	0.0627	12.1371	3.2017	0.0577	3.2595		8,478.2705	8,478.2705	0.1757		8,482.6627
Total	**3.8783**	**2.5369**	**23.2636**	**0.0850**	**12.0744**	**0.0627**	**12.1371**	**3.2017**	**0.0577**	**3.2595**		**8,478.2705**	**8,478.2705**	**0.1757**		**8,482.6627**

3.5 Apr-26 - 2026

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.3228	0.0000	4.3228	0.6546	0.0000	0.6546			0.0000			0.0000
Off-Road	4.9272	38.1010	179.7605	0.3712		0.8582	0.8582		0.8582	0.8582	0.0000	35,904.67 29	35,904.67 29	11.3912		36,189.45 27
Total	**4.9272**	**38.1010**	**179.7605**	**0.3712**	**4.3228**	**0.8582**	**5.1810**	**0.6546**	**0.8582**	**1.5128**	**0.0000**	**35,904.67 29**	**35,904.67 29**	**11.3912**		**36,189.45 27**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	3.8783	2.5369	23.2636	0.0850	12.0744	0.0627	12.1371	3.2017	0.0577	3.2595		8,478.270 5	8,478.270 5	0.1757		8,482.662 7
Total	**3.8783**	**2.5369**	**23.2636**	**0.0850**	**12.0744**	**0.0627**	**12.1371**	**3.2017**	**0.0577**	**3.2595**		**8,478.270 5**	**8,478.270 5**	**0.1757**		**8,482.662 7**

3.6 May-26 - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.3228	0.0000	4.3228	0.6546	0.0000	0.6546			0.0000			0.0000
Off-Road	13.9950	96.4891	109.4812	0.3660		3.6938	3.6938		3.4093	3.4093		35,407.3858	35,407.3858	11.2304		35,688.1448
Total	**13.9950**	**96.4891**	**109.4812**	**0.3660**	**4.3228**	**3.6938**	**8.0166**	**0.6546**	**3.4093**	**4.0639**		**35,407.3858**	**35,407.3858**	**11.2304**		**35,688.1448**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	3.8890	2.5439	23.3281	0.0852	12.1079	0.0629	12.1707	3.2106	0.0579	3.2685		8,501.7560	8,501.7560	0.1762		8,506.1604
Total	**3.8890**	**2.5439**	**23.3281**	**0.0852**	**12.1079**	**0.0629**	**12.1707**	**3.2106**	**0.0579**	**3.2685**		**8,501.7560**	**8,501.7560**	**0.1762**		**8,506.1604**

3.6 May-26 - 2026

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.3228	0.0000	4.3228	0.6546	0.0000	0.6546			0.0000			0.0000
Off-Road	4.8409	36.8665	176.8647	0.3660		0.8095	0.8095		0.8095	0.8095	0.0000	35,407.3858	35,407.3858	11.2304		35,688.1448
Total	**4.8409**	**36.8665**	**176.8647**	**0.3660**	**4.3228**	**0.8095**	**5.1323**	**0.6546**	**0.8095**	**1.4641**	**0.0000**	**35,407.3858**	**35,407.3858**	**11.2304**		**35,688.1448**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	3.8890	2.5439	23.3281	0.0852	12.1079	0.0629	12.1707	3.2106	0.0579	3.2685		8,501.7560	8,501.7560	0.1762		8,506.1604
Total	**3.8890**	**2.5439**	**23.3281**	**0.0852**	**12.1079**	**0.0629**	**12.1707**	**3.2106**	**0.0579**	**3.2685**		**8,501.7560**	**8,501.7560**	**0.1762**		**8,506.1604**

3.7 Jun-26 - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.3228	0.0000	4.3228	0.6546	0.0000	0.6546			0.0000			0.0000
Off-Road	19.7771	136.3969	159.4960	0.5211		5.2267	5.2267		4.8286	4.8286		50,404.1223	50,404.1223	15.8997		50,801.6148
Total	**19.7771**	**136.3969**	**159.4960**	**0.5211**	**4.3228**	**5.2267**	**9.5495**	**0.6546**	**4.8286**	**5.4832**		**50,404.1223**	**50,404.1223**	**15.8997**		**50,801.6148**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	4.0555	2.6529	24.3269	0.0889	12.6263	0.0655	12.6918	3.3481	0.0604	3.4084		8,865.7815	8,865.7815	0.1837		8,870.3745
Total	**4.0555**	**2.6529**	**24.3269**	**0.0889**	**12.6263**	**0.0655**	**12.6918**	**3.3481**	**0.0604**	**3.4084**		**8,865.7815**	**8,865.7815**	**0.1837**		**8,870.3745**

3.7 Jun-26 - 2026

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.3228	0.0000	4.3228	0.6546	0.0000	0.6546			0.0000			0.0000
Off-Road	6.9867	56.5240	255.8023	0.5211		1.1493	1.1493		1.1493	1.1493	0.0000	50,404.1223	50,404.1223	15.8997		50,801.6148
Total	**6.9867**	**56.5240**	**255.8023**	**0.5211**	**4.3228**	**1.1493**	**5.4722**	**0.6546**	**1.1493**	**1.8040**	**0.0000**	**50,404.1223**	**50,404.1223**	**15.8997**		**50,801.6148**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	4.0555	2.6529	24.3269	0.0889	12.6263	0.0655	12.6918	3.3481	0.0604	3.4084		8,865.7815	8,865.7815	0.1837		8,870.3745
Total	**4.0555**	**2.6529**	**24.3269**	**0.0889**	**12.6263**	**0.0655**	**12.6918**	**3.3481**	**0.0604**	**3.4084**		**8,865.7815**	**8,865.7815**	**0.1837**		**8,870.3745**

3.8 Jul-26 - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.3228	0.0000	4.3228	0.6546	0.0000	0.6546			0.0000			0.0000
Off-Road	13.5695	96.1508	106.2091	0.3537		3.6948	3.6948		3.4189	3.4189		34,203.4586	34,203.4586	10.6495		34,469.6971
Total	**13.5695**	**96.1508**	**106.2091**	**0.3537**	**4.3228**	**3.6948**	**8.0177**	**0.6546**	**3.4189**	**4.0735**		**34,203.4586**	**34,203.4586**	**10.6495**		**34,469.6971**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	3.9750	2.6002	23.8436	0.0871	12.3754	0.0642	12.4397	3.2815	0.0592	3.3407		8,689.6402	8,689.6402	0.1801		8,694.1419
Total	**3.9750**	**2.6002**	**23.8436**	**0.0871**	**12.3754**	**0.0642**	**12.4397**	**3.2815**	**0.0592**	**3.3407**		**8,689.6402**	**8,689.6402**	**0.1801**		**8,694.1419**

3.8 Jul-26 - 2026

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.3228	0.0000	4.3228	0.6546	0.0000	0.6546			0.0000			0.0000
Off-Road	4.7292	37.4219	172.2709	0.3537		0.7402	0.7402		0.7402	0.7402	0.0000	34,203.4586	34,203.4586	10.6495		34,469.6971
Total	**4.7292**	**37.4219**	**172.2709**	**0.3537**	**4.3228**	**0.7402**	**5.0631**	**0.6546**	**0.7402**	**1.3949**	**0.0000**	**34,203.4586**	**34,203.4586**	**10.6495**		**34,469.6971**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	3.9750	2.6002	23.8436	0.0871	12.3754	0.0642	12.4397	3.2815	0.0592	3.3407		8,689.6402	8,689.6402	0.1801		8,694.1419
Total	**3.9750**	**2.6002**	**23.8436**	**0.0871**	**12.3754**	**0.0642**	**12.4397**	**3.2815**	**0.0592**	**3.3407**		**8,689.6402**	**8,689.6402**	**0.1801**		**8,694.1419**

3.9 Aug-26 - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.3228	0.0000	4.3228	0.6546	0.0000	0.6546			0.0000			0.0000
Off-Road	31.6593	217.1362	253.7913	0.5806		7.8504	7.8504		7.5307	7.5307		53,531.7660	53,531.7660	12.3956		53,841.6567
Total	**31.6593**	**217.1362**	**253.7913**	**0.5806**	**4.3228**	**7.8504**	**12.1732**	**0.6546**	**7.5307**	**8.1853**		**53,531.7660**	**53,531.7660**	**12.3956**		**53,841.6567**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	3.8944	2.5474	23.3603	0.0853	12.1246	0.0629	12.1875	3.2150	0.0580	3.2730		8,513.4988	8,513.4988	0.1764		8,517.9093
Total	**3.8944**	**2.5474**	**23.3603**	**0.0853**	**12.1246**	**0.0629**	**12.1875**	**3.2150**	**0.0580**	**3.2730**		**8,513.4988**	**8,513.4988**	**0.1764**		**8,517.9093**

3.9 Aug-26 - 2026

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.3228	0.0000	4.3228	0.6546	0.0000	0.6546			0.0000			0.0000
Off-Road	8.7766	167.8108	309.6044	0.5806		3.8082	3.8082		3.8082	3.8082	0.0000	53,531.7659	53,531.7659	12.3956		53,841.6566
Total	**8.7766**	**167.8108**	**309.6044**	**0.5806**	**4.3228**	**3.8082**	**8.1310**	**0.6546**	**3.8082**	**4.4628**	**0.0000**	**53,531.7659**	**53,531.7659**	**12.3956**		**53,841.6566**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	3.8944	2.5474	23.3603	0.0853	12.1246	0.0629	12.1875	3.2150	0.0580	3.2730		8,513.4988	8,513.4988	0.1764		8,517.9093
Total	**3.8944**	**2.5474**	**23.3603**	**0.0853**	**12.1246**	**0.0629**	**12.1875**	**3.2150**	**0.0580**	**3.2730**		**8,513.4988**	**8,513.4988**	**0.1764**		**8,517.9093**

3.10 Sep-26 - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.3228	0.0000	4.3228	0.6546	0.0000	0.6546			0.0000			0.0000
Off-Road	36.6827	260.2825	302.2144	0.6758		9.7840	9.7840		9.3178	9.3178		62,636.5924	62,636.5924	15.2289		63,017.3158
Total	**36.6827**	**260.2825**	**302.2144**	**0.6758**	**4.3228**	**9.7840**	**14.1068**	**0.6546**	**9.3178**	**9.9724**		**62,636.5924**	**62,636.5924**	**15.2289**		**63,017.3158**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	4.0609	2.6564	24.3591	0.0890	12.6430	0.0656	12.7086	3.3525	0.0604	3.4129		8,877.5243	8,877.5243	0.1840		8,882.1233
Total	**4.0609**	**2.6564**	**24.3591**	**0.0890**	**12.6430**	**0.0656**	**12.7086**	**3.3525**	**0.0604**	**3.4129**		**8,877.5243**	**8,877.5243**	**0.1840**		**8,882.1233**

3.10 Sep-26 - 2026

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.3228	0.0000	4.3228	0.6546	0.0000	0.6546			0.0000			0.0000
Off-Road	10.0923	181.3945	368.0340	0.6758		4.0654	4.0654		4.0654	4.0654	0.0000	62,636.5923	62,636.5923	15.2289		63,017.3157
Total	**10.0923**	**181.3945**	**368.0340**	**0.6758**	**4.3228**	**4.0654**	**8.3882**	**0.6546**	**4.0654**	**4.7200**	**0.0000**	**62,636.5923**	**62,636.5923**	**15.2289**		**63,017.3157**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	4.0609	2.6564	24.3591	0.0890	12.6430	0.0656	12.7086	3.3525	0.0604	3.4129		8,877.5243	8,877.5243	0.1840		8,882.1233
Total	**4.0609**	**2.6564**	**24.3591**	**0.0890**	**12.6430**	**0.0656**	**12.7086**	**3.3525**	**0.0604**	**3.4129**		**8,877.5243**	**8,877.5243**	**0.1840**		**8,882.1233**

3.11 Oct-26 - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.3228	0.0000	4.3228	0.6546	0.0000	0.6546			0.0000			0.0000
Off-Road	38.2236	272.2153	321.6119	0.7121		10.3186	10.3186		9.8192	9.8192		66,131.4388	66,131.4388	16.1833		66,536.0223
Total	**38.2236**	**272.2153**	**321.6119**	**0.7121**	**4.3228**	**10.3186**	**14.6414**	**0.6546**	**9.8192**	**10.4738**		**66,131.4388**	**66,131.4388**	**16.1833**		**66,536.0223**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	4.6303	3.0288	27.7746	0.1015	14.4157	0.0748	14.4905	3.8226	0.0689	3.8915		10,122.2565	10,122.2565	0.2098		10,127.5004
Total	**4.6303**	**3.0288**	**27.7746**	**0.1015**	**14.4157**	**0.0748**	**14.4905**	**3.8226**	**0.0689**	**3.8915**		**10,122.2565**	**10,122.2565**	**0.2098**		**10,127.5004**

3.11 Oct-26 - 2026

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.3228	0.0000	4.3228	0.6546	0.0000	0.6546			0.0000			0.0000
Off-Road	10.6331	187.2542	391.2015	0.7121		4.1433	4.1433		4.1433	4.1433	0.0000	66,131.4388	66,131.4388	16.1833		66,536.0222
Total	**10.6331**	**187.2542**	**391.2015**	**0.7121**	**4.3228**	**4.1433**	**8.4661**	**0.6546**	**4.1433**	**4.7979**	**0.0000**	**66,131.4388**	**66,131.4388**	**16.1833**		**66,536.0222**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	4.6303	3.0288	27.7746	0.1015	14.4157	0.0748	14.4905	3.8226	0.0689	3.8915		10,122.2565	10,122.2565	0.2098		10,127.5004
Total	**4.6303**	**3.0288**	**27.7746**	**0.1015**	**14.4157**	**0.0748**	**14.4905**	**3.8226**	**0.0689**	**3.8915**		**10,122.2565**	**10,122.2565**	**0.2098**		**10,127.5004**

3.12 Nov-26 - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.3228	0.0000	4.3228	0.6546	0.0000	0.6546			0.0000			0.0000
Off-Road	29.1711	194.5123	246.1011	0.4996		7.0781	7.0781		6.8339	6.8339		45,406.6422	45,406.6422	9.6658		45,648.2878
Total	**29.1711**	**194.5123**	**246.1011**	**0.4996**	**4.3228**	**7.0781**	**11.4010**	**0.6546**	**6.8339**	**7.4886**		**45,406.6422**	**45,406.6422**	**9.6658**		**45,648.2878**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	4.3510	2.8461	26.0991	0.0954	13.5461	0.0703	13.6164	3.5920	0.0648	3.6567		9,511.6331	9,511.6331	0.1971		9,516.5607
Total	**4.3510**	**2.8461**	**26.0991**	**0.0954**	**13.5461**	**0.0703**	**13.6164**	**3.5920**	**0.0648**	**3.6567**		**9,511.6331**	**9,511.6331**	**0.1971**		**9,516.5607**

3.12 Nov-26 - 2026

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.3228	0.0000	4.3228	0.6546	0.0000	0.6546			0.0000			0.0000
Off-Road	7.6002	162.1296	281.2653	0.4996		3.8207	3.8207		3.8207	3.8207	0.0000	45,406.6422	45,406.6422	9.6658		45,648.2878
Total	**7.6002**	**162.1296**	**281.2653**	**0.4996**	**4.3228**	**3.8207**	**8.1435**	**0.6546**	**3.8207**	**4.4753**	**0.0000**	**45,406.6422**	**45,406.6422**	**9.6658**		**45,648.2878**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	4.3510	2.8461	26.0991	0.0954	13.5461	0.0703	13.6164	3.5920	0.0648	3.6567		9,511.6331	9,511.6331	0.1971		9,516.5607
Total	**4.3510**	**2.8461**	**26.0991**	**0.0954**	**13.5461**	**0.0703**	**13.6164**	**3.5920**	**0.0648**	**3.6567**		**9,511.6331**	**9,511.6331**	**0.1971**		**9,516.5607**

3.13 Dec-26 - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.3228	0.0000	4.3228	0.6546	0.0000	0.6546			0.0000			0.0000
Off-Road	25.3432	174.1662	217.9993	0.4488		6.4654	6.4654		6.2086	6.2086		41,119.4073	41,119.4073	9.1782		41,348.8614
Total	**25.3432**	**174.1662**	**217.9993**	**0.4488**	**4.3228**	**6.4654**	**10.7882**	**0.6546**	**6.2086**	**6.8632**		**41,119.4073**	**41,119.4073**	**9.1782**		**41,348.8614**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	4.3832	2.8672	26.2924	0.0961	13.6464	0.0708	13.7172	3.6186	0.0652	3.6838		9,582.0897	9,582.0897	0.1986		9,587.0537
Total	**4.3832**	**2.8672**	**26.2924**	**0.0961**	**13.6464**	**0.0708**	**13.7172**	**3.6186**	**0.0652**	**3.6838**		**9,582.0897**	**9,582.0897**	**0.1986**		**9,587.0537**

3.13 Dec-26 - 2026

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.3228	0.0000	4.3228	0.6546	0.0000	0.6546			0.0000			0.0000
Off-Road	6.7595	133.9302	252.7300	0.4488		3.1013	3.1013		3.1013	3.1013	0.0000	41,119.4073	41,119.4073	9.1782		41,348.8614
Total	**6.7595**	**133.9302**	**252.7300**	**0.4488**	**4.3228**	**3.1013**	**7.4241**	**0.6546**	**3.1013**	**3.7559**	**0.0000**	**41,119.4073**	**41,119.4073**	**9.1782**		**41,348.8614**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	4.3832	2.8672	26.2924	0.0961	13.6464	0.0708	13.7172	3.6186	0.0652	3.6838		9,582.0897	9,582.0897	0.1986		9,587.0537
Total	**4.3832**	**2.8672**	**26.2924**	**0.0961**	**13.6464**	**0.0708**	**13.7172**	**3.6186**	**0.0652**	**3.6838**		**9,582.0897**	**9,582.0897**	**0.1986**		**9,587.0537**

3.13 Dec-26 - 2027

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.3228	0.0000	4.3228	0.6546	0.0000	0.6546			0.0000			0.0000
Off-Road	25.3432	174.1662	217.9993	0.4488		6.4654	6.4654		6.2086	6.2086		41,119.4073	41,119.4073	9.1782		41,348.8614
Total	**25.3432**	**174.1662**	**217.9993**	**0.4488**	**4.3228**	**6.4654**	**10.7882**	**0.6546**	**6.2086**	**6.8632**		**41,119.4073**	**41,119.4073**	**9.1782**		**41,348.8614**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	4.1716	2.6097	24.3918	0.0927	13.6464	0.0668	13.7132	3.6186	0.0615	3.6801		9,251.1328	9,251.1328	0.1793		9,255.6155
Total	**4.1716**	**2.6097**	**24.3918**	**0.0927**	**13.6464**	**0.0668**	**13.7132**	**3.6186**	**0.0615**	**3.6801**		**9,251.1328**	**9,251.1328**	**0.1793**		**9,255.6155**

3.13 Dec-26 - 2027

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.3228	0.0000	4.3228	0.6546	0.0000	0.6546			0.0000			0.0000
Off-Road	6.7595	133.9302	252.7300	0.4488		3.1013	3.1013		3.1013	3.1013	0.0000	41,119.4073	41,119.4073	9.1782		41,348.8614
Total	**6.7595**	**133.9302**	**252.7300**	**0.4488**	**4.3228**	**3.1013**	**7.4241**	**0.6546**	**3.1013**	**3.7559**	**0.0000**	**41,119.4073**	**41,119.4073**	**9.1782**		**41,348.8614**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	4.1716	2.6097	24.3918	0.0927	13.6464	0.0668	13.7132	3.6186	0.0615	3.6801		9,251.1328	9,251.1328	0.1793		9,255.6155
Total	**4.1716**	**2.6097**	**24.3918**	**0.0927**	**13.6464**	**0.0668**	**13.7132**	**3.6186**	**0.0615**	**3.6801**		**9,251.1328**	**9,251.1328**	**0.1793**		**9,255.6155**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Heavy Industry	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Heavy Industry	13.00	13.00	13.00	59.00	28.00	13.00	92	5	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Heavy Industry	0.602606	0.026011	0.198672	0.108173	0.017753	0.004949	0.012577	0.019761	0.002270	0.001100	0.004459	0.000730	0.000939

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Heavy Industry	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Heavy Industry	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

DCPP Decommissioning

San Luis Obispo County APCD Air District, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Heavy Industry	0.00	1000sqft	585.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	3.2	**Precipitation Freq (Days)**	44
Climate Zone	4			**Operational Year**	2034
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

DCPP Decommissioning - San Luis Obispo County APCD Air District, Winter

Project Characteristics -

Land Use - Total lot acreage.

Construction Phase - 20 working days per month based on 4 day work week and 5 weeks per month.

Off-road Equipment - Data from PG&E equipment list for 2033.

Off-road Equipment - Data from PG&E equipment list for 2033.

Off-road Equipment - Data from PG&E equipment list for 2033.

Off-road Equipment - Data from PG&E equipment list for 2033.

Off-road Equipment - Data from PG&E equipment list for 2033.

Off-road Equipment - Data from PG&E equipment list for 2033.

Off-road Equipment - Data from PG&E equipment list for 2033.

Off-road Equipment - Data from PG&E equipment list for 2033.

Off-road Equipment - Data from PG&E equipment list for 2033.

Off-road Equipment - Data from PG&E equipment list for 2033.

Off-road Equipment - Data from PG&E equipment list for 2033.

Off-road Equipment - Data from PG&E equipment list for 2033.

Trips and VMT - Data from PG&E employee totals. Assumed 22 miles from downtown SLO to DCPP.

Demolition -

Grading -

Construction Off-road Equipment Mitigation - Scenario 2: Tier 4 Final for equipment HP>50, Tier 4 Interim for HP<50.

Table Name	Column Name	Default Value	New Value
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tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	134.00
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tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	20.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	116.00

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	95.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	8.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	241.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	80.00
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tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	8.00
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tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	200.00
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tblConstEquipMitigation	Tier	No Change	Tier 4 Final
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tblConstEquipMitigation	Tier	No Change	Tier 4 Final
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tblConstEquipMitigation	Tier	No Change	Tier 4 Final
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tblConstructionPhase	NumDays	600.00	20.00
tblConstructionPhase	NumDays	600.00	20.00
tblConstructionPhase	NumDays	600.00	20.00
tblLandUse	LotAcreage	0.00	585.00
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tblOffRoadEquipment	HorsePower	97.00	349.00
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tblOffRoadEquipment	UsageHours	8.00	9.00
tblOffRoadEquipment	UsageHours	8.00	9.00
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tblTripsAndVMT	WorkerTripNumber	308.00	429.00
tblTripsAndVMT	WorkerTripNumber	425.00	517.00
tblTripsAndVMT	WorkerTripNumber	240.00	409.00
tblTripsAndVMT	WorkerTripNumber	305.00	425.00
tblTripsAndVMT	WorkerTripNumber	368.00	381.00
tblTripsAndVMT	WorkerTripNumber	368.00	406.00
tblTripsAndVMT	WorkerTripNumber	370.00	405.00
tblTripsAndVMT	WorkerTripNumber	345.00	397.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2033	40.2598	183.7854	357.5691	0.9238	12.9689	3.8647	16.8336	2.9473	3.8625	6.8098	0.0000	90,881.4321	90,881.4321	3.4687	0.0000	90,966.3784
2034	34.4132	103.5576	301.9426	0.8758	11.4471	3.2754	14.7224	2.5437	3.2737	5.8174	0.0000	88,932.2734	88,932.2734	2.9697	0.0000	89,006.5152
Maximum	**40.2598**	**183.7854**	**357.5691**	**0.9238**	**12.9689**	**3.8647**	**16.8336**	**2.9473**	**3.8625**	**6.8098**	**0.0000**	**90,881.4321**	**90,881.4321**	**3.4687**	**0.0000**	**90,966.3784**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2033	12.2302	170.2217	450.3753	0.9238	12.9689	4.7039	17.6728	2.9473	4.7017	7.6490	0.0000	90,881.4321	90,881.4321	3.4687	0.0000	90,966.3783
2034	10.3798	45.9712	412.9153	0.8758	11.4471	1.2049	12.6519	2.5437	1.2032	3.7469	0.0000	88,932.2734	88,932.2734	2.9697	0.0000	89,006.5151
Maximum	**12.2302**	**170.2217**	**450.3753**	**0.9238**	**12.9689**	**4.7039**	**17.6728**	**2.9473**	**4.7017**	**7.6490**	**0.0000**	**90,881.4321**	**90,881.4321**	**3.4687**	**0.0000**	**90,966.3783**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**69.72**	**24.76**	**-30.90**	**0.00**	**0.00**	**17.24**	**3.90**	**0.00**	**17.25**	**9.75**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Jan-33	Demolition	1/3/2033	1/28/2033	5	20	
2	Feb-33	Demolition	2/1/2033	2/28/2033	5	20	
3	Mar-33	Demolition	3/1/2033	3/28/2033	5	20	
4	Apr-33	Demolition	4/1/2033	4/28/2033	5	20	
5	May-33	Demolition	5/1/2033	5/27/2033	5	20	
6	Jun-33	Demolition	6/1/2033	6/28/2033	5	20	
7	Jul-33	Demolition	7/1/2033	7/28/2033	5	20	
8	Aug-33	Demolition	8/1/2033	8/26/2033	5	20	
9	Sep-33	Demolition	9/1/2033	9/28/2033	5	20	
10	Oct-33	Demolition	10/1/2033	10/28/2033	5	20	
11	Nov-33	Demolition	11/1/2033	11/28/2033	5	20	
12	Dec-33	Demolition	12/6/2033	1/2/2034	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Jan-33	Air Compressors	3	9.00	78	0.48
Jan-33	Air Compressors	1	0.50	78	0.48
Jan-33	Air Compressors	1	0.10	78	0.48
Jan-33	Cranes	1	0.90	231	0.29
Jan-33	Cranes	4	9.00	231	0.29
Jan-33	Cranes	1	0.90	231	0.29
Jan-33	Crawler Tractors	1	0.10	159	0.43
Jan-33	Crushing/Proc. Equipment	1	9.00	85	0.78
Jan-33	Excavators	2	9.00	158	0.38
Jan-33	Excavators	4	9.00	158	0.38
Jan-33	Forklifts	1	3.60	89	0.20
Jan-33	Forklifts	1	3.60	89	0.20
Jan-33	Forklifts	4	9.00	89	0.20
Jan-33	Forklifts	2	9.00	89	0.20
Jan-33	Graders	1	1.80	199	0.41
Jan-33	Off-Highway Trucks	2	9.00	402	0.38
Jan-33	Off-Highway Trucks	8	9.00	402	0.38
Jan-33	Off-Highway Trucks	1	7.10	402	0.38
Jan-33	Off-Highway Trucks	1	7.20	402	0.38
Jan-33	Off-Highway Trucks	1	5.80	402	0.38
Jan-33	Off-Highway Trucks	1	0.10	402	0.38
Jan-33	Off-Highway Trucks	2	9.00	402	0.38
Jan-33	Off-Highway Trucks	1	9.00	142	0.38
Jan-33	Off-Highway Trucks	1	9.00	199	0.38
Jan-33	Off-Highway Trucks	1	3.10	142	0.38

Jan-33	Other Construction Equipment	4	9.00	6	0.42
Jan-33	Pumps	2	9.00	84	0.74
Jan-33	Pumps	1	5.80	84	0.74
Jan-33	Rollers	1	1.80	80	0.38
Jan-33	Rough Terrain Forklifts	1	9.00	100	0.40
Jan-33	Rough Terrain Forklifts	1	0.10	100	0.40
Jan-33	Rough Terrain Forklifts	1	9.00	100	0.40
Jan-33	Skid Steer Loaders	4	9.00	65	0.37
Jan-33	Tractors/Loaders/Backhoes	1	0.20	224	0.37
Jan-33	Tractors/Loaders/Backhoes	7	9.00	249	0.37
Jan-33	Tractors/Loaders/Backhoes	4	9.00	349	0.37
Jan-33	Tractors/Loaders/Backhoes	1	9.00	59	0.37
Jan-33	Tractors/Loaders/Backhoes	4	9.00	97	0.37
Jan-33	Tractors/Loaders/Backhoes	1	3.70	97	0.37
Jan-33	Welders	11	9.00	46	0.45
Jan-33	Welders	1	1.40	46	0.45
Jan-33	Welders	1	3.60	46	0.45
Feb-33	Air Compressors	1	0.10	78	0.48
Feb-33	Air Compressors	8	9.00	78	0.48
Feb-33	Air Compressors	1	5.80	78	0.48
Feb-33	Cranes	1	0.90	231	0.29
Feb-33	Cranes	4	9.00	231	0.29
Feb-33	Cranes	1	0.90	231	0.29
Feb-33	Crawler Tractors	1	0.10	212	0.43
Feb-33	Crushing/Proc. Equipment	1	9.00	85	0.78
Feb-33	Excavators	1	2.90	158	0.38
Feb-33	Excavators	2	9.00	158	0.38

Feb-33	Excavators	4	9.00	158	0.38
Feb-33	Forklifts	1	3.60	89	0.20
Feb-33	Forklifts	4	9.00	89	0.20
Feb-33	Forklifts	2	9.00	89	0.20
Feb-33	Forklifts	1	3.60	89	0.20
Feb-33	Forklifts	1	2.10	89	0.20
Feb-33	Graders	1	1.80	199	0.41
Feb-33	Off-Highway Trucks	2	9.00	402	0.38
Feb-33	Off-Highway Trucks	8	9.00	402	0.38
Feb-33	Off-Highway Trucks	1	7.10	402	0.38
Feb-33	Off-Highway Trucks	1	9.00	402	0.38
Feb-33	Off-Highway Trucks	1	7.20	402	0.38
Feb-33	Off-Highway Trucks	1	5.80	402	0.38
Feb-33	Off-Highway Trucks	1	2.20	402	0.38
Feb-33	Off-Highway Trucks	2	9.00	402	0.38
Feb-33	Off-Highway Trucks	1	9.00	142	0.38
Feb-33	Off-Highway Trucks	1	9.00	199	0.38
Feb-33	Off-Highway Trucks	1	4.90	402	0.38
Feb-33	Off-Highway Trucks	1	3.10	142	0.38
Feb-33	Other Construction Equipment	4	9.00	6	0.42
Feb-33	Pavers	1	3.10	130	0.42
Feb-33	Paving Equipment	1	3.10	132	0.36
Feb-33	Pumps	2	9.00	84	0.74
Feb-33	Pumps	1	5.80	84	0.74
Feb-33	Rollers	1	1.80	80	0.38
Feb-33	Rough Terrain Forklifts	1	9.00	100	0.40
Feb-33	Rough Terrain Forklifts	1	0.10	100	0.40

Feb-33	Rough Terrain Forklifts	1	9.00	100	0.40
Feb-33	Skid Steer Loaders	4	9.00	65	0.37
Feb-33	Tractors/Loaders/Backhoes	1	0.20	224	0.37
Feb-33	Tractors/Loaders/Backhoes	7	9.00	249	0.37
Feb-33	Tractors/Loaders/Backhoes	4	9.00	349	0.37
Feb-33	Tractors/Loaders/Backhoes	1	9.00	59	0.37
Feb-33	Tractors/Loaders/Backhoes	4	9.00	97	0.37
Feb-33	Tractors/Loaders/Backhoes	1	3.70	97	0.37
Feb-33	Welders	30	9.00	46	0.45
Feb-33	Welders	1	6.80	46	0.45
Feb-33	Welders	1	3.60	46	0.45
Mar-33	Air Compressors	20	9.00	78	0.48
Mar-33	Air Compressors	1	1.80	78	0.48
Mar-33	Cranes	1	0.90	231	0.29
Mar-33	Cranes	4	9.00	231	0.29
Mar-33	Cranes	1	0.90	231	0.29
Mar-33	Crawler Tractors	1	0.10	159	0.43
Mar-33	Crushing/Proc. Equipment	1	9.00	85	0.78
Mar-33	Excavators	1	2.90	158	0.38
Mar-33	Excavators	2	9.00	158	0.38
Mar-33	Excavators	4	9.00	158	0.38
Mar-33	Forklifts	1	3.60	89	0.20
Mar-33	Forklifts	4	9.00	89	0.20
Mar-33	Forklifts	2	9.00	89	0.20
Mar-33	Forklifts	1	3.60	89	0.20
Mar-33	Graders	1	1.80	199	0.41
Mar-33	Off-Highway Trucks	2	9.00	402	0.38

Mar-33	Off-Highway Trucks	8	9.00	402	0.38
Mar-33	Off-Highway Trucks	1	7.10	402	0.38
Mar-33	Off-Highway Trucks	1	9.00	402	0.38
Mar-33	Off-Highway Trucks	1	7.20	402	0.38
Mar-33	Off-Highway Trucks	1	5.80	402	0.38
Mar-33	Off-Highway Trucks	2	9.00	402	0.38
Mar-33	Off-Highway Trucks	1	9.00	142	0.38
Mar-33	Off-Highway Trucks	1	9.00	199	0.38
Mar-33	Off-Highway Trucks	1	4.90	402	0.38
Mar-33	Off-Highway Trucks	1	3.10	142	0.38
Mar-33	Other Construction Equipment	4	9.00	6	0.42
Mar-33	Pavers	1	3.10	130	0.42
Mar-33	Paving Equipment	1	3.10	132	0.36
Mar-33	Rollers	1	1.80	80	0.38
Mar-33	Rough Terrain Forklifts	1	9.00	100	0.40
Mar-33	Rough Terrain Forklifts	1	0.10	100	0.40
Mar-33	Rough Terrain Forklifts	1	9.00	100	0.40
Mar-33	Skid Steer Loaders	4	9.00	65	0.37
Mar-33	Tractors/Loaders/Backhoes	1	0.20	224	0.37
Mar-33	Tractors/Loaders/Backhoes	7	9.00	249	0.37
Mar-33	Tractors/Loaders/Backhoes	4	9.00	349	0.37
Mar-33	Tractors/Loaders/Backhoes	1	9.00	59	0.37
Mar-33	Tractors/Loaders/Backhoes	4	9.00	97	0.37
Mar-33	Tractors/Loaders/Backhoes	1	3.70	97	0.37
Mar-33	Welders	71	9.00	46	0.45
Mar-33	Welders	1	2.00	46	0.45
Mar-33	Welders	1	3.60	46	0.45

Apr-33	Air Compressors	5	9.00	78	0.48
Apr-33	Air Compressors	1	1.40	78	0.48
Apr-33	Cranes	1	0.90	231	0.29
Apr-33	Cranes	3	9.00	231	0.29
Apr-33	Cranes	1	4.50	231	0.29
Apr-33	Cranes	1	0.90	231	0.29
Apr-33	Crawler Tractors	1	0.10	159	0.43
Apr-33	Crushing/Proc. Equipment	1	7.90	85	0.78
Apr-33	Excavators	2	9.00	158	0.38
Apr-33	Excavators	3	9.00	158	0.38
Apr-33	Excavators	1	4.50	158	0.38
Apr-33	Forklifts	1	3.60	89	0.20
Apr-33	Forklifts	4	9.00	89	0.20
Apr-33	Forklifts	2	9.00	89	0.20
Apr-33	Forklifts	1	3.60	89	0.20
Apr-33	Graders	1	1.80	199	0.41
Apr-33	Off-Highway Trucks	2	9.00	402	0.38
Apr-33	Off-Highway Trucks	7	9.00	402	0.38
Apr-33	Off-Highway Trucks	1	7.10	402	0.38
Apr-33	Off-Highway Trucks	1	7.20	402	0.38
Apr-33	Off-Highway Trucks	1	5.80	402	0.38
Apr-33	Off-Highway Trucks	1	9.00	402	0.38
Apr-33	Off-Highway Trucks	1	9.00	142	0.38
Apr-33	Off-Highway Trucks	1	7.90	199	0.38
Apr-33	Off-Highway Trucks	1	6.80	402	0.38
Apr-33	Off-Highway Trucks	1	3.10	142	0.38
Apr-33	Other Construction Equipment	3	9.00	6	0.42

Apr-33	Other Construction Equipment	1	4.50	6	0.42
Apr-33	Rollers	1	1.80	80	0.38
Apr-33	Rough Terrain Forklifts	1	9.00	100	0.40
Apr-33	Rough Terrain Forklifts	1	0.10	100	0.40
Apr-33	Rough Terrain Forklifts	1	9.00	100	0.40
Apr-33	Skid Steer Loaders	3	9.00	65	0.37
Apr-33	Skid Steer Loaders	1	4.50	65	0.37
Apr-33	Tractors/Loaders/Backhoes	1	0.20	224	0.37
Apr-33	Tractors/Loaders/Backhoes	7	9.00	249	0.37
Apr-33	Tractors/Loaders/Backhoes	3	9.00	349	0.37
Apr-33	Tractors/Loaders/Backhoes	1	4.50	349	0.37
Apr-33	Tractors/Loaders/Backhoes	1	9.00	59	0.37
Apr-33	Tractors/Loaders/Backhoes	3	9.00	97	0.37
Apr-33	Tractors/Loaders/Backhoes	1	4.50	97	0.37
Apr-33	Tractors/Loaders/Backhoes	1	3.70	97	0.37
Apr-33	Welders	18	9.00	46	0.45
Apr-33	Welders	1	4.70	46	0.45
Apr-33	Welders	1	3.60	46	0.45
May-33	Air Compressors	11	9.00	78	0.48
May-33	Air Compressors	1	8.80	78	0.48
May-33	Cranes	1	0.90	231	0.29
May-33	Cranes	2	9.00	231	0.29
May-33	Cranes	1	0.90	231	0.29
May-33	Crawler Tractors	1	0.10	159	0.43
May-33	Crushing/Proc. Equipment	1	4.50	85	0.78
May-33	Excavators	2	9.00	158	0.38
May-33	Excavators	2	9.00	158	0.38

May-33	Forklifts	1	3.60	89	0.20
May-33	Forklifts	4	9.00	89	0.20
May-33	Forklifts	2	9.00	89	0.20
May-33	Forklifts	1	3.60	89	0.20
May-33	Graders	1	1.80	199	0.41
May-33	Off-Highway Trucks	2	9.00	402	0.38
May-33	Off-Highway Trucks	4	9.00	402	0.38
May-33	Off-Highway Trucks	1	7.10	402	0.38
May-33	Off-Highway Trucks	1	7.20	402	0.38
May-33	Off-Highway Trucks	1	5.80	402	0.38
May-33	Off-Highway Trucks	1	9.00	402	0.38
May-33	Off-Highway Trucks	1	9.00	142	0.38
May-33	Off-Highway Trucks	1	4.50	199	0.38
May-33	Off-Highway Trucks	1	3.10	142	0.38
May-33	Other Construction Equipment	2	9.00	6	0.42
May-33	Rollers	1	1.80	80	0.38
May-33	Rough Terrain Forklifts	1	9.00	100	0.40
May-33	Rough Terrain Forklifts	1	0.10	100	0.40
May-33	Rough Terrain Forklifts	1	9.00	100	0.40
May-33	Skid Steer Loaders	2	9.00	65	0.37
May-33	Tractors/Loaders/Backhoes	1	0.20	224	0.37
May-33	Tractors/Loaders/Backhoes	7	9.00	249	0.37
May-33	Tractors/Loaders/Backhoes	2	9.00	349	0.37
May-33	Tractors/Loaders/Backhoes	1	9.00	59	0.37
May-33	Tractors/Loaders/Backhoes	2	9.00	97	0.37
May-33	Tractors/Loaders/Backhoes	1	3.70	97	0.37
May-33	Welders	54	9.00	46	0.45

May-33	Welders	1	8.50	46	0.45
May-33	Welders	1	3.60	46	0.45
Jun-33	Air Compressors	16	9.00	78	0.48
Jun-33	Air Compressors	1	2.20	78	0.48
Jun-33	Cranes	1	0.90	231	0.29
Jun-33	Cranes	2	9.00	231	0.29
Jun-33	Cranes	1	0.90	231	0.29
Jun-33	Crawler Tractors	1	0.10	159	0.43
Jun-33	Crushing/Proc. Equipment	1	4.50	85	0.78
Jun-33	Excavators	2	9.00	158	0.38
Jun-33	Excavators	2	9.00	158	0.38
Jun-33	Forklifts	1	3.60	89	0.20
Jun-33	Forklifts	4	9.00	89	0.20
Jun-33	Forklifts	2	9.00	89	0.20
Jun-33	Forklifts	1	3.60	89	0.20
Jun-33	Graders	1	1.80	199	0.41
Jun-33	Off-Highway Trucks	2	9.00	402	0.38
Jun-33	Off-Highway Trucks	4	9.00	402	0.38
Jun-33	Off-Highway Trucks	1	7.10	402	0.38
Jun-33	Off-Highway Trucks	1	7.20	402	0.38
Jun-33	Off-Highway Trucks	1	5.80	402	0.38
Jun-33	Off-Highway Trucks	1	9.00	142	0.38
Jun-33	Off-Highway Trucks	1	4.50	199	0.38
Jun-33	Off-Highway Trucks	1	9.00	402	0.38
Jun-33	Off-Highway Trucks	1	3.10	142	0.38
Jun-33	Other Construction Equipment	2	9.00	6	0.42
Jun-33	Rollers	1	1.80	80	0.38

Jun-33	Rough Terrain Forklifts	1	9.00	100	0.40
Jun-33	Rough Terrain Forklifts	1	0.10	100	0.40
Jun-33	Rough Terrain Forklifts	1	9.00	100	0.40
Jun-33	Skid Steer Loaders	2	9.00	65	0.37
Jun-33	Tractors/Loaders/Backhoes	1	0.20	224	0.37
Jun-33	Tractors/Loaders/Backhoes	7	9.00	249	0.37
Jun-33	Tractors/Loaders/Backhoes	2	9.00	349	0.37
Jun-33	Tractors/Loaders/Backhoes	1	9.00	59	0.37
Jun-33	Tractors/Loaders/Backhoes	2	9.00	97	0.37
Jun-33	Tractors/Loaders/Backhoes	1	3.70	97	0.37
Jun-33	Welders	74	9.00	46	0.45
Jun-33	Welders	1	1.60	46	0.45
Jun-33	Welders	1	3.60	46	0.45
Jul-33	Air Compressors	11	9.00	78	0.48
Jul-33	Air Compressors	1	5.40	78	0.48
Jul-33	Air Compressors	2	9.00	78	0.48
Jul-33	Cranes	7	9.00	231	0.29
Jul-33	Crawler Tractors	1	0.10	159	0.43
Jul-33	Crushing/Proc. Equipment	1	9.00	85	0.78
Jul-33	Crushing/Proc. Equipment	1	6.80	85	0.78
Jul-33	Excavators	2	9.00	158	0.38
Jul-33	Excavators	7	9.00	158	0.38
Jul-33	Forklifts	4	9.00	89	0.20
Jul-33	Forklifts	2	9.00	89	0.20
Jul-33	Graders	1	1.80	199	0.41
Jul-33	Off-Highway Trucks	2	9.00	402	0.38
Jul-33	Off-Highway Trucks	8	9.00	402	0.38

Jul-33	Off-Highway Trucks	1	7.10	402	0.38
Jul-33	Off-Highway Trucks	1	5.80	402	0.38
Jul-33	Off-Highway Trucks	3	9.00	402	0.38
Jul-33	Off-Highway Trucks	1	4.50	402	0.38
Jul-33	Off-Highway Trucks	1	9.00	142	0.38
Jul-33	Off-Highway Trucks	1	9.00	199	0.38
Jul-33	Off-Highway Trucks	1	3.10	142	0.38
Jul-33	Off-Highway Trucks	1	6.80	199	0.38
Jul-33	Other Construction Equipment	7	9.00	6	0.42
Jul-33	Rollers	1	1.80	80	0.38
Jul-33	Rough Terrain Forklifts	1	9.00	100	0.40
Jul-33	Rough Terrain Forklifts	1	0.10	100	0.40
Jul-33	Rough Terrain Forklifts	1	9.00	100	0.40
Jul-33	Skid Steer Loaders	7	9.00	65	0.37
Jul-33	Tractors/Loaders/Backhoes	1	0.20	224	0.37
Jul-33	Tractors/Loaders/Backhoes	7	9.00	249	0.37
Jul-33	Tractors/Loaders/Backhoes	2	9.00	349	0.37
Jul-33	Tractors/Loaders/Backhoes	1	9.00	59	0.37
Jul-33	Tractors/Loaders/Backhoes	4	9.00	97	0.37
Jul-33	Tractors/Loaders/Backhoes	1	3.70	97	0.37
Jul-33	Welders	52	9.00	46	0.45
Jul-33	Welders	1	5.00	46	0.45
Aug-33	Air Compressors	10	9.00	78	0.48
Aug-33	Air Compressors	1	0.60	78	0.48
Aug-33	Cranes	7	9.00	231	0.29
Aug-33	Crawler Tractors	1	0.10	159	0.43
Aug-33	Crushing/Proc. Equipment	1	9.00	85	0.78

Aug-33	Crushing/Proc. Equipment	1	6.80	85	0.78
Aug-33	Excavators	2	9.00	158	0.38
Aug-33	Excavators	7	9.00	158	0.38
Aug-33	Forklifts	1	7.20	89	0.20
Aug-33	Forklifts	4	9.00	89	0.20
Aug-33	Forklifts	2	9.00	89	0.20
Aug-33	Forklifts	1	3.60	89	0.20
Aug-33	Graders	1	1.80	199	0.41
Aug-33	Off-Highway Trucks	2	9.00	402	0.38
Aug-33	Off-Highway Trucks	8	9.00	402	0.38
Aug-33	Off-Highway Trucks	1	7.10	402	0.38
Aug-33	Off-Highway Trucks	1	3.60	402	0.38
Aug-33	Off-Highway Trucks	1	5.80	402	0.38
Aug-33	Off-Highway Trucks	3	9.00	402	0.38
Aug-33	Off-Highway Trucks	1	4.50	402	0.38
Aug-33	Off-Highway Trucks	1	9.00	142	0.38
Aug-33	Off-Highway Trucks	1	9.00	199	0.38
Aug-33	Off-Highway Trucks	1	3.10	142	0.38
Aug-33	Off-Highway Trucks	1	6.80	199	0.38
Aug-33	Other Construction Equipment	7	9.00	6	0.42
Aug-33	Paving Equipment	1	0.20	132	0.36
Aug-33	Rollers	1	1.80	80	0.38
Aug-33	Rough Terrain Forklifts	1	9.00	100	0.40
Aug-33	Rough Terrain Forklifts	1	0.10	100	0.40
Aug-33	Rough Terrain Forklifts	1	9.00	100	0.40
Aug-33	Skid Steer Loaders	7	9.00	65	0.37
Aug-33	Tractors/Loaders/Backhoes	1	0.20	224	0.37

Aug-33	Tractors/Loaders/Backhoes	7	9.00	249	0.37
Aug-33	Tractors/Loaders/Backhoes	2	9.00	349	0.37
Aug-33	Tractors/Loaders/Backhoes	1	9.00	59	0.37
Aug-33	Tractors/Loaders/Backhoes	4	9.00	97	0.37
Aug-33	Tractors/Loaders/Backhoes	1	3.70	97	0.37
Aug-33	Welders	52	9.00	46	0.45
Aug-33	Welders	1	1.90	46	0.45
Sep-33	Air Compressors	7	9.00	78	0.48
Sep-33	Air Compressors	1	6.30	78	0.48
Sep-33	Air Compressors	4	9.00	78	0.48
Sep-33	Cranes	7	9.00	231	0.29
Sep-33	Crawler Tractors	1	0.10	159	0.43
Sep-33	Crushing/Proc. Equipment	1	9.00	85	0.78
Sep-33	Crushing/Proc. Equipment	1	6.80	85	0.78
Sep-33	Excavators	2	9.00	158	0.38
Sep-33	Excavators	7	9.00	158	0.38
Sep-33	Forklifts	1	7.20	89	0.20
Sep-33	Forklifts	4	9.00	89	0.20
Sep-33	Forklifts	2	9.00	89	0.20
Sep-33	Forklifts	1	3.60	89	0.20
Sep-33	Generator Sets	1	4.50	84	0.74
Sep-33	Graders	1	1.80	199	0.41
Sep-33	Off-Highway Trucks	2	9.00	402	0.38
Sep-33	Off-Highway Trucks	8	9.00	402	0.38
Sep-33	Off-Highway Trucks	1	7.10	402	0.38
Sep-33	Off-Highway Trucks	1	3.60	402	0.38
Sep-33	Off-Highway Trucks	1	5.80	402	0.38

Sep-33	Off-Highway Trucks	1	4.50	402	0.38
Sep-33	Off-Highway Trucks	3	9.00	402	0.38
Sep-33	Off-Highway Trucks	1	4.50	402	0.38
Sep-33	Off-Highway Trucks	1	9.00	142	0.38
Sep-33	Off-Highway Trucks	1	9.00	199	0.38
Sep-33	Off-Highway Trucks	1	3.10	142	0.38
Sep-33	Off-Highway Trucks	1	6.80	199	0.38
Sep-33	Other Construction Equipment	7	9.00	6	0.42
Sep-33	Paving Equipment	1	0.20	132	0.36
Sep-33	Rollers	1	1.80	80	0.38
Sep-33	Rough Terrain Forklifts	1	9.00	100	0.40
Sep-33	Rough Terrain Forklifts	1	0.10	100	0.40
Sep-33	Rough Terrain Forklifts	1	9.00	100	0.40
Sep-33	Skid Steer Loaders	7	9.00	65	0.37
Sep-33	Tractors/Loaders/Backhoes	1	0.20	224	0.37
Sep-33	Tractors/Loaders/Backhoes	7	9.00	249	0.37
Sep-33	Tractors/Loaders/Backhoes	2	9.00	349	0.37
Sep-33	Tractors/Loaders/Backhoes	1	9.00	59	0.37
Sep-33	Tractors/Loaders/Backhoes	4	9.00	97	0.37
Sep-33	Tractors/Loaders/Backhoes	1	3.70	97	0.37
Sep-33	Welders	39	9.00	46	0.45
Sep-33	Welders	1	8.30	46	0.45
Oct-33	Air Compressors	6	9.00	78	0.48
Oct-33	Air Compressors	1	8.20	78	0.48
Oct-33	Air Compressors	4	9.00	78	0.48
Oct-33	Cranes	7	9.00	231	0.29
Oct-33	Crawler Tractors	1	0.10	159	0.43

Oct-33	Crushing/Proc. Equipment	1	9.00	85	0.78
Oct-33	Crushing/Proc. Equipment	1	6.80	85	0.78
Oct-33	Excavators	2	9.00	158	0.38
Oct-33	Excavators	7	9.00	158	0.38
Oct-33	Forklifts	1	7.20	89	0.20
Oct-33	Forklifts	4	9.00	89	0.20
Oct-33	Forklifts	2	9.00	89	0.20
Oct-33	Forklifts	1	3.60	89	0.20
Oct-33	Generator Sets	1	4.50	84	0.74
Oct-33	Generator Sets	1	0.20	84	0.74
Oct-33	Graders	1	1.80	199	0.41
Oct-33	Off-Highway Trucks	2	9.00	402	0.38
Oct-33	Off-Highway Trucks	8	9.00	402	0.38
Oct-33	Off-Highway Trucks	1	7.10	402	0.38
Oct-33	Off-Highway Trucks	1	3.60	402	0.38
Oct-33	Off-Highway Trucks	1	5.80	402	0.38
Oct-33	Off-Highway Trucks	1	4.50	402	0.38
Oct-33	Off-Highway Trucks	3	9.00	402	0.38
Oct-33	Off-Highway Trucks	1	4.50	402	0.38
Oct-33	Off-Highway Trucks	1	9.00	142	0.38
Oct-33	Off-Highway Trucks	1	9.00	199	0.38
Oct-33	Off-Highway Trucks	1	3.10	142	0.38
Oct-33	Off-Highway Trucks	1	6.80	199	0.38
Oct-33	Other Construction Equipment	7	9.00	6	0.42
Oct-33	Paving Equipment	1	0.20	132	0.36
Oct-33	Rollers	1	1.80	80	0.38
Oct-33	Rough Terrain Forklifts	1	9.00	100	0.40

Oct-33	Rough Terrain Forklifts	1	0.20	100	0.40
Oct-33	Rough Terrain Forklifts	1	9.00	100	0.40
Oct-33	Skid Steer Loaders	7	9.00	65	0.37
Oct-33	Tractors/Loaders/Backhoes	1	0.20	224	0.37
Oct-33	Tractors/Loaders/Backhoes	7	9.00	249	0.37
Oct-33	Tractors/Loaders/Backhoes	2	9.00	349	0.37
Oct-33	Tractors/Loaders/Backhoes	1	9.00	59	0.37
Oct-33	Tractors/Loaders/Backhoes	4	9.00	97	0.37
Oct-33	Tractors/Loaders/Backhoes	1	3.70	97	0.37
Oct-33	Welders	35	9.00	46	0.45
Oct-33	Welders	1	7.40	46	0.45
Oct-33	Welders	1	0.70	46	0.45
Nov-33	Aerial Lifts	1	9.00	63	0.31
Nov-33	Air Compressors	8	9.00	78	0.48
Nov-33	Air Compressors	1	0.90	78	0.48
Nov-33	Air Compressors	3	9.00	78	0.48
Nov-33	Cranes	6	9.00	231	0.29
Nov-33	Cranes	1	9.00	231	0.29
Nov-33	Crawler Tractors	1	0.10	159	0.43
Nov-33	Crushing/Proc. Equipment	1	9.00	85	0.78
Nov-33	Crushing/Proc. Equipment	1	4.50	85	0.78
Nov-33	Excavators	2	9.00	158	0.38
Nov-33	Excavators	2	9.00	158	0.38
Nov-33	Excavators	10	9.00	158	0.38
Nov-33	Excavators	1	0.30	158	0.38
Nov-33	Excavators	6	9.00	158	0.38
Nov-33	Forklifts	1	7.20	89	0.20

Nov-33	Forklifts	4	9.00	89	0.20
Nov-33	Forklifts	2	9.00	89	0.20
Nov-33	Forklifts	1	3.60	89	0.20
Nov-33	Generator Sets	1	9.00	84	0.74
Nov-33	Generator Sets	1	4.50	84	0.74
Nov-33	Generator Sets	1	0.20	84	0.74
Nov-33	Graders	1	1.80	199	0.41
Nov-33	Off-Highway Trucks	2	9.00	402	0.38
Nov-33	Off-Highway Trucks	8	9.00	402	0.38
Nov-33	Off-Highway Trucks	1	0.30	402	0.38
Nov-33	Off-Highway Trucks	1	7.10	402	0.38
Nov-33	Off-Highway Trucks	1	3.60	402	0.38
Nov-33	Off-Highway Trucks	1	5.80	402	0.38
Nov-33	Off-Highway Trucks	1	4.50	402	0.38
Nov-33	Off-Highway Trucks	2	9.00	402	0.38
Nov-33	Off-Highway Trucks	3	9.00	402	0.38
Nov-33	Off-Highway Trucks	1	9.00	142	0.38
Nov-33	Off-Highway Trucks	1	15.00	199	0.38
Nov-33	Off-Highway Trucks	1	3.10	142	0.38
Nov-33	Off-Highway Trucks	1	4.50	199	0.38
Nov-33	Other Construction Equipment	1	9.00	6	0.42
Nov-33	Other Construction Equipment	6	9.00	6	0.42
Nov-33	Other Construction Equipment	5	9.00	15	0.42
Nov-33	Other Construction Equipment	1	9.00	6	0.42
Nov-33	Pavers	1	0.90	130	0.42
Nov-33	Paving Equipment	1	0.20	132	0.36
Nov-33	Paving Equipment	1	0.30	132	0.36

Nov-33	Pumps	1	9.00	84	0.74
Nov-33	Rollers	1	1.80	80	0.38
Nov-33	Rough Terrain Forklifts	1	9.00	100	0.40
Nov-33	Rough Terrain Forklifts	1	0.70	100	0.40
Nov-33	Rough Terrain Forklifts	2	9.00	100	0.40
Nov-33	Rough Terrain Forklifts	1	9.00	100	0.40
Nov-33	Skid Steer Loaders	4	9.00	65	0.37
Nov-33	Tractors/Loaders/Backhoes	1	0.20	224	0.37
Nov-33	Tractors/Loaders/Backhoes	7	9.00	249	0.37
Nov-33	Tractors/Loaders/Backhoes	2	9.00	349	0.37
Nov-33	Tractors/Loaders/Backhoes	2	9.00	999	0.37
Nov-33	Tractors/Loaders/Backhoes	1	9.00	59	0.37
Nov-33	Tractors/Loaders/Backhoes	4	9.00	97	0.37
Nov-33	Tractors/Loaders/Backhoes	1	3.70	97	0.37
Nov-33	Welders	41	9.00	46	0.45
Nov-33	Welders	1	8.60	46	0.45
Nov-33	Welders	1	0.70	46	0.45
Dec-33	Aerial Lifts	1	9.00	63	0.31
Dec-33	Air Compressors	3	9.00	78	0.48
Dec-33	Cranes	4	9.00	231	0.29
Dec-33	Cranes	1	9.00	231	0.29
Dec-33	Cranes	1	9.00	231	0.29
Dec-33	Crawler Tractors	1	0.10	159	0.43
Dec-33	Crushing/Proc. Equipment	3	9.00	85	0.78
Dec-33	Crushing/Proc. Equipment	1	4.50	85	0.78
Dec-33	Excavators	2	9.00	158	0.38
Dec-33	Excavators	2	9.00	158	0.38

Dec-33	Excavators	10	9.00	158	0.38
Dec-33	Excavators	2	9.00	158	0.38
Dec-33	Excavators	9	9.00	158	0.38
Dec-33	Forklifts	1	7.20	89	0.20
Dec-33	Forklifts	4	9.00	89	0.20
Dec-33	Forklifts	2	9.00	89	0.20
Dec-33	Forklifts	1	3.60	89	0.20
Dec-33	Generator Sets	1	9.00	84	0.74
Dec-33	Generator Sets	1	4.50	84	0.74
Dec-33	Graders	1	1.80	199	0.41
Dec-33	Off-Highway Trucks	2	9.00	402	0.38
Dec-33	Off-Highway Trucks	8	9.00	402	0.38
Dec-33	Off-Highway Trucks	1	7.10	402	0.38
Dec-33	Off-Highway Trucks	1	3.60	402	0.38
Dec-33	Off-Highway Trucks	2	5.80	402	0.38
Dec-33	Off-Highway Trucks	1	4.50	402	0.38
Dec-33	Off-Highway Trucks	2	9.00	402	0.38
Dec-33	Off-Highway Trucks	6	9.00	402	0.38
Dec-33	Off-Highway Trucks	1	9.00	142	0.38
Dec-33	Off-Highway Trucks	3	9.00	199	0.38
Dec-33	Off-Highway Trucks	1	4.50	199	0.38
Dec-33	Off-Highway Trucks	1	3.10	142	0.38
Dec-33	Other Construction Equipment	1	9.00	6	0.42
Dec-33	Other Construction Equipment	12	9.00	6	0.42
Dec-33	Other Construction Equipment	5	9.00	15	0.42
Dec-33	Other Construction Equipment	1	9.00	6	0.42
Dec-33	Paving Equipment	1	0.20	132	0.36

Dec-33	Pumps	1	9.00	84	0.74
Dec-33	Rollers	1	1.80	80	0.38
Dec-33	Rough Terrain Forklifts	1	9.00	100	0.40
Dec-33	Rough Terrain Forklifts	1	0.10	100	0.40
Dec-33	Rough Terrain Forklifts	2	9.00	100	0.40
Dec-33	Rough Terrain Forklifts	1	9.00	100	0.40
Dec-33	Skid Steer Loaders	4	9.00	65	0.37
Dec-33	Tractors/Loaders/Backhoes	1	0.20	224	0.37
Dec-33	Tractors/Loaders/Backhoes	7	9.00	249	0.37
Dec-33	Tractors/Loaders/Backhoes	2	9.00	349	0.37
Dec-33	Tractors/Loaders/Backhoes	2	9.00	999	0.37
Dec-33	Tractors/Loaders/Backhoes	1	9.00	59	0.37
Dec-33	Tractors/Loaders/Backhoes	4	9.00	97	0.37
Dec-33	Tractors/Loaders/Backhoes	1	3.70	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Jan-33	93	431.00	0.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Feb-33	123	429.00	0.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Mar-33	170	517.00	0.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Apr-33	96	409.00	0.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
May-33	122	425.00	0.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Jun-33	147	381.00	0.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Jul-33	147	406.00	0.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Aug-33	148	405.00	0.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Sep-33	138	397.00	0.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Oct-33	135	436.00	0.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Nov-33	168	442.00	0.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Dec-33	129	426.00	0.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

3.2 Jan-33 - 2033

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.3228	0.0000	4.3228	0.6546	0.0000	0.6546			0.0000			0.0000
Off-Road	23.4357	82.1991	191.5376	0.5840		2.1847	2.1847		2.1847	2.1847		58,914.4175	58,914.4175	2.0672		58,966.0983
Total	**23.4357**	**82.1991**	**191.5376**	**0.5840**	**4.3228**	**2.1847**	**6.5075**	**0.6546**	**2.1847**	**2.8393**		**58,914.4175**	**58,914.4175**	**2.0672**		**58,966.0983**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	1.4377	0.7911	8.5801	0.0420	7.2079	0.0227	7.2306	1.9113	0.0209	1.9322		4,197.0847	4,197.0847	0.0527		4,198.4026
Total	**1.4377**	**0.7911**	**8.5801**	**0.0420**	**7.2079**	**0.0227**	**7.2306**	**1.9113**	**0.0209**	**1.9322**		**4,197.0847**	**4,197.0847**	**0.0527**		**4,198.4026**

3.2 Jan-33 - 2033

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.3228	0.0000	4.3228	0.6546	0.0000	0.6546			0.0000			0.0000
Off-Road	6.6334	53.0704	274.2356	0.5840		1.3973	1.3973		1.3973	1.3973	0.0000	58,914.4174	58,914.4174	2.0672		58,966.0983
Total	**6.6334**	**53.0704**	**274.2356**	**0.5840**	**4.3228**	**1.3973**	**5.7201**	**0.6546**	**1.3973**	**2.0519**	**0.0000**	**58,914.4174**	**58,914.4174**	**2.0672**		**58,966.0983**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	1.4377	0.7911	8.5801	0.0420	7.2079	0.0227	7.2306	1.9113	0.0209	1.9322		4,197.0847	4,197.0847	0.0527		4,198.4026
Total	**1.4377**	**0.7911**	**8.5801**	**0.0420**	**7.2079**	**0.0227**	**7.2306**	**1.9113**	**0.0209**	**1.9322**		**4,197.0847**	**4,197.0847**	**0.0527**		**4,198.4026**

3.3 Feb-33 - 2033

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.3228	0.0000	4.3228	0.6546	0.0000	0.6546			0.0000			0.0000
Off-Road	29.6222	119.5008	251.7649	0.6992		2.8695	2.8695		2.8695	2.8695		69,575.4889	69,575.4889	2.6151		69,640.8653
Total	**29.6222**	**119.5008**	**251.7649**	**0.6992**	**4.3228**	**2.8695**	**7.1923**	**0.6546**	**2.8695**	**3.5241**		**69,575.4889**	**69,575.4889**	**2.6151**		**69,640.8653**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	1.4311	0.7875	8.5403	0.0418	7.1744	0.0226	7.1970	1.9024	0.0208	1.9232		4,177.6087	4,177.6087	0.0525		4,178.9204
Total	**1.4311**	**0.7875**	**8.5403**	**0.0418**	**7.1744**	**0.0226**	**7.1970**	**1.9024**	**0.0208**	**1.9232**		**4,177.6087**	**4,177.6087**	**0.0525**		**4,178.9204**

3.3 Feb-33 - 2033

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.3228	0.0000	4.3228	0.6546	0.0000	0.6546			0.0000			0.0000
Off-Road	8.2420	92.4830	338.7534	0.6992		2.5134	2.5134		2.5134	2.5134	0.0000	69,575.4888	69,575.4888	2.6151		69,640.8652
Total	**8.2420**	**92.4830**	**338.7534**	**0.6992**	**4.3228**	**2.5134**	**6.8362**	**0.6546**	**2.5134**	**3.1680**	**0.0000**	**69,575.4888**	**69,575.4888**	**2.6151**		**69,640.8652**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	1.4311	0.7875	8.5403	0.0418	7.1744	0.0226	7.1970	1.9024	0.0208	1.9232		4,177.6087	4,177.6087	0.0525		4,178.9204
Total	**1.4311**	**0.7875**	**8.5403**	**0.0418**	**7.1744**	**0.0226**	**7.1970**	**1.9024**	**0.0208**	**1.9232**		**4,177.6087**	**4,177.6087**	**0.0525**		**4,178.9204**

3.4 Mar-33 - 2033

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.3228	0.0000	4.3228	0.6546	0.0000	0.6546			0.0000			0.0000
Off-Road	38.5352	182.8364	343.7244	0.8432		3.8375	3.8375		3.8375	3.8375		81,570.3790	81,570.3790	3.4055		81,655.5157
Total	**38.5352**	**182.8364**	**343.7244**	**0.8432**	**4.3228**	**3.8375**	**8.1603**	**0.6546**	**3.8375**	**4.4921**		**81,570.3790**	**81,570.3790**	**3.4055**		**81,655.5157**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	1.7246	0.9490	10.2921	0.0504	8.6461	0.0272	8.6733	2.2927	0.0251	2.3177		5,034.5541	5,034.5541	0.0632		5,036.1349
Total	**1.7246**	**0.9490**	**10.2921**	**0.0504**	**8.6461**	**0.0272**	**8.6733**	**2.2927**	**0.0251**	**2.3177**		**5,034.5541**	**5,034.5541**	**0.0632**		**5,036.1349**

3.4 Mar-33 - 2033

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.3228	0.0000	4.3228	0.6546	0.0000	0.6546			0.0000			0.0000
Off-Road	10.5056	169.2728	424.6378	0.8432		4.6767	4.6767		4.6767	4.6767	0.0000	81,570.3789	81,570.3789	3.4055		81,655.5157
Total	**10.5056**	**169.2728**	**424.6378**	**0.8432**	**4.3228**	**4.6767**	**8.9995**	**0.6546**	**4.6767**	**5.3313**	**0.0000**	**81,570.3789**	**81,570.3789**	**3.4055**		**81,655.5157**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	1.7246	0.9490	10.2921	0.0504	8.6461	0.0272	8.6733	2.2927	0.0251	2.3177		5,034.5541	5,034.5541	0.0632		5,036.1349
Total	**1.7246**	**0.9490**	**10.2921**	**0.0504**	**8.6461**	**0.0272**	**8.6733**	**2.2927**	**0.0251**	**2.3177**		**5,034.5541**	**5,034.5541**	**0.0632**		**5,036.1349**

3.5 Apr-33 - 2033

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.3228	0.0000	4.3228	0.6546	0.0000	0.6546			0.0000			0.0000
Off-Road	22.9955	84.8983	188.0761	0.5548		2.1268	2.1268		2.1268	2.1268		55,507.5528	55,507.5528	2.0292		55,558.2827
Total	**22.9955**	**84.8983**	**188.0761**	**0.5548**	**4.3228**	**2.1268**	**6.4496**	**0.6546**	**2.1268**	**2.7814**		**55,507.5528**	**55,507.5528**	**2.0292**		**55,558.2827**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	1.3644	0.7508	8.1421	0.0399	6.8399	0.0216	6.8615	1.8137	0.0198	1.8335		3,982.8484	3,982.8484	0.0500		3,984.0990
Total	**1.3644**	**0.7508**	**8.1421**	**0.0399**	**6.8399**	**0.0216**	**6.8615**	**1.8137**	**0.0198**	**1.8335**		**3,982.8484**	**3,982.8484**	**0.0500**		**3,984.0990**

3.5 Apr-33 - 2033

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.3228	0.0000	4.3228	0.6546	0.0000	0.6546			0.0000			0.0000
Off-Road	6.4424	63.9066	262.2594	0.5548		1.7126	1.7126		1.7126	1.7126	0.0000	55,507.5528	55,507.5528	2.0292		55,558.2826
Total	**6.4424**	**63.9066**	**262.2594**	**0.5548**	**4.3228**	**1.7126**	**6.0354**	**0.6546**	**1.7126**	**2.3672**	**0.0000**	**55,507.5528**	**55,507.5528**	**2.0292**		**55,558.2826**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	1.3644	0.7508	8.1421	0.0399	6.8399	0.0216	6.8615	1.8137	0.0198	1.8335		3,982.8484	3,982.8484	0.0500		3,984.0990
Total	**1.3644**	**0.7508**	**8.1421**	**0.0399**	**6.8399**	**0.0216**	**6.8615**	**1.8137**	**0.0198**	**1.8335**		**3,982.8484**	**3,982.8484**	**0.0500**		**3,984.0990**

3.6 May-33 - 2033

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.3228	0.0000	4.3228	0.6546	0.0000	0.6546			0.0000			0.0000
Off-Road	26.3133	129.2072	237.9050	0.5696		2.5866	2.5866		2.5866	2.5866		54,426.4254	54,426.4254	2.3262		54,484.5799
Total	**26.3133**	**129.2072**	**237.9050**	**0.5696**	**4.3228**	**2.5866**	**6.9095**	**0.6546**	**2.5866**	**3.2413**		**54,426.4254**	**54,426.4254**	**2.3262**		**54,484.5799**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	1.4177	0.7801	8.4607	0.0414	7.1075	0.0224	7.1299	1.8847	0.0206	1.9053		4,138.6566	4,138.6566	0.0520		4,139.9561
Total	**1.4177**	**0.7801**	**8.4607**	**0.0414**	**7.1075**	**0.0224**	**7.1299**	**1.8847**	**0.0206**	**1.9053**		**4,138.6566**	**4,138.6566**	**0.0520**		**4,139.9561**

3.6 May-33 - 2033

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.3228	0.0000	4.3228	0.6546	0.0000	0.6546			0.0000			0.0000
Off-Road	7.1874	125.8320	288.1622	0.5696		3.4931	3.4931		3.4931	3.4931	0.0000	54,426.4253	54,426.4253	2.3262		54,484.5798
Total	**7.1874**	**125.8320**	**288.1622**	**0.5696**	**4.3228**	**3.4931**	**7.8159**	**0.6546**	**3.4931**	**4.1477**	**0.0000**	**54,426.4253**	**54,426.4253**	**2.3262**		**54,484.5798**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	1.4177	0.7801	8.4607	0.0414	7.1075	0.0224	7.1299	1.8847	0.0206	1.9053		4,138.6566	4,138.6566	0.0520		4,139.9561
Total	**1.4177**	**0.7801**	**8.4607**	**0.0414**	**7.1075**	**0.0224**	**7.1299**	**1.8847**	**0.0206**	**1.9053**		**4,138.6566**	**4,138.6566**	**0.0520**		**4,139.9561**

3.7 Jun-33 - 2033

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.3228	0.0000	4.3228	0.6546	0.0000	0.6546			0.0000			0.0000
Off-Road	30.6970	160.5426	284.0658	0.6439		3.0721	3.0721		3.0721	3.0721		60,716.9922	60,716.9922	2.7151		60,784.8688
Total	**30.6970**	**160.5426**	**284.0658**	**0.6439**	**4.3228**	**3.0721**	**7.3949**	**0.6546**	**3.0721**	**3.7267**		**60,716.9922**	**60,716.9922**	**2.7151**		**60,784.8688**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	1.2710	0.6994	7.5847	0.0372	6.3717	0.0201	6.3917	1.6896	0.0185	1.7080		3,710.1839	3,710.1839	0.0466		3,711.3489
Total	**1.2710**	**0.6994**	**7.5847**	**0.0372**	**6.3717**	**0.0201**	**6.3917**	**1.6896**	**0.0185**	**1.7080**		**3,710.1839**	**3,710.1839**	**0.0466**		**3,711.3489**

3.7 Jun-33 - 2033

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.3228	0.0000	4.3228	0.6546	0.0000	0.6546			0.0000			0.0000
Off-Road	8.3255	162.5990	332.2778	0.6439		4.5296	4.5296		4.5296	4.5296	0.0000	60,716.9922	60,716.9922	2.7151		60,784.8687
Total	**8.3255**	**162.5990**	**332.2778**	**0.6439**	**4.3228**	**4.5296**	**8.8524**	**0.6546**	**4.5296**	**5.1842**	**0.0000**	**60,716.9922**	**60,716.9922**	**2.7151**		**60,784.8687**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	1.2710	0.6994	7.5847	0.0372	6.3717	0.0201	6.3917	1.6896	0.0185	1.7080		3,710.1839	3,710.1839	0.0466		3,711.3489
Total	**1.2710**	**0.6994**	**7.5847**	**0.0372**	**6.3717**	**0.0201**	**6.3917**	**1.6896**	**0.0185**	**1.7080**		**3,710.1839**	**3,710.1839**	**0.0466**		**3,711.3489**

3.8 Jul-33 - 2033

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.3228	0.0000	4.3228	0.6546	0.0000	0.6546			0.0000			0.0000
Off-Road	34.3881	153.5143	305.4468	0.7736		3.3807	3.3807		3.3807	3.3807		75,445.5950	75,445.5950	3.0398		75,521.5886
Total	**34.3881**	**153.5143**	**305.4468**	**0.7736**	**4.3228**	**3.3807**	**7.7035**	**0.6546**	**3.3807**	**4.0353**		**75,445.5950**	**75,445.5950**	**3.0398**		**75,521.5886**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	1.3543	0.7452	8.0824	0.0396	6.7898	0.0214	6.8112	1.8004	0.0197	1.8201		3,953.6343	3,953.6343	0.0497		3,954.8757
Total	**1.3543**	**0.7452**	**8.0824**	**0.0396**	**6.7898**	**0.0214**	**6.8112**	**1.8004**	**0.0197**	**1.8201**		**3,953.6343**	**3,953.6343**	**0.0497**		**3,954.8757**

3.8 Jul-33 - 2033

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.3228	0.0000	4.3228	0.6546	0.0000	0.6546			0.0000			0.0000
Off-Road	9.4660	136.3866	385.3166	0.7736		3.6495	3.6495		3.6495	3.6495	0.0000	75,445.5949	75,445.5949	3.0398		75,521.5886
Total	**9.4660**	**136.3866**	**385.3166**	**0.7736**	**4.3228**	**3.6495**	**7.9724**	**0.6546**	**3.6495**	**4.3042**	**0.0000**	**75,445.5949**	**75,445.5949**	**3.0398**		**75,521.5886**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	1.3543	0.7452	8.0824	0.0396	6.7898	0.0214	6.8112	1.8004	0.0197	1.8201		3,953.6343	3,953.6343	0.0497		3,954.8757
Total	**1.3543**	**0.7452**	**8.0824**	**0.0396**	**6.7898**	**0.0214**	**6.8112**	**1.8004**	**0.0197**	**1.8201**		**3,953.6343**	**3,953.6343**	**0.0497**		**3,954.8757**

3.9 Aug-33 - 2033

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.3228	0.0000	4.3228	0.6546	0.0000	0.6546			0.0000			0.0000
Off-Road	34.0196	149.7558	298.3160	0.7656		3.2977	3.2977		3.2977	3.2977		74,815.2912	74,815.2912	3.0079		74,890.4885
Total	**34.0196**	**149.7558**	**298.3160**	**0.7656**	**4.3228**	**3.2977**	**7.6205**	**0.6546**	**3.2977**	**3.9523**		**74,815.2912**	**74,815.2912**	**3.0079**		**74,890.4885**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	1.3510	0.7434	8.0625	0.0395	6.7730	0.0213	6.7944	1.7960	0.0196	1.8156		3,943.8963	3,943.8963	0.0495		3,945.1347
Total	**1.3510**	**0.7434**	**8.0625**	**0.0395**	**6.7730**	**0.0213**	**6.7944**	**1.7960**	**0.0196**	**1.8156**		**3,943.8963**	**3,943.8963**	**0.0495**		**3,945.1347**

3.9 Aug-33 - 2033

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.3228	0.0000	4.3228	0.6546	0.0000	0.6546			0.0000			0.0000
Off-Road	9.3909	135.4913	379.3377	0.7656		3.6237	3.6237		3.6237	3.6237	0.0000	74,815.29 11	74,815.29 11	3.0079		74,890.48 84
Total	**9.3909**	**135.4913**	**379.3377**	**0.7656**	**4.3228**	**3.6237**	**7.9465**	**0.6546**	**3.6237**	**4.2783**	**0.0000**	**74,815.29 11**	**74,815.29 11**	**3.0079**		**74,890.48 84**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	1.3510	0.7434	8.0625	0.0395	6.7730	0.0213	6.7944	1.7960	0.0196	1.8156		3,943.896 3	3,943.896 3	0.0495		3,945.134 7
Total	**1.3510**	**0.7434**	**8.0625**	**0.0395**	**6.7730**	**0.0213**	**6.7944**	**1.7960**	**0.0196**	**1.8156**		**3,943.896 3**	**3,943.896 3**	**0.0495**		**3,945.134 7**

3.10 Sep-33 - 2033

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.3228	0.0000	4.3228	0.6546	0.0000	0.6546			0.0000			0.0000
Off-Road	32.5108	137.0424	284.2959	0.7488		3.1671	3.1671		3.1671	3.1671		73,848.1743	73,848.1743	2.8726		73,919.9885
Total	**32.5108**	**137.0424**	**284.2959**	**0.7488**	**4.3228**	**3.1671**	**7.4899**	**0.6546**	**3.1671**	**3.8217**		**73,848.1743**	**73,848.1743**	**2.8726**		**73,919.9885**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	1.3243	0.7287	7.9033	0.0387	6.6393	0.0209	6.6602	1.7605	0.0192	1.7797		3,865.9922	3,865.9922	0.0486		3,867.2061
Total	**1.3243**	**0.7287**	**7.9033**	**0.0387**	**6.6393**	**0.0209**	**6.6602**	**1.7605**	**0.0192**	**1.7797**		**3,865.9922**	**3,865.9922**	**0.0486**		**3,867.2061**

DCPP Decommissioning - San Luis Obispo County APCD Air District, Winter

3.10 Sep-33 - 2033

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.3228	0.0000	4.3228	0.6546	0.0000	0.6546			0.0000			0.0000
Off-Road	8.9860	113.3959	368.7490	0.7488		3.0044	3.0044		3.0044	3.0044	0.0000	73,848.1743	73,848.1743	2.8726		73,919.9885
Total	**8.9860**	**113.3959**	**368.7490**	**0.7488**	**4.3228**	**3.0044**	**7.3272**	**0.6546**	**3.0044**	**3.6590**	**0.0000**	**73,848.1743**	**73,848.1743**	**2.8726**		**73,919.9885**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	1.3243	0.7287	7.9033	0.0387	6.6393	0.0209	6.6602	1.7605	0.0192	1.7797		3,865.9922	3,865.9922	0.0486		3,867.2061
Total	**1.3243**	**0.7287**	**7.9033**	**0.0387**	**6.6393**	**0.0209**	**6.6602**	**1.7605**	**0.0192**	**1.7797**		**3,865.9922**	**3,865.9922**	**0.0486**		**3,867.2061**

3.11 Oct-33 - 2033

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.3228	0.0000	4.3228	0.6546	0.0000	0.6546			0.0000			0.0000
Off-Road	31.6216	130.6819	275.0449	0.7339		3.0699	3.0699		3.0699	3.0699		72,596.8782	72,596.8782	2.7937		72,666.7199
Total	**31.6216**	**130.6819**	**275.0449**	**0.7339**	**4.3228**	**3.0699**	**7.3928**	**0.6546**	**3.0699**	**3.7246**		**72,596.8782**	**72,596.8782**	**2.7937**		**72,666.7199**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	1.4544	0.8003	8.6796	0.0425	7.2915	0.0230	7.3144	1.9335	0.0211	1.9546		4,245.7748	4,245.7748	0.0533		4,247.1079
Total	**1.4544**	**0.8003**	**8.6796**	**0.0425**	**7.2915**	**0.0230**	**7.3144**	**1.9335**	**0.0211**	**1.9546**		**4,245.7748**	**4,245.7748**	**0.0533**		**4,247.1079**

3.11 Oct-33 - 2033

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.3228	0.0000	4.3228	0.6546	0.0000	0.6546			0.0000			0.0000
Off-Road	8.7548	105.7363	359.9414	0.7339		2.7885	2.7885		2.7885	2.7885	0.0000	72,596.8781	72,596.8781	2.7937		72,666.7198
Total	**8.7548**	**105.7363**	**359.9414**	**0.7339**	**4.3228**	**2.7885**	**7.1114**	**0.6546**	**2.7885**	**3.4432**	**0.0000**	**72,596.8781**	**72,596.8781**	**2.7937**		**72,666.7198**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	1.4544	0.8003	8.6796	0.0425	7.2915	0.0230	7.3144	1.9335	0.0211	1.9546		4,245.7748	4,245.7748	0.0533		4,247.1079
Total	**1.4544**	**0.8003**	**8.6796**	**0.0425**	**7.2915**	**0.0230**	**7.3144**	**1.9335**	**0.0211**	**1.9546**		**4,245.7748**	**4,245.7748**	**0.0533**		**4,247.1079**

3.12 Nov-33 - 2033

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.3228	0.0000	4.3228	0.6546	0.0000	0.6546			0.0000			0.0000
Off-Road	37.8027	156.2467	348.7701	0.8807		3.8184	3.8184		3.8184	3.8184		86,577.2292	86,577.2292	3.3438		86,660.8240
Total	**37.8027**	**156.2467**	**348.7701**	**0.8807**	**4.3228**	**3.8184**	**8.1412**	**0.6546**	**3.8184**	**4.4730**		**86,577.2292**	**86,577.2292**	**3.3438**		**86,660.8240**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	1.4744	0.8113	8.7991	0.0431	7.3918	0.0233	7.4151	1.9601	0.0214	1.9815		4,304.2029	4,304.2029	0.0541		4,305.5544
Total	**1.4744**	**0.8113**	**8.7991**	**0.0431**	**7.3918**	**0.0233**	**7.4151**	**1.9601**	**0.0214**	**1.9815**		**4,304.2029**	**4,304.2029**	**0.0541**		**4,305.5544**

3.12 Nov-33 - 2033

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.3228	0.0000	4.3228	0.6546	0.0000	0.6546			0.0000			0.0000
Off-Road	10.2788	120.1745	441.5762	0.8807		3.2822	3.2822		3.2822	3.2822	0.0000	86,577.2292	86,577.2292	3.3438		86,660.8239
Total	**10.2788**	**120.1745**	**441.5762**	**0.8807**	**4.3228**	**3.2822**	**7.6051**	**0.6546**	**3.2822**	**3.9369**	**0.0000**	**86,577.2292**	**86,577.2292**	**3.3438**		**86,660.8239**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	1.4744	0.8113	8.7991	0.0431	7.3918	0.0233	7.4151	1.9601	0.0214	1.9815		4,304.2029	4,304.2029	0.0541		4,305.5544
Total	**1.4744**	**0.8113**	**8.7991**	**0.0431**	**7.3918**	**0.0233**	**7.4151**	**1.9601**	**0.0214**	**1.9815**		**4,304.2029**	**4,304.2029**	**0.0541**		**4,305.5544**

3.13 Dec-33 - 2033

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.3228	0.0000	4.3228	0.6546	0.0000	0.6546			0.0000			0.0000
Off-Road	33.0761	102.8308	293.9263	0.8349		3.2544	3.2544		3.2544	3.2544		84,851.3623	84,851.3623	2.9220		84,924.4119
Total	**33.0761**	**102.8308**	**293.9263**	**0.8349**	**4.3228**	**3.2544**	**7.5772**	**0.6546**	**3.2544**	**3.9090**		**84,851.3623**	**84,851.3623**	**2.9220**		**84,924.4119**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	1.4211	0.7820	8.4806	0.0415	7.1242	0.0224	7.1467	1.8891	0.0206	1.9098		4,148.3947	4,148.3947	0.0521		4,149.6972
Total	**1.4211**	**0.7820**	**8.4806**	**0.0415**	**7.1242**	**0.0224**	**7.1467**	**1.8891**	**0.0206**	**1.9098**		**4,148.3947**	**4,148.3947**	**0.0521**		**4,149.6972**

3.13 Dec-33 - 2033

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.3228	0.0000	4.3228	0.6546	0.0000	0.6546			0.0000			0.0000
Off-Road	9.0427	45.2444	404.8990	0.8349		1.1839	1.1839		1.1839	1.1839	0.0000	84,851.3623	84,851.3623	2.9220		84,924.4118
Total	**9.0427**	**45.2444**	**404.8990**	**0.8349**	**4.3228**	**1.1839**	**5.5067**	**0.6546**	**1.1839**	**1.8385**	**0.0000**	**84,851.3623**	**84,851.3623**	**2.9220**		**84,924.4118**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	1.4211	0.7820	8.4806	0.0415	7.1242	0.0224	7.1467	1.8891	0.0206	1.9098		4,148.3947	4,148.3947	0.0521		4,149.6972
Total	**1.4211**	**0.7820**	**8.4806**	**0.0415**	**7.1242**	**0.0224**	**7.1467**	**1.8891**	**0.0206**	**1.9098**		**4,148.3947**	**4,148.3947**	**0.0521**		**4,149.6972**

3.13 Dec-33 - 2034

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.3228	0.0000	4.3228	0.6546	0.0000	0.6546			0.0000			0.0000
Off-Road	33.0761	102.8308	293.9263	0.8349		3.2544	3.2544		3.2544	3.2544		84,851.3623	84,851.3623	2.9220		84,924.4119
Total	**33.0761**	**102.8308**	**293.9263**	**0.8349**	**4.3228**	**3.2544**	**7.5772**	**0.6546**	**3.2544**	**3.9090**		**84,851.3623**	**84,851.3623**	**2.9220**		**84,924.4119**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	1.3371	0.7268	8.0163	0.0409	7.1242	0.0210	7.1452	1.8891	0.0193	1.9084		4,080.9111	4,080.9111	0.0477		4,082.1034
Total	**1.3371**	**0.7268**	**8.0163**	**0.0409**	**7.1242**	**0.0210**	**7.1452**	**1.8891**	**0.0193**	**1.9084**		**4,080.9111**	**4,080.9111**	**0.0477**		**4,082.1034**

3.13 Dec-33 - 2034

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.3228	0.0000	4.3228	0.6546	0.0000	0.6546			0.0000			0.0000
Off-Road	9.0427	45.2444	404.8990	0.8349		1.1839	1.1839		1.1839	1.1839	0.0000	84,851.3623	84,851.3623	2.9220		84,924.4118
Total	**9.0427**	**45.2444**	**404.8990**	**0.8349**	**4.3228**	**1.1839**	**5.5067**	**0.6546**	**1.1839**	**1.8385**	**0.0000**	**84,851.3623**	**84,851.3623**	**2.9220**		**84,924.4118**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	1.3371	0.7268	8.0163	0.0409	7.1242	0.0210	7.1452	1.8891	0.0193	1.9084		4,080.9111	4,080.9111	0.0477		4,082.1034
Total	**1.3371**	**0.7268**	**8.0163**	**0.0409**	**7.1242**	**0.0210**	**7.1452**	**1.8891**	**0.0193**	**1.9084**		**4,080.9111**	**4,080.9111**	**0.0477**		**4,082.1034**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Heavy Industry	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Heavy Industry	13.00	13.00	13.00	59.00	28.00	13.00	92	5	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Heavy Industry	0.615581	0.024499	0.200162	0.102060	0.012058	0.004089	0.012646	0.020218	0.002251	0.001029	0.004096	0.000689	0.000621

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Heavy Industry	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Heavy Industry	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

SMVRR Equipment

Santa Barbara County APCD Air District, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Industrial Park	217.80	1000sqft	5.00	217,800.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.9	**Precipitation Freq (Days)**	37
Climate Zone	4			**Operational Year**	2030
Utility Company	Pacific Gas and Electric Company				
CO2 Intensity (lb/MWhr)	203.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Waste transport to SMVRR 2024-2029. Assume equipment installed at start of Period 1 (Dec 2024).

Land Use - Betteravia Industrial park is 5 acres (SMVRR website).

Construction Phase - Period 1 12/1/2024 through 12/31/2029. Adjusted end date to account for 4 day work weeks.

Off-road Equipment - Generator set based on requirements for gantry lift system. Other equipment based on defaults or similar models

Trips and VMT - Assume 10 workers per day at one railyard. Used default trip length. 99 haul trips over distance from DCPP to SMVR (roughly 50 miles)

Energy Use -

Construction Off-road Equipment Mitigation - Assume Tier 4 final for hp >100 and Tier 4 interim for hp <100.

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstructionPhase	NumDays	5.00	1,060.00
tblConstructionPhase	PhaseEndDate	12/6/2024	12/22/2028
tblOffRoadEquipment	HorsePower	84.00	369.00
tblOffRoadEquipment	HorsePower	172.00	24.80
tblOffRoadEquipment	LoadFactor	0.38	0.38
tblOffRoadEquipment	LoadFactor	0.42	0.42
tblOffRoadEquipment	LoadFactor	0.31	0.31
tblOffRoadEquipment	LoadFactor	0.40	0.40
tblOffRoadEquipment	OffRoadEquipmentType	Rubber Tired Dozers	Generator Sets
tblOffRoadEquipment	OffRoadEquipmentType	Tractors/Loaders/Backhoes	Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Other Construction Equipment
tblOffRoadEquipment	OffRoadEquipmentType		Aerial Lifts
tblOffRoadEquipment	OffRoadEquipmentType		Rough Terrain Forklifts
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripLength	20.00	50.00
tblTripsAndVMT	HaulingTripNumber	0.00	99.00
tblTripsAndVMT	WorkerTripNumber	25.00	10.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2024	1.5359	11.2801	12.4669	0.0441	0.0672	0.3791	0.4463	0.0179	0.3611	0.3790	0.0000	4,679.355 2	4,679.355 2	0.6727	4.1700e-003	4,697.416 2
2025	1.4626	10.0453	12.3468	0.0441	0.0672	0.3257	0.3930	0.0179	0.3101	0.3280	0.0000	4,676.699 3	4,676.699 3	0.6723	4.0200e-003	4,694.704 4
2026	1.4613	10.0428	12.3339	0.0441	0.0672	0.3257	0.3929	0.0179	0.3101	0.3279	0.0000	4,674.842 9	4,674.842 9	0.6722	3.8700e-003	4,692.802 7
2027	1.4600	10.0405	12.3250	0.0440	0.0672	0.3257	0.3929	0.0179	0.3100	0.3279	0.0000	4,673.174 3	4,673.174 3	0.6721	3.7500e-003	4,691.093 1
2028	1.4589	10.0386	12.3177	0.0440	0.0672	0.3257	0.3929	0.0179	0.3100	0.3279	0.0000	4,671.642 7	4,671.642 7	0.6721	3.6300e-003	4,689.525 7
Maximum	**1.5359**	**11.2801**	**12.4669**	**0.0441**	**0.0672**	**0.3791**	**0.4463**	**0.0179**	**0.3611**	**0.3790**	**0.0000**	**4,679.355 2**	**4,679.355 2**	**0.6727**	**4.1700e-003**	**4,697.416 2**

2.1 Overall Construction (Maximum Daily Emission)

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2024	0.5614	3.1303	20.6370	0.0441	0.0672	0.1048	0.1720	0.0179	0.1048	0.1226	0.0000	4,679.3552	4,679.3552	0.6727	4.1700e-003	4,697.4162
2025	0.5598	3.1274	20.6248	0.0441	0.0672	0.1048	0.1720	0.0179	0.1047	0.1226	0.0000	4,676.6993	4,676.6993	0.6723	4.0200e-003	4,694.7044
2026	0.5585	3.1249	20.6118	0.0441	0.0672	0.1047	0.1720	0.0179	0.1047	0.1226	0.0000	4,674.8429	4,674.8429	0.6722	3.8700e-003	4,692.8027
2027	0.5572	3.1226	20.6029	0.0440	0.0672	0.1047	0.1719	0.0179	0.1047	0.1226	0.0000	4,673.1743	4,673.1743	0.6721	3.7500e-003	4,691.0931
2028	0.5561	3.1207	20.5956	0.0440	0.0672	0.1047	0.1719	0.0179	0.1047	0.1225	0.0000	4,671.6427	4,671.6427	0.6721	3.6300e-003	4,689.5257
Maximum	**0.5614**	**3.1303**	**20.6370**	**0.0441**	**0.0672**	**0.1048**	**0.1720**	**0.0179**	**0.1048**	**0.1226**	**0.0000**	**4,679.3552**	**4,679.3552**	**0.6727**	**4.1700e-003**	**4,697.4162**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**62.15**	**69.63**	**-66.81**	**0.00**	**0.00**	**68.86**	**57.39**	**0.00**	**67.31**	**63.75**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	6.0458	2.0000e-004	0.0221	0.0000		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005		0.0477	0.0477	1.2000e-004		0.0507
Energy	0.1043	0.9477	0.7961	5.6900e-003		0.0720	0.0720		0.0720	0.0720		1,137.2635	1,137.2635	0.0218	0.0209	1,144.0217
Mobile	1.3933	1.5749	12.2950	0.0231	2.9665	0.0165	2.9830	0.7925	0.0154	0.8079		2,357.7498	2,357.7498	0.1783	0.1295	2,400.7968
Total	**7.5434**	**2.5228**	**13.1132**	**0.0288**	**2.9665**	**0.0886**	**3.0551**	**0.7925**	**0.0875**	**0.8800**		**3,495.0610**	**3,495.0610**	**0.2002**	**0.1504**	**3,544.8693**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	6.0458	2.0000e-004	0.0221	0.0000		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005		0.0477	0.0477	1.2000e-004		0.0507
Energy	0.1043	0.9477	0.7961	5.6900e-003		0.0720	0.0720		0.0720	0.0720		1,137.2635	1,137.2635	0.0218	0.0209	1,144.0217
Mobile	1.3933	1.5749	12.2950	0.0231	2.9665	0.0165	2.9830	0.7925	0.0154	0.8079		2,357.7498	2,357.7498	0.1783	0.1295	2,400.7968
Total	**7.5434**	**2.5228**	**13.1132**	**0.0288**	**2.9665**	**0.0886**	**3.0551**	**0.7925**	**0.0875**	**0.8800**		**3,495.0610**	**3,495.0610**	**0.2002**	**0.1504**	**3,544.8693**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	SMVR Operations	Site Preparation	12/1/2024	12/22/2028	5	1060	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
SMVR Operations	Generator Sets	2	4.00	369	0.74
SMVR Operations	Off-Highway Trucks	2	4.00	402	0.38
SMVR Operations	Other Construction Equipment	2	4.00	24.8	0.42
SMVR Operations	Aerial Lifts	2	4.00	63	0.31
SMVR Operations	Rough Terrain Forklifts	2	4.00	100	0.40

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
SMVR Operations	10	10.00	0.00	99.00	8.30	6.40	50.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

3.2 SMVR Operations - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5096	11.2286	12.2723	0.0435		0.3785	0.3785		0.3606	0.3606		4,613.7922	4,613.7922	0.6696		4,630.5329
Total	**1.5096**	**11.2286**	**12.2723**	**0.0435**		**0.3785**	**0.3785**		**0.3606**	**0.3606**		**4,613.7922**	**4,613.7922**	**0.6696**		**4,630.5329**

3.2 SMVR Operations - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	4.5000e-004	0.0347	8.1600e-003	1.4000e-004	4.0600e-003	2.8000e-004	4.3500e-003	1.1100e-003	2.7000e-004	1.3800e-003		15.4063	15.4063	1.1400e-003	2.4700e-003	16.1714
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0259	0.0168	0.1864	5.0000e-004	0.0632	2.9000e-004	0.0635	0.0168	2.7000e-004	0.0170		50.1568	50.1568	1.9100e-003	1.7000e-003	50.7119
Total	**0.0263**	**0.0515**	**0.1946**	**6.4000e-004**	**0.0672**	**5.7000e-004**	**0.0678**	**0.0179**	**5.4000e-004**	**0.0184**		**65.5630**	**65.5630**	**3.0500e-003**	**4.1700e-003**	**66.8833**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5351	3.0788	20.4424	0.0435		0.1042	0.1042		0.1042	0.1042	0.0000	4,613.7922	4,613.7922	0.6696		4,630.5329
Total	**0.5351**	**3.0788**	**20.4424**	**0.0435**		**0.1042**	**0.1042**		**0.1042**	**0.1042**	**0.0000**	**4,613.7922**	**4,613.7922**	**0.6696**		**4,630.5329**

3.2 SMVR Operations - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	4.5000e-004	0.0347	8.1600e-003	1.4000e-004	4.0600e-003	2.8000e-004	4.3500e-003	1.1100e-003	2.7000e-004	1.3800e-003		15.4063	15.4063	1.1400e-003	2.4700e-003	16.1714
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0259	0.0168	0.1864	5.0000e-004	0.0632	2.9000e-004	0.0635	0.0168	2.7000e-004	0.0170		50.1568	50.1568	1.9100e-003	1.7000e-003	50.7119
Total	**0.0263**	**0.0515**	**0.1946**	**6.4000e-004**	**0.0672**	**5.7000e-004**	**0.0678**	**0.0179**	**5.4000e-004**	**0.0184**		**65.5630**	**65.5630**	**3.0500e-003**	**4.1700e-003**	**66.8833**

3.2 SMVR Operations - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.4379	9.9967	12.1645	0.0435		0.3252	0.3252		0.3096	0.3096		4,613.0500	4,613.0500	0.6694		4,629.7848
Total	**1.4379**	**9.9967**	**12.1645**	**0.0435**		**0.3252**	**0.3252**		**0.3096**	**0.3096**		**4,613.0500**	**4,613.0500**	**0.6694**		**4,629.7848**

3.2 SMVR Operations - 2025

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	4.3000e-004	0.0335	8.3100e-003	1.3000e-004	4.0600e-003	2.8000e-004	4.3400e-003	1.1100e-003	2.6000e-004	1.3700e-003		15.1199	15.1199	1.1900e-003	2.4300e-003	15.8733
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0244	0.0151	0.1740	4.8000e-004	0.0632	2.8000e-004	0.0634	0.0168	2.6000e-004	0.0170		48.5294	48.5294	1.7400e-003	1.5900e-003	49.0463
Total	**0.0248**	**0.0486**	**0.1823**	**6.1000e-004**	**0.0672**	**5.6000e-004**	**0.0678**	**0.0179**	**5.2000e-004**	**0.0184**		**63.6493**	**63.6493**	**2.9300e-003**	**4.0200e-003**	**64.9197**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5351	3.0788	20.4424	0.0435		0.1042	0.1042		0.1042	0.1042	0.0000	4,613.0500	4,613.0500	0.6694		4,629.7848
Total	**0.5351**	**3.0788**	**20.4424**	**0.0435**		**0.1042**	**0.1042**		**0.1042**	**0.1042**	**0.0000**	**4,613.0500**	**4,613.0500**	**0.6694**		**4,629.7848**

3.2 SMVR Operations - 2025

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	4.3000e-004	0.0335	8.3100e-003	1.3000e-004	4.0600e-003	2.8000e-004	4.3400e-003	1.1100e-003	2.6000e-004	1.3700e-003		15.1199	15.1199	1.1900e-003	2.4300e-003	15.8733
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0244	0.0151	0.1740	4.8000e-004	0.0632	2.8000e-004	0.0634	0.0168	2.6000e-004	0.0170		48.5294	48.5294	1.7400e-003	1.5900e-003	49.0463
Total	**0.0248**	**0.0486**	**0.1823**	**6.1000e-004**	**0.0672**	**5.6000e-004**	**0.0678**	**0.0179**	**5.2000e-004**	**0.0184**		**63.6493**	**63.6493**	**2.9300e-003**	**4.0200e-003**	**64.9197**

3.2 SMVR Operations - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.4379	9.9967	12.1645	0.0435		0.3252	0.3252		0.3096	0.3096		4,613.0500	4,613.0500	0.6694		4,629.7848
Total	**1.4379**	**9.9967**	**12.1645**	**0.0435**		**0.3252**	**0.3252**		**0.3096**	**0.3096**		**4,613.0500**	**4,613.0500**	**0.6694**		**4,629.7848**

3.2 SMVR Operations - 2026

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	4.2000e-004	0.0324	8.4200e-003	1.3000e-004	4.0600e-003	2.7000e-004	4.3300e-003	1.1100e-003	2.6000e-004	1.3700e-003		14.8295	14.8295	1.2400e-003	2.3800e-003	15.5708
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0230	0.0136	0.1610	4.6000e-004	0.0632	2.6000e-004	0.0634	0.0168	2.4000e-004	0.0170		46.9634	46.9634	1.5800e-003	1.4900e-003	47.4471
Total	**0.0234**	**0.0461**	**0.1694**	**5.9000e-004**	**0.0672**	**5.3000e-004**	**0.0677**	**0.0179**	**5.0000e-004**	**0.0184**		**61.7929**	**61.7929**	**2.8200e-003**	**3.8700e-003**	**63.0179**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5351	3.0788	20.4424	0.0435		0.1042	0.1042		0.1042	0.1042	0.0000	4,613.0500	4,613.0500	0.6694		4,629.7848
Total	**0.5351**	**3.0788**	**20.4424**	**0.0435**		**0.1042**	**0.1042**		**0.1042**	**0.1042**	**0.0000**	**4,613.0500**	**4,613.0500**	**0.6694**		**4,629.7848**

3.2 SMVR Operations - 2026

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					lb/day								lb/day			
Hauling	4.2000e-004	0.0324	8.4200e-003	1.3000e-004	4.0600e-003	2.7000e-004	4.3300e-003	1.1100e-003	2.6000e-004	1.3700e-003		14.8295	14.8295	1.2400e-003	2.3800e-003	15.5708
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0230	0.0136	0.1610	4.6000e-004	0.0632	2.6000e-004	0.0634	0.0168	2.4000e-004	0.0170		46.9634	46.9634	1.5800e-003	1.4900e-003	47.4471
Total	**0.0234**	**0.0461**	**0.1694**	**5.9000e-004**	**0.0672**	**5.3000e-004**	**0.0677**	**0.0179**	**5.0000e-004**	**0.0184**		**61.7929**	**61.7929**	**2.8200e-003**	**3.8700e-003**	**63.0179**

3.2 SMVR Operations - 2027

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					lb/day								lb/day			
Off-Road	1.4379	9.9967	12.1645	0.0435		0.3252	0.3252		0.3096	0.3096		4,613.0500	4,613.0500	0.6694		4,629.7848
Total	**1.4379**	**9.9967**	**12.1645**	**0.0435**		**0.3252**	**0.3252**		**0.3096**	**0.3096**		**4,613.0500**	**4,613.0500**	**0.6694**		**4,629.7848**

3.2 SMVR Operations - 2027

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	4.0000e-004	0.0314	8.5400e-003	1.3000e-004	4.0600e-003	2.6000e-004	4.3200e-003	1.1100e-003	2.5000e-004	1.3600e-003		14.5132	14.5132	1.2700e-003	2.3400e-003	15.2409
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0218	0.0124	0.1519	4.5000e-004	0.0632	2.4000e-004	0.0634	0.0168	2.2000e-004	0.0170		45.6110	45.6110	1.4600e-003	1.4100e-003	46.0675
Total	**0.0222**	**0.0438**	**0.1605**	**5.8000e-004**	**0.0672**	**5.0000e-004**	**0.0677**	**0.0179**	**4.7000e-004**	**0.0183**		**60.1243**	**60.1243**	**2.7300e-003**	**3.7500e-003**	**61.3084**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5351	3.0788	20.4424	0.0435		0.1042	0.1042		0.1042	0.1042	0.0000	4,613.0500	4,613.0500	0.6694		4,629.7848
Total	**0.5351**	**3.0788**	**20.4424**	**0.0435**		**0.1042**	**0.1042**		**0.1042**	**0.1042**	**0.0000**	**4,613.0500**	**4,613.0500**	**0.6694**		**4,629.7848**

3.2 SMVR Operations - 2027

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	4.0000e-004	0.0314	8.5400e-003	1.3000e-004	4.0600e-003	2.6000e-004	4.3200e-003	1.1100e-003	2.5000e-004	1.3600e-003		14.5132	14.5132	1.2700e-003	2.3400e-003	15.2409
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0218	0.0124	0.1519	4.5000e-004	0.0632	2.4000e-004	0.0634	0.0168	2.2000e-004	0.0170		45.6110	45.6110	1.4600e-003	1.4100e-003	46.0675
Total	**0.0222**	**0.0438**	**0.1605**	**5.8000e-004**	**0.0672**	**5.0000e-004**	**0.0677**	**0.0179**	**4.7000e-004**	**0.0183**		**60.1243**	**60.1243**	**2.7300e-003**	**3.7500e-003**	**61.3084**

3.2 SMVR Operations - 2028

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.4379	9.9967	12.1645	0.0435		0.3252	0.3252		0.3096	0.3096		4,613.0500	4,613.0500	0.6694		4,629.7848
Total	**1.4379**	**9.9967**	**12.1645**	**0.0435**		**0.3252**	**0.3252**		**0.3096**	**0.3096**		**4,613.0500**	**4,613.0500**	**0.6694**		**4,629.7848**

3.2 SMVR Operations - 2028

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	3.9000e-004	0.0305	8.6600e-003	1.2000e-004	4.0600e-003	2.5000e-004	4.3200e-003	1.1100e-003	2.4000e-004	1.3500e-003		14.2079	14.2079	1.3100e-003	2.2900e-003	14.9224
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0207	0.0114	0.1445	4.4000e-004	0.0632	2.3000e-004	0.0634	0.0168	2.1000e-004	0.0170		44.3848	44.3848	1.3500e-003	1.3400e-003	44.8185
Total	**0.0211**	**0.0419**	**0.1532**	**5.6000e-004**	**0.0672**	**4.8000e-004**	**0.0677**	**0.0179**	**4.5000e-004**	**0.0183**		**58.5927**	**58.5927**	**2.6600e-003**	**3.6300e-003**	**59.7409**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5351	3.0788	20.4424	0.0435		0.1042	0.1042		0.1042	0.1042	0.0000	4,613.0500	4,613.0500	0.6694		4,629.7848
Total	**0.5351**	**3.0788**	**20.4424**	**0.0435**		**0.1042**	**0.1042**		**0.1042**	**0.1042**	**0.0000**	**4,613.0500**	**4,613.0500**	**0.6694**		**4,629.7848**

3.2 SMVR Operations - 2028

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	3.9000e-004	0.0305	8.6600e-003	1.2000e-004	4.0600e-003	2.5000e-004	4.3200e-003	1.1100e-003	2.4000e-004	1.3500e-003		14.2079	14.2079	1.3100e-003	2.2900e-003	14.9224
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0207	0.0114	0.1445	4.4000e-004	0.0632	2.3000e-004	0.0634	0.0168	2.1000e-004	0.0170		44.3848	44.3848	1.3500e-003	1.3400e-003	44.8185
Total	**0.0211**	**0.0419**	**0.1532**	**5.6000e-004**	**0.0672**	**4.8000e-004**	**0.0677**	**0.0179**	**4.5000e-004**	**0.0183**		**58.5927**	**58.5927**	**2.6600e-003**	**3.6300e-003**	**59.7409**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.3933	1.5749	12.2950	0.0231	2.9665	0.0165	2.9830	0.7925	0.0154	0.8079		2,357.7498	2,357.7498	0.1783	0.1295	2,400.7968
Unmitigated	1.3933	1.5749	12.2950	0.0231	2.9665	0.0165	2.9830	0.7925	0.0154	0.8079		2,357.7498	2,357.7498	0.1783	0.1295	2,400.7968

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Industrial Park	733.99	553.21	270.07	1,226,595	1,226,595
Total	733.99	553.21	270.07	1,226,595	1,226,595

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Industrial Park	6.60	5.50	6.40	59.00	28.00	13.00	79	19	2

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Industrial Park	0.514923	0.057522	0.206064	0.138974	0.023636	0.006062	0.011219	0.006223	0.000940	0.000535	0.027699	0.003185	0.003017

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.1043	0.9477	0.7961	5.6900e-003		0.0720	0.0720		0.0720	0.0720		1,137.2635	1,137.2635	0.0218	0.0209	1,144.0217
NaturalGas Unmitigated	0.1043	0.9477	0.7961	5.6900e-003		0.0720	0.0720		0.0720	0.0720		1,137.2635	1,137.2635	0.0218	0.0209	1,144.0217

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Industrial Park	9666.74	0.1043	0.9477	0.7961	5.6900e-003		0.0720	0.0720		0.0720	0.0720		1,137.2635	1,137.2635	0.0218	0.0209	1,144.0217
Total		**0.1043**	**0.9477**	**0.7961**	**5.6900e-003**		**0.0720**	**0.0720**		**0.0720**	**0.0720**		**1,137.2635**	**1,137.2635**	**0.0218**	**0.0209**	**1,144.0217**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Industrial Park	9.66674	0.1043	0.9477	0.7961	5.6900e-003		0.0720	0.0720		0.0720	0.0720		1,137.2635	1,137.2635	0.0218	0.0209	1,144.0217
Total		**0.1043**	**0.9477**	**0.7961**	**5.6900e-003**		**0.0720**	**0.0720**		**0.0720**	**0.0720**		**1,137.2635**	**1,137.2635**	**0.0218**	**0.0209**	**1,144.0217**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	6.0458	2.0000e-004	0.0221	0.0000		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005		0.0477	0.0477	1.2000e-004		0.0507
Unmitigated	6.0458	2.0000e-004	0.0221	0.0000		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005		0.0477	0.0477	1.2000e-004		0.0507

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	1.3829					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	4.6609					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	2.0200e-003	2.0000e-004	0.0221	0.0000		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005		0.0477	0.0477	1.2000e-004		0.0507
Total	**6.0458**	**2.0000e-004**	**0.0221**	**0.0000**		**8.0000e-005**	**8.0000e-005**		**8.0000e-005**	**8.0000e-005**		**0.0477**	**0.0477**	**1.2000e-004**		**0.0507**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	1.3829					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	4.6609					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	2.0200e-003	2.0000e-004	0.0221	0.0000		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005		0.0477	0.0477	1.2000e-004		0.0507
Total	**6.0458**	**2.0000e-004**	**0.0221**	**0.0000**		**8.0000e-005**	**8.0000e-005**		**8.0000e-005**	**8.0000e-005**		**0.0477**	**0.0477**	**1.2000e-004**		**0.0507**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

DCPP Decommissioning

San Luis Obispo County APCD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Heavy Industry	0.00	1000sqft	585.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	3.2	**Precipitation Freq (Days)**	44
Climate Zone	4			**Operational Year**	2027
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Total lot acreage.

Construction Phase - 20 working days per month based on 4 day work week and 5 weeks per month.

Off-road Equipment - Data from PG&E equipment list for 2026.

Off-road Equipment - Data from PG&E equipment list for 2026.

Off-road Equipment - Data from PG&E equipment list for 2026.

Off-road Equipment - Data from PG&E equipment list for 2026.

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Off-road Equipment - Data from PG&E equipment list for 2026.

Off-road Equipment - Data from PG&E equipment list for 2026.

Off-road Equipment - Data from PG&E equipment list for 2026.

Trips and VMT - Data from PG&E employee totals. Assumed 22 miles from downtown SLO to DCPP.

Demolition -

Grading -

Construction Off-road Equipment Mitigation - Scenario 2: Tier 4 Final for equipment HP>100, Tier 4 Interim for equipment HP<100. Put all tractors/loaders at Tier 3 to be conservative because the equipment has both HP less than and greater than 100.

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	26.00
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tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	74.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	14.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	52.00

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	27.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	17.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	259.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	52.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	8.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	21.00
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tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	10.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	28.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	9.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	31.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	98.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	301.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Final

tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
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tblConstructionPhase	NumDays	600.00	20.00
tblConstructionPhase	NumDays	600.00	20.00
tblConstructionPhase	NumDays	600.00	20.00
tblLandUse	LotAcreage	0.00	585.00
tblOffRoadEquipment	HorsePower	187.00	199.00
tblOffRoadEquipment	HorsePower	187.00	199.00
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tblOffRoadEquipment	HorsePower	187.00	199.00
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tblOffRoadEquipment	HorsePower	187.00	199.00
tblOffRoadEquipment	HorsePower	187.00	199.00
tblOffRoadEquipment	HorsePower	187.00	199.00
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tblOffRoadEquipment	HorsePower	187.00	199.00
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tblOffRoadEquipment	UsageHours	8.00	9.00
tblOffRoadEquipment	UsageHours	8.00	9.00

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tblTripsAndVMT	HaulingTripNumber	387.00	0.00
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tblTripsAndVMT	WorkerTripNumber	150.00	722.00
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tblTripsAndVMT	WorkerTripNumber	173.00	755.00
tblTripsAndVMT	WorkerTripNumber	120.00	740.00
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2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2026	3.2655	19.9932	26.1495	0.0721	1.9785	0.7472	2.7258	0.4667	0.7041	1.1708	0.0000	6,235.8038	6,235.8038	1.4810	0.0000	6,272.8277
2027	0.0145	0.0884	0.1213	2.7000e-004	8.8100e-003	3.2700e-003	0.0121	2.0900e-003	3.1400e-003	5.2300e-003	0.0000	22.8822	22.8822	4.2500e-003	0.0000	22.9883
Maximum	**3.2655**	**19.9932**	**26.1495**	**0.0721**	**1.9785**	**0.7472**	**2.7258**	**0.4667**	**0.7041**	**1.1708**	**0.0000**	**6,235.8038**	**6,235.8038**	**1.4810**	**0.0000**	**6,272.8277**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2026	1.2928	12.0310	34.6854	0.0721	1.9785	0.2704	2.2489	0.4667	0.2698	0.7364	0.0000	6,235.7975	6,235.7975	1.4810	0.0000	6,272.8214
2027	5.2100e-003	0.0683	0.1386	2.7000e-004	8.8100e-003	1.5800e-003	0.0104	2.0900e-003	1.5800e-003	3.6700e-003	0.0000	22.8821	22.8821	4.2500e-003	0.0000	22.9883
Maximum	**1.2928**	**12.0310**	**34.6854**	**0.0721**	**1.9785**	**0.2704**	**2.2489**	**0.4667**	**0.2698**	**0.7364**	**0.0000**	**6,235.7975**	**6,235.7975**	**1.4810**	**0.0000**	**6,272.8214**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**60.43**	**39.75**	**-32.56**	**0.00**	**0.00**	**63.76**	**17.48**	**0.00**	**61.63**	**37.07**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	1-1-2026	3-31-2026	5.0724	2.1601
2	4-1-2026	6-30-2026	3.8490	1.6004
3	7-1-2026	9-30-2026	6.7237	4.2712
4	10-1-2026	12-31-2026	7.2534	5.0824
5	1-1-2027	3-31-2027	0.0737	0.0527
		Highest	7.2534	5.0824

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

DCPP Decommissioning - San Luis Obispo County APCD Air District, Annual

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Jan-26	Demolition	1/1/2026	1/28/2026	5	20	
2	Feb-26	Demolition	2/1/2026	2/28/2026	5	20	
3	Mar-26	Demolition	3/1/2026	3/27/2026	5	20	
4	Apr-26	Demolition	4/1/2026	4/28/2026	5	20	
5	May-26	Demolition	5/1/2026	5/28/2026	5	20	
6	Jun-26	Demolition	6/1/2026	6/26/2026	5	20	
7	Jul-26	Demolition	7/1/2026	7/28/2026	5	20	
8	Aug-26	Demolition	8/1/2026	8/28/2026	5	20	
9	Sep-26	Demolition	9/1/2026	9/28/2026	5	20	
10	Oct-26	Demolition	10/1/2026	10/28/2026	5	20	
11	Nov-26	Demolition	11/1/2026	11/27/2026	5	20	
12	Dec-26	Demolition	12/7/2026	1/1/2027	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

<u>OffRoad Equipment</u>

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Jan-26	Aerial Lifts	3	9.00	63	0.31
Jan-26	Aerial Lifts	1	3.60	63	0.31
Jan-26	Aerial Lifts	1	9.00	63	0.31
Jan-26	Cranes	4	9.00	231	0.29

Jan-26	Cranes	1	3.60	231	0.29
Jan-26	Crushing/Proc. Equipment	2	9.00	85	0.78
Jan-26	Excavators	1	9.00	158	0.38
Jan-26	Excavators	4	9.00	158	0.38
Jan-26	Excavators	1	1.80	158	0.38
Jan-26	Forklifts	1	9.00	89	0.20
Jan-26	Forklifts	1	9.00	89	0.20
Jan-26	Graders	1	1.80	199	0.41
Jan-26	Off-Highway Trucks	8	9.00	402	0.38
Jan-26	Off-Highway Trucks	1	7.10	402	0.38
Jan-26	Off-Highway Trucks	1	10.30	402	0.38
Jan-26	Off-Highway Trucks	2	9.00	402	0.38
Jan-26	Off-Highway Trucks	2	9.00	402	0.38
Jan-26	Off-Highway Trucks	1	3.60	402	0.38
Jan-26	Off-Highway Trucks	2	9.00	199	0.38
Jan-26	Off-Highway Trucks	2	9.00	402	0.38
Jan-26	Off-Highway Trucks	1	9.00	402	0.38
Jan-26	Off-Highway Trucks	1	9.00	402	0.38
Jan-26	Off-Highway Trucks	1	9.00	402	0.38
Jan-26	Other Construction Equipment	4	9.00	6	0.42
Jan-26	Other Construction Equipment	2	9.00	6	0.42
Jan-26	Other Construction Equipment	2	9.00	20	0.38
Jan-26	Plate Compactors	1	9.00	8	0.43
Jan-26	Rollers	1	1.80	80	0.38
Jan-26	Rollers	1	9.00	80	0.38
Jan-26	Skid Steer Loaders	4	9.00	65	0.37
Jan-26	Tractors/Loaders/Backhoes	1	0.20	224	0.37

Jan-26	Tractors/Loaders/Backhoes	4	9.00	349	0.37
Jan-26	Tractors/Loaders/Backhoes	1	9.00	59	0.37
Jan-26	Tractors/Loaders/Backhoes	4	9.00	97	0.37
Jan-26	Tractors/Loaders/Backhoes	1	3.70	97	0.37
Jan-26	Tractors/Loaders/Backhoes	1	9.00	97	0.37
Feb-26	Aerial Lifts	4	9.00	63	0.31
Feb-26	Aerial Lifts	1	4.50	63	0.31
Feb-26	Aerial Lifts	2	9.00	63	0.31
Feb-26	Aerial Lifts	1	9.00	63	0.31
Feb-26	Air Compressors	5	9.00	78	0.48
Feb-26	Cranes	4	9.00	231	0.29
Feb-26	Cranes	3	9.00	231	0.29
Feb-26	Cranes	1	4.50	231	0.29
Feb-26	Crushing/Proc. Equipment	1	9.00	85	0.78
Feb-26	Excavators	2	9.00	158	0.38
Feb-26	Excavators	1	9.00	158	0.38
Feb-26	Forklifts	1	9.00	89	0.20
Feb-26	Forklifts	1	9.00	89	0.20
Feb-26	Graders	1	1.80	199	0.41
Feb-26	Off-Highway Trucks	4	9.00	402	0.38
Feb-26	Off-Highway Trucks	4	9.00	402	0.38
Feb-26	Off-Highway Trucks	1	7.10	402	0.38
Feb-26	Off-Highway Trucks	1	9.00	402	0.38
Feb-26	Off-Highway Trucks	1	9.00	402	0.38
Feb-26	Off-Highway Trucks	16	9.00	402	0.38
Feb-26	Off-Highway Trucks	2	9.00	402	0.38
Feb-26	Off-Highway Trucks	1	9.00	199	0.38

Feb-26	Off-Highway Trucks	2	9.00	402	0.38
Feb-26	Off-Highway Trucks	1	9.00	402	0.38
Feb-26	Off-Highway Trucks	1	9.00	402	0.38
Feb-26	Off-Highway Trucks	1	9.00	402	0.38
Feb-26	Off-Highway Trucks	1	5.70	402	0.38
Feb-26	Other Construction Equipment	2	9.00	6	0.42
Feb-26	Other Construction Equipment	2	9.00	6	0.42
Feb-26	Other Construction Equipment	2	9.00	20	0.42
Feb-26	Plate Compactors	1	9.00	8	0.43
Feb-26	Rollers	1	1.80	80	0.38
Feb-26	Skid Steer Loaders	2	9.00	65	0.37
Feb-26	Tractors/Loaders/Backhoes	1	1.10	224	0.37
Feb-26	Tractors/Loaders/Backhoes	2	9.00	349	0.37
Feb-26	Tractors/Loaders/Backhoes	1	9.00	59	0.37
Feb-26	Tractors/Loaders/Backhoes	2	9.00	97	0.37
Feb-26	Tractors/Loaders/Backhoes	1	3.70	97	0.37
Feb-26	Tractors/Loaders/Backhoes	1	9.00	97	0.37
Feb-26	Welders	3	9.00	46	0.45
Mar-26	Aerial Lifts	2	9.00	63	0.31
Mar-26	Aerial Lifts	1	9.00	63	0.31
Mar-26	Bore/Drill Rigs	1	0.50	221	0.50
Mar-26	Bore/Drill Rigs	1	1.80	221	0.50
Mar-26	Cranes	4	9.00	231	0.29
Mar-26	Cranes	1	4.50	231	0.29
Mar-26	Crushing/Proc. Equipment	1	9.00	85	0.78
Mar-26	Excavators	2	9.00	158	0.38
Mar-26	Excavators	1	9.00	158	0.38

Mar-26	Graders	1	1.80	199	0.41
Mar-26	Off-Highway Trucks	4	9.00	402	0.38
Mar-26	Off-Highway Trucks	2	9.00	402	0.38
Mar-26	Off-Highway Trucks	5	9.00	402	0.38
Mar-26	Off-Highway Trucks	1	2.60	402	0.38
Mar-26	Off-Highway Trucks	1	1.80	402	0.38
Mar-26	Off-Highway Trucks	1	9.00	402	0.38
Mar-26	Off-Highway Trucks	1	9.00	402	0.38
Mar-26	Off-Highway Trucks	1	0.20	402	0.38
Mar-26	Off-Highway Trucks	4	9.00	402	0.38
Mar-26	Off-Highway Trucks	1	7.20	402	0.38
Mar-26	Off-Highway Trucks	1	9.00	199	0.38
Mar-26	Off-Highway Trucks	2	9.00	402	0.38
Mar-26	Off-Highway Trucks	1	9.00	402	0.38
Mar-26	Off-Highway Trucks	1	9.00	402	0.38
Mar-26	Off-Highway Trucks	1	9.00	402	0.38
Mar-26	Off-Highway Trucks	1	1.30	402	0.38
Mar-26	Other Construction Equipment	2	9.00	6	0.42
Mar-26	Other Construction Equipment	2	9.00	6	0.42
Mar-26	Other Construction Equipment	2	9.00	20	0.42
Mar-26	Plate Compactors	1	9.00	8	0.43
Mar-26	Rollers	1	1.80	80	0.38
Mar-26	Skid Steer Loaders	2	9.00	65	0.37
Mar-26	Tractors/Loaders/Backhoes	1	1.20	224	0.37
Mar-26	Tractors/Loaders/Backhoes	2	9.00	349	0.37
Mar-26	Tractors/Loaders/Backhoes	1	9.00	59	0.37
Mar-26	Tractors/Loaders/Backhoes	2	9.00	97	0.37

Mar-26	Tractors/Loaders/Backhoes	1	3.70	97	0.37
Mar-26	Tractors/Loaders/Backhoes	1	9.00	97	0.37
Apr-26	Aerial Lifts	1	9.00	63	0.31
Apr-26	Aerial Lifts	1	9.00	63	0.31
Apr-26	Bore/Drill Rigs	1	0.50	221	0.50
Apr-26	Bore/Drill Rigs	1	1.80	221	0.50
Apr-26	Cranes	4	9.00	231	0.29
Apr-26	Cranes	1	3.60	231	0.29
Apr-26	Cranes	1	4.50	231	0.29
Apr-26	Crushing/Proc. Equipment	1	9.00	85	0.78
Apr-26	Crushing/Proc. Equipment	1	0.90	85	0.78
Apr-26	Excavators	2	9.00	158	0.38
Apr-26	Excavators	1	1.80	158	0.38
Apr-26	Graders	1	1.80	199	0.41
Apr-26	Off-Highway Trucks	4	9.00	402	0.38
Apr-26	Off-Highway Trucks	1	3.60	402	0.38
Apr-26	Off-Highway Trucks	2	9.00	402	0.38
Apr-26	Off-Highway Trucks	1	9.00	402	0.38
Apr-26	Off-Highway Trucks	1	1.80	402	0.38
Apr-26	Off-Highway Trucks	1	5.80	402	0.38
Apr-26	Off-Highway Trucks	1	9.00	402	0.38
Apr-26	Off-Highway Trucks	1	0.20	402	0.38
Apr-26	Off-Highway Trucks	4	9.00	402	0.38
Apr-26	Off-Highway Trucks	1	7.20	402	0.38
Apr-26	Off-Highway Trucks	1	9.00	199	0.38
Apr-26	Off-Highway Trucks	2	9.00	402	0.38
Apr-26	Off-Highway Trucks	1	7.10	402	0.38

Apr-26	Off-Highway Trucks	1	0.90	402	0.38
Apr-26	Off-Highway Trucks	1	0.90	199	0.38
Apr-26	Other Construction Equipment	2	9.00	6	0.42
Apr-26	Other Construction Equipment	2	9.00	6	0.42
Apr-26	Other Construction Equipment	2	9.00	20	0.42
Apr-26	Other Construction Equipment	1	1.80	6	0.42
Apr-26	Rollers	1	1.80	80	0.38
Apr-26	Skid Steer Loaders	2	9.00	65	0.37
Apr-26	Skid Steer Loaders	1	4.50	65	0.37
Apr-26	Skid Steer Loaders	1	1.80	65	0.37
Apr-26	Tractors/Loaders/Backhoes	1	1.10	224	0.37
Apr-26	Tractors/Loaders/Backhoes	2	9.00	349	0.37
Apr-26	Tractors/Loaders/Backhoes	1	9.00	59	0.37
Apr-26	Tractors/Loaders/Backhoes	2	9.00	97	0.37
Apr-26	Tractors/Loaders/Backhoes	1	3.70	97	0.37
Apr-26	Tractors/Loaders/Backhoes	1	1.80	349	0.37
Apr-26	Tractors/Loaders/Backhoes	1	1.80	97	0.37
May-26	Aerial Lifts	1	9.00	63	0.31
May-26	Bore/Drill Rigs	1	0.50	221	0.50
May-26	Bore/Drill Rigs	1	1.80	221	0.50
May-26	Cranes	4	9.00	231	0.29
May-26	Cranes	1	3.60	231	0.29
May-26	Crushing/Proc. Equipment	1	9.00	85	0.78
May-26	Crushing/Proc. Equipment	1	0.90	85	0.78
May-26	Excavators	2	9.00	158	0.38
May-26	Excavators	1	1.80	158	0.38
May-26	Graders	1	1.80	199	0.41

May-26	Off-Highway Trucks	4	9.00	402	0.38
May-26	Off-Highway Trucks	1	3.60	402	0.38
May-26	Off-Highway Trucks	2	9.00	402	0.38
May-26	Off-Highway Trucks	1	9.00	402	0.38
May-26	Off-Highway Trucks	1	1.80	402	0.38
May-26	Off-Highway Trucks	1	5.80	402	0.38
May-26	Off-Highway Trucks	1	9.00	402	0.38
May-26	Off-Highway Trucks	1	0.20	402	0.38
May-26	Off-Highway Trucks	4	9.00	402	0.38
May-26	Off-Highway Trucks	1	7.20	402	0.38
May-26	Off-Highway Trucks	1	9.00	199	0.38
May-26	Off-Highway Trucks	2	9.00	402	0.38
May-26	Off-Highway Trucks	1	7.10	402	0.38
May-26	Off-Highway Trucks	1	0.90	402	0.38
May-26	Off-Highway Trucks	1	0.90	199	0.38
May-26	Other Construction Equipment	2	9.00	6	0.42
May-26	Other Construction Equipment	2	9.00	6	0.42
May-26	Other Construction Equipment	2	9.00	20	0.42
May-26	Other Construction Equipment	1	1.80	6	0.42
May-26	Rollers	1	1.80	80	0.38
May-26	Skid Steer Loaders	2	9.00	65	0.37
May-26	Skid Steer Loaders	1	4.50	65	0.37
May-26	Skid Steer Loaders	1	1.80	65	0.37
May-26	Tractors/Loaders/Backhoes	1	1.10	224	0.37
May-26	Tractors/Loaders/Backhoes	2	9.00	349	0.37
May-26	Tractors/Loaders/Backhoes	1	9.00	59	0.37
May-26	Tractors/Loaders/Backhoes	2	9.00	97	0.37

May-26	Tractors/Loaders/Backhoes	1	3.70	97	0.37
May-26	Tractors/Loaders/Backhoes	1	1.80	349	0.37
May-26	Tractors/Loaders/Backhoes	1	1.80	97	0.37
Jun-26	Aerial Lifts	1	9.00	63	0.31
Jun-26	Bore/Drill Rigs	1	0.50	221	0.50
Jun-26	Bore/Drill Rigs	1	1.80	221	0.50
Jun-26	Cranes	1	9.00	231	0.29
Jun-26	Cranes	4	9.00	231	0.29
Jun-26	Cranes	1	5.40	231	0.29
Jun-26	Crushing/Proc. Equipment	2	9.00	85	0.78
Jun-26	Excavators	4	9.00	158	0.38
Jun-26	Graders	1	1.80	199	0.41
Jun-26	Off-Highway Trucks	8	9.00	402	0.38
Jun-26	Off-Highway Trucks	4	9.00	402	0.38
Jun-26	Off-Highway Trucks	1	9.00	402	0.38
Jun-26	Off-Highway Trucks	1	1.80	402	0.38
Jun-26	Off-Highway Trucks	1	5.80	402	0.38
Jun-26	Off-Highway Trucks	2	9.00	402	0.38
Jun-26	Off-Highway Trucks	1	0.50	402	0.38
Jun-26	Off-Highway Trucks	4	9.00	402	0.38
Jun-26	Off-Highway Trucks	1	7.20	402	0.38
Jun-26	Off-Highway Trucks	2	9.00	199	0.38
Jun-26	Off-Highway Trucks	2	9.00	402	0.38
Jun-26	Off-Highway Trucks	1	2.60	402	0.38
Jun-26	Other Construction Equipment	4	9.00	6	0.42
Jun-26	Other Construction Equipment	2	9.00	6	0.42
Jun-26	Other Construction Equipment	2	9.00	20	0.42

Jun-26	Rollers	1	1.80	80	0.38
Jun-26	Skid Steer Loaders	4	9.00	65	0.37
Jun-26	Skid Steer Loaders	1	4.50	65	0.37
Jun-26	Tractors/Loaders/Backhoes	1	1.10	224	0.37
Jun-26	Tractors/Loaders/Backhoes	4	9.00	349	0.37
Jun-26	Tractors/Loaders/Backhoes	1	9.00	59	0.37
Jun-26	Tractors/Loaders/Backhoes	4	9.00	97	0.37
Jun-26	Tractors/Loaders/Backhoes	1	3.70	97	0.37
Jul-26	Bore/Drill Rigs	1	0.50	221	0.50
Jul-26	Bore/Drill Rigs	1	1.80	221	0.50
Jul-26	Cranes	1	9.00	231	0.29
Jul-26	Cranes	4	9.00	231	0.29
Jul-26	Cranes	1	5.40	231	0.29
Jul-26	Crushing/Proc. Equipment	1	9.00	85	0.78
Jul-26	Excavators	2	9.00	158	0.38
Jul-26	Graders	1	1.80	199	0.41
Jul-26	Off-Highway Trucks	4	9.00	402	0.38
Jul-26	Off-Highway Trucks	2	9.00	402	0.38
Jul-26	Off-Highway Trucks	1	7.10	402	0.38
Jul-26	Off-Highway Trucks	1	9.00	402	0.38
Jul-26	Off-Highway Trucks	1	9.00	402	0.38
Jul-26	Off-Highway Trucks	1	0.20	402	0.38
Jul-26	Off-Highway Trucks	4	9.00	402	0.38
Jul-26	Off-Highway Trucks	1	9.00	199	0.38
Jul-26	Off-Highway Trucks	2	9.00	402	0.38
Jul-26	Off-Highway Trucks	1	5.80	402	0.38
Jul-26	Other Construction Equipment	2	9.00	6	0.42

Jul-26	Other Construction Equipment	2	9.00	6	0.42
Jul-26	Pumps	1	9.00	84	0.74
Jul-26	Pumps	1	0.60	84	0.74
Jul-26	Rollers	1	1.80	80	0.38
Jul-26	Skid Steer Loaders	2	9.00	65	0.37
Jul-26	Skid Steer Loaders	1	4.50	65	0.37
Jul-26	Tractors/Loaders/Backhoes	1	1.10	224	0.37
Jul-26	Tractors/Loaders/Backhoes	1	4.50	249	0.37
Jul-26	Tractors/Loaders/Backhoes	2	9.00	349	0.37
Jul-26	Tractors/Loaders/Backhoes	1	9.00	59	0.37
Jul-26	Tractors/Loaders/Backhoes	2	9.00	97	0.37
Jul-26	Tractors/Loaders/Backhoes	1	3.70	97	0.37
Aug-26	Aerial Lifts	1	9.00	63	0.31
Aug-26	Air Compressors	13	9.00	78	0.48
Aug-26	Air Compressors	1	1.80	78	0.48
Aug-26	Air Compressors	1	2.30	78	0.48
Aug-26	Cranes	1	9.00	231	0.29
Aug-26	Cranes	4	9.00	231	0.29
Aug-26	Cranes	1	1.80	231	0.29
Aug-26	Cranes	1	7.60	231	0.29
Aug-26	Crushing/Proc. Equipment	1	9.00	85	0.78
Aug-26	Excavators	2	9.00	158	0.38
Aug-26	Forklifts	1	0.40	89	0.20
Aug-26	Graders	1	4.40	199	0.41
Aug-26	Graders	1	9.00	249	0.41
Aug-26	Off-Highway Trucks	1	0.10	402	0.38
Aug-26	Off-Highway Trucks	4	9.00	402	0.38

Aug-26	Off-Highway Trucks	3	9.00	402	0.38
Aug-26	Off-Highway Trucks	1	9.00	402	0.38
Aug-26	Off-Highway Trucks	1	9.00	402	0.38
Aug-26	Off-Highway Trucks	4	9.00	402	0.38
Aug-26	Off-Highway Trucks	1	9.00	199	0.38
Aug-26	Off-Highway Trucks	1	0.70	402	0.38
Aug-26	Off-Highway Trucks	1	5.80	402	0.38
Aug-26	Other Construction Equipment	2	9.00	6	0.42
Aug-26	Pumps	1	9.00	84	0.74
Aug-26	Pumps	1	0.60	84	0.74
Aug-26	Rollers	1	1.80	80	0.38
Aug-26	Rollers	1	9.00	80	0.38
Aug-26	Rubber Tired Dozers	1	9.00	247	0.40
Aug-26	Skid Steer Loaders	2	9.00	65	0.37
Aug-26	Skid Steer Loaders	1	4.50	65	0.37
Aug-26	Tractors/Loaders/Backhoes	1	1.10	224	0.37
Aug-26	Tractors/Loaders/Backhoes	1	4.50	249	0.37
Aug-26	Tractors/Loaders/Backhoes	2	9.00	349	0.37
Aug-26	Tractors/Loaders/Backhoes	1	9.00	59	0.37
Aug-26	Tractors/Loaders/Backhoes	2	9.00	97	0.37
Aug-26	Tractors/Loaders/Backhoes	2	9.00	97	0.37
Aug-26	Welders	55	9.00	46	0.45
Aug-26	Welders	1	7.20	46	0.45
Aug-26	Welders	1	0.50	46	0.45
Sep-26	Aerial Lifts	1	9.00	63	0.31
Sep-26	Air Compressors	13	9.00	78	0.48
Sep-26	Air Compressors	1	1.80	78	0.48

Sep-26	Cranes	1	9.00	231	0.29
Sep-26	Cranes	1	4.50	231	0.29
Sep-26	Cranes	4	9.00	231	0.29
Sep-26	Cranes	1	7.20	231	0.29
Sep-26	Cranes	1	5.40	231	0.29
Sep-26	Crushing/Proc. Equipment	1	9.00	85	0.78
Sep-26	Excavators	1	0.20	158	0.38
Sep-26	Excavators	4	9.00	158	0.38
Sep-26	Excavators	2	9.00	158	0.38
Sep-26	Excavators	1	9.00	158	0.38
Sep-26	Forklifts	1	9.00	89	0.20
Sep-26	Forklifts	1	1.90	89	0.20
Sep-26	Forklifts	1	0.70	89	0.20
Sep-26	Forklifts	1	9.00	89	0.20
Sep-26	Forklifts	1	1.80	89	0.20
Sep-26	Graders	1	6.90	199	0.41
Sep-26	Graders	1	9.00	249	0.41
Sep-26	Graders	1	9.00	169	0.41
Sep-26	Off-Highway Trucks	1	0.10	402	0.38
Sep-26	Off-Highway Trucks	4	9.00	402	0.38
Sep-26	Off-Highway Trucks	4	9.00	402	0.38
Sep-26	Off-Highway Trucks	1	5.20	402	0.38
Sep-26	Off-Highway Trucks	3	9.00	402	0.38
Sep-26	Off-Highway Trucks	1	4.10	402	0.38
Sep-26	Off-Highway Trucks	1	9.00	402	0.38
Sep-26	Off-Highway Trucks	1	9.00	402	0.38
Sep-26	Off-Highway Trucks	1	9.00	199	0.38

Sep-26	Off-Highway Trucks	1	5.80	402	0.38
Sep-26	Other Construction Equipment	2	9.00	6	0.42
Sep-26	Paving Equipment	1	0.60	132	0.36
Sep-26	Pumps	1	9.00	84	0.74
Sep-26	Pumps	1	0.60	84	0.74
Sep-26	Rollers	4	9.00	80	0.38
Sep-26	Rollers	1	0.70	80	0.38
Sep-26	Rollers	1	1.80	80	0.38
Sep-26	Rubber Tired Dozers	3	9.00	247	0.40
Sep-26	Skid Steer Loaders	2	9.00	65	0.37
Sep-26	Tractors/Loaders/Backhoes	1	0.20	224	0.37
Sep-26	Tractors/Loaders/Backhoes	1	4.50	249	0.37
Sep-26	Tractors/Loaders/Backhoes	2	9.00	349	0.37
Sep-26	Tractors/Loaders/Backhoes	1	9.00	59	0.37
Sep-26	Tractors/Loaders/Backhoes	2	9.00	97	0.37
Sep-26	Tractors/Loaders/Backhoes	2	9.00	97	0.37
Sep-26	Welders	55	9.00	46	0.45
Sep-26	Welders	1	7.20	46	0.45
Sep-26	Welders	2	9.00	46	0.45
Sep-26	Welders	1	2.60	46	0.45
Sep-26	Welders	1	1.80	46	0.45
Sep-26	Welders	1	1.80	46	0.45
Oct-26	Aerial Lifts	1	9.00	63	0.31
Oct-26	Aerial Lifts	1	4.50	63	0.31
Oct-26	Air Compressors	14	9.00	78	0.48
Oct-26	Air Compressors	1	6.70	78	0.48
Oct-26	Cranes	1	9.00	231	0.29

Oct-26	Cranes	1	4.50	231	0.29
Oct-26	Cranes	4	9.00	231	0.29
Oct-26	Cranes	1	7.20	231	0.29
Oct-26	Cranes	1	5.40	231	0.29
Oct-26	Crushing/Proc. Equipment	1	9.00	85	0.78
Oct-26	Excavators	1	0.20	158	0.38
Oct-26	Excavators	4	9.00	158	0.38
Oct-26	Excavators	2	9.00	158	0.38
Oct-26	Excavators	1	9.00	158	0.38
Oct-26	Forklifts	1	9.00	89	0.20
Oct-26	Forklifts	1	0.70	89	0.20
Oct-26	Forklifts	1	9.00	89	0.20
Oct-26	Forklifts	1	1.80	89	0.20
Oct-26	Forklifts	1	1.80	89	0.20
Oct-26	Graders	1	6.90	199	0.41
Oct-26	Graders	1	9.00	249	0.41
Oct-26	Graders	1	9.00	169	0.41
Oct-26	Off-Highway Trucks	4	9.00	402	0.38
Oct-26	Off-Highway Trucks	5	9.00	402	0.38
Oct-26	Off-Highway Trucks	1	0.70	402	0.38
Oct-26	Off-Highway Trucks	3	9.00	402	0.38
Oct-26	Off-Highway Trucks	1	4.10	402	0.38
Oct-26	Off-Highway Trucks	1	9.00	402	0.38
Oct-26	Off-Highway Trucks	1	4.10	402	0.38
Oct-26	Off-Highway Trucks	1	9.00	402	0.38
Oct-26	Off-Highway Trucks	1	9.00	199	0.38
Oct-26	Off-Highway Trucks	1	5.80	402	0.38

Oct-26	Other Construction Equipment	2	9.00	6	0.42
Oct-26	Paving Equipment	2	9.00	132	0.36
Oct-26	Paving Equipment	1	7.20	132	0.36
Oct-26	Paving Equipment	1	0.60	132	0.36
Oct-26	Pumps	1	9.00	84	0.74
Oct-26	Pumps	1	0.60	84	0.74
Oct-26	Rollers	5	9.00	80	0.38
Oct-26	Rollers	1	0.60	80	0.38
Oct-26	Rollers	1	5.90	80	0.38
Oct-26	Rubber Tired Dozers	3	9.00	247	0.40
Oct-26	Skid Steer Loaders	2	9.00	65	0.37
Oct-26	Tractors/Loaders/Backhoes	1	0.20	224	0.37
Oct-26	Tractors/Loaders/Backhoes	2	9.00	349	0.37
Oct-26	Tractors/Loaders/Backhoes	1	9.00	59	0.37
Oct-26	Tractors/Loaders/Backhoes	2	9.00	97	0.37
Oct-26	Tractors/Loaders/Backhoes	2	9.00	97	0.37
Oct-26	Tractors/Loaders/Backhoes	1	4.40	97	0.37
Oct-26	Welders	55	9.00	46	0.45
Oct-26	Welders	1	7.70	46	0.45
Oct-26	Welders	2	9.00	46	0.45
Oct-26	Welders	1	2.60	46	0.45
Oct-26	Welders	1	1.80	46	0.45
Oct-26	Welders	1	1.40	46	0.45
Nov-26	Aerial Lifts	1	4.50	63	0.31
Nov-26	Air Compressors	14	9.00	78	0.48
Nov-26	Air Compressors	1	6.60	78	0.48
Nov-26	Cranes	1	9.00	231	0.29

Nov-26	Cranes	1	5.40	231	0.29
Nov-26	Cranes	1	4.50	231	0.29
Nov-26	Cranes	1	7.20	231	0.29
Nov-26	Excavators	1	5.70	158	0.38
Nov-26	Excavators	1	0.20	158	0.38
Nov-26	Excavators	1	9.00	158	0.38
Nov-26	Excavators	1	0.10	158	0.38
Nov-26	Excavators	1	9.00	158	0.38
Nov-26	Forklifts	1	9.00	89	0.20
Nov-26	Forklifts	1	1.90	89	0.20
Nov-26	Forklifts	1	0.70	89	0.20
Nov-26	Forklifts	1	3.90	89	0.20
Nov-26	Forklifts	1	9.00	89	0.20
Nov-26	Forklifts	1	1.90	89	0.20
Nov-26	Generator Sets	1	0.10	84	0.74
Nov-26	Graders	1	5.70	199	0.41
Nov-26	Off-Highway Trucks	1	0.10	402	0.38
Nov-26	Off-Highway Trucks	2	9.00	402	0.38
Nov-26	Off-Highway Trucks	1	7.10	402	0.38
Nov-26	Off-Highway Trucks	3	9.00	402	0.38
Nov-26	Off-Highway Trucks	1	0.60	402	0.38
Nov-26	Off-Highway Trucks	2	9.00	402	0.38
Nov-26	Off-Highway Trucks	1	4.10	402	0.38
Nov-26	Off-Highway Trucks	1	9.00	402	0.38
Nov-26	Off-Highway Trucks	1	5.80	402	0.38
Nov-26	Pavers	1	9.00	130	0.42
Nov-26	Pavers	1	4.50	130	0.42

Nov-26	Pavers	1	6.20	130	0.42
Nov-26	Pavers	1	0.20	130	0.42
Nov-26	Paving Equipment	1	1.90	132	0.36
Nov-26	Paving Equipment	4	9.00	132	0.36
Nov-26	Paving Equipment	1	2.70	132	0.36
Nov-26	Paving Equipment	1	0.10	132	0.36
Nov-26	Paving Equipment	1	6.20	132	0.36
Nov-26	Rollers	1	12.60	80	0.38
Nov-26	Rollers	1	5.90	80	0.38
Nov-26	Rough Terrain Forklifts	1	0.10	100	0.40
Nov-26	Rubber Tired Dozers	1	5.10	247	0.40
Nov-26	Tractors/Loaders/Backhoes	1	1.00	224	0.37
Nov-26	Tractors/Loaders/Backhoes	1	9.00	249	0.37
Nov-26	Tractors/Loaders/Backhoes	1	7.60	97	0.37
Nov-26	Welders	55	9.00	46	0.45
Nov-26	Welders	1	7.70	46	0.45
Nov-26	Welders	1	1.80	46	0.45
Nov-26	Welders	4	9.00	46	0.45
Nov-26	Welders	1	5.40	46	0.45
Nov-26	Welders	1	0.40	46	0.45
Nov-26	Welders	1	9.00	46	0.45
Nov-26	Welders	1	7.60	46	0.45
Nov-26	Welders	1	1.80	46	0.45
Dec-26	Aerial Lifts	1	9.00	63	0.31
Dec-26	Air Compressors	11	9.00	78	0.48
Dec-26	Air Compressors	1	2.30	78	0.48
Dec-26	Cranes	1	9.00	231	0.29

Dec-26	Cranes	1	5.40	231	0.29
Dec-26	Cranes	1	4.50	231	0.29
Dec-26	Cranes	1	9.00	231	0.29
Dec-26	Cranes	1	9.00	231	0.29
Dec-26	Cranes	1	3.60	231	0.29
Dec-26	Excavators	1	5.70	158	0.38
Dec-26	Excavators	1	0.30	158	0.38
Dec-26	Excavators	1	9.00	158	0.38
Dec-26	Excavators	1	0.10	158	0.38
Dec-26	Excavators	1	9.00	158	0.38
Dec-26	Forklifts	1	9.00	89	0.20
Dec-26	Forklifts	1	1.90	89	0.20
Dec-26	Forklifts	1	4.50	89	0.20
Dec-26	Forklifts	1	3.90	89	0.20
Dec-26	Forklifts	1	9.00	89	0.20
Dec-26	Forklifts	1	1.90	89	0.20
Dec-26	Generator Sets	1	0.10	84	0.74
Dec-26	Graders	1	5.70	199	0.41
Dec-26	Off-Highway Trucks	1	0.20	402	0.38
Dec-26	Off-Highway Trucks	1	0.10	402	0.38
Dec-26	Off-Highway Trucks	2	9.00	402	0.38
Dec-26	Off-Highway Trucks	1	7.10	402	0.38
Dec-26	Off-Highway Trucks	3	9.00	402	0.38
Dec-26	Off-Highway Trucks	1	0.60	402	0.38
Dec-26	Off-Highway Trucks	1	9.00	402	0.38
Dec-26	Off-Highway Trucks	1	4.10	402	0.38
Dec-26	Off-Highway Trucks	1	9.00	402	0.38

Dec-26	Off-Highway Trucks	1	5.80	402	0.38
Dec-26	Off-Highway Trucks	1	2.10	402	0.38
Dec-26	Pavers	1	9.00	130	0.42
Dec-26	Pavers	1	4.50	130	0.42
Dec-26	Pavers	1	6.20	130	0.42
Dec-26	Pavers	1	0.20	130	0.42
Dec-26	Paving Equipment	1	1.90	132	0.36
Dec-26	Paving Equipment	4	9.00	132	0.36
Dec-26	Paving Equipment	1	2.70	132	0.36
Dec-26	Paving Equipment	1	0.10	132	0.36
Dec-26	Paving Equipment	1	6.20	132	0.36
Dec-26	Pumps	1	9.00	84	0.74
Dec-26	Pumps	1	1.40	84	0.74
Dec-26	Rollers	1	9.00	80	0.38
Dec-26	Rollers	1	3.60	80	0.38
Dec-26	Rollers	1	5.90	80	0.38
Dec-26	Rough Terrain Forklifts	1	0.10	100	0.40
Dec-26	Rubber Tired Dozers	1	5.10	247	0.40
Dec-26	Tractors/Loaders/Backhoes	1	1.00	224	0.37
Dec-26	Tractors/Loaders/Backhoes	1	9.00	97	0.37
Dec-26	Tractors/Loaders/Backhoes	1	7.60	97	0.37
Dec-26	Welders	42	9.00	46	0.45
Dec-26	Welders	1	5.40	46	0.45
Dec-26	Welders	1	1.80	46	0.45
Dec-26	Welders	4	9.00	46	0.45
Dec-26	Welders	1	5.40	46	0.45
Dec-26	Welders	1	0.40	46	0.45

Dec-26	Welders	1	9.00	46	0.45
Dec-26	Welders	1	3.10	46	0.45
Dec-26	Welders	1	1.80	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Jan-26	70	692.00	0.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Feb-26	85	658.00	0.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Mar-26	61	758.00	0.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Apr-26	60	722.00	0.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
May-26	58	724.00	0.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Jun-26	69	755.00	0.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Jul-26	48	740.00	0.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Aug-26	122	725.00	0.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Sep-26	144	756.00	0.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Oct-26	151	862.00	0.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Nov-26	131	810.00	0.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Dec-26	121	816.00	0.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

3.2 Jan-26 - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0432	0.0000	0.0432	6.5500e-003	0.0000	6.5500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1815	1.2790	1.5829	4.7800e-003		0.0494	0.0494		0.0457	0.0457	0.0000	419.2223	419.2223	0.1319	0.0000	422.5189
Total	**0.1815**	**1.2790**	**1.5829**	**4.7800e-003**	**0.0432**	**0.0494**	**0.0927**	**6.5500e-003**	**0.0457**	**0.0522**	**0.0000**	**419.2223**	**419.2223**	**0.1319**	**0.0000**	**422.5189**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0326	0.0239	0.2242	8.2000e-004	0.1127	6.0000e-004	0.1133	0.0299	5.5000e-004	0.0305	0.0000	74.3228	74.3228	1.5400e-003	0.0000	74.3614
Total	**0.0326**	**0.0239**	**0.2242**	**8.2000e-004**	**0.1127**	**6.0000e-004**	**0.1133**	**0.0299**	**5.5000e-004**	**0.0305**	**0.0000**	**74.3228**	**74.3228**	**1.5400e-003**	**0.0000**	**74.3614**

3.2 Jan-26 - 2026

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0432	0.0000	0.0432	6.5500e-003	0.0000	6.5500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0662	0.6053	2.4302	4.7800e-003		0.0119	0.0119		0.0119	0.0119	0.0000	419.2218	419.2218	0.1319	0.0000	422.5184
Total	**0.0662**	**0.6053**	**2.4302**	**4.7800e-003**	**0.0432**	**0.0119**	**0.0551**	**6.5500e-003**	**0.0119**	**0.0185**	**0.0000**	**419.2218**	**419.2218**	**0.1319**	**0.0000**	**422.5184**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0326	0.0239	0.2242	8.2000e-004	0.1127	6.0000e-004	0.1133	0.0299	5.5000e-004	0.0305	0.0000	74.3228	74.3228	1.5400e-003	0.0000	74.3614
Total	**0.0326**	**0.0239**	**0.2242**	**8.2000e-004**	**0.1127**	**6.0000e-004**	**0.1133**	**0.0299**	**5.5000e-004**	**0.0305**	**0.0000**	**74.3228**	**74.3228**	**1.5400e-003**	**0.0000**	**74.3614**

3.3 Feb-26 - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0432	0.0000	0.0432	6.5500e-003	0.0000	6.5500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2699	1.8300	2.0996	6.9200e-003		0.0690	0.0690		0.0640	0.0640	0.0000	605.8439	605.8439	0.1874	0.0000	610.5299
Total	**0.2699**	**1.8300**	**2.0996**	**6.9200e-003**	**0.0432**	**0.0690**	**0.1122**	**6.5500e-003**	**0.0640**	**0.0706**	**0.0000**	**605.8439**	**605.8439**	**0.1874**	**0.0000**	**610.5299**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0310	0.0227	0.2132	7.8000e-004	0.1072	5.7000e-004	0.1077	0.0285	5.3000e-004	0.0290	0.0000	70.6711	70.6711	1.4700e-003	0.0000	70.7078
Total	**0.0310**	**0.0227**	**0.2132**	**7.8000e-004**	**0.1072**	**5.7000e-004**	**0.1077**	**0.0285**	**5.3000e-004**	**0.0290**	**0.0000**	**70.6711**	**70.6711**	**1.4700e-003**	**0.0000**	**70.7078**

3.3 Feb-26 - 2026

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0432	0.0000	0.0432	6.5500e-003	0.0000	6.5500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0918	0.7310	3.3415	6.9200e-003		0.0171	0.0171		0.0171	0.0171	0.0000	605.8431	605.8431	0.1874	0.0000	610.5292
Total	**0.0918**	**0.7310**	**3.3415**	**6.9200e-003**	**0.0432**	**0.0171**	**0.0603**	**6.5500e-003**	**0.0171**	**0.0236**	**0.0000**	**605.8431**	**605.8431**	**0.1874**	**0.0000**	**610.5292**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0310	0.0227	0.2132	7.8000e-004	0.1072	5.7000e-004	0.1077	0.0285	5.3000e-004	0.0290	0.0000	70.6711	70.6711	1.4700e-003	0.0000	70.7078
Total	**0.0310**	**0.0227**	**0.2132**	**7.8000e-004**	**0.1072**	**5.7000e-004**	**0.1077**	**0.0285**	**5.3000e-004**	**0.0290**	**0.0000**	**70.6711**	**70.6711**	**1.4700e-003**	**0.0000**	**70.7078**

3.4 Mar-26 - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0432	0.0000	0.0432	6.5500e-003	0.0000	6.5500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1772	1.1991	1.3819	4.7000e-003		0.0453	0.0453		0.0418	0.0418	0.0000	411.9861	411.9861	0.1313	0.0000	415.2697
Total	**0.1772**	**1.1991**	**1.3819**	**4.7000e-003**	**0.0432**	**0.0453**	**0.0886**	**6.5500e-003**	**0.0418**	**0.0484**	**0.0000**	**411.9861**	**411.9861**	**0.1313**	**0.0000**	**415.2697**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0357	0.0262	0.2456	9.0000e-004	0.1234	6.6000e-004	0.1241	0.0328	6.1000e-004	0.0334	0.0000	81.4113	81.4113	1.6900e-003	0.0000	81.4536
Total	**0.0357**	**0.0262**	**0.2456**	**9.0000e-004**	**0.1234**	**6.6000e-004**	**0.1241**	**0.0328**	**6.1000e-004**	**0.0334**	**0.0000**	**81.4113**	**81.4113**	**1.6900e-003**	**0.0000**	**81.4536**

3.4 Mar-26 - 2026

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0432	0.0000	0.0432	6.5500e-003	0.0000	6.5500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0614	0.4374	2.2566	4.7000e-003		0.0102	0.0102		0.0102	0.0102	0.0000	411.9856	411.9856	0.1313	0.0000	415.2692
Total	**0.0614**	**0.4374**	**2.2566**	**4.7000e-003**	**0.0432**	**0.0102**	**0.0535**	**6.5500e-003**	**0.0102**	**0.0168**	**0.0000**	**411.9856**	**411.9856**	**0.1313**	**0.0000**	**415.2692**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0357	0.0262	0.2456	9.0000e-004	0.1234	6.6000e-004	0.1241	0.0328	6.1000e-004	0.0334	0.0000	81.4113	81.4113	1.6900e-003	0.0000	81.4536
Total	**0.0357**	**0.0262**	**0.2456**	**9.0000e-004**	**0.1234**	**6.6000e-004**	**0.1241**	**0.0328**	**6.1000e-004**	**0.0334**	**0.0000**	**81.4113**	**81.4113**	**1.6900e-003**	**0.0000**	**81.4536**

3.5 Apr-26 - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0432	0.0000	0.0432	6.5500e-003	0.0000	6.5500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1421	0.9886	1.1169	3.7100e-003		0.0378	0.0378		0.0349	0.0349	0.0000	325.7217	325.7217	0.1033	0.0000	328.3052
Total	**0.1421**	**0.9886**	**1.1169**	**3.7100e-003**	**0.0432**	**0.0378**	**0.0810**	**6.5500e-003**	**0.0349**	**0.0414**	**0.0000**	**325.7217**	**325.7217**	**0.1033**	**0.0000**	**328.3052**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0341	0.0249	0.2339	8.6000e-004	0.1176	6.3000e-004	0.1182	0.0312	5.8000e-004	0.0318	0.0000	77.5448	77.5448	1.6100e-003	0.0000	77.5851
Total	**0.0341**	**0.0249**	**0.2339**	**8.6000e-004**	**0.1176**	**6.3000e-004**	**0.1182**	**0.0312**	**5.8000e-004**	**0.0318**	**0.0000**	**77.5448**	**77.5448**	**1.6100e-003**	**0.0000**	**77.5851**

3.5 Apr-26 - 2026

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0432	0.0000	0.0432	6.5500e-003	0.0000	6.5500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0493	0.3810	1.7976	3.7100e-003		8.5800e-003	8.5800e-003		8.5800e-003	8.5800e-003	0.0000	325.7213	325.7213	0.1033	0.0000	328.3048
Total	**0.0493**	**0.3810**	**1.7976**	**3.7100e-003**	**0.0432**	**8.5800e-003**	**0.0518**	**6.5500e-003**	**8.5800e-003**	**0.0151**	**0.0000**	**325.7213**	**325.7213**	**0.1033**	**0.0000**	**328.3048**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0341	0.0249	0.2339	8.6000e-004	0.1176	6.3000e-004	0.1182	0.0312	5.8000e-004	0.0318	0.0000	77.5448	77.5448	1.6100e-003	0.0000	77.5851
Total	**0.0341**	**0.0249**	**0.2339**	**8.6000e-004**	**0.1176**	**6.3000e-004**	**0.1182**	**0.0312**	**5.8000e-004**	**0.0318**	**0.0000**	**77.5448**	**77.5448**	**1.6100e-003**	**0.0000**	**77.5851**

3.6 May-26 - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0432	0.0000	0.0432	6.5500e-003	0.0000	6.5500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1400	0.9649	1.0948	3.6600e-003		0.0369	0.0369		0.0341	0.0341	0.0000	321.2104	321.2104	0.1019	0.0000	323.7574
Total	**0.1400**	**0.9649**	**1.0948**	**3.6600e-003**	**0.0432**	**0.0369**	**0.0802**	**6.5500e-003**	**0.0341**	**0.0406**	**0.0000**	**321.2104**	**321.2104**	**0.1019**	**0.0000**	**323.7574**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0341	0.0250	0.2345	8.6000e-004	0.1179	6.3000e-004	0.1185	0.0313	5.8000e-004	0.0319	0.0000	77.7597	77.7597	1.6200e-003	0.0000	77.8000
Total	**0.0341**	**0.0250**	**0.2345**	**8.6000e-004**	**0.1179**	**6.3000e-004**	**0.1185**	**0.0313**	**5.8000e-004**	**0.0319**	**0.0000**	**77.7597**	**77.7597**	**1.6200e-003**	**0.0000**	**77.8000**

3.6 May-26 - 2026

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0432	0.0000	0.0432	6.5500e-003	0.0000	6.5500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0484	0.3687	1.7686	3.6600e-003		8.1000e-003	8.1000e-003		8.1000e-003	8.1000e-003	0.0000	321.2100	321.2100	0.1019	0.0000	323.7570
Total	**0.0484**	**0.3687**	**1.7686**	**3.6600e-003**	**0.0432**	**8.1000e-003**	**0.0513**	**6.5500e-003**	**8.1000e-003**	**0.0147**	**0.0000**	**321.2100**	**321.2100**	**0.1019**	**0.0000**	**323.7570**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0341	0.0250	0.2345	8.6000e-004	0.1179	6.3000e-004	0.1185	0.0313	5.8000e-004	0.0319	0.0000	77.7597	77.7597	1.6200e-003	0.0000	77.8000
Total	**0.0341**	**0.0250**	**0.2345**	**8.6000e-004**	**0.1179**	**6.3000e-004**	**0.1185**	**0.0313**	**5.8000e-004**	**0.0319**	**0.0000**	**77.7597**	**77.7597**	**1.6200e-003**	**0.0000**	**77.8000**

3.7 Jun-26 - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0432	0.0000	0.0432	6.5500e-003	0.0000	6.5500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1978	1.3640	1.5950	5.2100e-003		0.0523	0.0523		0.0483	0.0483	0.0000	457.2585	457.2585	0.1442	0.0000	460.8645
Total	**0.1978**	**1.3640**	**1.5950**	**5.2100e-003**	**0.0432**	**0.0523**	**0.0955**	**6.5500e-003**	**0.0483**	**0.0548**	**0.0000**	**457.2585**	**457.2585**	**0.1442**	**0.0000**	**460.8645**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0356	0.0261	0.2446	9.0000e-004	0.1230	6.6000e-004	0.1236	0.0327	6.0000e-004	0.0333	0.0000	81.0891	81.0891	1.6900e-003	0.0000	81.1313
Total	**0.0356**	**0.0261**	**0.2446**	**9.0000e-004**	**0.1230**	**6.6000e-004**	**0.1236**	**0.0327**	**6.0000e-004**	**0.0333**	**0.0000**	**81.0891**	**81.0891**	**1.6900e-003**	**0.0000**	**81.1313**

3.7 Jun-26 - 2026

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0432	0.0000	0.0432	6.5500e-003	0.0000	6.5500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0699	0.5652	2.5580	5.2100e-003		0.0115	0.0115		0.0115	0.0115	0.0000	457.2580	457.2580	0.1442	0.0000	460.8640
Total	**0.0699**	**0.5652**	**2.5580**	**5.2100e-003**	**0.0432**	**0.0115**	**0.0547**	**6.5500e-003**	**0.0115**	**0.0180**	**0.0000**	**457.2580**	**457.2580**	**0.1442**	**0.0000**	**460.8640**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0356	0.0261	0.2446	9.0000e-004	0.1230	6.6000e-004	0.1236	0.0327	6.0000e-004	0.0333	0.0000	81.0891	81.0891	1.6900e-003	0.0000	81.1313
Total	**0.0356**	**0.0261**	**0.2446**	**9.0000e-004**	**0.1230**	**6.6000e-004**	**0.1236**	**0.0327**	**6.0000e-004**	**0.0333**	**0.0000**	**81.0891**	**81.0891**	**1.6900e-003**	**0.0000**	**81.1313**

3.8 Jul-26 - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0432	0.0000	0.0432	6.5500e-003	0.0000	6.5500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1357	0.9615	1.0621	3.5400e-003		0.0370	0.0370		0.0342	0.0342	0.0000	310.2886	310.2886	0.0966	0.0000	312.7038
Total	**0.1357**	**0.9615**	**1.0621**	**3.5400e-003**	**0.0432**	**0.0370**	**0.0802**	**6.5500e-003**	**0.0342**	**0.0407**	**0.0000**	**310.2886**	**310.2886**	**0.0966**	**0.0000**	**312.7038**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0349	0.0256	0.2397	8.8000e-004	0.1205	6.4000e-004	0.1212	0.0320	5.9000e-004	0.0326	0.0000	79.4781	79.4781	1.6500e-003	0.0000	79.5194
Total	**0.0349**	**0.0256**	**0.2397**	**8.8000e-004**	**0.1205**	**6.4000e-004**	**0.1212**	**0.0320**	**5.9000e-004**	**0.0326**	**0.0000**	**79.4781**	**79.4781**	**1.6500e-003**	**0.0000**	**79.5194**

3.8 Jul-26 - 2026

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0432	0.0000	0.0432	6.5500e-003	0.0000	6.5500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0473	0.3742	1.7227	3.5400e-003		7.4000e-003	7.4000e-003		7.4000e-003	7.4000e-003	0.0000	310.2882	310.2882	0.0966	0.0000	312.7035
Total	**0.0473**	**0.3742**	**1.7227**	**3.5400e-003**	**0.0432**	**7.4000e-003**	**0.0506**	**6.5500e-003**	**7.4000e-003**	**0.0140**	**0.0000**	**310.2882**	**310.2882**	**0.0966**	**0.0000**	**312.7035**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0349	0.0256	0.2397	8.8000e-004	0.1205	6.4000e-004	0.1212	0.0320	5.9000e-004	0.0326	0.0000	79.4781	79.4781	1.6500e-003	0.0000	79.5194
Total	**0.0349**	**0.0256**	**0.2397**	**8.8000e-004**	**0.1205**	**6.4000e-004**	**0.1212**	**0.0320**	**5.9000e-004**	**0.0326**	**0.0000**	**79.4781**	**79.4781**	**1.6500e-003**	**0.0000**	**79.5194**

3.9 Aug-26 - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0432	0.0000	0.0432	6.5500e-003	0.0000	6.5500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.3166	2.1714	2.5379	5.8100e-003		0.0785	0.0785		0.0753	0.0753	0.0000	485.6320	485.6320	0.1125	0.0000	488.4433
Total	**0.3166**	**2.1714**	**2.5379**	**5.8100e-003**	**0.0432**	**0.0785**	**0.1217**	**6.5500e-003**	**0.0753**	**0.0819**	**0.0000**	**485.6320**	**485.6320**	**0.1125**	**0.0000**	**488.4433**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0342	0.0250	0.2349	8.6000e-004	0.1181	6.3000e-004	0.1187	0.0314	5.8000e-004	0.0320	0.0000	77.8671	77.8671	1.6200e-003	0.0000	77.9075
Total	**0.0342**	**0.0250**	**0.2349**	**8.6000e-004**	**0.1181**	**6.3000e-004**	**0.1187**	**0.0314**	**5.8000e-004**	**0.0320**	**0.0000**	**77.8671**	**77.8671**	**1.6200e-003**	**0.0000**	**77.9075**

3.9 Aug-26 - 2026

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0432	0.0000	0.0432	6.5500e-003	0.0000	6.5500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0878	1.6781	3.0960	5.8100e-003		0.0381	0.0381		0.0381	0.0381	0.0000	485.6314	485.6314	0.1125	0.0000	488.4427
Total	**0.0878**	**1.6781**	**3.0960**	**5.8100e-003**	**0.0432**	**0.0381**	**0.0813**	**6.5500e-003**	**0.0381**	**0.0446**	**0.0000**	**485.6314**	**485.6314**	**0.1125**	**0.0000**	**488.4427**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0342	0.0250	0.2349	8.6000e-004	0.1181	6.3000e-004	0.1187	0.0314	5.8000e-004	0.0320	0.0000	77.8671	77.8671	1.6200e-003	0.0000	77.9075
Total	**0.0342**	**0.0250**	**0.2349**	**8.6000e-004**	**0.1181**	**6.3000e-004**	**0.1187**	**0.0314**	**5.8000e-004**	**0.0320**	**0.0000**	**77.8671**	**77.8671**	**1.6200e-003**	**0.0000**	**77.9075**

3.10 Sep-26 - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0432	0.0000	0.0432	6.5500e-003	0.0000	6.5500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.3668	2.6028	3.0221	6.7600e-003		0.0978	0.0978		0.0932	0.0932	0.0000	568.2296	568.2296	0.1382	0.0000	571.6835
Total	**0.3668**	**2.6028**	**3.0221**	**6.7600e-003**	**0.0432**	**0.0978**	**0.1411**	**6.5500e-003**	**0.0932**	**0.0997**	**0.0000**	**568.2296**	**568.2296**	**0.1382**	**0.0000**	**571.6835**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0357	0.0261	0.2449	9.0000e-004	0.1231	6.6000e-004	0.1238	0.0327	6.0000e-004	0.0333	0.0000	81.1965	81.1965	1.6900e-003	0.0000	81.2387
Total	**0.0357**	**0.0261**	**0.2449**	**9.0000e-004**	**0.1231**	**6.6000e-004**	**0.1238**	**0.0327**	**6.0000e-004**	**0.0333**	**0.0000**	**81.1965**	**81.1965**	**1.6900e-003**	**0.0000**	**81.2387**

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Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0432	0.0000	0.0432	6.5500e-003	0.0000	6.5500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1009	1.8139	3.6803	6.7600e-003		0.0407	0.0407		0.0407	0.0407	0.0000	568.2289	568.2289	0.1382	0.0000	571.6828
Total	**0.1009**	**1.8139**	**3.6803**	**6.7600e-003**	**0.0432**	**0.0407**	**0.0839**	**6.5500e-003**	**0.0407**	**0.0472**	**0.0000**	**568.2289**	**568.2289**	**0.1382**	**0.0000**	**571.6828**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0357	0.0261	0.2449	9.0000e-004	0.1231	6.6000e-004	0.1238	0.0327	6.0000e-004	0.0333	0.0000	81.1965	81.1965	1.6900e-003	0.0000	81.2387
Total	**0.0357**	**0.0261**	**0.2449**	**9.0000e-004**	**0.1231**	**6.6000e-004**	**0.1238**	**0.0327**	**6.0000e-004**	**0.0333**	**0.0000**	**81.1965**	**81.1965**	**1.6900e-003**	**0.0000**	**81.2387**

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Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0432	0.0000	0.0432	6.5500e-003	0.0000	6.5500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.3822	2.7222	3.2161	7.1200e-003		0.1032	0.1032		0.0982	0.0982	0.0000	599.9343	599.9343	0.1468	0.0000	603.6046
Total	**0.3822**	**2.7222**	**3.2161**	**7.1200e-003**	**0.0432**	**0.1032**	**0.1464**	**6.5500e-003**	**0.0982**	**0.1047**	**0.0000**	**599.9343**	**599.9343**	**0.1468**	**0.0000**	**603.6046**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0407	0.0298	0.2793	1.0200e-003	0.1404	7.5000e-004	0.1411	0.0373	6.9000e-004	0.0380	0.0000	92.5812	92.5812	1.9200e-003	0.0000	92.6293
Total	**0.0407**	**0.0298**	**0.2793**	**1.0200e-003**	**0.1404**	**7.5000e-004**	**0.1411**	**0.0373**	**6.9000e-004**	**0.0380**	**0.0000**	**92.5812**	**92.5812**	**1.9200e-003**	**0.0000**	**92.6293**

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Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0432	0.0000	0.0432	6.5500e-003	0.0000	6.5500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1063	1.8725	3.9120	7.1200e-003		0.0414	0.0414		0.0414	0.0414	0.0000	599.9336	599.9336	0.1468	0.0000	603.6039
Total	**0.1063**	**1.8725**	**3.9120**	**7.1200e-003**	**0.0432**	**0.0414**	**0.0847**	**6.5500e-003**	**0.0414**	**0.0480**	**0.0000**	**599.9336**	**599.9336**	**0.1468**	**0.0000**	**603.6039**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0407	0.0298	0.2793	1.0200e-003	0.1404	7.5000e-004	0.1411	0.0373	6.9000e-004	0.0380	0.0000	92.5812	92.5812	1.9200e-003	0.0000	92.6293
Total	**0.0407**	**0.0298**	**0.2793**	**1.0200e-003**	**0.1404**	**7.5000e-004**	**0.1411**	**0.0373**	**6.9000e-004**	**0.0380**	**0.0000**	**92.5812**	**92.5812**	**1.9200e-003**	**0.0000**	**92.6293**

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Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0432	0.0000	0.0432	6.5500e-003	0.0000	6.5500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2917	1.9451	2.4610	5.0000e-003		0.0708	0.0708		0.0683	0.0683	0.0000	411.9221	411.9221	0.0877	0.0000	414.1143
Total	**0.2917**	**1.9451**	**2.4610**	**5.0000e-003**	**0.0432**	**0.0708**	**0.1140**	**6.5500e-003**	**0.0683**	**0.0749**	**0.0000**	**411.9221**	**411.9221**	**0.0877**	**0.0000**	**414.1143**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0382	0.0280	0.2624	9.6000e-004	0.1319	7.0000e-004	0.1326	0.0351	6.5000e-004	0.0357	0.0000	86.9963	86.9963	1.8100e-003	0.0000	87.0415
Total	**0.0382**	**0.0280**	**0.2624**	**9.6000e-004**	**0.1319**	**7.0000e-004**	**0.1326**	**0.0351**	**6.5000e-004**	**0.0357**	**0.0000**	**86.9963**	**86.9963**	**1.8100e-003**	**0.0000**	**87.0415**

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Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0432	0.0000	0.0432	6.5500e-003	0.0000	6.5500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0760	1.6213	2.8127	5.0000e-003		0.0382	0.0382		0.0382	0.0382	0.0000	411.9216	411.9216	0.0877	0.0000	414.1138
Total	**0.0760**	**1.6213**	**2.8127**	**5.0000e-003**	**0.0432**	**0.0382**	**0.0814**	**6.5500e-003**	**0.0382**	**0.0448**	**0.0000**	**411.9216**	**411.9216**	**0.0877**	**0.0000**	**414.1138**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0382	0.0280	0.2624	9.6000e-004	0.1319	7.0000e-004	0.1326	0.0351	6.5000e-004	0.0357	0.0000	86.9963	86.9963	1.8100e-003	0.0000	87.0415
Total	**0.0382**	**0.0280**	**0.2624**	**9.6000e-004**	**0.1319**	**7.0000e-004**	**0.1326**	**0.0351**	**6.5000e-004**	**0.0357**	**0.0000**	**86.9963**	**86.9963**	**1.8100e-003**	**0.0000**	**87.0415**

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Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0411	0.0000	0.0411	6.2200e-003	0.0000	6.2200e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2408	1.6546	2.0710	4.2600e-003		0.0614	0.0614		0.0590	0.0590	0.0000	354.3775	354.3775	0.0791	0.0000	356.3550
Total	**0.2408**	**1.6546**	**2.0710**	**4.2600e-003**	**0.0411**	**0.0614**	**0.1025**	**6.2200e-003**	**0.0590**	**0.0652**	**0.0000**	**354.3775**	**354.3775**	**0.0791**	**0.0000**	**356.3550**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0366	0.0268	0.2511	9.2000e-004	0.1262	6.7000e-004	0.1269	0.0335	6.2000e-004	0.0342	0.0000	83.2587	83.2587	1.7300e-003	0.0000	83.3019
Total	**0.0366**	**0.0268**	**0.2511**	**9.2000e-004**	**0.1262**	**6.7000e-004**	**0.1269**	**0.0335**	**6.2000e-004**	**0.0342**	**0.0000**	**83.2587**	**83.2587**	**1.7300e-003**	**0.0000**	**83.3019**

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Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0411	0.0000	0.0411	6.2200e-003	0.0000	6.2200e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0642	1.2723	2.4009	4.2600e-003		0.0295	0.0295		0.0295	0.0295	0.0000	354.3771	354.3771	0.0791	0.0000	356.3546
Total	**0.0642**	**1.2723**	**2.4009**	**4.2600e-003**	**0.0411**	**0.0295**	**0.0705**	**6.2200e-003**	**0.0295**	**0.0357**	**0.0000**	**354.3771**	**354.3771**	**0.0791**	**0.0000**	**356.3546**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0366	0.0268	0.2511	9.2000e-004	0.1262	6.7000e-004	0.1269	0.0335	6.2000e-004	0.0342	0.0000	83.2587	83.2587	1.7300e-003	0.0000	83.3019
Total	**0.0366**	**0.0268**	**0.2511**	**9.2000e-004**	**0.1262**	**6.7000e-004**	**0.1269**	**0.0335**	**6.2000e-004**	**0.0342**	**0.0000**	**83.2587**	**83.2587**	**1.7300e-003**	**0.0000**	**83.3019**

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Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.1600e-003	0.0000	2.1600e-003	3.3000e-004	0.0000	3.3000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0127	0.0871	0.1090	2.2000e-004		3.2300e-003	3.2300e-003		3.1000e-003	3.1000e-003	0.0000	18.6515	18.6515	4.1600e-003	0.0000	18.7555
Total	**0.0127**	**0.0871**	**0.1090**	**2.2000e-004**	**2.1600e-003**	**3.2300e-003**	**5.3900e-003**	**3.3000e-004**	**3.1000e-003**	**3.4300e-003**	**0.0000**	**18.6515**	**18.6515**	**4.1600e-003**	**0.0000**	**18.7555**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.8300e-003	1.2800e-003	0.0123	5.0000e-005	6.6400e-003	3.0000e-005	6.6800e-003	1.7700e-003	3.0000e-005	1.8000e-003	0.0000	4.2307	4.2307	8.0000e-005	0.0000	4.2328
Total	**1.8300e-003**	**1.2800e-003**	**0.0123**	**5.0000e-005**	**6.6400e-003**	**3.0000e-005**	**6.6800e-003**	**1.7700e-003**	**3.0000e-005**	**1.8000e-003**	**0.0000**	**4.2307**	**4.2307**	**8.0000e-005**	**0.0000**	**4.2328**

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Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.1600e-003	0.0000	2.1600e-003	3.3000e-004	0.0000	3.3000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.3800e-003	0.0670	0.1264	2.2000e-004		1.5500e-003	1.5500e-003		1.5500e-003	1.5500e-003	0.0000	18.6514	18.6514	4.1600e-003	0.0000	18.7555
Total	**3.3800e-003**	**0.0670**	**0.1264**	**2.2000e-004**	**2.1600e-003**	**1.5500e-003**	**3.7100e-003**	**3.3000e-004**	**1.5500e-003**	**1.8800e-003**	**0.0000**	**18.6514**	**18.6514**	**4.1600e-003**	**0.0000**	**18.7555**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.8300e-003	1.2800e-003	0.0123	5.0000e-005	6.6400e-003	3.0000e-005	6.6800e-003	1.7700e-003	3.0000e-005	1.8000e-003	0.0000	4.2307	4.2307	8.0000e-005	0.0000	4.2328
Total	**1.8300e-003**	**1.2800e-003**	**0.0123**	**5.0000e-005**	**6.6400e-003**	**3.0000e-005**	**6.6800e-003**	**1.7700e-003**	**3.0000e-005**	**1.8000e-003**	**0.0000**	**4.2307**	**4.2307**	**8.0000e-005**	**0.0000**	**4.2328**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Heavy Industry	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Heavy Industry	13.00	13.00	13.00	59.00	28.00	13.00	92	5	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Heavy Industry	0.602606	0.026011	0.198672	0.108173	0.017753	0.004949	0.012577	0.019761	0.002270	0.001100	0.004459	0.000730	0.000939

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Heavy Industry	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Heavy Industry	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Heavy Industry	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Heavy Industry	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Heavy Industry	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Heavy Industry	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Heavy Industry	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Heavy Industry	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

DCPP Decommissioning

San Luis Obispo County APCD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Heavy Industry	0.00	1000sqft	585.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	3.2	**Precipitation Freq (Days)**	44
Climate Zone	4			**Operational Year**	2034
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Total lot acreage.

Construction Phase - 20 working days per month based on 4 day work week and 5 weeks per month.

Off-road Equipment - Data from PG&E equipment list for 2033.

Off-road Equipment - Data from PG&E equipment list for 2033.

Off-road Equipment - Data from PG&E equipment list for 2033.

Off-road Equipment - Data from PG&E equipment list for 2033.

Off-road Equipment - Data from PG&E equipment list for 2033.

Off-road Equipment - Data from PG&E equipment list for 2033.

Off-road Equipment - Data from PG&E equipment list for 2033.

Off-road Equipment - Data from PG&E equipment list for 2033.

Off-road Equipment - Data from PG&E equipment list for 2033.

Off-road Equipment - Data from PG&E equipment list for 2033.

Off-road Equipment - Data from PG&E equipment list for 2033.

Off-road Equipment - Data from PG&E equipment list for 2033.

Trips and VMT - Data from PG&E employee totals. Assumed 22 miles from downtown SLO to DCPP.

Demolition -

Grading -

Construction Off-road Equipment Mitigation - Scenario 2: Tier 4 Final for equipment HP>50, Tier 4 Interim for HP<50.

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	134.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	73.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	20.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	116.00

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	95.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	8.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	241.00
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tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	8.00
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tblConstEquipMitigation	Tier	No Change	Tier 4 Final
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tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final

tblConstEquipMitigation	Tier	No Change	Tier 4 Final
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tblConstructionPhase	NumDays	600.00	20.00
tblConstructionPhase	NumDays	600.00	20.00
tblConstructionPhase	NumDays	600.00	20.00
tblConstructionPhase	NumDays	600.00	20.00
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tblConstructionPhase	PhaseEndDate	4/19/2058	11/28/2033
tblConstructionPhase	PhaseEndDate	8/6/2060	1/2/2034
tblConstructionPhase	PhaseEndDate	8/7/2037	2/28/2033
tblConstructionPhase	PhaseEndDate	11/25/2039	3/28/2033
tblConstructionPhase	PhaseEndDate	3/14/2042	4/28/2033
tblConstructionPhase	PhaseEndDate	7/1/2044	5/27/2033
tblConstructionPhase	PhaseEndDate	10/19/2046	6/28/2033
tblConstructionPhase	PhaseEndDate	2/5/2049	7/28/2033

tblConstructionPhase	PhaseEndDate	5/26/2051	8/26/2033
tblConstructionPhase	PhaseEndDate	9/12/2053	9/28/2033
tblConstructionPhase	PhaseStartDate	9/13/2053	10/1/2033
tblConstructionPhase	PhaseStartDate	1/1/2056	11/1/2033
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tblConstructionPhase	PhaseStartDate	8/8/2037	3/1/2033
tblConstructionPhase	PhaseStartDate	11/26/2039	4/1/2033
tblConstructionPhase	PhaseStartDate	3/15/2042	5/1/2033
tblConstructionPhase	PhaseStartDate	7/2/2044	6/1/2033
tblConstructionPhase	PhaseStartDate	10/20/2046	7/1/2033
tblConstructionPhase	PhaseStartDate	2/6/2049	8/1/2033
tblConstructionPhase	PhaseStartDate	5/27/2051	9/1/2033
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tblOffRoadEquipment	HorsePower	97.00	249.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	7.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00

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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	7.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	7.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
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tblOffRoadEquipment	UsageHours	8.00	9.00

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tblOffRoadEquipment	UsageHours	8.00	9.00
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tblTripsAndVMT	WorkerTripLength	13.00	22.00
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tblTripsAndVMT	WorkerTripLength	13.00	22.00
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tblTripsAndVMT	WorkerTripLength	13.00	22.00
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tblTripsAndVMT	WorkerTripNumber	368.00	381.00
tblTripsAndVMT	WorkerTripNumber	368.00	406.00
tblTripsAndVMT	WorkerTripNumber	370.00	405.00
tblTripsAndVMT	WorkerTripNumber	345.00	397.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2033	3.8810	15.9329	33.9017	0.0909	1.3443	0.3677	1.7120	0.2982	0.3675	0.6656	0.0000	8,114.8392	8,114.8392	0.3050	0.0000	8,122.4645
2034	0.0171	0.0518	0.1510	4.4000e-004	5.6300e-003	1.6400e-003	7.2700e-003	1.2500e-003	1.6400e-003	2.8900e-003	0.0000	40.3543	40.3543	1.3500e-003	0.0000	40.3880
Maximum	**3.8810**	**15.9329**	**33.9017**	**0.0909**	**1.3443**	**0.3677**	**1.7120**	**0.2982**	**0.3675**	**0.6656**	**0.0000**	**8,114.8392**	**8,114.8392**	**0.3050**	**0.0000**	**8,122.4645**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2033	1.1754	13.3050	43.4189	0.0909	1.3443	0.3606	1.7049	0.2982	0.3604	0.6586	0.0000	8,114.8301	8,114.8301	0.3050	0.0000	8,122.4554
2034	5.1000e-003	0.0230	0.2065	4.4000e-004	5.6300e-003	6.0000e-004	6.2300e-003	1.2500e-003	6.0000e-004	1.8500e-003	0.0000	40.3543	40.3543	1.3500e-003	0.0000	40.3880
Maximum	**1.1754**	**13.3050**	**43.4189**	**0.0909**	**1.3443**	**0.3606**	**1.7049**	**0.2982**	**0.3604**	**0.6586**	**0.0000**	**8,114.8301**	**8,114.8301**	**0.3050**	**0.0000**	**8,122.4554**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**69.72**	**16.62**	**-28.11**	**0.00**	**0.00**	**2.20**	**0.47**	**0.00**	**2.20**	**1.21**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**1-3-2033**	**4-2-2033**	4.8338	3.4806
2	**4-3-2033**	**7-2-2033**	4.6006	3.8018
3	**7-3-2033**	**10-2-2033**	5.3147	4.0572
4	**10-3-2033**	**1-2-2034**	4.8724	2.9763
		Highest	5.3147	4.0572

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

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Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Jan-33	Demolition	1/3/2033	1/28/2033	5	20	
2	Feb-33	Demolition	2/1/2033	2/28/2033	5	20	
3	Mar-33	Demolition	3/1/2033	3/28/2033	5	20	
4	Apr-33	Demolition	4/1/2033	4/28/2033	5	20	
5	May-33	Demolition	5/1/2033	5/27/2033	5	20	
6	Jun-33	Demolition	6/1/2033	6/28/2033	5	20	
7	Jul-33	Demolition	7/1/2033	7/28/2033	5	20	
8	Aug-33	Demolition	8/1/2033	8/26/2033	5	20	
9	Sep-33	Demolition	9/1/2033	9/28/2033	5	20	
10	Oct-33	Demolition	10/1/2033	10/28/2033	5	20	
11	Nov-33	Demolition	11/1/2033	11/28/2033	5	20	
12	Dec-33	Demolition	12/6/2033	1/2/2034	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Jan-33	Air Compressors	3	9.00	78	0.48
Jan-33	Air Compressors	1	0.50	78	0.48
Jan-33	Air Compressors	1	0.10	78	0.48
Jan-33	Cranes	1	0.90	231	0.29

Jan-33	Cranes	4	9.00	231	0.29
Jan-33	Cranes	1	0.90	231	0.29
Jan-33	Crawler Tractors	1	0.10	159	0.43
Jan-33	Crushing/Proc. Equipment	1	9.00	85	0.78
Jan-33	Excavators	2	9.00	158	0.38
Jan-33	Excavators	4	9.00	158	0.38
Jan-33	Forklifts	1	3.60	89	0.20
Jan-33	Forklifts	1	3.60	89	0.20
Jan-33	Forklifts	4	9.00	89	0.20
Jan-33	Forklifts	2	9.00	89	0.20
Jan-33	Graders	1	1.80	199	0.41
Jan-33	Off-Highway Trucks	2	9.00	402	0.38
Jan-33	Off-Highway Trucks	8	9.00	402	0.38
Jan-33	Off-Highway Trucks	1	7.10	402	0.38
Jan-33	Off-Highway Trucks	1	7.20	402	0.38
Jan-33	Off-Highway Trucks	1	5.80	402	0.38
Jan-33	Off-Highway Trucks	1	0.10	402	0.38
Jan-33	Off-Highway Trucks	2	9.00	402	0.38
Jan-33	Off-Highway Trucks	1	9.00	142	0.38
Jan-33	Off-Highway Trucks	1	9.00	199	0.38
Jan-33	Off-Highway Trucks	1	3.10	142	0.38
Jan-33	Other Construction Equipment	4	9.00	6	0.42
Jan-33	Pumps	2	9.00	84	0.74
Jan-33	Pumps	1	5.80	84	0.74
Jan-33	Rollers	1	1.80	80	0.38
Jan-33	Rough Terrain Forklifts	1	9.00	100	0.40
Jan-33	Rough Terrain Forklifts	1	0.10	100	0.40

Jan-33	Rough Terrain Forklifts	1	9.00	100	0.40
Jan-33	Skid Steer Loaders	4	9.00	65	0.37
Jan-33	Tractors/Loaders/Backhoes	1	0.20	224	0.37
Jan-33	Tractors/Loaders/Backhoes	7	9.00	249	0.37
Jan-33	Tractors/Loaders/Backhoes	4	9.00	349	0.37
Jan-33	Tractors/Loaders/Backhoes	1	9.00	59	0.37
Jan-33	Tractors/Loaders/Backhoes	4	9.00	97	0.37
Jan-33	Tractors/Loaders/Backhoes	1	3.70	97	0.37
Jan-33	Welders	11	9.00	46	0.45
Jan-33	Welders	1	1.40	46	0.45
Jan-33	Welders	1	3.60	46	0.45
Feb-33	Air Compressors	1	0.10	78	0.48
Feb-33	Air Compressors	8	9.00	78	0.48
Feb-33	Air Compressors	1	5.80	78	0.48
Feb-33	Cranes	1	0.90	231	0.29
Feb-33	Cranes	4	9.00	231	0.29
Feb-33	Cranes	1	0.90	231	0.29
Feb-33	Crawler Tractors	1	0.10	212	0.43
Feb-33	Crushing/Proc. Equipment	1	9.00	85	0.78
Feb-33	Excavators	1	2.90	158	0.38
Feb-33	Excavators	2	9.00	158	0.38
Feb-33	Excavators	4	9.00	158	0.38
Feb-33	Forklifts	1	3.60	89	0.20
Feb-33	Forklifts	4	9.00	89	0.20
Feb-33	Forklifts	2	9.00	89	0.20
Feb-33	Forklifts	1	3.60	89	0.20
Feb-33	Forklifts	1	2.10	89	0.20

Feb-33	Graders	1	1.80	199	0.41
Feb-33	Off-Highway Trucks	2	9.00	402	0.38
Feb-33	Off-Highway Trucks	8	9.00	402	0.38
Feb-33	Off-Highway Trucks	1	7.10	402	0.38
Feb-33	Off-Highway Trucks	1	9.00	402	0.38
Feb-33	Off-Highway Trucks	1	7.20	402	0.38
Feb-33	Off-Highway Trucks	1	5.80	402	0.38
Feb-33	Off-Highway Trucks	1	2.20	402	0.38
Feb-33	Off-Highway Trucks	2	9.00	402	0.38
Feb-33	Off-Highway Trucks	1	9.00	142	0.38
Feb-33	Off-Highway Trucks	1	9.00	199	0.38
Feb-33	Off-Highway Trucks	1	4.90	402	0.38
Feb-33	Off-Highway Trucks	1	3.10	142	0.38
Feb-33	Other Construction Equipment	4	9.00	6	0.42
Feb-33	Pavers	1	3.10	130	0.42
Feb-33	Paving Equipment	1	3.10	132	0.36
Feb-33	Pumps	2	9.00	84	0.74
Feb-33	Pumps	1	5.80	84	0.74
Feb-33	Rollers	1	1.80	80	0.38
Feb-33	Rough Terrain Forklifts	1	9.00	100	0.40
Feb-33	Rough Terrain Forklifts	1	0.10	100	0.40
Feb-33	Rough Terrain Forklifts	1	9.00	100	0.40
Feb-33	Skid Steer Loaders	4	9.00	65	0.37
Feb-33	Tractors/Loaders/Backhoes	1	0.20	224	0.37
Feb-33	Tractors/Loaders/Backhoes	7	9.00	249	0.37
Feb-33	Tractors/Loaders/Backhoes	4	9.00	349	0.37
Feb-33	Tractors/Loaders/Backhoes	1	9.00	59	0.37

Feb-33	Tractors/Loaders/Backhoes	4	9.00	97	0.37
Feb-33	Tractors/Loaders/Backhoes	1	3.70	97	0.37
Feb-33	Welders	30	9.00	46	0.45
Feb-33	Welders	1	6.80	46	0.45
Feb-33	Welders	1	3.60	46	0.45
Mar-33	Air Compressors	20	9.00	78	0.48
Mar-33	Air Compressors	1	1.80	78	0.48
Mar-33	Cranes	1	0.90	231	0.29
Mar-33	Cranes	4	9.00	231	0.29
Mar-33	Cranes	1	0.90	231	0.29
Mar-33	Crawler Tractors	1	0.10	159	0.43
Mar-33	Crushing/Proc. Equipment	1	9.00	85	0.78
Mar-33	Excavators	1	2.90	158	0.38
Mar-33	Excavators	2	9.00	158	0.38
Mar-33	Excavators	4	9.00	158	0.38
Mar-33	Forklifts	1	3.60	89	0.20
Mar-33	Forklifts	4	9.00	89	0.20
Mar-33	Forklifts	2	9.00	89	0.20
Mar-33	Forklifts	1	3.60	89	0.20
Mar-33	Graders	1	1.80	199	0.41
Mar-33	Off-Highway Trucks	2	9.00	402	0.38
Mar-33	Off-Highway Trucks	8	9.00	402	0.38
Mar-33	Off-Highway Trucks	1	7.10	402	0.38
Mar-33	Off-Highway Trucks	1	9.00	402	0.38
Mar-33	Off-Highway Trucks	1	7.20	402	0.38
Mar-33	Off-Highway Trucks	1	5.80	402	0.38
Mar-33	Off-Highway Trucks	2	9.00	402	0.38

Mar-33	Off-Highway Trucks	1	9.00	142	0.38
Mar-33	Off-Highway Trucks	1	9.00	199	0.38
Mar-33	Off-Highway Trucks	1	4.90	402	0.38
Mar-33	Off-Highway Trucks	1	3.10	142	0.38
Mar-33	Other Construction Equipment	4	9.00	6	0.42
Mar-33	Pavers	1	3.10	130	0.42
Mar-33	Paving Equipment	1	3.10	132	0.36
Mar-33	Rollers	1	1.80	80	0.38
Mar-33	Rough Terrain Forklifts	1	9.00	100	0.40
Mar-33	Rough Terrain Forklifts	1	0.10	100	0.40
Mar-33	Rough Terrain Forklifts	1	9.00	100	0.40
Mar-33	Skid Steer Loaders	4	9.00	65	0.37
Mar-33	Tractors/Loaders/Backhoes	1	0.20	224	0.37
Mar-33	Tractors/Loaders/Backhoes	7	9.00	249	0.37
Mar-33	Tractors/Loaders/Backhoes	4	9.00	349	0.37
Mar-33	Tractors/Loaders/Backhoes	1	9.00	59	0.37
Mar-33	Tractors/Loaders/Backhoes	4	9.00	97	0.37
Mar-33	Tractors/Loaders/Backhoes	1	3.70	97	0.37
Mar-33	Welders	71	9.00	46	0.45
Mar-33	Welders	1	2.00	46	0.45
Mar-33	Welders	1	3.60	46	0.45
Apr-33	Air Compressors	5	9.00	78	0.48
Apr-33	Air Compressors	1	1.40	78	0.48
Apr-33	Cranes	1	0.90	231	0.29
Apr-33	Cranes	3	9.00	231	0.29
Apr-33	Cranes	1	4.50	231	0.29
Apr-33	Cranes	1	0.90	231	0.29

Apr-33	Crawler Tractors	1	0.10	159	0.43
Apr-33	Crushing/Proc. Equipment	1	7.90	85	0.78
Apr-33	Excavators	2	9.00	158	0.38
Apr-33	Excavators	3	9.00	158	0.38
Apr-33	Excavators	1	4.50	158	0.38
Apr-33	Forklifts	1	3.60	89	0.20
Apr-33	Forklifts	4	9.00	89	0.20
Apr-33	Forklifts	2	9.00	89	0.20
Apr-33	Forklifts	1	3.60	89	0.20
Apr-33	Graders	1	1.80	199	0.41
Apr-33	Off-Highway Trucks	2	9.00	402	0.38
Apr-33	Off-Highway Trucks	7	9.00	402	0.38
Apr-33	Off-Highway Trucks	1	7.10	402	0.38
Apr-33	Off-Highway Trucks	1	7.20	402	0.38
Apr-33	Off-Highway Trucks	1	5.80	402	0.38
Apr-33	Off-Highway Trucks	1	9.00	402	0.38
Apr-33	Off-Highway Trucks	1	9.00	142	0.38
Apr-33	Off-Highway Trucks	1	7.90	199	0.38
Apr-33	Off-Highway Trucks	1	6.80	402	0.38
Apr-33	Off-Highway Trucks	1	3.10	142	0.38
Apr-33	Other Construction Equipment	3	9.00	6	0.42
Apr-33	Other Construction Equipment	1	4.50	6	0.42
Apr-33	Rollers	1	1.80	80	0.38
Apr-33	Rough Terrain Forklifts	1	9.00	100	0.40
Apr-33	Rough Terrain Forklifts	1	0.10	100	0.40
Apr-33	Rough Terrain Forklifts	1	9.00	100	0.40
Apr-33	Skid Steer Loaders	3	9.00	65	0.37

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Apr-33	Skid Steer Loaders	1	4.50	65	0.37
Apr-33	Tractors/Loaders/Backhoes	1	0.20	224	0.37
Apr-33	Tractors/Loaders/Backhoes	7	9.00	249	0.37
Apr-33	Tractors/Loaders/Backhoes	3	9.00	349	0.37
Apr-33	Tractors/Loaders/Backhoes	1	4.50	349	0.37
Apr-33	Tractors/Loaders/Backhoes	1	9.00	59	0.37
Apr-33	Tractors/Loaders/Backhoes	3	9.00	97	0.37
Apr-33	Tractors/Loaders/Backhoes	1	4.50	97	0.37
Apr-33	Tractors/Loaders/Backhoes	1	3.70	97	0.37
Apr-33	Welders	18	9.00	46	0.45
Apr-33	Welders	1	4.70	46	0.45
Apr-33	Welders	1	3.60	46	0.45
May-33	Air Compressors	11	9.00	78	0.48
May-33	Air Compressors	1	8.80	78	0.48
May-33	Cranes	1	0.90	231	0.29
May-33	Cranes	2	9.00	231	0.29
May-33	Cranes	1	0.90	231	0.29
May-33	Crawler Tractors	1	0.10	159	0.43
May-33	Crushing/Proc. Equipment	1	4.50	85	0.78
May-33	Excavators	2	9.00	158	0.38
May-33	Excavators	2	9.00	158	0.38
May-33	Forklifts	1	3.60	89	0.20
May-33	Forklifts	4	9.00	89	0.20
May-33	Forklifts	2	9.00	89	0.20
May-33	Forklifts	1	3.60	89	0.20
May-33	Graders	1	1.80	199	0.41
May-33	Off-Highway Trucks	2	9.00	402	0.38

May-33	Off-Highway Trucks	4	9.00	402	0.38
May-33	Off-Highway Trucks	1	7.10	402	0.38
May-33	Off-Highway Trucks	1	7.20	402	0.38
May-33	Off-Highway Trucks	1	5.80	402	0.38
May-33	Off-Highway Trucks	1	9.00	402	0.38
May-33	Off-Highway Trucks	1	9.00	142	0.38
May-33	Off-Highway Trucks	1	4.50	199	0.38
May-33	Off-Highway Trucks	1	3.10	142	0.38
May-33	Other Construction Equipment	2	9.00	6	0.42
May-33	Rollers	1	1.80	80	0.38
May-33	Rough Terrain Forklifts	1	9.00	100	0.40
May-33	Rough Terrain Forklifts	1	0.10	100	0.40
May-33	Rough Terrain Forklifts	1	9.00	100	0.40
May-33	Skid Steer Loaders	2	9.00	65	0.37
May-33	Tractors/Loaders/Backhoes	1	0.20	224	0.37
May-33	Tractors/Loaders/Backhoes	7	9.00	249	0.37
May-33	Tractors/Loaders/Backhoes	2	9.00	349	0.37
May-33	Tractors/Loaders/Backhoes	1	9.00	59	0.37
May-33	Tractors/Loaders/Backhoes	2	9.00	97	0.37
May-33	Tractors/Loaders/Backhoes	1	3.70	97	0.37
May-33	Welders	54	9.00	46	0.45
May-33	Welders	1	8.50	46	0.45
May-33	Welders	1	3.60	46	0.45
Jun-33	Air Compressors	16	9.00	78	0.48
Jun-33	Air Compressors	1	2.20	78	0.48
Jun-33	Cranes	1	0.90	231	0.29
Jun-33	Cranes	2	9.00	231	0.29

Jun-33	Cranes	1	0.90	231	0.29
Jun-33	Crawler Tractors	1	0.10	159	0.43
Jun-33	Crushing/Proc. Equipment	1	4.50	85	0.78
Jun-33	Excavators	2	9.00	158	0.38
Jun-33	Excavators	2	9.00	158	0.38
Jun-33	Forklifts	1	3.60	89	0.20
Jun-33	Forklifts	4	9.00	89	0.20
Jun-33	Forklifts	2	9.00	89	0.20
Jun-33	Forklifts	1	3.60	89	0.20
Jun-33	Graders	1	1.80	199	0.41
Jun-33	Off-Highway Trucks	2	9.00	402	0.38
Jun-33	Off-Highway Trucks	4	9.00	402	0.38
Jun-33	Off-Highway Trucks	1	7.10	402	0.38
Jun-33	Off-Highway Trucks	1	7.20	402	0.38
Jun-33	Off-Highway Trucks	1	5.80	402	0.38
Jun-33	Off-Highway Trucks	1	9.00	142	0.38
Jun-33	Off-Highway Trucks	1	4.50	199	0.38
Jun-33	Off-Highway Trucks	1	9.00	402	0.38
Jun-33	Off-Highway Trucks	1	3.10	142	0.38
Jun-33	Other Construction Equipment	2	9.00	6	0.42
Jun-33	Rollers	1	1.80	80	0.38
Jun-33	Rough Terrain Forklifts	1	9.00	100	0.40
Jun-33	Rough Terrain Forklifts	1	0.10	100	0.40
Jun-33	Rough Terrain Forklifts	1	9.00	100	0.40
Jun-33	Skid Steer Loaders	2	9.00	65	0.37
Jun-33	Tractors/Loaders/Backhoes	1	0.20	224	0.37
Jun-33	Tractors/Loaders/Backhoes	7	9.00	249	0.37

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Jun-33	Tractors/Loaders/Backhoes	2	9.00	349	0.37
Jun-33	Tractors/Loaders/Backhoes	1	9.00	59	0.37
Jun-33	Tractors/Loaders/Backhoes	2	9.00	97	0.37
Jun-33	Tractors/Loaders/Backhoes	1	3.70	97	0.37
Jun-33	Welders	74	9.00	46	0.45
Jun-33	Welders	1	1.60	46	0.45
Jun-33	Welders	1	3.60	46	0.45
Jul-33	Air Compressors	11	9.00	78	0.48
Jul-33	Air Compressors	1	5.40	78	0.48
Jul-33	Air Compressors	2	9.00	78	0.48
Jul-33	Cranes	7	9.00	231	0.29
Jul-33	Crawler Tractors	1	0.10	159	0.43
Jul-33	Crushing/Proc. Equipment	1	9.00	85	0.78
Jul-33	Crushing/Proc. Equipment	1	6.80	85	0.78
Jul-33	Excavators	2	9.00	158	0.38
Jul-33	Excavators	7	9.00	158	0.38
Jul-33	Forklifts	4	9.00	89	0.20
Jul-33	Forklifts	2	9.00	89	0.20
Jul-33	Graders	1	1.80	199	0.41
Jul-33	Off-Highway Trucks	2	9.00	402	0.38
Jul-33	Off-Highway Trucks	8	9.00	402	0.38
Jul-33	Off-Highway Trucks	1	7.10	402	0.38
Jul-33	Off-Highway Trucks	1	5.80	402	0.38
Jul-33	Off-Highway Trucks	3	9.00	402	0.38
Jul-33	Off-Highway Trucks	1	4.50	402	0.38
Jul-33	Off-Highway Trucks	1	9.00	142	0.38
Jul-33	Off-Highway Trucks	1	9.00	199	0.38

Jul-33	Off-Highway Trucks	1	3.10	142	0.38
Jul-33	Off-Highway Trucks	1	6.80	199	0.38
Jul-33	Other Construction Equipment	7	9.00	6	0.42
Jul-33	Rollers	1	1.80	80	0.38
Jul-33	Rough Terrain Forklifts	1	9.00	100	0.40
Jul-33	Rough Terrain Forklifts	1	0.10	100	0.40
Jul-33	Rough Terrain Forklifts	1	9.00	100	0.40
Jul-33	Skid Steer Loaders	7	9.00	65	0.37
Jul-33	Tractors/Loaders/Backhoes	1	0.20	224	0.37
Jul-33	Tractors/Loaders/Backhoes	7	9.00	249	0.37
Jul-33	Tractors/Loaders/Backhoes	2	9.00	349	0.37
Jul-33	Tractors/Loaders/Backhoes	1	9.00	59	0.37
Jul-33	Tractors/Loaders/Backhoes	4	9.00	97	0.37
Jul-33	Tractors/Loaders/Backhoes	1	3.70	97	0.37
Jul-33	Welders	52	9.00	46	0.45
Jul-33	Welders	1	5.00	46	0.45
Aug-33	Air Compressors	10	9.00	78	0.48
Aug-33	Air Compressors	1	0.60	78	0.48
Aug-33	Cranes	7	9.00	231	0.29
Aug-33	Crawler Tractors	1	0.10	159	0.43
Aug-33	Crushing/Proc. Equipment	1	9.00	85	0.78
Aug-33	Crushing/Proc. Equipment	1	6.80	85	0.78
Aug-33	Excavators	2	9.00	158	0.38
Aug-33	Excavators	7	9.00	158	0.38
Aug-33	Forklifts	1	7.20	89	0.20
Aug-33	Forklifts	4	9.00	89	0.20
Aug-33	Forklifts	2	9.00	89	0.20

Aug-33	Forklifts	1	3.60	89	0.20
Aug-33	Graders	1	1.80	199	0.41
Aug-33	Off-Highway Trucks	2	9.00	402	0.38
Aug-33	Off-Highway Trucks	8	9.00	402	0.38
Aug-33	Off-Highway Trucks	1	7.10	402	0.38
Aug-33	Off-Highway Trucks	1	3.60	402	0.38
Aug-33	Off-Highway Trucks	1	5.80	402	0.38
Aug-33	Off-Highway Trucks	3	9.00	402	0.38
Aug-33	Off-Highway Trucks	1	4.50	402	0.38
Aug-33	Off-Highway Trucks	1	9.00	142	0.38
Aug-33	Off-Highway Trucks	1	9.00	199	0.38
Aug-33	Off-Highway Trucks	1	3.10	142	0.38
Aug-33	Off-Highway Trucks	1	6.80	199	0.38
Aug-33	Other Construction Equipment	7	9.00	6	0.42
Aug-33	Paving Equipment	1	0.20	132	0.36
Aug-33	Rollers	1	1.80	80	0.38
Aug-33	Rough Terrain Forklifts	1	9.00	100	0.40
Aug-33	Rough Terrain Forklifts	1	0.10	100	0.40
Aug-33	Rough Terrain Forklifts	1	9.00	100	0.40
Aug-33	Skid Steer Loaders	7	9.00	65	0.37
Aug-33	Tractors/Loaders/Backhoes	1	0.20	224	0.37
Aug-33	Tractors/Loaders/Backhoes	7	9.00	249	0.37
Aug-33	Tractors/Loaders/Backhoes	2	9.00	349	0.37
Aug-33	Tractors/Loaders/Backhoes	1	9.00	59	0.37
Aug-33	Tractors/Loaders/Backhoes	4	9.00	97	0.37
Aug-33	Tractors/Loaders/Backhoes	1	3.70	97	0.37
Aug-33	Welders	52	9.00	46	0.45

Aug-33	Welders	1	1.90	46	0.45
Sep-33	Air Compressors	7	9.00	78	0.48
Sep-33	Air Compressors	1	6.30	78	0.48
Sep-33	Air Compressors	4	9.00	78	0.48
Sep-33	Cranes	7	9.00	231	0.29
Sep-33	Crawler Tractors	1	0.10	159	0.43
Sep-33	Crushing/Proc. Equipment	1	9.00	85	0.78
Sep-33	Crushing/Proc. Equipment	1	6.80	85	0.78
Sep-33	Excavators	2	9.00	158	0.38
Sep-33	Excavators	7	9.00	158	0.38
Sep-33	Forklifts	1	7.20	89	0.20
Sep-33	Forklifts	4	9.00	89	0.20
Sep-33	Forklifts	2	9.00	89	0.20
Sep-33	Forklifts	1	3.60	89	0.20
Sep-33	Generator Sets	1	4.50	84	0.74
Sep-33	Graders	1	1.80	199	0.41
Sep-33	Off-Highway Trucks	2	9.00	402	0.38
Sep-33	Off-Highway Trucks	8	9.00	402	0.38
Sep-33	Off-Highway Trucks	1	7.10	402	0.38
Sep-33	Off-Highway Trucks	1	3.60	402	0.38
Sep-33	Off-Highway Trucks	1	5.80	402	0.38
Sep-33	Off-Highway Trucks	1	4.50	402	0.38
Sep-33	Off-Highway Trucks	3	9.00	402	0.38
Sep-33	Off-Highway Trucks	1	4.50	402	0.38
Sep-33	Off-Highway Trucks	1	9.00	142	0.38
Sep-33	Off-Highway Trucks	1	9.00	199	0.38
Sep-33	Off-Highway Trucks	1	3.10	142	0.38

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Sep-33	Off-Highway Trucks	1	6.80	199	0.38
Sep-33	Other Construction Equipment	7	9.00	6	0.42
Sep-33	Paving Equipment	1	0.20	132	0.36
Sep-33	Rollers	1	1.80	80	0.38
Sep-33	Rough Terrain Forklifts	1	9.00	100	0.40
Sep-33	Rough Terrain Forklifts	1	0.10	100	0.40
Sep-33	Rough Terrain Forklifts	1	9.00	100	0.40
Sep-33	Skid Steer Loaders	7	9.00	65	0.37
Sep-33	Tractors/Loaders/Backhoes	1	0.20	224	0.37
Sep-33	Tractors/Loaders/Backhoes	7	9.00	249	0.37
Sep-33	Tractors/Loaders/Backhoes	2	9.00	349	0.37
Sep-33	Tractors/Loaders/Backhoes	1	9.00	59	0.37
Sep-33	Tractors/Loaders/Backhoes	4	9.00	97	0.37
Sep-33	Tractors/Loaders/Backhoes	1	3.70	97	0.37
Sep-33	Welders	39	9.00	46	0.45
Sep-33	Welders	1	8.30	46	0.45
Oct-33	Air Compressors	6	9.00	78	0.48
Oct-33	Air Compressors	1	8.20	78	0.48
Oct-33	Air Compressors	4	9.00	78	0.48
Oct-33	Cranes	7	9.00	231	0.29
Oct-33	Crawler Tractors	1	0.10	159	0.43
Oct-33	Crushing/Proc. Equipment	1	9.00	85	0.78
Oct-33	Crushing/Proc. Equipment	1	6.80	85	0.78
Oct-33	Excavators	2	9.00	158	0.38
Oct-33	Excavators	7	9.00	158	0.38
Oct-33	Forklifts	1	7.20	89	0.20
Oct-33	Forklifts	4	9.00	89	0.20

Oct-33	Forklifts	2	9.00	89	0.20
Oct-33	Forklifts	1	3.60	89	0.20
Oct-33	Generator Sets	1	4.50	84	0.74
Oct-33	Generator Sets	1	0.20	84	0.74
Oct-33	Graders	1	1.80	199	0.41
Oct-33	Off-Highway Trucks	2	9.00	402	0.38
Oct-33	Off-Highway Trucks	8	9.00	402	0.38
Oct-33	Off-Highway Trucks	1	7.10	402	0.38
Oct-33	Off-Highway Trucks	1	3.60	402	0.38
Oct-33	Off-Highway Trucks	1	5.80	402	0.38
Oct-33	Off-Highway Trucks	1	4.50	402	0.38
Oct-33	Off-Highway Trucks	3	9.00	402	0.38
Oct-33	Off-Highway Trucks	1	4.50	402	0.38
Oct-33	Off-Highway Trucks	1	9.00	142	0.38
Oct-33	Off-Highway Trucks	1	9.00	199	0.38
Oct-33	Off-Highway Trucks	1	3.10	142	0.38
Oct-33	Off-Highway Trucks	1	6.80	199	0.38
Oct-33	Other Construction Equipment	7	9.00	6	0.42
Oct-33	Paving Equipment	1	0.20	132	0.36
Oct-33	Rollers	1	1.80	80	0.38
Oct-33	Rough Terrain Forklifts	1	9.00	100	0.40
Oct-33	Rough Terrain Forklifts	1	0.20	100	0.40
Oct-33	Rough Terrain Forklifts	1	9.00	100	0.40
Oct-33	Skid Steer Loaders	7	9.00	65	0.37
Oct-33	Tractors/Loaders/Backhoes	1	0.20	224	0.37
Oct-33	Tractors/Loaders/Backhoes	7	9.00	249	0.37
Oct-33	Tractors/Loaders/Backhoes	2	9.00	349	0.37

Oct-33	Tractors/Loaders/Backhoes	1	9.00	59	0.37
Oct-33	Tractors/Loaders/Backhoes	4	9.00	97	0.37
Oct-33	Tractors/Loaders/Backhoes	1	3.70	97	0.37
Oct-33	Welders	35	9.00	46	0.45
Oct-33	Welders	1	7.40	46	0.45
Oct-33	Welders	1	0.70	46	0.45
Nov-33	Aerial Lifts	1	9.00	63	0.31
Nov-33	Air Compressors	8	9.00	78	0.48
Nov-33	Air Compressors	1	0.90	78	0.48
Nov-33	Air Compressors	3	9.00	78	0.48
Nov-33	Cranes	6	9.00	231	0.29
Nov-33	Cranes	1	9.00	231	0.29
Nov-33	Crawler Tractors	1	0.10	159	0.43
Nov-33	Crushing/Proc. Equipment	1	9.00	85	0.78
Nov-33	Crushing/Proc. Equipment	1	4.50	85	0.78
Nov-33	Excavators	2	9.00	158	0.38
Nov-33	Excavators	2	9.00	158	0.38
Nov-33	Excavators	10	9.00	158	0.38
Nov-33	Excavators	1	0.30	158	0.38
Nov-33	Excavators	6	9.00	158	0.38
Nov-33	Forklifts	1	7.20	89	0.20
Nov-33	Forklifts	4	9.00	89	0.20
Nov-33	Forklifts	2	9.00	89	0.20
Nov-33	Forklifts	1	3.60	89	0.20
Nov-33	Generator Sets	1	9.00	84	0.74
Nov-33	Generator Sets	1	4.50	84	0.74
Nov-33	Generator Sets	1	0.20	84	0.74

Nov-33	Graders	1	1.80	199	0.41
Nov-33	Off-Highway Trucks	2	9.00	402	0.38
Nov-33	Off-Highway Trucks	8	9.00	402	0.38
Nov-33	Off-Highway Trucks	1	0.30	402	0.38
Nov-33	Off-Highway Trucks	1	7.10	402	0.38
Nov-33	Off-Highway Trucks	1	3.60	402	0.38
Nov-33	Off-Highway Trucks	1	5.80	402	0.38
Nov-33	Off-Highway Trucks	1	4.50	402	0.38
Nov-33	Off-Highway Trucks	2	9.00	402	0.38
Nov-33	Off-Highway Trucks	3	9.00	402	0.38
Nov-33	Off-Highway Trucks	1	9.00	142	0.38
Nov-33	Off-Highway Trucks	1	15.00	199	0.38
Nov-33	Off-Highway Trucks	1	3.10	142	0.38
Nov-33	Off-Highway Trucks	1	4.50	199	0.38
Nov-33	Other Construction Equipment	1	9.00	6	0.42
Nov-33	Other Construction Equipment	6	9.00	6	0.42
Nov-33	Other Construction Equipment	5	9.00	15	0.42
Nov-33	Other Construction Equipment	1	9.00	6	0.42
Nov-33	Pavers	1	0.90	130	0.42
Nov-33	Paving Equipment	1	0.20	132	0.36
Nov-33	Paving Equipment	1	0.30	132	0.36
Nov-33	Pumps	1	9.00	84	0.74
Nov-33	Rollers	1	1.80	80	0.38
Nov-33	Rough Terrain Forklifts	1	9.00	100	0.40
Nov-33	Rough Terrain Forklifts	1	0.70	100	0.40
Nov-33	Rough Terrain Forklifts	2	9.00	100	0.40
Nov-33	Rough Terrain Forklifts	1	9.00	100	0.40

Nov-33	Skid Steer Loaders	4	9.00	65	0.37
Nov-33	Tractors/Loaders/Backhoes	1	0.20	224	0.37
Nov-33	Tractors/Loaders/Backhoes	7	9.00	249	0.37
Nov-33	Tractors/Loaders/Backhoes	2	9.00	349	0.37
Nov-33	Tractors/Loaders/Backhoes	2	9.00	999	0.37
Nov-33	Tractors/Loaders/Backhoes	1	9.00	59	0.37
Nov-33	Tractors/Loaders/Backhoes	4	9.00	97	0.37
Nov-33	Tractors/Loaders/Backhoes	1	3.70	97	0.37
Nov-33	Welders	41	9.00	46	0.45
Nov-33	Welders	1	8.60	46	0.45
Nov-33	Welders	1	0.70	46	0.45
Dec-33	Aerial Lifts	1	9.00	63	0.31
Dec-33	Air Compressors	3	9.00	78	0.48
Dec-33	Cranes	4	9.00	231	0.29
Dec-33	Cranes	1	9.00	231	0.29
Dec-33	Cranes	1	9.00	231	0.29
Dec-33	Crawler Tractors	1	0.10	159	0.43
Dec-33	Crushing/Proc. Equipment	3	9.00	85	0.78
Dec-33	Crushing/Proc. Equipment	1	4.50	85	0.78
Dec-33	Excavators	2	9.00	158	0.38
Dec-33	Excavators	2	9.00	158	0.38
Dec-33	Excavators	10	9.00	158	0.38
Dec-33	Excavators	2	9.00	158	0.38
Dec-33	Excavators	9	9.00	158	0.38
Dec-33	Forklifts	1	7.20	89	0.20
Dec-33	Forklifts	4	9.00	89	0.20
Dec-33	Forklifts	2	9.00	89	0.20

Dec-33	Forklifts	1	3.60	89	0.20
Dec-33	Generator Sets	1	9.00	84	0.74
Dec-33	Generator Sets	1	4.50	84	0.74
Dec-33	Graders	1	1.80	199	0.41
Dec-33	Off-Highway Trucks	2	9.00	402	0.38
Dec-33	Off-Highway Trucks	8	9.00	402	0.38
Dec-33	Off-Highway Trucks	1	7.10	402	0.38
Dec-33	Off-Highway Trucks	1	3.60	402	0.38
Dec-33	Off-Highway Trucks	2	5.80	402	0.38
Dec-33	Off-Highway Trucks	1	4.50	402	0.38
Dec-33	Off-Highway Trucks	2	9.00	402	0.38
Dec-33	Off-Highway Trucks	6	9.00	402	0.38
Dec-33	Off-Highway Trucks	1	9.00	142	0.38
Dec-33	Off-Highway Trucks	3	9.00	199	0.38
Dec-33	Off-Highway Trucks	1	4.50	199	0.38
Dec-33	Off-Highway Trucks	1	3.10	142	0.38
Dec-33	Other Construction Equipment	1	9.00	6	0.42
Dec-33	Other Construction Equipment	12	9.00	6	0.42
Dec-33	Other Construction Equipment	5	9.00	15	0.42
Dec-33	Other Construction Equipment	1	9.00	6	0.42
Dec-33	Paving Equipment	1	0.20	132	0.36
Dec-33	Pumps	1	9.00	84	0.74
Dec-33	Rollers	1	1.80	80	0.38
Dec-33	Rough Terrain Forklifts	1	9.00	100	0.40
Dec-33	Rough Terrain Forklifts	1	0.10	100	0.40
Dec-33	Rough Terrain Forklifts	2	9.00	100	0.40
Dec-33	Rough Terrain Forklifts	1	9.00	100	0.40

Dec-33	Skid Steer Loaders	4	9.00	65	0.37
Dec-33	Tractors/Loaders/Backhoes	1	0.20	224	0.37
Dec-33	Tractors/Loaders/Backhoes	7	9.00	249	0.37
Dec-33	Tractors/Loaders/Backhoes	2	9.00	349	0.37
Dec-33	Tractors/Loaders/Backhoes	2	9.00	999	0.37
Dec-33	Tractors/Loaders/Backhoes	1	9.00	59	0.37
Dec-33	Tractors/Loaders/Backhoes	4	9.00	97	0.37
Dec-33	Tractors/Loaders/Backhoes	1	3.70	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Jan-33	93	431.00	0.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Feb-33	123	429.00	0.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Mar-33	170	517.00	0.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Apr-33	96	409.00	0.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
May-33	122	425.00	0.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Jun-33	147	381.00	0.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Jul-33	147	406.00	0.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Aug-33	148	405.00	0.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Sep-33	138	397.00	0.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Oct-33	135	436.00	0.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Nov-33	168	442.00	0.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Dec-33	129	426.00	0.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

3.2 Jan-33 - 2033

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0432	0.0000	0.0432	6.5500e-003	0.0000	6.5500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2344	0.8220	1.9154	5.8400e-003		0.0219	0.0219		0.0219	0.0219	0.0000	534.4626	534.4626	0.0188	0.0000	534.9315
Total	**0.2344**	**0.8220**	**1.9154**	**5.8400e-003**	**0.0432**	**0.0219**	**0.0651**	**6.5500e-003**	**0.0219**	**0.0284**	**0.0000**	**534.4626**	**534.4626**	**0.0188**	**0.0000**	**534.9315**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0125	7.7800e-003	0.0865	4.2000e-004	0.0702	2.3000e-004	0.0704	0.0187	2.1000e-004	0.0189	0.0000	38.3902	38.3902	4.8000e-004	0.0000	38.4023
Total	**0.0125**	**7.7800e-003**	**0.0865**	**4.2000e-004**	**0.0702**	**2.3000e-004**	**0.0704**	**0.0187**	**2.1000e-004**	**0.0189**	**0.0000**	**38.3902**	**38.3902**	**4.8000e-004**	**0.0000**	**38.4023**

3.2 Jan-33 - 2033

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0432	0.0000	0.0432	6.5500e-003	0.0000	6.5500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0663	0.5307	2.7424	5.8400e-003		0.0140	0.0140		0.0140	0.0140	0.0000	534.4620	534.4620	0.0188	0.0000	534.9308
Total	**0.0663**	**0.5307**	**2.7424**	**5.8400e-003**	**0.0432**	**0.0140**	**0.0572**	**6.5500e-003**	**0.0140**	**0.0205**	**0.0000**	**534.4620**	**534.4620**	**0.0188**	**0.0000**	**534.9308**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0125	7.7800e-003	0.0865	4.2000e-004	0.0702	2.3000e-004	0.0704	0.0187	2.1000e-004	0.0189	0.0000	38.3902	38.3902	4.8000e-004	0.0000	38.4023
Total	**0.0125**	**7.7800e-003**	**0.0865**	**4.2000e-004**	**0.0702**	**2.3000e-004**	**0.0704**	**0.0187**	**2.1000e-004**	**0.0189**	**0.0000**	**38.3902**	**38.3902**	**4.8000e-004**	**0.0000**	**38.4023**

3.3 Feb-33 - 2033

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0432	0.0000	0.0432	6.5500e-003	0.0000	6.5500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2962	1.1950	2.5177	6.9900e-003		0.0287	0.0287		0.0287	0.0287	0.0000	631.1782	631.1782	0.0237	0.0000	631.7713
Total	**0.2962**	**1.1950**	**2.5177**	**6.9900e-003**	**0.0432**	**0.0287**	**0.0719**	**6.5500e-003**	**0.0287**	**0.0352**	**0.0000**	**631.1782**	**631.1782**	**0.0237**	**0.0000**	**631.7713**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0124	7.7400e-003	0.0861	4.2000e-004	0.0699	2.3000e-004	0.0701	0.0186	2.1000e-004	0.0188	0.0000	38.2120	38.2120	4.8000e-004	0.0000	38.2241
Total	**0.0124**	**7.7400e-003**	**0.0861**	**4.2000e-004**	**0.0699**	**2.3000e-004**	**0.0701**	**0.0186**	**2.1000e-004**	**0.0188**	**0.0000**	**38.2120**	**38.2120**	**4.8000e-004**	**0.0000**	**38.2241**

3.3 Feb-33 - 2033

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0432	0.0000	0.0432	6.5500e-003	0.0000	6.5500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0824	0.9248	3.3875	6.9900e-003		0.0251	0.0251		0.0251	0.0251	0.0000	631.1775	631.1775	0.0237	0.0000	631.7706
Total	**0.0824**	**0.9248**	**3.3875**	**6.9900e-003**	**0.0432**	**0.0251**	**0.0684**	**6.5500e-003**	**0.0251**	**0.0317**	**0.0000**	**631.1775**	**631.1775**	**0.0237**	**0.0000**	**631.7706**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0124	7.7400e-003	0.0861	4.2000e-004	0.0699	2.3000e-004	0.0701	0.0186	2.1000e-004	0.0188	0.0000	38.2120	38.2120	4.8000e-004	0.0000	38.2241
Total	**0.0124**	**7.7400e-003**	**0.0861**	**4.2000e-004**	**0.0699**	**2.3000e-004**	**0.0701**	**0.0186**	**2.1000e-004**	**0.0188**	**0.0000**	**38.2120**	**38.2120**	**4.8000e-004**	**0.0000**	**38.2241**

3.4 Mar-33 - 2033

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0432	0.0000	0.0432	6.5500e-003	0.0000	6.5500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.3854	1.8284	3.4372	8.4300e-003		0.0384	0.0384		0.0384	0.0384	0.0000	739.9940	739.9940	0.0309	0.0000	740.7664
Total	**0.3854**	**1.8284**	**3.4372**	**8.4300e-003**	**0.0432**	**0.0384**	**0.0816**	**6.5500e-003**	**0.0384**	**0.0449**	**0.0000**	**739.9940**	**739.9940**	**0.0309**	**0.0000**	**740.7664**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0150	9.3300e-003	0.1038	5.1000e-004	0.0842	2.7000e-004	0.0845	0.0224	2.5000e-004	0.0226	0.0000	46.0504	46.0504	5.8000e-004	0.0000	46.0649
Total	**0.0150**	**9.3300e-003**	**0.1038**	**5.1000e-004**	**0.0842**	**2.7000e-004**	**0.0845**	**0.0224**	**2.5000e-004**	**0.0226**	**0.0000**	**46.0504**	**46.0504**	**5.8000e-004**	**0.0000**	**46.0649**

3.4 Mar-33 - 2033

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0432	0.0000	0.0432	6.5500e-003	0.0000	6.5500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1051	1.6927	4.2464	8.4300e-003		0.0468	0.0468		0.0468	0.0468	0.0000	739.9932	739.9932	0.0309	0.0000	740.7655
Total	**0.1051**	**1.6927**	**4.2464**	**8.4300e-003**	**0.0432**	**0.0468**	**0.0900**	**6.5500e-003**	**0.0468**	**0.0533**	**0.0000**	**739.9932**	**739.9932**	**0.0309**	**0.0000**	**740.7655**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0150	9.3300e-003	0.1038	5.1000e-004	0.0842	2.7000e-004	0.0845	0.0224	2.5000e-004	0.0226	0.0000	46.0504	46.0504	5.8000e-004	0.0000	46.0649
Total	**0.0150**	**9.3300e-003**	**0.1038**	**5.1000e-004**	**0.0842**	**2.7000e-004**	**0.0845**	**0.0224**	**2.5000e-004**	**0.0226**	**0.0000**	**46.0504**	**46.0504**	**5.8000e-004**	**0.0000**	**46.0649**

3.5 Apr-33 - 2033

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0432	0.0000	0.0432	6.5500e-003	0.0000	6.5500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2300	0.8490	1.8808	5.5500e-003		0.0213	0.0213		0.0213	0.0213	0.0000	503.5561	503.5561	0.0184	0.0000	504.0163
Total	**0.2300**	**0.8490**	**1.8808**	**5.5500e-003**	**0.0432**	**0.0213**	**0.0645**	**6.5500e-003**	**0.0213**	**0.0278**	**0.0000**	**503.5561**	**503.5561**	**0.0184**	**0.0000**	**504.0163**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0119	7.3800e-003	0.0821	4.0000e-004	0.0666	2.2000e-004	0.0668	0.0177	2.0000e-004	0.0179	0.0000	36.4306	36.4306	4.6000e-004	0.0000	36.4421
Total	**0.0119**	**7.3800e-003**	**0.0821**	**4.0000e-004**	**0.0666**	**2.2000e-004**	**0.0668**	**0.0177**	**2.0000e-004**	**0.0179**	**0.0000**	**36.4306**	**36.4306**	**4.6000e-004**	**0.0000**	**36.4421**

3.5 Apr-33 - 2033

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0432	0.0000	0.0432	6.5500e-003	0.0000	6.5500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0644	0.6391	2.6226	5.5500e-003		0.0171	0.0171		0.0171	0.0171	0.0000	503.5555	503.5555	0.0184	0.0000	504.0157
Total	**0.0644**	**0.6391**	**2.6226**	**5.5500e-003**	**0.0432**	**0.0171**	**0.0604**	**6.5500e-003**	**0.0171**	**0.0237**	**0.0000**	**503.5555**	**503.5555**	**0.0184**	**0.0000**	**504.0157**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0119	7.3800e-003	0.0821	4.0000e-004	0.0666	2.2000e-004	0.0668	0.0177	2.0000e-004	0.0179	0.0000	36.4306	36.4306	4.6000e-004	0.0000	36.4421
Total	**0.0119**	**7.3800e-003**	**0.0821**	**4.0000e-004**	**0.0666**	**2.2000e-004**	**0.0668**	**0.0177**	**2.0000e-004**	**0.0179**	**0.0000**	**36.4306**	**36.4306**	**4.6000e-004**	**0.0000**	**36.4421**

3.6 May-33 - 2033

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0432	0.0000	0.0432	6.5500e-003	0.0000	6.5500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2631	1.2921	2.3791	5.7000e-003		0.0259	0.0259		0.0259	0.0259	0.0000	493.7482	493.7482	0.0211	0.0000	494.2758
Total	**0.2631**	**1.2921**	**2.3791**	**5.7000e-003**	**0.0432**	**0.0259**	**0.0691**	**6.5500e-003**	**0.0259**	**0.0324**	**0.0000**	**493.7482**	**493.7482**	**0.0211**	**0.0000**	**494.2758**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0123	7.6700e-003	0.0853	4.2000e-004	0.0692	2.2000e-004	0.0694	0.0184	2.1000e-004	0.0186	0.0000	37.8557	37.8557	4.8000e-004	0.0000	37.8677
Total	**0.0123**	**7.6700e-003**	**0.0853**	**4.2000e-004**	**0.0692**	**2.2000e-004**	**0.0694**	**0.0184**	**2.1000e-004**	**0.0186**	**0.0000**	**37.8557**	**37.8557**	**4.8000e-004**	**0.0000**	**37.8677**

3.6 May-33 - 2033

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0432	0.0000	0.0432	6.5500e-003	0.0000	6.5500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0719	1.2583	2.8816	5.7000e-003		0.0349	0.0349		0.0349	0.0349	0.0000	493.7476	493.7476	0.0211	0.0000	494.2752
Total	**0.0719**	**1.2583**	**2.8816**	**5.7000e-003**	**0.0432**	**0.0349**	**0.0782**	**6.5500e-003**	**0.0349**	**0.0415**	**0.0000**	**493.7476**	**493.7476**	**0.0211**	**0.0000**	**494.2752**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0123	7.6700e-003	0.0853	4.2000e-004	0.0692	2.2000e-004	0.0694	0.0184	2.1000e-004	0.0186	0.0000	37.8557	37.8557	4.8000e-004	0.0000	37.8677
Total	**0.0123**	**7.6700e-003**	**0.0853**	**4.2000e-004**	**0.0692**	**2.2000e-004**	**0.0694**	**0.0184**	**2.1000e-004**	**0.0186**	**0.0000**	**37.8557**	**37.8557**	**4.8000e-004**	**0.0000**	**37.8677**

3.7 Jun-33 - 2033

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0432	0.0000	0.0432	6.5500e-003	0.0000	6.5500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.3070	1.6054	2.8407	6.4400e-003		0.0307	0.0307		0.0307	0.0307	0.0000	550.8153	550.8153	0.0246	0.0000	551.4311
Total	**0.3070**	**1.6054**	**2.8407**	**6.4400e-003**	**0.0432**	**0.0307**	**0.0740**	**6.5500e-003**	**0.0307**	**0.0373**	**0.0000**	**550.8153**	**550.8153**	**0.0246**	**0.0000**	**551.4311**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0110	6.8800e-003	0.0765	3.7000e-004	0.0621	2.0000e-004	0.0623	0.0165	1.8000e-004	0.0167	0.0000	33.9365	33.9365	4.3000e-004	0.0000	33.9473
Total	**0.0110**	**6.8800e-003**	**0.0765**	**3.7000e-004**	**0.0621**	**2.0000e-004**	**0.0623**	**0.0165**	**1.8000e-004**	**0.0167**	**0.0000**	**33.9365**	**33.9365**	**4.3000e-004**	**0.0000**	**33.9473**

3.7 Jun-33 - 2033

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0432	0.0000	0.0432	6.5500e-003	0.0000	6.5500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0833	1.6260	3.3228	6.4400e-003		0.0453	0.0453		0.0453	0.0453	0.0000	550.8146	550.8146	0.0246	0.0000	551.4304
Total	**0.0833**	**1.6260**	**3.3228**	**6.4400e-003**	**0.0432**	**0.0453**	**0.0885**	**6.5500e-003**	**0.0453**	**0.0519**	**0.0000**	**550.8146**	**550.8146**	**0.0246**	**0.0000**	**551.4304**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0110	6.8800e-003	0.0765	3.7000e-004	0.0621	2.0000e-004	0.0623	0.0165	1.8000e-004	0.0167	0.0000	33.9365	33.9365	4.3000e-004	0.0000	33.9473
Total	**0.0110**	**6.8800e-003**	**0.0765**	**3.7000e-004**	**0.0621**	**2.0000e-004**	**0.0623**	**0.0165**	**1.8000e-004**	**0.0167**	**0.0000**	**33.9365**	**33.9365**	**4.3000e-004**	**0.0000**	**33.9473**

3.8 Jul-33 - 2033

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0432	0.0000	0.0432	6.5500e-003	0.0000	6.5500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.3439	1.5351	3.0545	7.7400e-003		0.0338	0.0338		0.0338	0.0338	0.0000	684.4309	684.4309	0.0276	0.0000	685.1203
Total	**0.3439**	**1.5351**	**3.0545**	**7.7400e-003**	**0.0432**	**0.0338**	**0.0770**	**6.5500e-003**	**0.0338**	**0.0404**	**0.0000**	**684.4309**	**684.4309**	**0.0276**	**0.0000**	**685.1203**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0118	7.3300e-003	0.0815	4.0000e-004	0.0661	2.1000e-004	0.0663	0.0176	2.0000e-004	0.0178	0.0000	36.1634	36.1634	4.6000e-004	0.0000	36.1748
Total	**0.0118**	**7.3300e-003**	**0.0815**	**4.0000e-004**	**0.0661**	**2.1000e-004**	**0.0663**	**0.0176**	**2.0000e-004**	**0.0178**	**0.0000**	**36.1634**	**36.1634**	**4.6000e-004**	**0.0000**	**36.1748**

3.8 Jul-33 - 2033

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0432	0.0000	0.0432	6.5500e-003	0.0000	6.5500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0947	1.3639	3.8532	7.7400e-003		0.0365	0.0365		0.0365	0.0365	0.0000	684.4301	684.4301	0.0276	0.0000	685.1195
Total	**0.0947**	**1.3639**	**3.8532**	**7.7400e-003**	**0.0432**	**0.0365**	**0.0797**	**6.5500e-003**	**0.0365**	**0.0431**	**0.0000**	**684.4301**	**684.4301**	**0.0276**	**0.0000**	**685.1195**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0118	7.3300e-003	0.0815	4.0000e-004	0.0661	2.1000e-004	0.0663	0.0176	2.0000e-004	0.0178	0.0000	36.1634	36.1634	4.6000e-004	0.0000	36.1748
Total	**0.0118**	**7.3300e-003**	**0.0815**	**4.0000e-004**	**0.0661**	**2.1000e-004**	**0.0663**	**0.0176**	**2.0000e-004**	**0.0178**	**0.0000**	**36.1634**	**36.1634**	**4.6000e-004**	**0.0000**	**36.1748**

3.9 Aug-33 - 2033

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0432	0.0000	0.0432	6.5500e-003	0.0000	6.5500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.3402	1.4976	2.9832	7.6600e-003		0.0330	0.0330		0.0330	0.0330	0.0000	678.7129	678.7129	0.0273	0.0000	679.3951
Total	**0.3402**	**1.4976**	**2.9832**	**7.6600e-003**	**0.0432**	**0.0330**	**0.0762**	**6.5500e-003**	**0.0330**	**0.0395**	**0.0000**	**678.7129**	**678.7129**	**0.0273**	**0.0000**	**679.3951**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0117	7.3100e-003	0.0813	4.0000e-004	0.0660	2.1000e-004	0.0662	0.0175	2.0000e-004	0.0177	0.0000	36.0743	36.0743	4.6000e-004	0.0000	36.0857
Total	**0.0117**	**7.3100e-003**	**0.0813**	**4.0000e-004**	**0.0660**	**2.1000e-004**	**0.0662**	**0.0175**	**2.0000e-004**	**0.0177**	**0.0000**	**36.0743**	**36.0743**	**4.6000e-004**	**0.0000**	**36.0857**

3.9 Aug-33 - 2033

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0432	0.0000	0.0432	6.5500e-003	0.0000	6.5500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0939	1.3549	3.7934	7.6600e-003		0.0362	0.0362		0.0362	0.0362	0.0000	678.7121	678.7121	0.0273	0.0000	679.3943
Total	**0.0939**	**1.3549**	**3.7934**	**7.6600e-003**	**0.0432**	**0.0362**	**0.0795**	**6.5500e-003**	**0.0362**	**0.0428**	**0.0000**	**678.7121**	**678.7121**	**0.0273**	**0.0000**	**679.3943**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0117	7.3100e-003	0.0813	4.0000e-004	0.0660	2.1000e-004	0.0662	0.0175	2.0000e-004	0.0177	0.0000	36.0743	36.0743	4.6000e-004	0.0000	36.0857
Total	**0.0117**	**7.3100e-003**	**0.0813**	**4.0000e-004**	**0.0660**	**2.1000e-004**	**0.0662**	**0.0175**	**2.0000e-004**	**0.0177**	**0.0000**	**36.0743**	**36.0743**	**4.6000e-004**	**0.0000**	**36.0857**

3.10 Sep-33 - 2033

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0432	0.0000	0.0432	6.5500e-003	0.0000	6.5500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.3251	1.3704	2.8430	7.4900e-003		0.0317	0.0317		0.0317	0.0317	0.0000	669.9394	669.9394	0.0261	0.0000	670.5909
Total	**0.3251**	**1.3704**	**2.8430**	**7.4900e-003**	**0.0432**	**0.0317**	**0.0749**	**6.5500e-003**	**0.0317**	**0.0382**	**0.0000**	**669.9394**	**669.9394**	**0.0261**	**0.0000**	**670.5909**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0115	7.1700e-003	0.0797	3.9000e-004	0.0647	2.1000e-004	0.0649	0.0172	1.9000e-004	0.0174	0.0000	35.3617	35.3617	4.5000e-004	0.0000	35.3729
Total	**0.0115**	**7.1700e-003**	**0.0797**	**3.9000e-004**	**0.0647**	**2.1000e-004**	**0.0649**	**0.0172**	**1.9000e-004**	**0.0174**	**0.0000**	**35.3617**	**35.3617**	**4.5000e-004**	**0.0000**	**35.3729**

3.10 Sep-33 - 2033

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0432	0.0000	0.0432	6.5500e-003	0.0000	6.5500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0899	1.1340	3.6875	7.4900e-003		0.0300	0.0300		0.0300	0.0300	0.0000	669.9386	669.9386	0.0261	0.0000	670.5901
Total	**0.0899**	**1.1340**	**3.6875**	**7.4900e-003**	**0.0432**	**0.0300**	**0.0733**	**6.5500e-003**	**0.0300**	**0.0366**	**0.0000**	**669.9386**	**669.9386**	**0.0261**	**0.0000**	**670.5901**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0115	7.1700e-003	0.0797	3.9000e-004	0.0647	2.1000e-004	0.0649	0.0172	1.9000e-004	0.0174	0.0000	35.3617	35.3617	4.5000e-004	0.0000	35.3729
Total	**0.0115**	**7.1700e-003**	**0.0797**	**3.9000e-004**	**0.0647**	**2.1000e-004**	**0.0649**	**0.0172**	**1.9000e-004**	**0.0174**	**0.0000**	**35.3617**	**35.3617**	**4.5000e-004**	**0.0000**	**35.3729**

3.11 Oct-33 - 2033

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0432	0.0000	0.0432	6.5500e-003	0.0000	6.5500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.3162	1.3068	2.7505	7.3400e-003		0.0307	0.0307		0.0307	0.0307	0.0000	658.5878	658.5878	0.0253	0.0000	659.2214
Total	**0.3162**	**1.3068**	**2.7505**	**7.3400e-003**	**0.0432**	**0.0307**	**0.0739**	**6.5500e-003**	**0.0307**	**0.0373**	**0.0000**	**658.5878**	**658.5878**	**0.0253**	**0.0000**	**659.2214**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0126	7.8700e-003	0.0875	4.3000e-004	0.0710	2.3000e-004	0.0712	0.0189	2.1000e-004	0.0191	0.0000	38.8355	38.8355	4.9000e-004	0.0000	38.8478
Total	**0.0126**	**7.8700e-003**	**0.0875**	**4.3000e-004**	**0.0710**	**2.3000e-004**	**0.0712**	**0.0189**	**2.1000e-004**	**0.0191**	**0.0000**	**38.8355**	**38.8355**	**4.9000e-004**	**0.0000**	**38.8478**

3.11 Oct-33 - 2033

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0432	0.0000	0.0432	6.5500e-003	0.0000	6.5500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0876	1.0574	3.5994	7.3400e-003		0.0279	0.0279		0.0279	0.0279	0.0000	658.5870	658.5870	0.0253	0.0000	659.2206
Total	**0.0876**	**1.0574**	**3.5994**	**7.3400e-003**	**0.0432**	**0.0279**	**0.0711**	**6.5500e-003**	**0.0279**	**0.0344**	**0.0000**	**658.5870**	**658.5870**	**0.0253**	**0.0000**	**659.2206**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0126	7.8700e-003	0.0875	4.3000e-004	0.0710	2.3000e-004	0.0712	0.0189	2.1000e-004	0.0191	0.0000	38.8355	38.8355	4.9000e-004	0.0000	38.8478
Total	**0.0126**	**7.8700e-003**	**0.0875**	**4.3000e-004**	**0.0710**	**2.3000e-004**	**0.0712**	**0.0189**	**2.1000e-004**	**0.0191**	**0.0000**	**38.8355**	**38.8355**	**4.9000e-004**	**0.0000**	**38.8478**

3.12 Nov-33 - 2033

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0432	0.0000	0.0432	6.5500e-003	0.0000	6.5500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.3780	1.5625	3.4877	8.8100e-003		0.0382	0.0382		0.0382	0.0382	0.0000	785.4154	785.4154	0.0303	0.0000	786.1738
Total	**0.3780**	**1.5625**	**3.4877**	**8.8100e-003**	**0.0432**	**0.0382**	**0.0814**	**6.5500e-003**	**0.0382**	**0.0447**	**0.0000**	**785.4154**	**785.4154**	**0.0303**	**0.0000**	**786.1738**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0128	7.9800e-003	0.0887	4.3000e-004	0.0720	2.3000e-004	0.0722	0.0191	2.1000e-004	0.0193	0.0000	39.3700	39.3700	5.0000e-004	0.0000	39.3824
Total	**0.0128**	**7.9800e-003**	**0.0887**	**4.3000e-004**	**0.0720**	**2.3000e-004**	**0.0722**	**0.0191**	**2.1000e-004**	**0.0193**	**0.0000**	**39.3700**	**39.3700**	**5.0000e-004**	**0.0000**	**39.3824**

3.12 Nov-33 - 2033

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0432	0.0000	0.0432	6.5500e-003	0.0000	6.5500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1028	1.2017	4.4158	8.8100e-003		0.0328	0.0328		0.0328	0.0328	0.0000	785.4145	785.4145	0.0303	0.0000	786.1728
Total	**0.1028**	**1.2017**	**4.4158**	**8.8100e-003**	**0.0432**	**0.0328**	**0.0761**	**6.5500e-003**	**0.0328**	**0.0394**	**0.0000**	**785.4145**	**785.4145**	**0.0303**	**0.0000**	**786.1728**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0128	7.9800e-003	0.0887	4.3000e-004	0.0720	2.3000e-004	0.0722	0.0191	2.1000e-004	0.0193	0.0000	39.3700	39.3700	5.0000e-004	0.0000	39.3824
Total	**0.0128**	**7.9800e-003**	**0.0887**	**4.3000e-004**	**0.0720**	**2.3000e-004**	**0.0722**	**0.0191**	**2.1000e-004**	**0.0193**	**0.0000**	**39.3700**	**39.3700**	**5.0000e-004**	**0.0000**	**39.3824**

3.13 Dec-33 - 2033

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0411	0.0000	0.0411	6.2200e-003	0.0000	6.2200e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.3142	0.9769	2.7923	7.9300e-003		0.0309	0.0309		0.0309	0.0309	0.0000	731.2707	731.2707	0.0252	0.0000	731.9002
Total	**0.3142**	**0.9769**	**2.7923**	**7.9300e-003**	**0.0411**	**0.0309**	**0.0720**	**6.2200e-003**	**0.0309**	**0.0371**	**0.0000**	**731.2707**	**731.2707**	**0.0252**	**0.0000**	**731.9002**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0117	7.3100e-003	0.0812	4.0000e-004	0.0659	2.1000e-004	0.0661	0.0175	2.0000e-004	0.0177	0.0000	36.0476	36.0476	4.6000e-004	0.0000	36.0589
Total	**0.0117**	**7.3100e-003**	**0.0812**	**4.0000e-004**	**0.0659**	**2.1000e-004**	**0.0661**	**0.0175**	**2.0000e-004**	**0.0177**	**0.0000**	**36.0476**	**36.0476**	**4.6000e-004**	**0.0000**	**36.0589**

3.13 Dec-33 - 2033

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0411	0.0000	0.0411	6.2200e-003	0.0000	6.2200e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0859	0.4298	3.8465	7.9300e-003		0.0113	0.0113		0.0113	0.0113	0.0000	731.2698	731.2698	0.0252	0.0000	731.8994
Total	**0.0859**	**0.4298**	**3.8465**	**7.9300e-003**	**0.0411**	**0.0113**	**0.0523**	**6.2200e-003**	**0.0113**	**0.0175**	**0.0000**	**731.2698**	**731.2698**	**0.0252**	**0.0000**	**731.8994**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0117	7.3100e-003	0.0812	4.0000e-004	0.0659	2.1000e-004	0.0661	0.0175	2.0000e-004	0.0177	0.0000	36.0476	36.0476	4.6000e-004	0.0000	36.0589
Total	**0.0117**	**7.3100e-003**	**0.0812**	**4.0000e-004**	**0.0659**	**2.1000e-004**	**0.0661**	**0.0175**	**2.0000e-004**	**0.0177**	**0.0000**	**36.0476**	**36.0476**	**4.6000e-004**	**0.0000**	**36.0589**

3.13 Dec-33 - 2034

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.1600e-003	0.0000	2.1600e-003	3.3000e-004	0.0000	3.3000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0165	0.0514	0.1470	4.2000e-004		1.6300e-003	1.6300e-003		1.6300e-003	1.6300e-003	0.0000	38.4879	38.4879	1.3300e-003	0.0000	38.5211
Total	**0.0165**	**0.0514**	**0.1470**	**4.2000e-004**	**2.1600e-003**	**1.6300e-003**	**3.7900e-003**	**3.3000e-004**	**1.6300e-003**	**1.9600e-003**	**0.0000**	**38.4879**	**38.4879**	**1.3300e-003**	**0.0000**	**38.5211**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.8000e-004	3.6000e-004	4.0400e-003	2.0000e-005	3.4700e-003	1.0000e-005	3.4800e-003	9.2000e-004	1.0000e-005	9.3000e-004	0.0000	1.8664	1.8664	2.0000e-005	0.0000	1.8669
Total	**5.8000e-004**	**3.6000e-004**	**4.0400e-003**	**2.0000e-005**	**3.4700e-003**	**1.0000e-005**	**3.4800e-003**	**9.2000e-004**	**1.0000e-005**	**9.3000e-004**	**0.0000**	**1.8664**	**1.8664**	**2.0000e-005**	**0.0000**	**1.8669**

3.13 Dec-33 - 2034

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.1600e-003	0.0000	2.1600e-003	3.3000e-004	0.0000	3.3000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.5200e-003	0.0226	0.2025	4.2000e-004		5.9000e-004	5.9000e-004		5.9000e-004	5.9000e-004	0.0000	38.4879	38.4879	1.3300e-003	0.0000	38.5210
Total	**4.5200e-003**	**0.0226**	**0.2025**	**4.2000e-004**	**2.1600e-003**	**5.9000e-004**	**2.7500e-003**	**3.3000e-004**	**5.9000e-004**	**9.2000e-004**	**0.0000**	**38.4879**	**38.4879**	**1.3300e-003**	**0.0000**	**38.5210**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.8000e-004	3.6000e-004	4.0400e-003	2.0000e-005	3.4700e-003	1.0000e-005	3.4800e-003	9.2000e-004	1.0000e-005	9.3000e-004	0.0000	1.8664	1.8664	2.0000e-005	0.0000	1.8669
Total	**5.8000e-004**	**3.6000e-004**	**4.0400e-003**	**2.0000e-005**	**3.4700e-003**	**1.0000e-005**	**3.4800e-003**	**9.2000e-004**	**1.0000e-005**	**9.3000e-004**	**0.0000**	**1.8664**	**1.8664**	**2.0000e-005**	**0.0000**	**1.8669**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Heavy Industry	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Heavy Industry	13.00	13.00	13.00	59.00	28.00	13.00	92	5	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Heavy Industry	0.615581	0.024499	0.200162	0.102060	0.012058	0.004089	0.012646	0.020218	0.002251	0.001029	0.004096	0.000689	0.000621

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Heavy Industry	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Heavy Industry	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Heavy Industry	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Heavy Industry	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Heavy Industry	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Heavy Industry	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Heavy Industry	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Heavy Industry	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

SMVRR Equipment

Santa Barbara County APCD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Industrial Park	217.80	1000sqft	5.00	217,800.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.9	**Precipitation Freq (Days)**	37
Climate Zone	4			**Operational Year**	2030
Utility Company	Pacific Gas and Electric Company				
CO2 Intensity (lb/MWhr)	203.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Waste transport to SMVRR 2024-2029. Assume equipment installed at start of Period 1 (Dec 2024).

Land Use - Betteravia Industrial park is 5 acres (SMVRR website).

Construction Phase - Period 1 12/1/2024 through 12/31/2029. Adjusted end date to account for 4 day work weeks.

Off-road Equipment - Generator set based on requirements for gantry lift system. Other equipment based on defaults or similar models

Trips and VMT - Assume 10 workers per day at one railyard. Used default trip length. 99 haul trips over distance from DCPP to SMVR (roughly 50 miles)

Energy Use -

Construction Off-road Equipment Mitigation - Assume Tier 4 final for hp >100 and Tier 4 interim for hp <100.

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstructionPhase	NumDays	5.00	1,060.00
tblConstructionPhase	PhaseEndDate	12/6/2024	12/22/2028
tblOffRoadEquipment	HorsePower	84.00	369.00
tblOffRoadEquipment	HorsePower	172.00	24.80
tblOffRoadEquipment	LoadFactor	0.38	0.38
tblOffRoadEquipment	LoadFactor	0.42	0.42
tblOffRoadEquipment	LoadFactor	0.31	0.31
tblOffRoadEquipment	LoadFactor	0.40	0.40
tblOffRoadEquipment	OffRoadEquipmentType	Rubber Tired Dozers	Generator Sets
tblOffRoadEquipment	OffRoadEquipmentType	Tractors/Loaders/Backhoes	Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Other Construction Equipment
tblOffRoadEquipment	OffRoadEquipmentType		Aerial Lifts
tblOffRoadEquipment	OffRoadEquipmentType		Rough Terrain Forklifts
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripLength	20.00	50.00
tblTripsAndVMT	HaulingTripNumber	0.00	99.00
tblTripsAndVMT	WorkerTripNumber	25.00	10.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2024	0.0169	0.1241	0.1371	4.9000e-004	7.2000e-004	4.1700e-003	4.8900e-003	1.9000e-004	3.9700e-003	4.1600e-003	0.0000	46.6959	46.6959	6.7100e-003	4.0000e-005	46.8760
2025	0.1907	1.3109	1.6106	5.7500e-003	8.5800e-003	0.0425	0.0511	2.2800e-003	0.0405	0.0428	0.0000	553.6689	553.6689	0.0796	4.7000e-004	555.7992
2026	0.1905	1.3106	1.6090	5.7500e-003	8.5800e-003	0.0425	0.0511	2.2800e-003	0.0405	0.0428	0.0000	553.4490	553.4490	0.0796	4.6000e-004	555.5739
2027	0.1903	1.3103	1.6078	5.7500e-003	8.5800e-003	0.0425	0.0511	2.2800e-003	0.0405	0.0427	0.0000	553.2512	553.2512	0.0796	4.4000e-004	555.3715
2028	0.1858	1.2799	1.5700	5.6100e-003	8.3800e-003	0.0415	0.0499	2.2300e-003	0.0395	0.0418	0.0000	540.3555	540.3555	0.0777	4.2000e-004	542.4229
Maximum	**0.1907**	**1.3109**	**1.6106**	**5.7500e-003**	**8.5800e-003**	**0.0425**	**0.0511**	**2.2800e-003**	**0.0405**	**0.0428**	**0.0000**	**553.6689**	**553.6689**	**0.0796**	**4.7000e-004**	**555.7992**

2.1 Overall Construction

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2024	6.1600e-003	0.0344	0.2270	4.9000e-004	7.2000e-004	1.1500e-003	1.8800e-003	1.9000e-004	1.1500e-003	1.3400e-003	0.0000	46.6959	46.6959	6.7100e-003	4.0000e-005	46.8760
2025	0.0728	0.4081	2.6909	5.7500e-003	8.5800e-003	0.0137	0.0223	2.2800e-003	0.0137	0.0160	0.0000	553.6683	553.6683	0.0796	4.7000e-004	555.7985
2026	0.0727	0.4078	2.6892	5.7500e-003	8.5800e-003	0.0137	0.0223	2.2800e-003	0.0137	0.0160	0.0000	553.4483	553.4483	0.0796	4.6000e-004	555.5733
2027	0.0725	0.4075	2.6881	5.7500e-003	8.5800e-003	0.0137	0.0223	2.2800e-003	0.0137	0.0160	0.0000	553.2506	553.2506	0.0796	4.4000e-004	555.3708
2028	0.0707	0.3979	2.6254	5.6100e-003	8.3800e-003	0.0134	0.0217	2.2300e-003	0.0134	0.0156	0.0000	540.3549	540.3549	0.0777	4.2000e-004	542.4223
Maximum	**0.0728**	**0.4081**	**2.6909**	**5.7500e-003**	**8.5800e-003**	**0.0137**	**0.0223**	**2.2800e-003**	**0.0137**	**0.0160**	**0.0000**	**553.6683**	**553.6683**	**0.0796**	**4.7000e-004**	**555.7985**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**61.91**	**68.97**	**-67.12**	**0.00**	**0.00**	**67.95**	**56.57**	**0.00**	**66.35**	**62.81**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**12-1-2024**	**2-28-2025**	0.3844	0.1186
2	**3-1-2025**	**5-31-2025**	0.3780	0.1210
3	**6-1-2025**	**8-31-2025**	0.3780	0.1210
4	**9-1-2025**	**11-30-2025**	0.3740	0.1198
5	**12-1-2025**	**2-28-2026**	0.3698	0.1184
6	**3-1-2026**	**5-31-2026**	0.3779	0.1209
7	**6-1-2026**	**8-31-2026**	0.3778	0.1209

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

8	**9-1-2026**	**11-30-2026**	0.3738	0.1197
9	**12-1-2026**	**2-28-2027**	0.3697	0.1183
10	**3-1-2027**	**5-31-2027**	0.3778	0.1208
11	**6-1-2027**	**8-31-2027**	0.3777	0.1208
12	**9-1-2027**	**11-30-2027**	0.3737	0.1195
13	**12-1-2027**	**2-29-2028**	0.3737	0.1195
14	**3-1-2028**	**5-31-2028**	0.3777	0.1207
15	**6-1-2028**	**8-31-2028**	0.3776	0.1207
16	**9-1-2028**	**9-30-2028**	0.1231	0.0394
		Highest	0.3844	0.1210

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	1.1032	2.0000e-005	1.9900e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	3.8900e-003	3.8900e-003	1.0000e-005	0.0000	4.1400e-003
Energy	0.0190	0.1730	0.1453	1.0400e-003		0.0131	0.0131		0.0131	0.0131	0.0000	534.2910	534.2910	0.0596	0.0102	538.8313
Mobile	0.2211	0.2484	1.8741	3.6800e-003	0.4619	2.6200e-003	0.4645	0.1236	2.4500e-003	0.1261	0.0000	340.1965	340.1965	0.0249	0.0184	346.3156
Waste						0.0000	0.0000		0.0000	0.0000	56.0837	0.0000	56.0837	2.7810	0.0000	125.6088
Water						0.0000	0.0000		0.0000	0.0000	17.8197	25.2157	43.0353	0.0654	0.0393	56.3661
Total	**1.3433**	**0.4213**	**2.0213**	**4.7200e-003**	**0.4619**	**0.0158**	**0.4777**	**0.1236**	**0.0156**	**0.1392**	**73.9033**	**899.7071**	**973.6104**	**2.9309**	**0.0679**	**1,067.1260**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	1.1032	2.0000e-005	1.9900e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	3.8900e-003	3.8900e-003	1.0000e-005	0.0000	4.1400e-003
Energy	0.0190	0.1730	0.1453	1.0400e-003		0.0131	0.0131		0.0131	0.0131	0.0000	534.2910	534.2910	0.0596	0.0102	538.8313
Mobile	0.2211	0.2484	1.8741	3.6800e-003	0.4619	2.6200e-003	0.4645	0.1236	2.4500e-003	0.1261	0.0000	340.1965	340.1965	0.0249	0.0184	346.3156
Waste						0.0000	0.0000		0.0000	0.0000	56.0837	0.0000	56.0837	2.7810	0.0000	125.6088
Water						0.0000	0.0000		0.0000	0.0000	17.8197	25.2157	43.0353	0.0654	0.0393	56.3661
Total	**1.3433**	**0.4213**	**2.0213**	**4.7200e-003**	**0.4619**	**0.0158**	**0.4777**	**0.1236**	**0.0156**	**0.1392**	**73.9033**	**899.7071**	**973.6104**	**2.9309**	**0.0679**	**1,067.1260**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	SMVR Operations	Site Preparation	12/1/2024	12/22/2028	5	1060	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
SMVR Operations	Generator Sets	2	4.00	369	0.74
SMVR Operations	Off-Highway Trucks	2	4.00	402	0.38
SMVR Operations	Other Construction Equipment	2	4.00	24.8	0.42
SMVR Operations	Aerial Lifts	2	4.00	63	0.31
SMVR Operations	Rough Terrain Forklifts	2	4.00	100	0.40

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
SMVR Operations	10	10.00	0.00	99.00	8.30	6.40	50.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

3.2 SMVR Operations - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0166	0.1235	0.1350	4.8000e-004		4.1600e-003	4.1600e-003		3.9700e-003	3.9700e-003	0.0000	46.0412	46.0412	6.6800e-003	0.0000	46.2082
Total	**0.0166**	**0.1235**	**0.1350**	**4.8000e-004**		**4.1600e-003**	**4.1600e-003**		**3.9700e-003**	**3.9700e-003**	**0.0000**	**46.0412**	**46.0412**	**6.6800e-003**	**0.0000**	**46.2082**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.0000e-005	3.9000e-004	9.0000e-005	0.0000	4.0000e-005	0.0000	5.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.1537	0.1537	1.0000e-005	2.0000e-005	0.1614
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.7000e-004	1.8000e-004	2.0000e-003	1.0000e-005	6.8000e-004	0.0000	6.8000e-004	1.8000e-004	0.0000	1.8000e-004	0.0000	0.5010	0.5010	2.0000e-005	2.0000e-005	0.5065
Total	**2.8000e-004**	**5.7000e-004**	**2.0900e-003**	**1.0000e-005**	**7.2000e-004**	**0.0000**	**7.3000e-004**	**1.9000e-004**	**0.0000**	**1.9000e-004**	**0.0000**	**0.6548**	**0.6548**	**3.0000e-005**	**4.0000e-005**	**0.6678**

3.2 SMVR Operations - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	5.8900e-003	0.0339	0.2249	4.8000e-004		1.1500e-003	1.1500e-003		1.1500e-003	1.1500e-003	0.0000	46.0411	46.0411	6.6800e-003	0.0000	46.2082
Total	**5.8900e-003**	**0.0339**	**0.2249**	**4.8000e-004**		**1.1500e-003**	**1.1500e-003**		**1.1500e-003**	**1.1500e-003**	**0.0000**	**46.0411**	**46.0411**	**6.6800e-003**	**0.0000**	**46.2082**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.0000e-005	3.9000e-004	9.0000e-005	0.0000	4.0000e-005	0.0000	5.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.1537	0.1537	1.0000e-005	2.0000e-005	0.1614
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.7000e-004	1.8000e-004	2.0000e-003	1.0000e-005	6.8000e-004	0.0000	6.8000e-004	1.8000e-004	0.0000	1.8000e-004	0.0000	0.5010	0.5010	2.0000e-005	2.0000e-005	0.5065
Total	**2.8000e-004**	**5.7000e-004**	**2.0900e-003**	**1.0000e-005**	**7.2000e-004**	**0.0000**	**7.3000e-004**	**1.9000e-004**	**0.0000**	**1.9000e-004**	**0.0000**	**0.6548**	**0.6548**	**3.0000e-005**	**4.0000e-005**	**0.6678**

3.2 SMVR Operations - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1876	1.3046	1.5875	5.6700e-003		0.0424	0.0424		0.0404	0.0404	0.0000	546.1280	546.1280	0.0793	0.0000	548.1092
Total	**0.1876**	**1.3046**	**1.5875**	**5.6700e-003**		**0.0424**	**0.0424**		**0.0404**	**0.0404**	**0.0000**	**546.1280**	**546.1280**	**0.0793**	**0.0000**	**548.1092**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	6.0000e-005	4.4300e-003	1.0800e-003	2.0000e-005	5.2000e-004	4.0000e-005	5.6000e-004	1.4000e-004	3.0000e-005	1.8000e-004	0.0000	1.7897	1.7897	1.4000e-004	2.9000e-004	1.8789
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.9500e-003	1.9200e-003	0.0221	6.0000e-005	8.0600e-003	4.0000e-005	8.1000e-003	2.1400e-003	3.0000e-005	2.1800e-003	0.0000	5.7513	5.7513	2.0000e-004	1.8000e-004	5.8112
Total	**3.0100e-003**	**6.3500e-003**	**0.0232**	**8.0000e-005**	**8.5800e-003**	**8.0000e-005**	**8.6600e-003**	**2.2800e-003**	**6.0000e-005**	**2.3600e-003**	**0.0000**	**7.5409**	**7.5409**	**3.4000e-004**	**4.7000e-004**	**7.6901**

3.2 SMVR Operations - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0698	0.4018	2.6677	5.6700e-003		0.0136	0.0136		0.0136	0.0136	0.0000	546.1273	546.1273	0.0793	0.0000	548.1085
Total	**0.0698**	**0.4018**	**2.6677**	**5.6700e-003**		**0.0136**	**0.0136**		**0.0136**	**0.0136**	**0.0000**	**546.1273**	**546.1273**	**0.0793**	**0.0000**	**548.1085**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	6.0000e-005	4.4300e-003	1.0800e-003	2.0000e-005	5.2000e-004	4.0000e-005	5.6000e-004	1.4000e-004	3.0000e-005	1.8000e-004	0.0000	1.7897	1.7897	1.4000e-004	2.9000e-004	1.8789
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.9500e-003	1.9200e-003	0.0221	6.0000e-005	8.0600e-003	4.0000e-005	8.1000e-003	2.1400e-003	3.0000e-005	2.1800e-003	0.0000	5.7513	5.7513	2.0000e-004	1.8000e-004	5.8112
Total	**3.0100e-003**	**6.3500e-003**	**0.0232**	**8.0000e-005**	**8.5800e-003**	**8.0000e-005**	**8.6600e-003**	**2.2800e-003**	**6.0000e-005**	**2.3600e-003**	**0.0000**	**7.5409**	**7.5409**	**3.4000e-004**	**4.7000e-004**	**7.6901**

3.2 SMVR Operations - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1876	1.3046	1.5875	5.6700e-003		0.0424	0.0424		0.0404	0.0404	0.0000	546.1280	546.1280	0.0793	0.0000	548.1092
Total	**0.1876**	**1.3046**	**1.5875**	**5.6700e-003**		**0.0424**	**0.0424**		**0.0404**	**0.0404**	**0.0000**	**546.1280**	**546.1280**	**0.0793**	**0.0000**	**548.1092**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	6.0000e-005	4.2800e-003	1.1000e-003	2.0000e-005	5.2000e-004	3.0000e-005	5.5000e-004	1.4000e-004	3.0000e-005	1.8000e-004	0.0000	1.7553	1.7553	1.5000e-004	2.8000e-004	1.8430
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.7800e-003	1.7300e-003	0.0204	6.0000e-005	8.0600e-003	3.0000e-005	8.0900e-003	2.1400e-003	3.0000e-005	2.1700e-003	0.0000	5.5657	5.5657	1.8000e-004	1.7000e-004	5.6218
Total	**2.8400e-003**	**6.0100e-003**	**0.0215**	**8.0000e-005**	**8.5800e-003**	**6.0000e-005**	**8.6400e-003**	**2.2800e-003**	**6.0000e-005**	**2.3500e-003**	**0.0000**	**7.3210**	**7.3210**	**3.3000e-004**	**4.5000e-004**	**7.4648**

3.2 SMVR Operations - 2026

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0698	0.4018	2.6677	5.6700e-003		0.0136	0.0136		0.0136	0.0136	0.0000	546.1273	546.1273	0.0793	0.0000	548.1085
Total	**0.0698**	**0.4018**	**2.6677**	**5.6700e-003**		**0.0136**	**0.0136**		**0.0136**	**0.0136**	**0.0000**	**546.1273**	**546.1273**	**0.0793**	**0.0000**	**548.1085**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	6.0000e-005	4.2800e-003	1.1000e-003	2.0000e-005	5.2000e-004	3.0000e-005	5.5000e-004	1.4000e-004	3.0000e-005	1.8000e-004	0.0000	1.7553	1.7553	1.5000e-004	2.8000e-004	1.8430
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.7800e-003	1.7300e-003	0.0204	6.0000e-005	8.0600e-003	3.0000e-005	8.0900e-003	2.1400e-003	3.0000e-005	2.1700e-003	0.0000	5.5657	5.5657	1.8000e-004	1.7000e-004	5.6218
Total	**2.8400e-003**	**6.0100e-003**	**0.0215**	**8.0000e-005**	**8.5800e-003**	**6.0000e-005**	**8.6400e-003**	**2.2800e-003**	**6.0000e-005**	**2.3500e-003**	**0.0000**	**7.3210**	**7.3210**	**3.3000e-004**	**4.5000e-004**	**7.4648**

3.2 SMVR Operations - 2027

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1876	1.3046	1.5875	5.6700e-003		0.0424	0.0424		0.0404	0.0404	0.0000	546.1280	546.1280	0.0793	0.0000	548.1092
Total	**0.1876**	**1.3046**	**1.5875**	**5.6700e-003**		**0.0424**	**0.0424**		**0.0404**	**0.0404**	**0.0000**	**546.1280**	**546.1280**	**0.0793**	**0.0000**	**548.1092**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	5.0000e-005	4.1500e-003	1.1100e-003	2.0000e-005	5.2000e-004	3.0000e-005	5.5000e-004	1.4000e-004	3.0000e-005	1.8000e-004	0.0000	1.7179	1.7179	1.5000e-004	2.8000e-004	1.8040
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.6300e-003	1.5700e-003	0.0193	6.0000e-005	8.0600e-003	3.0000e-005	8.0900e-003	2.1400e-003	3.0000e-005	2.1700e-003	0.0000	5.4054	5.4054	1.7000e-004	1.6000e-004	5.4583
Total	**2.6800e-003**	**5.7200e-003**	**0.0204**	**8.0000e-005**	**8.5800e-003**	**6.0000e-005**	**8.6400e-003**	**2.2800e-003**	**6.0000e-005**	**2.3500e-003**	**0.0000**	**7.1233**	**7.1233**	**3.2000e-004**	**4.4000e-004**	**7.2623**

3.2 SMVR Operations - 2027

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0698	0.4018	2.6677	5.6700e-003		0.0136	0.0136		0.0136	0.0136	0.0000	546.1273	546.1273	0.0793	0.0000	548.1085
Total	**0.0698**	**0.4018**	**2.6677**	**5.6700e-003**		**0.0136**	**0.0136**		**0.0136**	**0.0136**	**0.0000**	**546.1273**	**546.1273**	**0.0793**	**0.0000**	**548.1085**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	5.0000e-005	4.1500e-003	1.1100e-003	2.0000e-005	5.2000e-004	3.0000e-005	5.5000e-004	1.4000e-004	3.0000e-005	1.8000e-004	0.0000	1.7179	1.7179	1.5000e-004	2.8000e-004	1.8040
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.6300e-003	1.5700e-003	0.0193	6.0000e-005	8.0600e-003	3.0000e-005	8.0900e-003	2.1400e-003	3.0000e-005	2.1700e-003	0.0000	5.4054	5.4054	1.7000e-004	1.6000e-004	5.4583
Total	**2.6800e-003**	**5.7200e-003**	**0.0204**	**8.0000e-005**	**8.5800e-003**	**6.0000e-005**	**8.6400e-003**	**2.2800e-003**	**6.0000e-005**	**2.3500e-003**	**0.0000**	**7.1233**	**7.1233**	**3.2000e-004**	**4.4000e-004**	**7.2623**

3.2 SMVR Operations - 2028

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1833	1.2746	1.5510	5.5400e-003		0.0415	0.0415		0.0395	0.0395	0.0000	533.5733	533.5733	0.0774	0.0000	535.5089
Total	**0.1833**	**1.2746**	**1.5510**	**5.5400e-003**		**0.0415**	**0.0415**		**0.0395**	**0.0395**	**0.0000**	**533.5733**	**533.5733**	**0.0774**	**0.0000**	**535.5089**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	5.0000e-005	3.9300e-003	1.1000e-003	2.0000e-005	5.1000e-004	3.0000e-005	5.4000e-004	1.4000e-004	3.0000e-005	1.7000e-004	0.0000	1.6431	1.6431	1.5000e-004	2.6000e-004	1.7257
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.4400e-003	1.4100e-003	0.0179	6.0000e-005	7.8700e-003	3.0000e-005	7.9000e-003	2.0900e-003	3.0000e-005	2.1200e-003	0.0000	5.1392	5.1392	1.5000e-004	1.5000e-004	5.1883
Total	**2.4900e-003**	**5.3400e-003**	**0.0190**	**8.0000e-005**	**8.3800e-003**	**6.0000e-005**	**8.4400e-003**	**2.2300e-003**	**6.0000e-005**	**2.2900e-003**	**0.0000**	**6.7822**	**6.7822**	**3.0000e-004**	**4.1000e-004**	**6.9140**

3.2 SMVR Operations - 2028

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0682	0.3926	2.6064	5.5400e-003		0.0133	0.0133		0.0133	0.0133	0.0000	533.5727	533.5727	0.0774	0.0000	535.5083
Total	**0.0682**	**0.3926**	**2.6064**	**5.5400e-003**		**0.0133**	**0.0133**		**0.0133**	**0.0133**	**0.0000**	**533.5727**	**533.5727**	**0.0774**	**0.0000**	**535.5083**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	5.0000e-005	3.9300e-003	1.1000e-003	2.0000e-005	5.1000e-004	3.0000e-005	5.4000e-004	1.4000e-004	3.0000e-005	1.7000e-004	0.0000	1.6431	1.6431	1.5000e-004	2.6000e-004	1.7257
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.4400e-003	1.4100e-003	0.0179	6.0000e-005	7.8700e-003	3.0000e-005	7.9000e-003	2.0900e-003	3.0000e-005	2.1200e-003	0.0000	5.1392	5.1392	1.5000e-004	1.5000e-004	5.1883
Total	**2.4900e-003**	**5.3400e-003**	**0.0190**	**8.0000e-005**	**8.3800e-003**	**6.0000e-005**	**8.4400e-003**	**2.2300e-003**	**6.0000e-005**	**2.2900e-003**	**0.0000**	**6.7822**	**6.7822**	**3.0000e-004**	**4.1000e-004**	**6.9140**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.2211	0.2484	1.8741	3.6800e-003	0.4619	2.6200e-003	0.4645	0.1236	2.4500e-003	0.1261	0.0000	340.1965	340.1965	0.0249	0.0184	346.3156
Unmitigated	0.2211	0.2484	1.8741	3.6800e-003	0.4619	2.6200e-003	0.4645	0.1236	2.4500e-003	0.1261	0.0000	340.1965	340.1965	0.0249	0.0184	346.3156

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Industrial Park	733.99	553.21	270.07	1,226,595	1,226,595
Total	733.99	553.21	270.07	1,226,595	1,226,595

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Industrial Park	6.60	5.50	6.40	59.00	28.00	13.00	79	19	2

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Industrial Park	0.514923	0.057522	0.206064	0.138974	0.023636	0.006062	0.011219	0.006223	0.000940	0.000535	0.027699	0.003185	0.003017

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	346.0043	346.0043	0.0560	6.7900e-003	349.4257
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	346.0043	346.0043	0.0560	6.7900e-003	349.4257
NaturalGas Mitigated	0.0190	0.1730	0.1453	1.0400e-003		0.0131	0.0131		0.0131	0.0131	0.0000	188.2867	188.2867	3.6100e-003	3.4500e-003	189.4056
NaturalGas Unmitigated	0.0190	0.1730	0.1453	1.0400e-003		0.0131	0.0131		0.0131	0.0131	0.0000	188.2867	188.2867	3.6100e-003	3.4500e-003	189.4056

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Industrial Park	3.52836e+006	0.0190	0.1730	0.1453	1.0400e-003		0.0131	0.0131		0.0131	0.0131	0.0000	188.2867	188.2867	3.6100e-003	3.4500e-003	189.4056
Total		**0.0190**	**0.1730**	**0.1453**	**1.0400e-003**		**0.0131**	**0.0131**		**0.0131**	**0.0131**	**0.0000**	**188.2867**	**188.2867**	**3.6100e-003**	**3.4500e-003**	**189.4056**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Industrial Park	3.52836e+006	0.0190	0.1730	0.1453	1.0400e-003		0.0131	0.0131		0.0131	0.0131	0.0000	188.2867	188.2867	3.6100e-003	3.4500e-003	189.4056
Total		**0.0190**	**0.1730**	**0.1453**	**1.0400e-003**		**0.0131**	**0.0131**		**0.0131**	**0.0131**	**0.0000**	**188.2867**	**188.2867**	**3.6100e-003**	**3.4500e-003**	**189.4056**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Industrial Park	3.73963e+006	346.0043	0.0560	6.7900e-003	349.4257
Total		**346.0043**	**0.0560**	**6.7900e-003**	**349.4257**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Industrial Park	3.73963e+006	346.0043	0.0560	6.7900e-003	349.4257
Total		**346.0043**	**0.0560**	**6.7900e-003**	**349.4257**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	1.1032	2.0000e-005	1.9900e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	3.8900e-003	3.8900e-003	1.0000e-005	0.0000	4.1400e-003
Unmitigated	1.1032	2.0000e-005	1.9900e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	3.8900e-003	3.8900e-003	1.0000e-005	0.0000	4.1400e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.2524					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.8506					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.8000e-004	2.0000e-005	1.9900e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	3.8900e-003	3.8900e-003	1.0000e-005	0.0000	4.1400e-003
Total	**1.1032**	**2.0000e-005**	**1.9900e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**	**0.0000**	**3.8900e-003**	**3.8900e-003**	**1.0000e-005**	**0.0000**	**4.1400e-003**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.2524					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.8506					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.8000e-004	2.0000e-005	1.9900e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	3.8900e-003	3.8900e-003	1.0000e-005	0.0000	4.1400e-003
Total	**1.1032**	**2.0000e-005**	**1.9900e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**	**0.0000**	**3.8900e-003**	**3.8900e-003**	**1.0000e-005**	**0.0000**	**4.1400e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	43.0353	0.0654	0.0393	56.3661
Unmitigated	43.0353	0.0654	0.0393	56.3661

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Industrial Park	50.3663 / 0	43.0353	0.0654	0.0393	56.3661
Total		**43.0353**	**0.0654**	**0.0393**	**56.3661**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Industrial Park	50.3663 / 0	43.0353	0.0654	0.0393	56.3661
Total		**43.0353**	**0.0654**	**0.0393**	**56.3661**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	56.0837	2.7810	0.0000	125.6088
Unmitigated	56.0837	2.7810	0.0000	125.6088

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Industrial Park	270.07	56.0837	2.7810	0.0000	125.6088
Total		**56.0837**	**2.7810**	**0.0000**	**125.6088**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Industrial Park	270.07	56.0837	2.7810	0.0000	125.6088
Total		**56.0837**	**2.7810**	**0.0000**	**125.6088**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Appendix D1.10

Phase 1 CalEEMod SB County

SMVRR Equipment

Santa Barbara County APCD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Industrial Park	217.80	1000sqft	5.00	217,800.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.9	**Precipitation Freq (Days)**	37
Climate Zone	4			**Operational Year**	2030
Utility Company	Pacific Gas and Electric Company				
CO2 Intensity (lb/MWhr)	203.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Waste transport to SMVRR 2024-2029. Assume equipment installed at start of Period 1 (Dec 2024).

Land Use - Betteravia Industrial park is 5 acres (SMVRR website).

Construction Phase - Period 1 12/1/2024 through 12/31/2029. Adjusted end date to account for 4 day work weeks.

Off-road Equipment - Generator set based on requirements for gantry lift system. Other equipment based on defaults or similar models

Trips and VMT - Assume 10 workers per day at one railyard. Used default trip length. 99 haul trips over distance from DCPP to SMVR (roughly 50 miles)

Energy Use -

Construction Off-road Equipment Mitigation - Assume Tier 4 final for hp >100 and Tier 4 interim for hp <100.

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstructionPhase	NumDays	5.00	1,060.00
tblConstructionPhase	PhaseEndDate	12/6/2024	12/22/2028
tblOffRoadEquipment	HorsePower	84.00	369.00
tblOffRoadEquipment	HorsePower	172.00	24.80
tblOffRoadEquipment	LoadFactor	0.38	0.38
tblOffRoadEquipment	LoadFactor	0.42	0.42
tblOffRoadEquipment	LoadFactor	0.31	0.31
tblOffRoadEquipment	LoadFactor	0.40	0.40
tblOffRoadEquipment	OffRoadEquipmentType	Rubber Tired Dozers	Generator Sets
tblOffRoadEquipment	OffRoadEquipmentType	Tractors/Loaders/Backhoes	Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Other Construction Equipment
tblOffRoadEquipment	OffRoadEquipmentType		Aerial Lifts
tblOffRoadEquipment	OffRoadEquipmentType		Rough Terrain Forklifts
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripLength	20.00	50.00
tblTripsAndVMT	HaulingTripNumber	0.00	99.00
tblTripsAndVMT	WorkerTripNumber	25.00	10.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2024	0.0169	0.1241	0.1371	4.9000e-004	7.2000e-004	4.1700e-003	4.8900e-003	1.9000e-004	3.9700e-003	4.1600e-003	0.0000	46.6959	46.6959	6.7100e-003	4.0000e-005	46.8760
2025	0.1907	1.3109	1.6106	5.7500e-003	8.5800e-003	0.0425	0.0511	2.2800e-003	0.0405	0.0428	0.0000	553.6689	553.6689	0.0796	4.7000e-004	555.7992
2026	0.1905	1.3106	1.6090	5.7500e-003	8.5800e-003	0.0425	0.0511	2.2800e-003	0.0405	0.0428	0.0000	553.4490	553.4490	0.0796	4.6000e-004	555.5739
2027	0.1903	1.3103	1.6078	5.7500e-003	8.5800e-003	0.0425	0.0511	2.2800e-003	0.0405	0.0427	0.0000	553.2512	553.2512	0.0796	4.4000e-004	555.3715
2028	0.1858	1.2799	1.5700	5.6100e-003	8.3800e-003	0.0415	0.0499	2.2300e-003	0.0395	0.0418	0.0000	540.3555	540.3555	0.0777	4.2000e-004	542.4229
Maximum	**0.1907**	**1.3109**	**1.6106**	**5.7500e-003**	**8.5800e-003**	**0.0425**	**0.0511**	**2.2800e-003**	**0.0405**	**0.0428**	**0.0000**	**553.6689**	**553.6689**	**0.0796**	**4.7000e-004**	**555.7992**

2.1 Overall Construction

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2024	6.1600e-003	0.0344	0.2270	4.9000e-004	7.2000e-004	1.1500e-003	1.8800e-003	1.9000e-004	1.1500e-003	1.3400e-003	0.0000	46.6959	46.6959	6.7100e-003	4.0000e-005	46.8760
2025	0.0728	0.4081	2.6909	5.7500e-003	8.5800e-003	0.0137	0.0223	2.2800e-003	0.0137	0.0160	0.0000	553.6683	553.6683	0.0796	4.7000e-004	555.7985
2026	0.0727	0.4078	2.6892	5.7500e-003	8.5800e-003	0.0137	0.0223	2.2800e-003	0.0137	0.0160	0.0000	553.4483	553.4483	0.0796	4.6000e-004	555.5733
2027	0.0725	0.4075	2.6881	5.7500e-003	8.5800e-003	0.0137	0.0223	2.2800e-003	0.0137	0.0160	0.0000	553.2506	553.2506	0.0796	4.4000e-004	555.3708
2028	0.0707	0.3979	2.6254	5.6100e-003	8.3800e-003	0.0134	0.0217	2.2300e-003	0.0134	0.0156	0.0000	540.3549	540.3549	0.0777	4.2000e-004	542.4223
Maximum	**0.0728**	**0.4081**	**2.6909**	**5.7500e-003**	**8.5800e-003**	**0.0137**	**0.0223**	**2.2800e-003**	**0.0137**	**0.0160**	**0.0000**	**553.6683**	**553.6683**	**0.0796**	**4.7000e-004**	**555.7985**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**61.91**	**68.97**	**-67.12**	**0.00**	**0.00**	**67.95**	**56.57**	**0.00**	**66.35**	**62.81**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**12-1-2024**	**2-28-2025**	0.3844	0.1186
2	**3-1-2025**	**5-31-2025**	0.3780	0.1210
3	**6-1-2025**	**8-31-2025**	0.3780	0.1210
4	**9-1-2025**	**11-30-2025**	0.3740	0.1198
5	**12-1-2025**	**2-28-2026**	0.3698	0.1184
6	**3-1-2026**	**5-31-2026**	0.3779	0.1209
7	**6-1-2026**	**8-31-2026**	0.3778	0.1209

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

8	**9-1-2026**	**11-30-2026**	0.3738	0.1197
9	**12-1-2026**	**2-28-2027**	0.3697	0.1183
10	**3-1-2027**	**5-31-2027**	0.3778	0.1208
11	**6-1-2027**	**8-31-2027**	0.3777	0.1208
12	**9-1-2027**	**11-30-2027**	0.3737	0.1195
13	**12-1-2027**	**2-29-2028**	0.3737	0.1195
14	**3-1-2028**	**5-31-2028**	0.3777	0.1207
15	**6-1-2028**	**8-31-2028**	0.3776	0.1207
16	**9-1-2028**	**9-30-2028**	0.1231	0.0394
		Highest	0.3844	0.1210

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	1.1032	2.0000e-005	1.9900e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	3.8900e-003	3.8900e-003	1.0000e-005	0.0000	4.1400e-003
Energy	0.0190	0.1730	0.1453	1.0400e-003		0.0131	0.0131		0.0131	0.0131	0.0000	534.2910	534.2910	0.0596	0.0102	538.8313
Mobile	0.2211	0.2484	1.8741	3.6800e-003	0.4619	2.6200e-003	0.4645	0.1236	2.4500e-003	0.1261	0.0000	340.1965	340.1965	0.0249	0.0184	346.3156
Waste						0.0000	0.0000		0.0000	0.0000	56.0837	0.0000	56.0837	2.7810	0.0000	125.6088
Water						0.0000	0.0000		0.0000	0.0000	17.8197	25.2157	43.0353	0.0654	0.0393	56.3661
Total	**1.3433**	**0.4213**	**2.0213**	**4.7200e-003**	**0.4619**	**0.0158**	**0.4777**	**0.1236**	**0.0156**	**0.1392**	**73.9033**	**899.7071**	**973.6104**	**2.9309**	**0.0679**	**1,067.1260**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	1.1032	2.0000e-005	1.9900e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	3.8900e-003	3.8900e-003	1.0000e-005	0.0000	4.1400e-003
Energy	0.0190	0.1730	0.1453	1.0400e-003		0.0131	0.0131		0.0131	0.0131	0.0000	534.2910	534.2910	0.0596	0.0102	538.8313
Mobile	0.2211	0.2484	1.8741	3.6800e-003	0.4619	2.6200e-003	0.4645	0.1236	2.4500e-003	0.1261	0.0000	340.1965	340.1965	0.0249	0.0184	346.3156
Waste						0.0000	0.0000		0.0000	0.0000	56.0837	0.0000	56.0837	2.7810	0.0000	125.6088
Water						0.0000	0.0000		0.0000	0.0000	17.8197	25.2157	43.0353	0.0654	0.0393	56.3661
Total	**1.3433**	**0.4213**	**2.0213**	**4.7200e-003**	**0.4619**	**0.0158**	**0.4777**	**0.1236**	**0.0156**	**0.1392**	**73.9033**	**899.7071**	**973.6104**	**2.9309**	**0.0679**	**1,067.1260**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	SMVR Operations	Site Preparation	12/1/2024	12/22/2028	5	1060	

Acres of Grading (Site Preparation Phase): 0

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
SMVR Operations	Generator Sets	2	4.00	369	0.74
SMVR Operations	Off-Highway Trucks	2	4.00	402	0.38
SMVR Operations	Other Construction Equipment	2	4.00	24.8	0.42
SMVR Operations	Aerial Lifts	2	4.00	63	0.31
SMVR Operations	Rough Terrain Forklifts	2	4.00	100	0.40

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
SMVR Operations	10	10.00	0.00	99.00	8.30	6.40	50.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

3.2 SMVR Operations - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0166	0.1235	0.1350	4.8000e-004		4.1600e-003	4.1600e-003		3.9700e-003	3.9700e-003	0.0000	46.0412	46.0412	6.6800e-003	0.0000	46.2082
Total	**0.0166**	**0.1235**	**0.1350**	**4.8000e-004**		**4.1600e-003**	**4.1600e-003**		**3.9700e-003**	**3.9700e-003**	**0.0000**	**46.0412**	**46.0412**	**6.6800e-003**	**0.0000**	**46.2082**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.0000e-005	3.9000e-004	9.0000e-005	0.0000	4.0000e-005	0.0000	5.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.1537	0.1537	1.0000e-005	2.0000e-005	0.1614
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.7000e-004	1.8000e-004	2.0000e-003	1.0000e-005	6.8000e-004	0.0000	6.8000e-004	1.8000e-004	0.0000	1.8000e-004	0.0000	0.5010	0.5010	2.0000e-005	2.0000e-005	0.5065
Total	**2.8000e-004**	**5.7000e-004**	**2.0900e-003**	**1.0000e-005**	**7.2000e-004**	**0.0000**	**7.3000e-004**	**1.9000e-004**	**0.0000**	**1.9000e-004**	**0.0000**	**0.6548**	**0.6548**	**3.0000e-005**	**4.0000e-005**	**0.6678**

3.2 SMVR Operations - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	5.8900e-003	0.0339	0.2249	4.8000e-004		1.1500e-003	1.1500e-003		1.1500e-003	1.1500e-003	0.0000	46.0411	46.0411	6.6800e-003	0.0000	46.2082
Total	**5.8900e-003**	**0.0339**	**0.2249**	**4.8000e-004**		**1.1500e-003**	**1.1500e-003**		**1.1500e-003**	**1.1500e-003**	**0.0000**	**46.0411**	**46.0411**	**6.6800e-003**	**0.0000**	**46.2082**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.0000e-005	3.9000e-004	9.0000e-005	0.0000	4.0000e-005	0.0000	5.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.1537	0.1537	1.0000e-005	2.0000e-005	0.1614
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.7000e-004	1.8000e-004	2.0000e-003	1.0000e-005	6.8000e-004	0.0000	6.8000e-004	1.8000e-004	0.0000	1.8000e-004	0.0000	0.5010	0.5010	2.0000e-005	2.0000e-005	0.5065
Total	**2.8000e-004**	**5.7000e-004**	**2.0900e-003**	**1.0000e-005**	**7.2000e-004**	**0.0000**	**7.3000e-004**	**1.9000e-004**	**0.0000**	**1.9000e-004**	**0.0000**	**0.6548**	**0.6548**	**3.0000e-005**	**4.0000e-005**	**0.6678**

3.2 SMVR Operations - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1876	1.3046	1.5875	5.6700e-003		0.0424	0.0424		0.0404	0.0404	0.0000	546.1280	546.1280	0.0793	0.0000	548.1092
Total	**0.1876**	**1.3046**	**1.5875**	**5.6700e-003**		**0.0424**	**0.0424**		**0.0404**	**0.0404**	**0.0000**	**546.1280**	**546.1280**	**0.0793**	**0.0000**	**548.1092**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	6.0000e-005	4.4300e-003	1.0800e-003	2.0000e-005	5.2000e-004	4.0000e-005	5.6000e-004	1.4000e-004	3.0000e-005	1.8000e-004	0.0000	1.7897	1.7897	1.4000e-004	2.9000e-004	1.8789
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.9500e-003	1.9200e-003	0.0221	6.0000e-005	8.0600e-003	4.0000e-005	8.1000e-003	2.1400e-003	3.0000e-005	2.1800e-003	0.0000	5.7513	5.7513	2.0000e-004	1.8000e-004	5.8112
Total	**3.0100e-003**	**6.3500e-003**	**0.0232**	**8.0000e-005**	**8.5800e-003**	**8.0000e-005**	**8.6600e-003**	**2.2800e-003**	**6.0000e-005**	**2.3600e-003**	**0.0000**	**7.5409**	**7.5409**	**3.4000e-004**	**4.7000e-004**	**7.6901**

3.2 SMVR Operations - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0698	0.4018	2.6677	5.6700e-003		0.0136	0.0136		0.0136	0.0136	0.0000	546.1273	546.1273	0.0793	0.0000	548.1085
Total	**0.0698**	**0.4018**	**2.6677**	**5.6700e-003**		**0.0136**	**0.0136**		**0.0136**	**0.0136**	**0.0000**	**546.1273**	**546.1273**	**0.0793**	**0.0000**	**548.1085**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	6.0000e-005	4.4300e-003	1.0800e-003	2.0000e-005	5.2000e-004	4.0000e-005	5.6000e-004	1.4000e-004	3.0000e-005	1.8000e-004	0.0000	1.7897	1.7897	1.4000e-004	2.9000e-004	1.8789
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.9500e-003	1.9200e-003	0.0221	6.0000e-005	8.0600e-003	4.0000e-005	8.1000e-003	2.1400e-003	3.0000e-005	2.1800e-003	0.0000	5.7513	5.7513	2.0000e-004	1.8000e-004	5.8112
Total	**3.0100e-003**	**6.3500e-003**	**0.0232**	**8.0000e-005**	**8.5800e-003**	**8.0000e-005**	**8.6600e-003**	**2.2800e-003**	**6.0000e-005**	**2.3600e-003**	**0.0000**	**7.5409**	**7.5409**	**3.4000e-004**	**4.7000e-004**	**7.6901**

3.2 SMVR Operations - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1876	1.3046	1.5875	5.6700e-003		0.0424	0.0424		0.0404	0.0404	0.0000	546.1280	546.1280	0.0793	0.0000	548.1092
Total	**0.1876**	**1.3046**	**1.5875**	**5.6700e-003**		**0.0424**	**0.0424**		**0.0404**	**0.0404**	**0.0000**	**546.1280**	**546.1280**	**0.0793**	**0.0000**	**548.1092**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	6.0000e-005	4.2800e-003	1.1000e-003	2.0000e-005	5.2000e-004	3.0000e-005	5.5000e-004	1.4000e-004	3.0000e-005	1.8000e-004	0.0000	1.7553	1.7553	1.5000e-004	2.8000e-004	1.8430
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.7800e-003	1.7300e-003	0.0204	6.0000e-005	8.0600e-003	3.0000e-005	8.0900e-003	2.1400e-003	3.0000e-005	2.1700e-003	0.0000	5.5657	5.5657	1.8000e-004	1.7000e-004	5.6218
Total	**2.8400e-003**	**6.0100e-003**	**0.0215**	**8.0000e-005**	**8.5800e-003**	**6.0000e-005**	**8.6400e-003**	**2.2800e-003**	**6.0000e-005**	**2.3500e-003**	**0.0000**	**7.3210**	**7.3210**	**3.3000e-004**	**4.5000e-004**	**7.4648**

3.2 SMVR Operations - 2026

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0698	0.4018	2.6677	5.6700e-003		0.0136	0.0136		0.0136	0.0136	0.0000	546.1273	546.1273	0.0793	0.0000	548.1085
Total	**0.0698**	**0.4018**	**2.6677**	**5.6700e-003**		**0.0136**	**0.0136**		**0.0136**	**0.0136**	**0.0000**	**546.1273**	**546.1273**	**0.0793**	**0.0000**	**548.1085**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	6.0000e-005	4.2800e-003	1.1000e-003	2.0000e-005	5.2000e-004	3.0000e-005	5.5000e-004	1.4000e-004	3.0000e-005	1.8000e-004	0.0000	1.7553	1.7553	1.5000e-004	2.8000e-004	1.8430
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.7800e-003	1.7300e-003	0.0204	6.0000e-005	8.0600e-003	3.0000e-005	8.0900e-003	2.1400e-003	3.0000e-005	2.1700e-003	0.0000	5.5657	5.5657	1.8000e-004	1.7000e-004	5.6218
Total	**2.8400e-003**	**6.0100e-003**	**0.0215**	**8.0000e-005**	**8.5800e-003**	**6.0000e-005**	**8.6400e-003**	**2.2800e-003**	**6.0000e-005**	**2.3500e-003**	**0.0000**	**7.3210**	**7.3210**	**3.3000e-004**	**4.5000e-004**	**7.4648**

3.2 SMVR Operations - 2027

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1876	1.3046	1.5875	5.6700e-003		0.0424	0.0424		0.0404	0.0404	0.0000	546.1280	546.1280	0.0793	0.0000	548.1092
Total	**0.1876**	**1.3046**	**1.5875**	**5.6700e-003**		**0.0424**	**0.0424**		**0.0404**	**0.0404**	**0.0000**	**546.1280**	**546.1280**	**0.0793**	**0.0000**	**548.1092**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	5.0000e-005	4.1500e-003	1.1100e-003	2.0000e-005	5.2000e-004	3.0000e-005	5.5000e-004	1.4000e-004	3.0000e-005	1.8000e-004	0.0000	1.7179	1.7179	1.5000e-004	2.8000e-004	1.8040
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.6300e-003	1.5700e-003	0.0193	6.0000e-005	8.0600e-003	3.0000e-005	8.0900e-003	2.1400e-003	3.0000e-005	2.1700e-003	0.0000	5.4054	5.4054	1.7000e-004	1.6000e-004	5.4583
Total	**2.6800e-003**	**5.7200e-003**	**0.0204**	**8.0000e-005**	**8.5800e-003**	**6.0000e-005**	**8.6400e-003**	**2.2800e-003**	**6.0000e-005**	**2.3500e-003**	**0.0000**	**7.1233**	**7.1233**	**3.2000e-004**	**4.4000e-004**	**7.2623**

3.2 SMVR Operations - 2027

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0698	0.4018	2.6677	5.6700e-003		0.0136	0.0136		0.0136	0.0136	0.0000	546.1273	546.1273	0.0793	0.0000	548.1085
Total	**0.0698**	**0.4018**	**2.6677**	**5.6700e-003**		**0.0136**	**0.0136**		**0.0136**	**0.0136**	**0.0000**	**546.1273**	**546.1273**	**0.0793**	**0.0000**	**548.1085**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	5.0000e-005	4.1500e-003	1.1100e-003	2.0000e-005	5.2000e-004	3.0000e-005	5.5000e-004	1.4000e-004	3.0000e-005	1.8000e-004	0.0000	1.7179	1.7179	1.5000e-004	2.8000e-004	1.8040
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.6300e-003	1.5700e-003	0.0193	6.0000e-005	8.0600e-003	3.0000e-005	8.0900e-003	2.1400e-003	3.0000e-005	2.1700e-003	0.0000	5.4054	5.4054	1.7000e-004	1.6000e-004	5.4583
Total	**2.6800e-003**	**5.7200e-003**	**0.0204**	**8.0000e-005**	**8.5800e-003**	**6.0000e-005**	**8.6400e-003**	**2.2800e-003**	**6.0000e-005**	**2.3500e-003**	**0.0000**	**7.1233**	**7.1233**	**3.2000e-004**	**4.4000e-004**	**7.2623**

3.2 SMVR Operations - 2028

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1833	1.2746	1.5510	5.5400e-003		0.0415	0.0415		0.0395	0.0395	0.0000	533.5733	533.5733	0.0774	0.0000	535.5089
Total	**0.1833**	**1.2746**	**1.5510**	**5.5400e-003**		**0.0415**	**0.0415**		**0.0395**	**0.0395**	**0.0000**	**533.5733**	**533.5733**	**0.0774**	**0.0000**	**535.5089**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	5.0000e-005	3.9300e-003	1.1000e-003	2.0000e-005	5.1000e-004	3.0000e-005	5.4000e-004	1.4000e-004	3.0000e-005	1.7000e-004	0.0000	1.6431	1.6431	1.5000e-004	2.6000e-004	1.7257
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.4400e-003	1.4100e-003	0.0179	6.0000e-005	7.8700e-003	3.0000e-005	7.9000e-003	2.0900e-003	3.0000e-005	2.1200e-003	0.0000	5.1392	5.1392	1.5000e-004	1.5000e-004	5.1883
Total	**2.4900e-003**	**5.3400e-003**	**0.0190**	**8.0000e-005**	**8.3800e-003**	**6.0000e-005**	**8.4400e-003**	**2.2300e-003**	**6.0000e-005**	**2.2900e-003**	**0.0000**	**6.7822**	**6.7822**	**3.0000e-004**	**4.1000e-004**	**6.9140**

3.2 SMVR Operations - 2028

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0682	0.3926	2.6064	5.5400e-003		0.0133	0.0133		0.0133	0.0133	0.0000	533.5727	533.5727	0.0774	0.0000	535.5083
Total	**0.0682**	**0.3926**	**2.6064**	**5.5400e-003**		**0.0133**	**0.0133**		**0.0133**	**0.0133**	**0.0000**	**533.5727**	**533.5727**	**0.0774**	**0.0000**	**535.5083**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	5.0000e-005	3.9300e-003	1.1000e-003	2.0000e-005	5.1000e-004	3.0000e-005	5.4000e-004	1.4000e-004	3.0000e-005	1.7000e-004	0.0000	1.6431	1.6431	1.5000e-004	2.6000e-004	1.7257
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.4400e-003	1.4100e-003	0.0179	6.0000e-005	7.8700e-003	3.0000e-005	7.9000e-003	2.0900e-003	3.0000e-005	2.1200e-003	0.0000	5.1392	5.1392	1.5000e-004	1.5000e-004	5.1883
Total	**2.4900e-003**	**5.3400e-003**	**0.0190**	**8.0000e-005**	**8.3800e-003**	**6.0000e-005**	**8.4400e-003**	**2.2300e-003**	**6.0000e-005**	**2.2900e-003**	**0.0000**	**6.7822**	**6.7822**	**3.0000e-004**	**4.1000e-004**	**6.9140**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.2211	0.2484	1.8741	3.6800e-003	0.4619	2.6200e-003	0.4645	0.1236	2.4500e-003	0.1261	0.0000	340.1965	340.1965	0.0249	0.0184	346.3156
Unmitigated	0.2211	0.2484	1.8741	3.6800e-003	0.4619	2.6200e-003	0.4645	0.1236	2.4500e-003	0.1261	0.0000	340.1965	340.1965	0.0249	0.0184	346.3156

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Industrial Park	733.99	553.21	270.07	1,226,595	1,226,595
Total	733.99	553.21	270.07	1,226,595	1,226,595

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Industrial Park	6.60	5.50	6.40	59.00	28.00	13.00	79	19	2

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Industrial Park	0.514923	0.057522	0.206064	0.138974	0.023636	0.006062	0.011219	0.006223	0.000940	0.000535	0.027699	0.003185	0.003017

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	346.0043	346.0043	0.0560	6.7900e-003	349.4257
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	346.0043	346.0043	0.0560	6.7900e-003	349.4257
NaturalGas Mitigated	0.0190	0.1730	0.1453	1.0400e-003		0.0131	0.0131		0.0131	0.0131	0.0000	188.2867	188.2867	3.6100e-003	3.4500e-003	189.4056
NaturalGas Unmitigated	0.0190	0.1730	0.1453	1.0400e-003		0.0131	0.0131		0.0131	0.0131	0.0000	188.2867	188.2867	3.6100e-003	3.4500e-003	189.4056

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Industrial Park	3.52836e+006	0.0190	0.1730	0.1453	1.0400e-003		0.0131	0.0131		0.0131	0.0131	0.0000	188.2867	188.2867	3.6100e-003	3.4500e-003	189.4056
Total		**0.0190**	**0.1730**	**0.1453**	**1.0400e-003**		**0.0131**	**0.0131**		**0.0131**	**0.0131**	**0.0000**	**188.2867**	**188.2867**	**3.6100e-003**	**3.4500e-003**	**189.4056**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Industrial Park	3.52836e+006	0.0190	0.1730	0.1453	1.0400e-003		0.0131	0.0131		0.0131	0.0131	0.0000	188.2867	188.2867	3.6100e-003	3.4500e-003	189.4056
Total		**0.0190**	**0.1730**	**0.1453**	**1.0400e-003**		**0.0131**	**0.0131**		**0.0131**	**0.0131**	**0.0000**	**188.2867**	**188.2867**	**3.6100e-003**	**3.4500e-003**	**189.4056**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Industrial Park	3.73963e +006	346.0043	0.0560	6.7900e-003	349.4257
Total		**346.0043**	**0.0560**	**6.7900e-003**	**349.4257**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Industrial Park	3.73963e +006	346.0043	0.0560	6.7900e-003	349.4257
Total		**346.0043**	**0.0560**	**6.7900e-003**	**349.4257**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	1.1032	2.0000e-005	1.9900e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	3.8900e-003	3.8900e-003	1.0000e-005	0.0000	4.1400e-003
Unmitigated	1.1032	2.0000e-005	1.9900e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	3.8900e-003	3.8900e-003	1.0000e-005	0.0000	4.1400e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.2524					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.8506					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.8000e-004	2.0000e-005	1.9900e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	3.8900e-003	3.8900e-003	1.0000e-005	0.0000	4.1400e-003
Total	**1.1032**	**2.0000e-005**	**1.9900e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**	**0.0000**	**3.8900e-003**	**3.8900e-003**	**1.0000e-005**	**0.0000**	**4.1400e-003**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.2524					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.8506					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.8000e-004	2.0000e-005	1.9900e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	3.8900e-003	3.8900e-003	1.0000e-005	0.0000	4.1400e-003
Total	**1.1032**	**2.0000e-005**	**1.9900e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**	**0.0000**	**3.8900e-003**	**3.8900e-003**	**1.0000e-005**	**0.0000**	**4.1400e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	43.0353	0.0654	0.0393	56.3661
Unmitigated	43.0353	0.0654	0.0393	56.3661

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Industrial Park	50.3663 / 0	43.0353	0.0654	0.0393	56.3661
Total		**43.0353**	**0.0654**	**0.0393**	**56.3661**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Industrial Park	50.3663 / 0	43.0353	0.0654	0.0393	56.3661
Total		**43.0353**	**0.0654**	**0.0393**	**56.3661**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	56.0837	2.7810	0.0000	125.6088
Unmitigated	56.0837	2.7810	0.0000	125.6088

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Industrial Park	270.07	56.0837	2.7810	0.0000	125.6088
Total		**56.0837**	**2.7810**	**0.0000**	**125.6088**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Industrial Park	270.07	56.0837	2.7810	0.0000	125.6088
Total		**56.0837**	**2.7810**	**0.0000**	**125.6088**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

SMVRR Equipment

Santa Barbara County APCD Air District, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Industrial Park	217.80	1000sqft	5.00	217,800.00	0

1.2 Other Project Characteristics

Urbanization Rural **Wind Speed (m/s)** 2.9 **Precipitation Freq (Days)** 37

Climate Zone 4 **Operational Year** 2030

Utility Company Pacific Gas and Electric Company

CO2 Intensity (lb/MWhr) 203.98 **CH4 Intensity (lb/MWhr)** 0.033 **N2O Intensity (lb/MWhr)** 0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Waste transport to SMVRR 2024-2029. Assume equipment installed at start of Period 1 (Dec 2024).

Land Use - Betteravia Industrial park is 5 acres (SMVRR website).

Construction Phase - Period 1 12/1/2024 through 12/31/2029. Adjusted end date to account for 4 day work weeks.

Off-road Equipment - Generator set based on requirements for gantry lift system. Other equipment based on defaults or similar models

Trips and VMT - Assume 10 workers per day at one railyard. Used default trip length. 99 haul trips over distance from DCPP to SMVR (roughly 50 miles)

Energy Use -

Construction Off-road Equipment Mitigation - Assume Tier 4 final for hp >100 and Tier 4 interim for hp <100.

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstructionPhase	NumDays	5.00	1,060.00
tblConstructionPhase	PhaseEndDate	12/6/2024	12/22/2028
tblOffRoadEquipment	HorsePower	84.00	369.00
tblOffRoadEquipment	HorsePower	172.00	24.80
tblOffRoadEquipment	LoadFactor	0.38	0.38
tblOffRoadEquipment	LoadFactor	0.42	0.42
tblOffRoadEquipment	LoadFactor	0.31	0.31
tblOffRoadEquipment	LoadFactor	0.40	0.40
tblOffRoadEquipment	OffRoadEquipmentType	Rubber Tired Dozers	Generator Sets
tblOffRoadEquipment	OffRoadEquipmentType	Tractors/Loaders/Backhoes	Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Other Construction Equipment
tblOffRoadEquipment	OffRoadEquipmentType		Aerial Lifts
tblOffRoadEquipment	OffRoadEquipmentType		Rough Terrain Forklifts
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripLength	20.00	50.00
tblTripsAndVMT	HaulingTripNumber	0.00	99.00
tblTripsAndVMT	WorkerTripNumber	25.00	10.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2024	1.5359	11.2801	12.4669	0.0441	0.0672	0.3791	0.4463	0.0179	0.3611	0.3790	0.0000	4,679.3552	4,679.3552	0.6727	4.1700e-003	4,697.4162
2025	1.4626	10.0453	12.3468	0.0441	0.0672	0.3257	0.3930	0.0179	0.3101	0.3280	0.0000	4,676.6993	4,676.6993	0.6723	4.0200e-003	4,694.7044
2026	1.4613	10.0428	12.3339	0.0441	0.0672	0.3257	0.3929	0.0179	0.3101	0.3279	0.0000	4,674.8429	4,674.8429	0.6722	3.8700e-003	4,692.8027
2027	1.4600	10.0405	12.3250	0.0440	0.0672	0.3257	0.3929	0.0179	0.3100	0.3279	0.0000	4,673.1743	4,673.1743	0.6721	3.7500e-003	4,691.0931
2028	1.4589	10.0386	12.3177	0.0440	0.0672	0.3257	0.3929	0.0179	0.3100	0.3279	0.0000	4,671.6427	4,671.6427	0.6721	3.6300e-003	4,689.5257
Maximum	**1.5359**	**11.2801**	**12.4669**	**0.0441**	**0.0672**	**0.3791**	**0.4463**	**0.0179**	**0.3611**	**0.3790**	**0.0000**	**4,679.3552**	**4,679.3552**	**0.6727**	**4.1700e-003**	**4,697.4162**

2.1 Overall Construction (Maximum Daily Emission)

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2024	0.5614	3.1303	20.6370	0.0441	0.0672	0.1048	0.1720	0.0179	0.1048	0.1226	0.0000	4,679.3552	4,679.3552	0.6727	4.1700e-003	4,697.4162
2025	0.5598	3.1274	20.6248	0.0441	0.0672	0.1048	0.1720	0.0179	0.1047	0.1226	0.0000	4,676.6993	4,676.6993	0.6723	4.0200e-003	4,694.7044
2026	0.5585	3.1249	20.6118	0.0441	0.0672	0.1047	0.1720	0.0179	0.1047	0.1226	0.0000	4,674.8429	4,674.8429	0.6722	3.8700e-003	4,692.8027
2027	0.5572	3.1226	20.6029	0.0440	0.0672	0.1047	0.1719	0.0179	0.1047	0.1226	0.0000	4,673.1743	4,673.1743	0.6721	3.7500e-003	4,691.0931
2028	0.5561	3.1207	20.5956	0.0440	0.0672	0.1047	0.1719	0.0179	0.1047	0.1225	0.0000	4,671.6427	4,671.6427	0.6721	3.6300e-003	4,689.5257
Maximum	**0.5614**	**3.1303**	**20.6370**	**0.0441**	**0.0672**	**0.1048**	**0.1720**	**0.0179**	**0.1048**	**0.1226**	**0.0000**	**4,679.3552**	**4,679.3552**	**0.6727**	**4.1700e-003**	**4,697.4162**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**62.15**	**69.63**	**-66.81**	**0.00**	**0.00**	**68.86**	**57.39**	**0.00**	**67.31**	**63.75**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	6.0458	2.0000e-004	0.0221	0.0000		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005		0.0477	0.0477	1.2000e-004		0.0507
Energy	0.1043	0.9477	0.7961	5.6900e-003		0.0720	0.0720		0.0720	0.0720		1,137.2635	1,137.2635	0.0218	0.0209	1,144.0217
Mobile	1.3933	1.5749	12.2950	0.0231	2.9665	0.0165	2.9830	0.7925	0.0154	0.8079		2,357.7498	2,357.7498	0.1783	0.1295	2,400.7968
Total	**7.5434**	**2.5228**	**13.1132**	**0.0288**	**2.9665**	**0.0886**	**3.0551**	**0.7925**	**0.0875**	**0.8800**		**3,495.0610**	**3,495.0610**	**0.2002**	**0.1504**	**3,544.8693**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	6.0458	2.0000e-004	0.0221	0.0000		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005		0.0477	0.0477	1.2000e-004		0.0507
Energy	0.1043	0.9477	0.7961	5.6900e-003		0.0720	0.0720		0.0720	0.0720		1,137.2635	1,137.2635	0.0218	0.0209	1,144.0217
Mobile	1.3933	1.5749	12.2950	0.0231	2.9665	0.0165	2.9830	0.7925	0.0154	0.8079		2,357.7498	2,357.7498	0.1783	0.1295	2,400.7968
Total	**7.5434**	**2.5228**	**13.1132**	**0.0288**	**2.9665**	**0.0886**	**3.0551**	**0.7925**	**0.0875**	**0.8800**		**3,495.0610**	**3,495.0610**	**0.2002**	**0.1504**	**3,544.8693**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	SMVR Operations	Site Preparation	12/1/2024	12/22/2028	5	1060	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
SMVR Operations	Generator Sets	2	4.00	369	0.74
SMVR Operations	Off-Highway Trucks	2	4.00	402	0.38
SMVR Operations	Other Construction Equipment	2	4.00	24.8	0.42
SMVR Operations	Aerial Lifts	2	4.00	63	0.31
SMVR Operations	Rough Terrain Forklifts	2	4.00	100	0.40

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
SMVR Operations	10	10.00	0.00	99.00	8.30	6.40	50.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

3.2 SMVR Operations - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5096	11.2286	12.2723	0.0435		0.3785	0.3785		0.3606	0.3606		4,613.7922	4,613.7922	0.6696		4,630.5329
Total	**1.5096**	**11.2286**	**12.2723**	**0.0435**		**0.3785**	**0.3785**		**0.3606**	**0.3606**		**4,613.7922**	**4,613.7922**	**0.6696**		**4,630.5329**

3.2 SMVR Operations - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	4.5000e-004	0.0347	8.1600e-003	1.4000e-004	4.0600e-003	2.8000e-004	4.3500e-003	1.1100e-003	2.7000e-004	1.3800e-003		15.4063	15.4063	1.1400e-003	2.4700e-003	16.1714
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0259	0.0168	0.1864	5.0000e-004	0.0632	2.9000e-004	0.0635	0.0168	2.7000e-004	0.0170		50.1568	50.1568	1.9100e-003	1.7000e-003	50.7119
Total	**0.0263**	**0.0515**	**0.1946**	**6.4000e-004**	**0.0672**	**5.7000e-004**	**0.0678**	**0.0179**	**5.4000e-004**	**0.0184**		**65.5630**	**65.5630**	**3.0500e-003**	**4.1700e-003**	**66.8833**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5351	3.0788	20.4424	0.0435		0.1042	0.1042		0.1042	0.1042	0.0000	4,613.7922	4,613.7922	0.6696		4,630.5329
Total	**0.5351**	**3.0788**	**20.4424**	**0.0435**		**0.1042**	**0.1042**		**0.1042**	**0.1042**	**0.0000**	**4,613.7922**	**4,613.7922**	**0.6696**		**4,630.5329**

3.2 SMVR Operations - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	4.5000e-004	0.0347	8.1600e-003	1.4000e-004	4.0600e-003	2.8000e-004	4.3500e-003	1.1100e-003	2.7000e-004	1.3800e-003		15.4063	15.4063	1.1400e-003	2.4700e-003	16.1714
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0259	0.0168	0.1864	5.0000e-004	0.0632	2.9000e-004	0.0635	0.0168	2.7000e-004	0.0170		50.1568	50.1568	1.9100e-003	1.7000e-003	50.7119
Total	**0.0263**	**0.0515**	**0.1946**	**6.4000e-004**	**0.0672**	**5.7000e-004**	**0.0678**	**0.0179**	**5.4000e-004**	**0.0184**		**65.5630**	**65.5630**	**3.0500e-003**	**4.1700e-003**	**66.8833**

3.2 SMVR Operations - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.4379	9.9967	12.1645	0.0435		0.3252	0.3252		0.3096	0.3096		4,613.0500	4,613.0500	0.6694		4,629.7848
Total	**1.4379**	**9.9967**	**12.1645**	**0.0435**		**0.3252**	**0.3252**		**0.3096**	**0.3096**		**4,613.0500**	**4,613.0500**	**0.6694**		**4,629.7848**

3.2 SMVR Operations - 2025

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	4.3000e-004	0.0335	8.3100e-003	1.3000e-004	4.0600e-003	2.8000e-004	4.3400e-003	1.1100e-003	2.6000e-004	1.3700e-003		15.1199	15.1199	1.1900e-003	2.4300e-003	15.8733
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0244	0.0151	0.1740	4.8000e-004	0.0632	2.8000e-004	0.0634	0.0168	2.6000e-004	0.0170		48.5294	48.5294	1.7400e-003	1.5900e-003	49.0463
Total	**0.0248**	**0.0486**	**0.1823**	**6.1000e-004**	**0.0672**	**5.6000e-004**	**0.0678**	**0.0179**	**5.2000e-004**	**0.0184**		**63.6493**	**63.6493**	**2.9300e-003**	**4.0200e-003**	**64.9197**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5351	3.0788	20.4424	0.0435		0.1042	0.1042		0.1042	0.1042	0.0000	4,613.0500	4,613.0500	0.6694		4,629.7848
Total	**0.5351**	**3.0788**	**20.4424**	**0.0435**		**0.1042**	**0.1042**		**0.1042**	**0.1042**	**0.0000**	**4,613.0500**	**4,613.0500**	**0.6694**		**4,629.7848**

3.2 SMVR Operations - 2025

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	4.3000e-004	0.0335	8.3100e-003	1.3000e-004	4.0600e-003	2.8000e-004	4.3400e-003	1.1100e-003	2.6000e-004	1.3700e-003		15.1199	15.1199	1.1900e-003	2.4300e-003	15.8733
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0244	0.0151	0.1740	4.8000e-004	0.0632	2.8000e-004	0.0634	0.0168	2.6000e-004	0.0170		48.5294	48.5294	1.7400e-003	1.5900e-003	49.0463
Total	**0.0248**	**0.0486**	**0.1823**	**6.1000e-004**	**0.0672**	**5.6000e-004**	**0.0678**	**0.0179**	**5.2000e-004**	**0.0184**		**63.6493**	**63.6493**	**2.9300e-003**	**4.0200e-003**	**64.9197**

3.2 SMVR Operations - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.4379	9.9967	12.1645	0.0435		0.3252	0.3252		0.3096	0.3096		4,613.0500	4,613.0500	0.6694		4,629.7848
Total	**1.4379**	**9.9967**	**12.1645**	**0.0435**		**0.3252**	**0.3252**		**0.3096**	**0.3096**		**4,613.0500**	**4,613.0500**	**0.6694**		**4,629.7848**

3.2 SMVR Operations - 2026

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	4.2000e-004	0.0324	8.4200e-003	1.3000e-004	4.0600e-003	2.7000e-004	4.3300e-003	1.1100e-003	2.6000e-004	1.3700e-003		14.8295	14.8295	1.2400e-003	2.3800e-003	15.5708
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0230	0.0136	0.1610	4.6000e-004	0.0632	2.6000e-004	0.0634	0.0168	2.4000e-004	0.0170		46.9634	46.9634	1.5800e-003	1.4900e-003	47.4471
Total	**0.0234**	**0.0461**	**0.1694**	**5.9000e-004**	**0.0672**	**5.3000e-004**	**0.0677**	**0.0179**	**5.0000e-004**	**0.0184**		**61.7929**	**61.7929**	**2.8200e-003**	**3.8700e-003**	**63.0179**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5351	3.0788	20.4424	0.0435		0.1042	0.1042		0.1042	0.1042	0.0000	4,613.0500	4,613.0500	0.6694		4,629.7848
Total	**0.5351**	**3.0788**	**20.4424**	**0.0435**		**0.1042**	**0.1042**		**0.1042**	**0.1042**	**0.0000**	**4,613.0500**	**4,613.0500**	**0.6694**		**4,629.7848**

3.2 SMVR Operations - 2026

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	4.2000e-004	0.0324	8.4200e-003	1.3000e-004	4.0600e-003	2.7000e-004	4.3300e-003	1.1100e-003	2.6000e-004	1.3700e-003		14.8295	14.8295	1.2400e-003	2.3800e-003	15.5708
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0230	0.0136	0.1610	4.6000e-004	0.0632	2.6000e-004	0.0634	0.0168	2.4000e-004	0.0170		46.9634	46.9634	1.5800e-003	1.4900e-003	47.4471
Total	**0.0234**	**0.0461**	**0.1694**	**5.9000e-004**	**0.0672**	**5.3000e-004**	**0.0677**	**0.0179**	**5.0000e-004**	**0.0184**		**61.7929**	**61.7929**	**2.8200e-003**	**3.8700e-003**	**63.0179**

3.2 SMVR Operations - 2027

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.4379	9.9967	12.1645	0.0435		0.3252	0.3252		0.3096	0.3096		4,613.0500	4,613.0500	0.6694		4,629.7848
Total	**1.4379**	**9.9967**	**12.1645**	**0.0435**		**0.3252**	**0.3252**		**0.3096**	**0.3096**		**4,613.0500**	**4,613.0500**	**0.6694**		**4,629.7848**

3.2 SMVR Operations - 2027

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	4.0000e-004	0.0314	8.5400e-003	1.3000e-004	4.0600e-003	2.6000e-004	4.3200e-003	1.1100e-003	2.5000e-004	1.3600e-003		14.5132	14.5132	1.2700e-003	2.3400e-003	15.2409
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0218	0.0124	0.1519	4.5000e-004	0.0632	2.4000e-004	0.0634	0.0168	2.2000e-004	0.0170		45.6110	45.6110	1.4600e-003	1.4100e-003	46.0675
Total	**0.0222**	**0.0438**	**0.1605**	**5.8000e-004**	**0.0672**	**5.0000e-004**	**0.0677**	**0.0179**	**4.7000e-004**	**0.0183**		**60.1243**	**60.1243**	**2.7300e-003**	**3.7500e-003**	**61.3084**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5351	3.0788	20.4424	0.0435		0.1042	0.1042		0.1042	0.1042	0.0000	4,613.0500	4,613.0500	0.6694		4,629.7848
Total	**0.5351**	**3.0788**	**20.4424**	**0.0435**		**0.1042**	**0.1042**		**0.1042**	**0.1042**	**0.0000**	**4,613.0500**	**4,613.0500**	**0.6694**		**4,629.7848**

3.2 SMVR Operations - 2027

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	4.0000e-004	0.0314	8.5400e-003	1.3000e-004	4.0600e-003	2.6000e-004	4.3200e-003	1.1100e-003	2.5000e-004	1.3600e-003		14.5132	14.5132	1.2700e-003	2.3400e-003	15.2409
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0218	0.0124	0.1519	4.5000e-004	0.0632	2.4000e-004	0.0634	0.0168	2.2000e-004	0.0170		45.6110	45.6110	1.4600e-003	1.4100e-003	46.0675
Total	**0.0222**	**0.0438**	**0.1605**	**5.8000e-004**	**0.0672**	**5.0000e-004**	**0.0677**	**0.0179**	**4.7000e-004**	**0.0183**		**60.1243**	**60.1243**	**2.7300e-003**	**3.7500e-003**	**61.3084**

3.2 SMVR Operations - 2028

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.4379	9.9967	12.1645	0.0435		0.3252	0.3252		0.3096	0.3096		4,613.0500	4,613.0500	0.6694		4,629.7848
Total	**1.4379**	**9.9967**	**12.1645**	**0.0435**		**0.3252**	**0.3252**		**0.3096**	**0.3096**		**4,613.0500**	**4,613.0500**	**0.6694**		**4,629.7848**

3.2 SMVR Operations - 2028

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	3.9000e-004	0.0305	8.6600e-003	1.2000e-004	4.0600e-003	2.5000e-004	4.3200e-003	1.1100e-003	2.4000e-004	1.3500e-003		14.2079	14.2079	1.3100e-003	2.2900e-003	14.9224
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0207	0.0114	0.1445	4.4000e-004	0.0632	2.3000e-004	0.0634	0.0168	2.1000e-004	0.0170		44.3848	44.3848	1.3500e-003	1.3400e-003	44.8185
Total	**0.0211**	**0.0419**	**0.1532**	**5.6000e-004**	**0.0672**	**4.8000e-004**	**0.0677**	**0.0179**	**4.5000e-004**	**0.0183**		**58.5927**	**58.5927**	**2.6600e-003**	**3.6300e-003**	**59.7409**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5351	3.0788	20.4424	0.0435		0.1042	0.1042		0.1042	0.1042	0.0000	4,613.0500	4,613.0500	0.6694		4,629.7848
Total	**0.5351**	**3.0788**	**20.4424**	**0.0435**		**0.1042**	**0.1042**		**0.1042**	**0.1042**	**0.0000**	**4,613.0500**	**4,613.0500**	**0.6694**		**4,629.7848**

3.2 SMVR Operations - 2028

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	3.9000e-004	0.0305	8.6600e-003	1.2000e-004	4.0600e-003	2.5000e-004	4.3200e-003	1.1100e-003	2.4000e-004	1.3500e-003		14.2079	14.2079	1.3100e-003	2.2900e-003	14.9224
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0207	0.0114	0.1445	4.4000e-004	0.0632	2.3000e-004	0.0634	0.0168	2.1000e-004	0.0170		44.3848	44.3848	1.3500e-003	1.3400e-003	44.8185
Total	**0.0211**	**0.0419**	**0.1532**	**5.6000e-004**	**0.0672**	**4.8000e-004**	**0.0677**	**0.0179**	**4.5000e-004**	**0.0183**		**58.5927**	**58.5927**	**2.6600e-003**	**3.6300e-003**	**59.7409**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.3933	1.5749	12.2950	0.0231	2.9665	0.0165	2.9830	0.7925	0.0154	0.8079		2,357.749 8	2,357.749 8	0.1783	0.1295	2,400.796 8
Unmitigated	1.3933	1.5749	12.2950	0.0231	2.9665	0.0165	2.9830	0.7925	0.0154	0.8079		2,357.749 8	2,357.749 8	0.1783	0.1295	2,400.796 8

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Industrial Park	733.99	553.21	270.07	1,226,595	1,226,595
Total	733.99	553.21	270.07	1,226,595	1,226,595

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Industrial Park	6.60	5.50	6.40	59.00	28.00	13.00	79	19	2

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Industrial Park	0.514923	0.057522	0.206064	0.138974	0.023636	0.006062	0.011219	0.006223	0.000940	0.000535	0.027699	0.003185	0.003017

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.1043	0.9477	0.7961	5.6900e-003		0.0720	0.0720		0.0720	0.0720		1,137.2635	1,137.2635	0.0218	0.0209	1,144.0217
NaturalGas Unmitigated	0.1043	0.9477	0.7961	5.6900e-003		0.0720	0.0720		0.0720	0.0720		1,137.2635	1,137.2635	0.0218	0.0209	1,144.0217

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Industrial Park	9666.74	0.1043	0.9477	0.7961	5.6900e-003		0.0720	0.0720		0.0720	0.0720		1,137.2635	1,137.2635	0.0218	0.0209	1,144.0217
Total		**0.1043**	**0.9477**	**0.7961**	**5.6900e-003**		**0.0720**	**0.0720**		**0.0720**	**0.0720**		**1,137.2635**	**1,137.2635**	**0.0218**	**0.0209**	**1,144.0217**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Industrial Park	9.66674	0.1043	0.9477	0.7961	5.6900e-003		0.0720	0.0720		0.0720	0.0720		1,137.2635	1,137.2635	0.0218	0.0209	1,144.0217
Total		**0.1043**	**0.9477**	**0.7961**	**5.6900e-003**		**0.0720**	**0.0720**		**0.0720**	**0.0720**		**1,137.2635**	**1,137.2635**	**0.0218**	**0.0209**	**1,144.0217**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	6.0458	2.0000e-004	0.0221	0.0000		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005		0.0477	0.0477	1.2000e-004		0.0507
Unmitigated	6.0458	2.0000e-004	0.0221	0.0000		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005		0.0477	0.0477	1.2000e-004		0.0507

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	1.3829					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	4.6609					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	2.0200e-003	2.0000e-004	0.0221	0.0000		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005		0.0477	0.0477	1.2000e-004		0.0507
Total	**6.0458**	**2.0000e-004**	**0.0221**	**0.0000**		**8.0000e-005**	**8.0000e-005**		**8.0000e-005**	**8.0000e-005**		**0.0477**	**0.0477**	**1.2000e-004**		**0.0507**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	1.3829					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	4.6609					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	2.0200e-003	2.0000e-004	0.0221	0.0000		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005		0.0477	0.0477	1.2000e-004		0.0507
Total	**6.0458**	**2.0000e-004**	**0.0221**	**0.0000**		**8.0000e-005**	**8.0000e-005**		**8.0000e-005**	**8.0000e-005**		**0.0477**	**0.0477**	**1.2000e-004**		**0.0507**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Appendix D2

Proposed Project AQ and GHG Emissions
Phase 2

D2.1 Phase 2 Summary AQ and GHG Emissions

D2.2 Phase 2 Truck Emissions Calculations

D2.3 Phase 2 Construction Emissions Calculations

D2.4 Phase 2 Operational Emission Calculations

D2.5 Phase 2 CalEEMod Output Files

Appendix D2.1

Phase 2 Summary AQ and GHG Emissions

Emission Calculations for Phase 2

Activity Data
Activity Data is from PG&E Letter DCL-21-072 (October 6, 2021) -
Responses to August 9, 2021 Information Hold Letter and September 17, 2021 Comments.
Equipment data provided as pdf table in Response to GC-3.

Calculations are for AQ and GHG emissions for Phase 2 of Proposed Project
Subphases were created by grouping together similar tasks that would be completed together and within the same time scale, to align with PG&E's activity breakdowns.

AQ Emissions Basis:
Daily Maximum values were used to provide most conservative estimate of possible maximum daily emissions
To calculate maximum values, the total hours of usage per equipment type was divided by the total days of that equipment type. This gives an appropriate approximate estimate of daily hourly usage.
The hours resulting were multiplied by 1.25. This 25% increase provides a more conservative estimate to account for any deviations from average daily usage.
All equipment hours were included for all of the days within each sub phase. This calculation is also inherently conservative, as the equipment days are equal to or less than the total days in a subphase.

GHG Emissions Basis:
Using the above methodology would overestimate overall activity and result in an overprediction of GHG emissions.
GHG emissions begin with the daily usage, where the total hours of equipment usage was divided by the total days in the subphase that equipment was being used. Since GHG emissions are calculated as yearly totals rather than daily like AQ, the yearly usage is a more appropriate basis than daily.

Table 1.1

Air Quality

Mitigated Construction

	NOx	ROG	PM10 Total	PM2.5 Total	CO	SO2	Fugitive PM10	Exhaust PM10	Fugitive PM2.5	Exhaust PM2.5
Year	lb/day									
2032	19.7012	6.0399	10.1169	3.1416	78.8491	0.1829	9.4782	0.6388	2.5051	0.6365
2033	19.6392	5.9481	17.1412	4.4694	78.3749	0.1819	17.0158	0.6371	4.3458	0.6350
2034	3.5088	2.4037	17.1398	4.4680	25.0195	0.0861	17.0158	0.1240	4.3458	0.1223
2035	18.2626	8.7165	17.1073	4.4357	85.9085	0.2549	17.0158	0.6550	4.3458	0.6534
2036	12.3438	7.7542	32.9353	8.3756	65.3749	0.2228	32.7724	0.4419	8.2143	0.4401
2037	3.9384	2.6813	9.1618	2.5241	26.2089	0.0987	9.0307	0.1311	2.3946	0.1294
2038	3.9384	2.6813	9.1618	2.5241	26.2089	0.0987	9.0307	0.1311	2.3946	0.1294
2039	3.9384	2.6813	9.1618	2.5241	26.2089	0.0987	9.0307	0.1311	2.3946	0.1294
Maximum	**19.70**	**8.72**	**32.94**	**8.38**	**85.91**	**0.25**	**32.77**	**0.66**	**8.21**	**0.65**

Table 1.2

Mitigated Operational

	NOx	ROG	PM10 Total	PM2.5 Total	CO	SO2	Fugitive PM10	Exhaust PM10	Fugitive PM2.5	Exhaust PM2.5
Category	lb/day									
Area	0.0302	0.3075	0.0119	0.0119	3.3303	2.5000e-004		0.0119		0.0119
Energy	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0000
Mobile	1.33	0.99	0.30	0.1267	9.55	0.0184	0.28	0.0155	0.11	0.0145
Total	**1.36**	**1.30**	**0.31**	0.1386	**12.88**	0.0187	**0.28**	0.0274	**0.11**	0.0264

GHG

Mitigated Construction

	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	MT/yr					
2032	0	1346	1346	0	0	1351
2033	0	728	728	0	0	733
2034	0	681	681	0	0	685
2035	0	1581	1581	0	0	1586
2036	0	1068	1068	0	0	1073
2037	0	823	823	0	0	827
2038	0	823	823	0	0	827
2039	0	612	612	0	0	615
Total	**0**	**7663**	**7663**	**0**	**0**	**7698**

Mitigated Operational

	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	MT/yr					
Area	0.00	5.84E-01	5.84E-01	1.52E-03	0.00	6.22E-01
Energy	0.00	0.00	0.00	0.00	0.00	0.00
Mobile	0.00	310.32	310.32	2.11E-02	1.56E-02	315.48
Waste	6.09E-03	0.00	6.09E-03	3.60E-04	0.00	1.51E-02
Water	0.00	0.00	0.00	0.00	0.00	0.00
Total	**0**	**311**	**311**	**0**	**0**	**316**

Appendix D2.2

Phase 2 Truck Emissions Calculations

Activity	Equipment Type	Decommissioning Phase 2(2032 – 2039) Air Quality: Duration (Days)	Run Time (Hours)	Hours per Day Peak Use	25% contingency factor	Sum of total peak hours per equipment type	Hours Per Day Per Unit, Peak Usage	Equipment Count, Daily Peak Use	Hours per Day Average Use	average hours per equipment type	Hours Per Day, Peak Usage	Equipment Count, Daily Peak Use
Demolition	Haul Truck	237	2372	10	13	13	8	2	10	10	8	1
Mobilization and Site Preparation	Pickup- 3/4T	2	20	34	43	43	8	5	10	10	8	1
Soil Remediation	Pickup- 1/2T	1	10	54	67	122	8	15	10	20	8	3
Soil Remediation	Water Tanker Trucks-Off Hig	1	10	59	73	73	8	9	10	10	8	1
Soil Remediation	Pickup- 3/4T	1	10	44	55				10			
Revegetation	Pickup - 1/2T	574	2868	5	6	19	8	2	5	15	8	2
Revegetation	Flatbed Truck with Liftgate	20	200	10	13				10			
Mobilization and Site Prep Landscape	Water Tanker Trucks-Off Hig	3	58	41	52	52	8	6	19	19	8	2
Mobilization and Site Prep Landscape	Articulated Dump Truck, Of	3	66	44	55	55	8	7	22	22	8	3
Mass Excavation	Water Tanker Trucks-Off Hig	233	4669	60	75	75	8	9	20	20	8	3
Mass Excavation	Articulated Dump Truck, Of	233	9338	60	75	75	8	9	40	40	8	5
Mass Excavation	Pickup- 3/4T	233	2335	20	25	25	8	3	10	10	8	1
Backfill Building Foundation	Water Tanker Trucks-Off Hig	21	215	21	27	27	8	3	10	10	8	1
Backfill Tunnels	Pickup- 3/4T	20	200	10	13	13	8	2	10	10	8	1
Backfill and Grading of Zones	Pickup- 3/4T	2	20	30	37	37	8	5	10	10	8	1
Backfill and Grading of Zones	Water Tanker Trucks-Off Hig	2	20	50	62	62	8	8	10	10	8	1
Erosion Control and Restoration	Pickup- 1/2T	3	112	122	153	176	8	22	37	56	8	7
Erosion Control and Restoration	Pickup- 3/4T	3	56	19	23				19			
Erosion Control and Restoration	Water Tanker Trucks-Off Hig	9	174	19	24	24	8	3	19	19	8	2
Erosion Control and Restoration	Articulated Dump Truck, Of	9	87	10	12	12	8	2	10	10	8	1

		Waste Transportation Trips: Recyclable Metal	Hazardous/Regulated Waste	Clean Debris and Soil	Pickup Trips AQ	Pickup Trips GHG	Worker Trips	Total Truck Trips AQ	Total Truck Trips GHG	Water Truck Vendor Trips AQ	Water Truck Vendor Trips GHG
		total	total	total	/day	/day	/day	/day	/day	/day	/day
Demolition	255	42					540	540	540		
Mobilization and Site Preparation	6				5	1	540	545	541		
Soil Remediation	18		20		15	3	540	555	543	9	1
Revegetation	574				2	2	540	542	542		
Mobilization and Site Prep Landscape	3						540	540	540		
Mass Excavation	233			60	3	1	540	543	541	9	3
Backfill Building Foundation	21						540	540	540	3	1
Backfill Tunnels	20				2	1	540	542	541		
Backfill and Grading of Zones	46				5	1	540	545	541	8	1
Erosion Control and Restoration	9				22	7	540	562	547	3	2
Movement and Stockpiling	574						540	540	540		

Appendix D2.3

Phase 2 Construction Emissions Calculations

	Number of Days
Demolition	255
Mobilization and Site Preparation	6
Soil Remediation	18
Revegetation	574
Mobilization and Site Prep Landscape	3
Mass Excavation	233
Backfill Building Foundation	21
Backfill Tunnels	20
Backfill and Grading of Zones	46
Erosion Control and Restoration	9
Movement and Stockpiling	574

		Air Quality		GHG	
Phase	Equipment Type	Amount	Hours	Amount	Hours / Day
Demolition	Aerial Lifts	2	7	1	2
Demolition	Crushing/Proc. Equipment	2	7	1	8
Demolition	Crushing/Proc. Equipment	2	7	1	6
Demolition	Excavators	2	7	2	6
Demolition	Forklifts	2	7	1	6
Demolition	Generator Sets	2	7	2	7
Demolition	Other Construction Equipment	2	7	1	8
Demolition	Paving Equipment	2	7	1	3
Demolition	Rubber Tired Loaders	2	7	1	8
Demolition	Skid Steer Loaders	2	7	2	5
Demolition	Welders	2	7	2	7
Mobilization and Site Preparation	Excavators	7	8	2	8
Mobilization and Site Preparation	Tractors/Loaders/Backhoes	6	8	2	5
Soil Remediation	Excavators	8	8	3	7
Soil Remediation	Graders	3	7	2	7
Soil Remediation	Off-Highway Tractors	3	7	2	7
Soil Remediation	Tractors/Loaders/Backhoes	9	8	3	7
Revegetation	Excavators	2	8	1	1
Revegetation	Graders	3	6	1	1
Mobilization and Site Prep Landscape	Excavators	7	8	7	8
Mobilization and Site Prep Landscape	Graders	4	7	4	7
Mobilization and Site Prep Landscape	Off-Highway Tractors	4	7	4	7
Mobilization and Site Prep Landscape	Tractors/Loaders/Backhoes	4	7	4	7
Mass Excavation	Excavators	7	8	5	7
Backfill Building Foundation	Plate Compactors	7	8	4	8
Backfill Building Foundation	Tractors/Loaders/Backhoes	7	8	4	8
Backfill Tunnels	Tractors/Loaders/Backhoes	4	7	4	7
Backfill Tunnels	Concrete Batch Plant	3	8	3	8
Backfill and Grading of Zones	Graders	4	7	2	7
Backfill and Grading of Zones	Off-Highway Tractors	11	8	7	8
Backfill and Grading of Zones	Plate Compactors	11	8	7	8
Erosion Control and Restoration	Excavators	4	7	3	6
Erosion Control and Restoration	Graders	3	8	4	7
Erosion Control and Restoration	Off-Highway Tractors	3	8	4	7
Erosion Control and Restoration	Rollers	2	7	2	7
Erosion Control and Restoration	Rubber Tired Loaders	2	6	2	7
Movement and Stockpiling	Rubber Tired Loaders	4	7	1	8

		101	acres
Grading Acres		697	total days
Mobilization and Site Preparation	6	0.9	
Soil Remediation	18	2.6	
Revegetation	574	83.2	
Mobilization and Site Prep Landscape	3	0.4	
Backfill Building Foundation	21	3.0	
Backfill Tunnels	20	2.9	
Backfill and Grading of Zones	46	6.7	
Erosion Control and Restoration	9	1.3	

Appendix D2.4

Phase 2 Operational Emissions Calculations

Vehicles Per Day

200	Visitors
5	Employees
32,670	x 1000 sqft

Vehicle trips in trips/100 sqft/ day
0.006275

Solid Waste Generation
Units of tons/year

205	people
128	grams/person/dady
365	days/year
26240	grams/year
0.000001102	tons/gram
0.02891648	tons/year

Appendix D2.5

Phase 2 CalEEMod Output Files

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Diablo Canyon Decommissioning Phase 2

South Central Coast Air Basin, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Heavy Industry	32,670.00	1000sqft	750.00	32,670,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.9	**Precipitation Freq (Days)**	37
Climate Zone	4			**Operational Year**	2024
Utility Company					
CO2 Intensity (lb/MWhr)	0	**CH4 Intensity (lb/MWhr)**	0	**N2O Intensity (lb/MWhr)**	0

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase - Timing on Equipment List excel

Off-road Equipment - equipment list

Off-road Equipment - equipment sheet

Off-road Equipment - equipment list, other equipment is batch plant

Off-road Equipment - crushing processing are hydraulic breaker and hammers, other eq fogger mister

Off-road Equipment - equipment list

Off-road Equipment - equipment list

Off-road Equipment - equipment excel

Off-road Equipment - equipment list excel

Off-road Equipment - equipment list

Off-road Equipment - equipment list excel

Off-road Equipment - equipment list

Trips and VMT - Water trucks for vendor trips

Demolition -

Grading - Grading tab

Vehicle Trips - marina usage

Road Dust - no operational

Consumer Products - no operational

Area Coating - no architectural coating

Energy Use - no operational

Water And Wastewater - no indoor water use

Solid Waste - no op

Construction Off-road Equipment Mitigation - APM AQ 1-5

Fleet Mix - all personal vehicles

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_EF_Nonresidential_Exterior	250	0
tblAreaCoating	Area_EF_Nonresidential_Interior	250	0
tblAreaCoating	Area_EF_Parking	250	0
tblAreaCoating	Area_EF_Residential_Exterior	250	0
tblAreaCoating	Area_EF_Residential_Interior	250	0
tblAreaCoating	Area_Nonresidential_Exterior	16335000	0
tblAreaCoating	Area_Nonresidential_Interior	49005000	0
tblAreaCoating	ReapplicationRatePercent	10	0
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	7.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
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tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
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tblConstructionPhase	NumDays	800.00	574.00
tblConstructionPhase	NumDays	1,240.00	21.00

tblConstructionPhase	NumDays	1,240.00	20.00
tblConstructionPhase	NumDays	1,240.00	46.00
tblConstructionPhase	NumDays	480.00	9.00
tblConstructionPhase	NumDays	480.00	6.00
tblConstructionPhase	NumDays	480.00	18.00
tblConstructionPhase	NumDays	480.00	574.00
tblConstructionPhase	NumDays	480.00	3.00
tblConsumerProducts	ROG_EF	2.14E-05	0
tblConsumerProducts	ROG_EF_Degreaser	3.542E-07	0
tblConsumerProducts	ROG_EF_PesticidesFertilizers	5.152E-08	0
tblEnergyUse	LightingElect	3.08	0.00
tblEnergyUse	NT24E	3.70	0.00
tblEnergyUse	NT24NG	6.67	0.00
tblEnergyUse	T24E	1.32	0.00
tblEnergyUse	T24NG	19.51	0.00
tblGrading	AcresOfGrading	23.63	2.60
tblGrading	AcresOfGrading	645.75	83.20
tblGrading	AcresOfGrading	645.75	0.00
tblGrading	AcresOfGrading	5.25	0.40
tblGrading	AcresOfGrading	80.50	6.70
tblGrading	AcresOfGrading	13.50	1.30
tblOffRoadEquipment	HorsePower	124.00	260.00
tblOffRoadEquipment	HorsePower	124.00	260.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	4.00
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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	11.00
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tblOffRoadEquipment	PhaseName		Mobilization and Site Prep Landscape
tblOffRoadEquipment	PhaseName		Backfill and Grading of Zones
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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblOffRoadEquipment	PhaseName		Erosion Control and Restoration
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tblOffRoadEquipment	PhaseName		Demolition
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tblOffRoadEquipment	UsageHours	8.00	7.00
tblOffRoadEquipment	UsageHours	8.00	7.00
tblOffRoadEquipment	UsageHours	8.00	7.00
tblRoadDust	MeanVehicleSpeed	40	0
tblRoadDust	MobileAverageVehicleWeight	2.4	0
tblRoadDust	RoadSiltLoading	0.1	0
tblSolidWaste	SolidWasteGenerationRate	40,510.80	0.03
tblTripsAndVMT	HaulingTripLength	20.00	0.00
tblTripsAndVMT	HaulingTripNumber	81.00	42.00
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tblTripsAndVMT	HaulingTripNumber	0.00	60.00
tblTripsAndVMT	VendorTripLength	7.30	13.00
tblTripsAndVMT	VendorTripLength	7.30	13.00
tblTripsAndVMT	VendorTripLength	7.30	13.00

tblTripsAndVMT	VendorTripLength	7.30	13.00
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tblTripsAndVMT	WorkerTripNumber	48.00	545.00
tblTripsAndVMT	WorkerTripNumber	120.00	555.00
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tblTripsAndVMT	WorkerTripNumber	50.00	543.00
tblTripsAndVMT	WorkerTripNumber	35.00	540.00
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tblTripsAndVMT	WorkerTripNumber	78.00	545.00
tblVehicleTrips	ST_TR	6.42	0.01
tblVehicleTrips	SU_TR	5.09	0.01
tblVehicleTrips	WD_TR	3.93	0.01
tblWater	ElectricityIntensityFactorForWastewaterTreatment	1,911.00	0.00
tblWater	ElectricityIntensityFactorToDistribute	1,272.00	0.00
tblWater	ElectricityIntensityFactorToSupply	2,117.00	0.00
tblWater	ElectricityIntensityFactorToTreat	111.00	0.00
tblWater	IndoorWaterUseRate	7,554,937,500.00	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2032	6.7773	24.0318	77.1281	0.1829	9.5624	0.7442	10.3067	2.5142	0.7420	3.2561	0.0000	18,103.8671	18,103.8671	0.5460	0.1758	18,153.2740
2033	6.6854	22.5178	76.6540	0.1819	17.1003	0.7426	17.2456	4.3549	0.7405	4.4983	0.0000	17,640.4419	17,640.4419	0.5411	0.1717	17,705.1434
2034	2.5997	3.9839	23.9624	0.0861	17.1003	0.1439	17.2442	4.3549	0.1421	4.4970	0.0000	8,508.0562	8,508.0562	0.1638	0.1155	8,546.5745
2035	9.3104	19.7480	83.8224	0.2549	17.1003	0.7161	17.2016	4.3549	0.7144	4.4545	0.0000	26,271.4460	26,271.4460	0.7494	0.1558	26,323.8333
2036	7.9370	12.4839	64.9252	0.2228	32.8557	0.4512	33.0347	8.2233	0.4494	8.4006	0.0000	23,785.1226	23,785.1226	0.6411	0.1558	23,847.5699
2037	3.1122	4.4515	22.5122	0.0987	9.0307	0.1541	9.1848	2.3946	0.1525	2.5471	0.0000	10,530.0005	10,530.0005	0.2127	0.1129	10,568.9698
2038	3.1122	4.4515	22.5122	0.0987	9.0307	0.1541	9.1848	2.3946	0.1525	2.5471	0.0000	10,530.0005	10,530.0005	0.2127	0.1129	10,568.9698
2039	3.1122	4.4515	22.5122	0.0987	9.0307	0.1541	9.1848	2.3946	0.1525	2.5471	0.0000	10,530.0005	10,530.0005	0.2127	0.1129	10,568.9698
Maximum	**9.3104**	**24.0318**	**83.8224**	**0.2549**	**32.8557**	**0.7442**	**33.0347**	**8.2233**	**0.7420**	**8.4006**	**0.0000**	**26,271.4460**	**26,271.4460**	**0.7494**	**0.1758**	**26,323.8333**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

2.1 Overall Construction (Maximum Daily Emission)

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2032	6.0399	19.7012	78.8491	0.1829	9.4782	0.6388	10.1169	2.5051	0.6365	3.1416	0.0000	18,103.8671	18,103.8671	0.5460	0.1758	18,153.2740
2033	5.9481	19.6392	78.3749	0.1819	17.0158	0.6371	17.1412	4.3458	0.6350	4.4694	0.0000	17,640.4419	17,640.4419	0.5411	0.1717	17,705.1433
2034	2.4037	3.5088	25.0195	0.0861	17.0158	0.1240	17.1398	4.3458	0.1223	4.4680	0.0000	8,508.0562	8,508.0562	0.1638	0.1155	8,546.5745
2035	8.7165	18.2626	85.9085	0.2549	17.0158	0.6550	17.1073	4.3458	0.6534	4.4357	0.0000	26,271.4460	26,271.4460	0.7494	0.1558	26,323.8333
2036	7.7542	12.3438	65.3749	0.2228	32.7724	0.4419	32.9353	8.2143	0.4401	8.3756	0.0000	23,785.1226	23,785.1226	0.6411	0.1558	23,847.5698
2037	2.6813	3.9384	26.2089	0.0987	9.0307	0.1311	9.1618	2.3946	0.1294	2.5241	0.0000	10,530.0005	10,530.0005	0.2127	0.1129	10,568.9698
2038	2.6813	3.9384	26.2089	0.0987	9.0307	0.1311	9.1618	2.3946	0.1294	2.5241	0.0000	10,530.0005	10,530.0005	0.2127	0.1129	10,568.9698
2039	2.6813	3.9384	26.2089	0.0987	9.0307	0.1311	9.1618	2.3946	0.1294	2.5241	0.0000	10,530.0005	10,530.0005	0.2127	0.1129	10,568.9698
Maximum	**8.7165**	**19.7012**	**85.9085**	**0.2549**	**32.7724**	**0.6550**	**32.9353**	**8.2143**	**0.6534**	**8.3756**	**0.0000**	**26,271.4460**	**26,271.4460**	**0.7494**	**0.1758**	**26,323.8333**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**8.77**	**11.29**	**-4.60**	**0.00**	**0.35**	**11.36**	**0.54**	**0.15**	**11.41**	**0.87**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.3075	0.0302	3.3303	2.5000e-004		0.0119	0.0119		0.0119	0.0119		7.1499	7.1499	0.0187		7.6166
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.9945	1.3323	9.5539	0.0184	0.2816	0.0155	0.2971	0.1122	0.0145	0.1267		1,874.4016	1,874.4016	0.1317	0.0956	1,906.1706
Total	**1.3019**	**1.3626**	**12.8842**	**0.0187**	**0.2816**	**0.0274**	**0.3089**	**0.1122**	**0.0264**	**0.1386**		**1,881.5515**	**1,881.5515**	**0.1504**	**0.0956**	**1,913.7871**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.3075	0.0302	3.3303	2.5000e-004		0.0119	0.0119		0.0119	0.0119		7.1499	7.1499	0.0187		7.6166
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.9945	1.3323	9.5539	0.0184	0.2816	0.0155	0.2971	0.1122	0.0145	0.1267		1,874.4016	1,874.4016	0.1317	0.0956	1,906.1706
Total	**1.3019**	**1.3626**	**12.8842**	**0.0187**	**0.2816**	**0.0274**	**0.3089**	**0.1122**	**0.0264**	**0.1386**		**1,881.5515**	**1,881.5515**	**0.1504**	**0.0956**	**1,913.7871**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2032	12/22/2032	5	255	
2	Mobilization and Site Preparation	Site Preparation	12/23/2032	12/30/2032	5	6	
3	Soil Remediation	Site Preparation	12/31/2032	1/25/2033	5	18	
4	Revegetation	Site Preparation	1/26/2033	4/9/2035	5	574	
5	Mobilization and Site Prep Landscape	Site Preparation	4/10/2035	4/12/2035	5	3	
6	Mass Excavation	Trenching	4/15/2035	3/5/2036	5	233	
7	Backfill Building Foundation	Grading	3/6/2036	4/3/2036	5	21	
8	Backfill Tunnels	Grading	4/4/2036	5/1/2036	5	20	
9	Backfill and Grading of Zones	Grading	5/2/2036	7/4/2036	5	46	
10	Erosion Control and Restoration	Site Preparation	7/7/2036	7/17/2036	5	9	
11	Movement and Stockpiling	Demolition	7/18/2036	9/29/2039	5	574	

Acres of Grading (Site Preparation Phase): 0.9

Acres of Grading (Grading Phase): 3

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Aerial Lifts	2	7.00	63	0.31
Demolition	Crushing/Proc. Equipment	2	7.00	85	0.78
Demolition	Crushing/Proc. Equipment	2	7.00	85	0.78
Demolition	Excavators	2	7.00	158	0.38
Demolition	Forklifts	2	7.00	89	0.20
Demolition	Generator Sets	2	7.00	84	0.74
Demolition	Off-Highway Trucks	2	8.00	402	0.38
Demolition	Other Construction Equipment	2	7.00	172	0.42
Demolition	Paving Equipment	2	7.00	132	0.36
Demolition	Rubber Tired Loaders	2	7.00	203	0.36
Demolition	Skid Steer Loaders	2	7.00	65	0.37
Demolition	Welders	2	7.00	46	0.45
Mobilization and Site Preparation	Excavators	7	8.00	158	0.38
Mobilization and Site Preparation	Tractors/Loaders/Backhoes	6	8.00	97	0.37
Soil Remediation	Excavators	8	8.00	158	0.38
Soil Remediation	Graders	3	7.00	187	0.41
Soil Remediation	Off-Highway Tractors	3	7.00	124	0.44
Soil Remediation	Tractors/Loaders/Backhoes	9	8.00	97	0.37
Revegetation	Excavators	2	8.00	158	0.38
Revegetation	Graders	3	6.00	187	0.41
Mobilization and Site Prep Landscape	Excavators	7	8.00	158	0.38
Mobilization and Site Prep Landscape	Graders	4	7.00	187	0.41
Mobilization and Site Prep Landscape	Off-Highway Tractors	4	7.00	124	0.44
Mobilization and Site Prep Landscape	Off-Highway Trucks	7	8.00	402	0.38
Mobilization and Site Prep Landscape	Tractors/Loaders/Backhoes	4	7.00	97	0.37
Mass Excavation	Excavators	7	8.00	158	0.38
Mass Excavation	Off-Highway Trucks	9	8.00	402	0.38
Backfill Building Foundation	Aerial Lifts	0		63	0.31

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Backfill Building Foundation	Plate Compactors	7	8.00	8	0.43
Backfill Building Foundation	Tractors/Loaders/Backhoes	7	8.00	97	0.37
Backfill Tunnels	Other Construction Equipment	3	8.00	172	0.42
Backfill Tunnels	Tractors/Loaders/Backhoes	4	7.00	97	0.37
Backfill and Grading of Zones	Graders	4	7.00	187	0.41
Backfill and Grading of Zones	Off-Highway Tractors	11	8.00	260	0.44
Backfill and Grading of Zones	Plate Compactors	11	8.00	8	0.43
Erosion Control and Restoration	Excavators	4	7.00	158	0.38
Erosion Control and Restoration	Graders	3	8.00	187	0.41
Erosion Control and Restoration	Off-Highway Tractors	3	8.00	260	0.44
Erosion Control and Restoration	Off-Highway Trucks	2	8.00	402	0.38
Erosion Control and Restoration	Rollers	2	7.00	80	0.38
Erosion Control and Restoration	Rubber Tired Loaders	2	6.00	400	0.36
Movement and Stockpiling	Rubber Tired Loaders	4	7.00	400	0.36

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	24	540.00	0.00	42.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Mobilization and Site Preparation	19	545.00	0.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Soil Remediation	48	555.00	9.00	20.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Revegetation	8	542.00	0.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Revegetation	8	0.00	0.00	0.00	22.00	13.00	0.00	LD_Mix	HDT_Mix	HHDT
Mobilization and Site Prep Landscape	26	540.00	0.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Mass Excavation	20	543.00	9.00	60.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Backfill Building Foundation	14	540.00	3.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Backfill Tunnels	6	542.00	0.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Backfill and Grading of Zones	31	545.00	8.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT

Erosion Control and Restoration	41	562.00	3.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Movement and Stockpiling	4	540.00	0.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Demolition - 2032

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0706	0.0000	0.0706	0.0107	0.0000	0.0107			0.0000			0.0000
Off-Road	4.9858	23.1276	57.4980	0.1257		0.6242	0.6242		0.6242	0.6242		12,353.74 51	12,353.74 51	0.4401		12,364.74 77
Total	**4.9858**	**23.1276**	**57.4980**	**0.1257**	**0.0706**	**0.6242**	**0.6948**	**0.0107**	**0.6242**	**0.6349**		**12,353.74 51**	**12,353.74 51**	**0.4401**		**12,364.74 77**

3.2 Demolition - 2032

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	3.1000e-004	0.0199	6.8200e-003	8.0000e-005	2.8800e-003	1.5000e-004	3.0300e-003	7.9000e-004	1.5000e-004	9.4000e-004		9.0000	9.0000	8.1000e-004	1.4400e-003	9.4504
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.6553	0.8843	14.1775	0.0568	9.0307	0.0250	9.0558	2.3946	0.0230	2.4177		5,741.1220	5,741.1220	0.0751	0.1211	5,779.0759
Total	**1.6557**	**0.9042**	**14.1844**	**0.0569**	**9.0336**	**0.0252**	**9.0588**	**2.3954**	**0.0232**	**2.4186**		**5,750.1220**	**5,750.1220**	**0.0760**	**0.1225**	**5,788.5263**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0318	0.0000	0.0318	4.8100e-003	0.0000	4.8100e-003			0.0000			0.0000
Off-Road	3.7596	17.6595	59.8945	0.1257		0.4363	0.4363		0.4363	0.4363	0.0000	12,353.7451	12,353.7451	0.4401		12,364.7477
Total	**3.7596**	**17.6595**	**59.8945**	**0.1257**	**0.0318**	**0.4363**	**0.4681**	**4.8100e-003**	**0.4363**	**0.4411**	**0.0000**	**12,353.7451**	**12,353.7451**	**0.4401**		**12,364.7477**

3.2 Demolition - 2032

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	3.1000e-004	0.0199	6.8200e-003	8.0000e-005	2.8800e-003	1.5000e-004	3.0300e-003	7.9000e-004	1.5000e-004	9.4000e-004		9.0000	9.0000	8.1000e-004	1.4400e-003	9.4504
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.6553	0.8843	14.1775	0.0568	9.0307	0.0250	9.0558	2.3946	0.0230	2.4177		5,741.1220	5,741.1220	0.0751	0.1211	5,779.0759
Total	**1.6557**	**0.9042**	**14.1844**	**0.0569**	**9.0336**	**0.0252**	**9.0588**	**2.3954**	**0.0232**	**2.4186**		**5,750.1220**	**5,750.1220**	**0.0760**	**0.1225**	**5,788.5263**

3.3 Mobilization and Site Preparation - 2032

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.1591	0.0000	0.1591	0.0172	0.0000	0.0172			0.0000			0.0000
Off-Road	2.6119	10.0594	38.9921	0.0673		0.2844	0.2844		0.2844	0.2844		6,370.8693	6,370.8693	0.2320		6,376.6689
Total	**2.6119**	**10.0594**	**38.9921**	**0.0673**	**0.1591**	**0.2844**	**0.4435**	**0.0172**	**0.2844**	**0.3016**		**6,370.8693**	**6,370.8693**	**0.2320**		**6,376.6689**

Diablo Canyon Decommissioning Phase 2 - South Central Coast Air Basin, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.3 Mobilization and Site Preparation - 2032

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.6707	0.8925	14.3088	0.0573	9.1143	0.0253	9.1396	2.4168	0.0233	2.4401		5,794.280 6	5,794.280 6	0.0758	0.1222	5,832.585 9
Total	**1.6707**	**0.8925**	**14.3088**	**0.0573**	**9.1143**	**0.0253**	**9.1396**	**2.4168**	**0.0233**	**2.4401**		**5,794.280 6**	**5,794.280 6**	**0.0758**	**0.1222**	**5,832.585 9**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0716	0.0000	0.0716	7.7300e-003	0.0000	7.7300e-003			0.0000			0.0000
Off-Road	2.2789	8.8770	39.4401	0.0673		0.2510	0.2510		0.2510	0.2510	0.0000	6,370.869 3	6,370.869 3	0.2320		6,376.668 9
Total	**2.2789**	**8.8770**	**39.4401**	**0.0673**	**0.0716**	**0.2510**	**0.3226**	**7.7300e-003**	**0.2510**	**0.2588**	**0.0000**	**6,370.869 3**	**6,370.869 3**	**0.2320**		**6,376.668 9**

3.3 Mobilization and Site Preparation - 2032

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.6707	0.8925	14.3088	0.0573	9.1143	0.0253	9.1396	2.4168	0.0233	2.4401		5,794.2806	5,794.2806	0.0758	0.1222	5,832.5859
Total	**1.6707**	**0.8925**	**14.3088**	**0.0573**	**9.1143**	**0.0253**	**9.1396**	**2.4168**	**0.0233**	**2.4401**		**5,794.2806**	**5,794.2806**	**0.0758**	**0.1222**	**5,832.5859**

3.4 Soil Remediation - 2032

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.1532	0.0000	0.1532	0.0165	0.0000	0.0165			0.0000			0.0000
Off-Road	5.0629	20.9670	62.3396	0.1215		0.7136	0.7136		0.7136	0.7136		11,504.5774	11,504.5774	0.4485		11,515.7894
Total	**5.0629**	**20.9670**	**62.3396**	**0.1215**	**0.1532**	**0.7136**	**0.8668**	**0.0165**	**0.7136**	**0.7302**		**11,504.5774**	**11,504.5774**	**0.4485**		**11,515.7894**

3.4 Soil Remediation - 2032

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	2.1100e-003	0.1341	0.0460	5.3000e-004	0.0194	1.0400e-003	0.0205	5.3200e-003	1.0000e-003	6.3200e-003		60.7140	60.7140	5.4900e-003	9.7300e-003	63.7524
Vendor	0.0110	0.5699	0.1712	2.5600e-003	0.1083	3.8100e-003	0.1121	0.0312	3.6400e-003	0.0348		280.9910	280.9910	0.0148	0.0416	293.7663
Worker	1.7013	0.9089	14.5714	0.0584	9.2816	0.0257	9.3073	2.4612	0.0237	2.4848		5,900.5976	5,900.5976	0.0772	0.1244	5,939.6058
Total	**1.7144**	**1.6128**	**14.7886**	**0.0615**	**9.4093**	**0.0306**	**9.4398**	**2.4976**	**0.0283**	**2.5260**		**6,242.3026**	**6,242.3026**	**0.0975**	**0.1758**	**6,297.1246**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0689	0.0000	0.0689	7.4400e-003	0.0000	7.4400e-003			0.0000			0.0000
Off-Road	4.3255	18.0884	64.0605	0.1215		0.6082	0.6082		0.6082	0.6082	0.0000	11,504.5774	11,504.5774	0.4485		11,515.7894
Total	**4.3255**	**18.0884**	**64.0605**	**0.1215**	**0.0689**	**0.6082**	**0.6771**	**7.4400e-003**	**0.6082**	**0.6156**	**0.0000**	**11,504.5774**	**11,504.5774**	**0.4485**		**11,515.7894**

3.4 Soil Remediation - 2032

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	2.1100e-003	0.1341	0.0460	5.3000e-004	0.0194	1.0400e-003	0.0205	5.3200e-003	1.0000e-003	6.3200e-003		60.7140	60.7140	5.4900e-003	9.7300e-003	63.7524
Vendor	0.0110	0.5699	0.1712	2.5600e-003	0.1083	3.8100e-003	0.1121	0.0312	3.6400e-003	0.0348		280.9910	280.9910	0.0148	0.0416	293.7663
Worker	1.7013	0.9089	14.5714	0.0584	9.2816	0.0257	9.3073	2.4612	0.0237	2.4848		5,900.5976	5,900.5976	0.0772	0.1244	5,939.6058
Total	**1.7144**	**1.6128**	**14.7886**	**0.0615**	**9.4093**	**0.0306**	**9.4398**	**2.4976**	**0.0283**	**2.5260**		**6,242.3026**	**6,242.3026**	**0.0975**	**0.1758**	**6,297.1246**

3.4 Soil Remediation - 2033

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.1532	0.0000	0.1532	0.0165	0.0000	0.0165			0.0000			0.0000
Off-Road	5.0629	20.9670	62.3396	0.1215		0.7136	0.7136		0.7136	0.7136		11,504.5774	11,504.5774	0.4485		11,515.7894
Total	**5.0629**	**20.9670**	**62.3396**	**0.1215**	**0.1532**	**0.7136**	**0.8668**	**0.0165**	**0.7136**	**0.7302**		**11,504.5774**	**11,504.5774**	**0.4485**		**11,515.7894**

Diablo Canyon Decommissioning Phase 2 - South Central Coast Air Basin, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.4 Soil Remediation - 2033

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	2.0900e-003	0.1323	0.0464	5.2000e-004	0.0194	1.0300e-003	0.0204	5.3200e-003	9.9000e-004	6.3100e-003		59.7667	59.7667	5.5700e-003	9.5900e-003	62.7630
Vendor	0.0108	0.5636	0.1717	2.5200e-003	0.1083	3.7700e-003	0.1121	0.0312	3.6000e-003	0.0348		277.0861	277.0861	0.0150	0.0411	289.6972
Worker	1.6097	0.8550	14.0963	0.0574	9.2816	0.0241	9.3057	2.4612	0.0222	2.4834		5,799.0117	5,799.0117	0.0721	0.1211	5,836.8937
Total	**1.6225**	**1.5509**	**14.3144**	**0.0604**	**9.4093**	**0.0289**	**9.4382**	**2.4976**	**0.0268**	**2.5244**		**6,135.8645**	**6,135.8645**	**0.0926**	**0.1717**	**6,189.3539**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0689	0.0000	0.0689	7.4400e-003	0.0000	7.4400e-003			0.0000			0.0000
Off-Road	4.3255	18.0884	64.0605	0.1215		0.6082	0.6082		0.6082	0.6082	0.0000	11,504.5774	11,504.5774	0.4485		11,515.7894
Total	**4.3255**	**18.0884**	**64.0605**	**0.1215**	**0.0689**	**0.6082**	**0.6771**	**7.4400e-003**	**0.6082**	**0.6156**	**0.0000**	**11,504.5774**	**11,504.5774**	**0.4485**		**11,515.7894**

3.4 Soil Remediation - 2033

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	2.0900e-003	0.1323	0.0464	5.2000e-004	0.0194	1.0300e-003	0.0204	5.3200e-003	9.9000e-004	6.3100e-003		59.7667	59.7667	5.5700e-003	9.5900e-003	62.7630
Vendor	0.0108	0.5636	0.1717	2.5200e-003	0.1083	3.7700e-003	0.1121	0.0312	3.6000e-003	0.0348		277.0861	277.0861	0.0150	0.0411	289.6972
Worker	1.6097	0.8550	14.0963	0.0574	9.2816	0.0241	9.3057	2.4612	0.0222	2.4834		5,799.0117	5,799.0117	0.0721	0.1211	5,836.8937
Total	**1.6225**	**1.5509**	**14.3144**	**0.0604**	**9.4093**	**0.0289**	**9.4382**	**2.4976**	**0.0268**	**2.5244**		**6,135.8645**	**6,135.8645**	**0.0926**	**0.1717**	**6,189.3539**

3.5 Revegetation - 2033

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.1537	0.0000	0.1537	0.0166	0.0000	0.0166			0.0000			0.0000
Off-Road	1.1083	3.1930	10.6130	0.0310		0.1217	0.1217		0.1217	0.1217		2,932.6275	2,932.6275	0.0981		2,935.0787
Total	**1.1083**	**3.1930**	**10.6130**	**0.0310**	**0.1537**	**0.1217**	**0.2755**	**0.0166**	**0.1217**	**0.1383**		**2,932.6275**	**2,932.6275**	**0.0981**		**2,935.0787**

3.5 Revegetation - 2033

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.5720	0.8350	13.7661	0.0560	16.9466	0.0236	16.9702	4.3383	0.0217	4.3600		5,663.179 0	5,663.179 0	0.0704	0.1182	5,700.173 7
Total	**1.5720**	**0.8350**	**13.7661**	**0.0560**	**16.9466**	**0.0236**	**16.9702**	**4.3383**	**0.0217**	**4.3600**		**5,663.179 0**	**5,663.179 0**	**0.0704**	**0.1182**	**5,700.173 7**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0692	0.0000	0.0692	7.4700e-003	0.0000	7.4700e-003			0.0000			0.0000
Off-Road	0.9123	2.7178	11.6701	0.0310		0.1019	0.1019		0.1019	0.1019	0.0000	2,932.627 5	2,932.627 5	0.0981		2,935.078 7
Total	**0.9123**	**2.7178**	**11.6701**	**0.0310**	**0.0692**	**0.1019**	**0.1711**	**7.4700e-003**	**0.1019**	**0.1094**	**0.0000**	**2,932.627 5**	**2,932.627 5**	**0.0981**		**2,935.078 7**

3.5 Revegetation - 2033

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					lb/day								lb/day			
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.5720	0.8350	13.7661	0.0560	16.9466	0.0236	16.9702	4.3383	0.0217	4.3600		5,663.1790	5,663.1790	0.0704	0.1182	5,700.1737
Total	**1.5720**	**0.8350**	**13.7661**	**0.0560**	**16.9466**	**0.0236**	**16.9702**	**4.3383**	**0.0217**	**4.3600**		**5,663.1790**	**5,663.1790**	**0.0704**	**0.1182**	**5,700.1737**

3.5 Revegetation - 2034

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					lb/day								lb/day			
Fugitive Dust					0.1537	0.0000	0.1537	0.0166	0.0000	0.0166			0.0000			0.0000
Off-Road	1.1083	3.1930	10.6130	0.0310		0.1217	0.1217		0.1217	0.1217		2,932.6275	2,932.6275	0.0981		2,935.0787
Total	**1.1083**	**3.1930**	**10.6130**	**0.0310**	**0.1537**	**0.1217**	**0.2755**	**0.0166**	**0.1217**	**0.1383**		**2,932.6275**	**2,932.6275**	**0.0981**		**2,935.0787**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.5 Revegetation - 2034

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4914	0.7909	13.3494	0.0552	16.9466	0.0221	16.9687	4.3383	0.0204	4.3587		5,575.4287	5,575.4287	0.0658	0.1155	5,611.4958
Total	**1.4914**	**0.7909**	**13.3494**	**0.0552**	**16.9466**	**0.0221**	**16.9687**	**4.3383**	**0.0204**	**4.3587**		**5,575.4287**	**5,575.4287**	**0.0658**	**0.1155**	**5,611.4958**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0692	0.0000	0.0692	7.4700e-003	0.0000	7.4700e-003			0.0000			0.0000
Off-Road	0.9123	2.7178	11.6701	0.0310		0.1019	0.1019		0.1019	0.1019	0.0000	2,932.6275	2,932.6275	0.0981		2,935.0787
Total	**0.9123**	**2.7178**	**11.6701**	**0.0310**	**0.0692**	**0.1019**	**0.1711**	**7.4700e-003**	**0.1019**	**0.1094**	**0.0000**	**2,932.6275**	**2,932.6275**	**0.0981**		**2,935.0787**

3.5 Revegetation - 2034

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4914	0.7909	13.3494	0.0552	16.9466	0.0221	16.9687	4.3383	0.0204	4.3587		5,575.4287	5,575.4287	0.0658	0.1155	5,611.4958
Total	**1.4914**	**0.7909**	**13.3494**	**0.0552**	**16.9466**	**0.0221**	**16.9687**	**4.3383**	**0.0204**	**4.3587**		**5,575.4287**	**5,575.4287**	**0.0658**	**0.1155**	**5,611.4958**

3.5 Revegetation - 2035

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.1537	0.0000	0.1537	0.0166	0.0000	0.0166			0.0000			0.0000
Off-Road	1.0136	2.1482	10.5817	0.0310		0.0805	0.0805		0.0805	0.0805		2,932.6275	2,932.6275	0.0877		2,934.8207
Total	**1.0136**	**2.1482**	**10.5817**	**0.0310**	**0.1537**	**0.0805**	**0.2342**	**0.0166**	**0.0805**	**0.0971**		**2,932.6275**	**2,932.6275**	**0.0877**		**2,934.8207**

3.5 Revegetation - 2035

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4196	0.7564	12.9955	0.0544	16.9466	0.0209	16.9675	4.3383	0.0192	4.3575		5,498.659 2	5,498.659 2	0.0618	0.1133	5,533.980 9
Total	**1.4196**	**0.7564**	**12.9955**	**0.0544**	**16.9466**	**0.0209**	**16.9675**	**4.3383**	**0.0192**	**4.3575**		**5,498.659 2**	**5,498.659 2**	**0.0618**	**0.1133**	**5,533.980 9**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0692	0.0000	0.0692	7.4700e-003	0.0000	7.4700e-003			0.0000			0.0000
Off-Road	0.8413	1.9388	11.6480	0.0310		0.0707	0.0707		0.0707	0.0707	0.0000	2,932.627 5	2,932.627 5	0.0877		2,934.820 7
Total	**0.8413**	**1.9388**	**11.6480**	**0.0310**	**0.0692**	**0.0707**	**0.1399**	**7.4700e-003**	**0.0707**	**0.0782**	**0.0000**	**2,932.627 5**	**2,932.627 5**	**0.0877**		**2,934.820 7**

3.5 Revegetation - 2035

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4196	0.7564	12.9955	0.0544	16.9466	0.0209	16.9675	4.3383	0.0192	4.3575		5,498.659 2	5,498.659 2	0.0618	0.1133	5,533.980 9
Total	**1.4196**	**0.7564**	**12.9955**	**0.0544**	**16.9466**	**0.0209**	**16.9675**	**4.3383**	**0.0192**	**4.3575**		**5,498.659 2**	**5,498.659 2**	**0.0618**	**0.1133**	**5,533.980 9**

3.6 Mobilization and Site Prep Landscape - 2035

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.1414	0.0000	0.1414	0.0153	0.0000	0.0153			0.0000			0.0000
Off-Road	7.8960	18.9943	70.8748	0.2007		0.6953	0.6953		0.6953	0.6953		20,793.07 71	20,793.07 71	0.6878		20,810.27 29
Total	**7.8960**	**18.9943**	**70.8748**	**0.2007**	**0.1414**	**0.6953**	**0.8367**	**0.0153**	**0.6953**	**0.7106**		**20,793.07 71**	**20,793.07 71**	**0.6878**		**20,810.27 29**

3.6 Mobilization and Site Prep Landscape - 2035

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4143	0.7536	12.9475	0.0542	9.0307	0.0208	9.0515	2.3946	0.0191	2.4138		5,478.3689	5,478.3689	0.0616	0.1129	5,513.5604
Total	**1.4143**	**0.7536**	**12.9475**	**0.0542**	**9.0307**	**0.0208**	**9.0515**	**2.3946**	**0.0191**	**2.4138**		**5,478.3689**	**5,478.3689**	**0.0616**	**0.1129**	**5,513.5604**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0636	0.0000	0.0636	6.8700e-003	0.0000	6.8700e-003			0.0000			0.0000
Off-Road	7.3022	17.5089	72.9609	0.2007		0.6343	0.6343		0.6343	0.6343	0.0000	20,793.0771	20,793.0771	0.6878		20,810.2729
Total	**7.3022**	**17.5089**	**72.9609**	**0.2007**	**0.0636**	**0.6343**	**0.6979**	**6.8700e-003**	**0.6343**	**0.6411**	**0.0000**	**20,793.0771**	**20,793.0771**	**0.6878**		**20,810.2729**

3.6 Mobilization and Site Prep Landscape - 2035

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4143	0.7536	12.9475	0.0542	9.0307	0.0208	9.0515	2.3946	0.0191	2.4138		5,478.368 9	5,478.368 9	0.0616	0.1129	5,513.560 4
Total	**1.4143**	**0.7536**	**12.9475**	**0.0542**	**9.0307**	**0.0208**	**9.0515**	**2.3946**	**0.0191**	**2.4138**		**5,478.368 9**	**5,478.368 9**	**0.0616**	**0.1129**	**5,513.560 4**

3.7 Mass Excavation - 2035

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	6.5039	11.1439	51.7222	0.1657		0.4264	0.4264		0.4264	0.4264		17,992.62 90	17,992.62 90	0.5625		18,006.69 09
Total	**6.5039**	**11.1439**	**51.7222**	**0.1657**		**0.4264**	**0.4264**		**0.4264**	**0.4264**		**17,992.62 90**	**17,992.62 90**	**0.5625**		**18,006.69 09**

3.7 Mass Excavation - 2035

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	4.8000e-004	0.0300	0.0109	1.2000e-004	4.5000e-003	2.4000e-004	4.7300e-003	1.2300e-003	2.2000e-004	1.4600e-003		13.4693	13.4693	1.3200e-003	2.1600e-003	14.1466
Vendor	0.0105	0.5523	0.1726	2.4500e-003	0.1083	3.6900e-003	0.1120	0.0312	3.5300e-003	0.0347		270.2201	270.2201	0.0153	0.0401	282.5412
Worker	1.4222	0.7578	13.0195	0.0545	9.0809	0.0209	9.1018	2.4079	0.0192	2.4272		5,508.8043	5,508.8043	0.0619	0.1136	5,544.1912
Total	**1.4332**	**1.3401**	**13.2030**	**0.0571**	**9.1937**	**0.0248**	**9.2185**	**2.4403**	**0.0230**	**2.4633**		**5,792.4937**	**5,792.4937**	**0.0786**	**0.1558**	**5,840.8790**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	6.3211	11.0038	52.1719	0.1657		0.4171	0.4171		0.4171	0.4171	0.0000	17,992.6289	17,992.6289	0.5625		18,006.6908
Total	**6.3211**	**11.0038**	**52.1719**	**0.1657**		**0.4171**	**0.4171**		**0.4171**	**0.4171**	**0.0000**	**17,992.6289**	**17,992.6289**	**0.5625**		**18,006.6908**

3.7 Mass Excavation - 2035

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	4.8000e-004	0.0300	0.0109	1.2000e-004	4.5000e-003	2.4000e-004	4.7300e-003	1.2300e-003	2.2000e-004	1.4600e-003		13.4693	13.4693	1.3200e-003	2.1600e-003	14.1466
Vendor	0.0105	0.5523	0.1726	2.4500e-003	0.1083	3.6900e-003	0.1120	0.0312	3.5300e-003	0.0347		270.2201	270.2201	0.0153	0.0401	282.5412
Worker	1.4222	0.7578	13.0195	0.0545	9.0809	0.0209	9.1018	2.4079	0.0192	2.4272		5,508.8043	5,508.8043	0.0619	0.1136	5,544.1912
Total	**1.4332**	**1.3401**	**13.2030**	**0.0571**	**9.1937**	**0.0248**	**9.2185**	**2.4403**	**0.0230**	**2.4633**		**5,792.4937**	**5,792.4937**	**0.0786**	**0.1558**	**5,840.8790**

3.7 Mass Excavation - 2036

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	6.5039	11.1439	51.7222	0.1657		0.4264	0.4264		0.4264	0.4264		17,992.6290	17,992.6290	0.5625		18,006.6909
Total	**6.5039**	**11.1439**	**51.7222**	**0.1657**		**0.4264**	**0.4264**		**0.4264**	**0.4264**		**17,992.6290**	**17,992.6290**	**0.5625**		**18,006.6909**

3.7 Mass Excavation - 2036

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	4.8000e-004	0.0300	0.0109	1.2000e-004	4.5000e-003	2.4000e-004	4.7300e-003	1.2300e-003	2.2000e-004	1.4600e-003		13.4693	13.4693	1.3200e-003	2.1600e-003	14.1466
Vendor	0.0105	0.5523	0.1726	2.4500e-003	0.1083	3.6900e-003	0.1120	0.0312	3.5300e-003	0.0347		270.2201	270.2201	0.0153	0.0401	282.5412
Worker	1.4222	0.7578	13.0195	0.0545	9.0809	0.0209	9.1018	2.4079	0.0192	2.4272		5,508.8043	5,508.8043	0.0619	0.1136	5,544.1912
Total	**1.4332**	**1.3401**	**13.2030**	**0.0571**	**9.1937**	**0.0248**	**9.2185**	**2.4403**	**0.0230**	**2.4633**		**5,792.4937**	**5,792.4937**	**0.0786**	**0.1558**	**5,840.8790**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	6.3211	11.0038	52.1719	0.1657		0.4171	0.4171		0.4171	0.4171	0.0000	17,992.6289	17,992.6289	0.5625		18,006.6908
Total	**6.3211**	**11.0038**	**52.1719**	**0.1657**		**0.4171**	**0.4171**		**0.4171**	**0.4171**	**0.0000**	**17,992.6289**	**17,992.6289**	**0.5625**		**18,006.6908**

3.7 Mass Excavation - 2036

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	4.8000e-004	0.0300	0.0109	1.2000e-004	4.5000e-003	2.4000e-004	4.7300e-003	1.2300e-003	2.2000e-004	1.4600e-003		13.4693	13.4693	1.3200e-003	2.1600e-003	14.1466
Vendor	0.0105	0.5523	0.1726	2.4500e-003	0.1083	3.6900e-003	0.1120	0.0312	3.5300e-003	0.0347		270.2201	270.2201	0.0153	0.0401	282.5412
Worker	1.4222	0.7578	13.0195	0.0545	9.0809	0.0209	9.1018	2.4079	0.0192	2.4272		5,508.8043	5,508.8043	0.0619	0.1136	5,544.1912
Total	**1.4332**	**1.3401**	**13.2030**	**0.0571**	**9.1937**	**0.0248**	**9.2185**	**2.4403**	**0.0230**	**2.4633**		**5,792.4937**	**5,792.4937**	**0.0786**	**0.1558**	**5,840.8790**

3.8 Backfill Building Foundation - 2036

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.1515	0.0000	0.1515	0.0164	0.0000	0.0164			0.0000			0.0000
Off-Road	1.4239	8.4986	17.8815	0.0300		0.1570	0.1570		0.1570	0.1570		2,759.4538	2,759.4538	0.1270		2,762.6280
Total	**1.4239**	**8.4986**	**17.8815**	**0.0300**	**0.1515**	**0.1570**	**0.3085**	**0.0164**	**0.1570**	**0.1734**		**2,759.4538**	**2,759.4538**	**0.1270**		**2,762.6280**

3.8 Backfill Building Foundation - 2036

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.4900e-003	0.1841	0.0575	8.2000e-004	0.1134	1.2300e-003	0.1147	0.0294	1.1800e-003	0.0306		90.0734	90.0734	5.1100e-003	0.0134	94.1804
Worker	1.4143	0.7536	12.9475	0.0542	32.5907	0.0208	32.6115	8.1776	0.0191	8.1967		5,478.3689	5,478.3689	0.0616	0.1129	5,513.5604
Total	**1.4178**	**0.9377**	**13.0051**	**0.0550**	**32.7042**	**0.0220**	**32.7262**	**8.2069**	**0.0203**	**8.2272**		**5,568.4423**	**5,568.4423**	**0.0667**	**0.1263**	**5,607.7407**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0682	0.0000	0.0682	7.3600e-003	0.0000	7.3600e-003			0.0000			0.0000
Off-Road	1.2527	7.4111	17.7172	0.0300		0.1410	0.1410		0.1410	0.1410	0.0000	2,759.4538	2,759.4538	0.1270		2,762.6280
Total	**1.2527**	**7.4111**	**17.7172**	**0.0300**	**0.0682**	**0.1410**	**0.2092**	**7.3600e-003**	**0.1410**	**0.1483**	**0.0000**	**2,759.4538**	**2,759.4538**	**0.1270**		**2,762.6280**

3.8 Backfill Building Foundation - 2036

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.4900e-003	0.1841	0.0575	8.2000e-004	0.1134	1.2300e-003	0.1147	0.0294	1.1800e-003	0.0306		90.0734	90.0734	5.1100e-003	0.0134	94.1804
Worker	1.4143	0.7536	12.9475	0.0542	32.5907	0.0208	32.6115	8.1776	0.0191	8.1967		5,478.3689	5,478.3689	0.0616	0.1129	5,513.5604
Total	**1.4178**	**0.9377**	**13.0051**	**0.0550**	**32.7042**	**0.0220**	**32.7262**	**8.2069**	**0.0203**	**8.2272**		**5,568.4423**	**5,568.4423**	**0.0667**	**0.1263**	**5,607.7407**

3.9 Backfill Tunnels - 2036

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.1538	0.0000	0.1538	0.0166	0.0000	0.0166			0.0000			0.0000
Off-Road	1.1449	4.6464	20.1600	0.0362		0.0940	0.0940		0.0940	0.0940		3,431.2506	3,431.2506	0.1007		3,433.7668
Total	**1.1449**	**4.6464**	**20.1600**	**0.0362**	**0.1538**	**0.0940**	**0.2478**	**0.0166**	**0.0940**	**0.1106**		**3,431.2506**	**3,431.2506**	**0.1007**		**3,433.7668**

3.9 Backfill Tunnels - 2036

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					lb/day								lb/day			
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4196	0.7564	12.9955	0.0544	9.0642	0.0209	9.0850	2.4035	0.0192	2.4227		5,498.659 2	5,498.659 2	0.0618	0.1133	5,533.980 9
Total	**1.4196**	**0.7564**	**12.9955**	**0.0544**	**9.0642**	**0.0209**	**9.0850**	**2.4035**	**0.0192**	**2.4227**		**5,498.659 2**	**5,498.659 2**	**0.0618**	**0.1133**	**5,533.980 9**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					lb/day								lb/day			
Fugitive Dust					0.0692	0.0000	0.0692	7.4700e-003	0.0000	7.4700e-003			0.0000			0.0000
Off-Road	0.9028	4.0580	21.2521	0.0362		0.0802	0.0802		0.0802	0.0802	0.0000	3,431.250 6	3,431.250 6	0.1007		3,433.766 8
Total	**0.9028**	**4.0580**	**21.2521**	**0.0362**	**0.0692**	**0.0802**	**0.1494**	**7.4700e-003**	**0.0802**	**0.0877**	**0.0000**	**3,431.250 6**	**3,431.250 6**	**0.1007**		**3,433.766 8**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.9 Backfill Tunnels - 2036

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4196	0.7564	12.9955	0.0544	9.0642	0.0209	9.0850	2.4035	0.0192	2.4227		5,498.6592	5,498.6592	0.0618	0.1133	5,533.9809
Total	**1.4196**	**0.7564**	**12.9955**	**0.0544**	**9.0642**	**0.0209**	**9.0850**	**2.4035**	**0.0192**	**2.4227**		**5,498.6592**	**5,498.6592**	**0.0618**	**0.1133**	**5,533.9809**

3.10 Backfill and Grading of Zones - 2036

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.1545	0.0000	0.1545	0.0167	0.0000	0.0167			0.0000			0.0000
Off-Road	1.3688	4.9035	7.6970	0.0337		0.1832	0.1832		0.1832	0.1832		3,068.9163	3,068.9163	0.1198		3,071.9122
Total	**1.3688**	**4.9035**	**7.6970**	**0.0337**	**0.1545**	**0.1832**	**0.3376**	**0.0167**	**0.1832**	**0.1999**		**3,068.9163**	**3,068.9163**	**0.1198**		**3,071.9122**

3.10 Backfill and Grading of Zones - 2036

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	9.3100e-003	0.4909	0.1535	2.1800e-003	0.0963	3.2800e-003	0.0995	0.0277	3.1400e-003	0.0308		240.1956	240.1956	0.0136	0.0356	251.1477
Worker	1.4274	0.7606	13.0674	0.0547	9.1143	0.0210	9.1353	2.4168	0.0193	2.4361		5,529.0945	5,529.0945	0.0622	0.1140	5,564.6118
Total	**1.4368**	**1.2515**	**13.2209**	**0.0569**	**9.2106**	**0.0243**	**9.2348**	**2.4445**	**0.0224**	**2.4669**		**5,769.2902**	**5,769.2902**	**0.0758**	**0.1496**	**5,815.7595**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0695	0.0000	0.0695	7.5100e-003	0.0000	7.5100e-003			0.0000			0.0000
Off-Road	1.1336	4.3359	8.9013	0.0337		0.1604	0.1604		0.1604	0.1604	0.0000	3,068.9163	3,068.9163	0.1198		3,071.9122
Total	**1.1336**	**4.3359**	**8.9013**	**0.0337**	**0.0695**	**0.1604**	**0.2299**	**7.5100e-003**	**0.1604**	**0.1679**	**0.0000**	**3,068.9163**	**3,068.9163**	**0.1198**		**3,071.9122**

3.10 Backfill and Grading of Zones - 2036

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	9.3100e-003	0.4909	0.1535	2.1800e-003	0.0963	3.2800e-003	0.0995	0.0277	3.1400e-003	0.0308		240.1956	240.1956	0.0136	0.0356	251.1477
Worker	1.4274	0.7606	13.0674	0.0547	9.1143	0.0210	9.1353	2.4168	0.0193	2.4361		5,529.0945	5,529.0945	0.0622	0.1140	5,564.6118
Total	**1.4368**	**1.2515**	**13.2209**	**0.0569**	**9.2106**	**0.0243**	**9.2348**	**2.4445**	**0.0224**	**2.4669**		**5,769.2902**	**5,769.2902**	**0.0758**	**0.1496**	**5,815.7595**

3.11 Erosion Control and Restoration - 2036

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.1532	0.0000	0.1532	0.0165	0.0000	0.0165			0.0000			0.0000
Off-Road	3.6158	8.1945	30.5349	0.0982		0.2805	0.2805		0.2805	0.2805		10,172.1218	10,172.1218	0.3153		10,180.0045
Total	**3.6158**	**8.1945**	**30.5349**	**0.0982**	**0.1532**	**0.2805**	**0.4337**	**0.0165**	**0.2805**	**0.2971**		**10,172.1218**	**10,172.1218**	**0.3153**		**10,180.0045**

3.11 Erosion Control and Restoration - 2036

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.4900e-003	0.1841	0.0575	8.2000e-004	0.0361	1.2300e-003	0.0373	0.0104	1.1800e-003	0.0116		90.0734	90.0734	5.1100e-003	0.0134	94.1804
Worker	1.4720	0.7844	13.4750	0.0564	9.3986	0.0216	9.4203	2.4922	0.0199	2.5121		5,701.5617	5,701.5617	0.0641	0.1175	5,738.1869
Total	**1.4755**	**0.9684**	**13.5326**	**0.0572**	**9.4347**	**0.0229**	**9.4576**	**2.5026**	**0.0211**	**2.5237**		**5,791.6351**	**5,791.6351**	**0.0692**	**0.1309**	**5,832.3673**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0689	0.0000	0.0689	7.4400e-003	0.0000	7.4400e-003			0.0000			0.0000
Off-Road	3.0868	7.0266	33.6279	0.0982		0.2439	0.2439		0.2439	0.2439	0.0000	10,172.1218	10,172.1218	0.3153		10,180.0045
Total	**3.0868**	**7.0266**	**33.6279**	**0.0982**	**0.0689**	**0.2439**	**0.3129**	**7.4400e-003**	**0.2439**	**0.2514**	**0.0000**	**10,172.1218**	**10,172.1218**	**0.3153**		**10,180.0045**

3.11 Erosion Control and Restoration - 2036

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.4900e-003	0.1841	0.0575	8.2000e-004	0.0361	1.2300e-003	0.0373	0.0104	1.1800e-003	0.0116		90.0734	90.0734	5.1100e-003	0.0134	94.1804
Worker	1.4720	0.7844	13.4750	0.0564	9.3986	0.0216	9.4203	2.4922	0.0199	2.5121		5,701.5617	5,701.5617	0.0641	0.1175	5,738.1869
Total	**1.4755**	**0.9684**	**13.5326**	**0.0572**	**9.4347**	**0.0229**	**9.4576**	**2.5026**	**0.0211**	**2.5237**		**5,791.6351**	**5,791.6351**	**0.0692**	**0.1309**	**5,832.3673**

3.12 Movement and Stockpiling - 2036

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.6978	3.6978	9.5646	0.0445		0.1333	0.1333		0.1333	0.1333		5,051.6316	5,051.6316	0.1511		5,055.4095
Total	**1.6978**	**3.6978**	**9.5646**	**0.0445**		**0.1333**	**0.1333**		**0.1333**	**0.1333**		**5,051.6316**	**5,051.6316**	**0.1511**		**5,055.4095**

3.12 Movement and Stockpiling - 2036

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4143	0.7536	12.9475	0.0542	9.0307	0.0208	9.0515	2.3946	0.0191	2.4138		5,478.3689	5,478.3689	0.0616	0.1129	5,513.5604
Total	**1.4143**	**0.7536**	**12.9475**	**0.0542**	**9.0307**	**0.0208**	**9.0515**	**2.3946**	**0.0191**	**2.4138**		**5,478.3689**	**5,478.3689**	**0.0616**	**0.1129**	**5,513.5604**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2670	3.1848	13.2614	0.0445		0.1103	0.1103		0.1103	0.1103	0.0000	5,051.6316	5,051.6316	0.1511		5,055.4095
Total	**1.2670**	**3.1848**	**13.2614**	**0.0445**		**0.1103**	**0.1103**		**0.1103**	**0.1103**	**0.0000**	**5,051.6316**	**5,051.6316**	**0.1511**		**5,055.4095**

3.12 Movement and Stockpiling - 2036

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4143	0.7536	12.9475	0.0542	9.0307	0.0208	9.0515	2.3946	0.0191	2.4138		5,478.3689	5,478.3689	0.0616	0.1129	5,513.5604
Total	**1.4143**	**0.7536**	**12.9475**	**0.0542**	**9.0307**	**0.0208**	**9.0515**	**2.3946**	**0.0191**	**2.4138**		**5,478.3689**	**5,478.3689**	**0.0616**	**0.1129**	**5,513.5604**

3.12 Movement and Stockpiling - 2037

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.6978	3.6978	9.5646	0.0445		0.1333	0.1333		0.1333	0.1333		5,051.6316	5,051.6316	0.1511		5,055.4095
Total	**1.6978**	**3.6978**	**9.5646**	**0.0445**		**0.1333**	**0.1333**		**0.1333**	**0.1333**		**5,051.6316**	**5,051.6316**	**0.1511**		**5,055.4095**

3.12 Movement and Stockpiling - 2037

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4143	0.7536	12.9475	0.0542	9.0307	0.0208	9.0515	2.3946	0.0191	2.4138		5,478.368 9	5,478.368 9	0.0616	0.1129	5,513.560 4
Total	**1.4143**	**0.7536**	**12.9475**	**0.0542**	**9.0307**	**0.0208**	**9.0515**	**2.3946**	**0.0191**	**2.4138**		**5,478.368 9**	**5,478.368 9**	**0.0616**	**0.1129**	**5,513.560 4**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2670	3.1848	13.2614	0.0445		0.1103	0.1103		0.1103	0.1103	0.0000	5,051.631 6	5,051.631 6	0.1511		5,055.409 5
Total	**1.2670**	**3.1848**	**13.2614**	**0.0445**		**0.1103**	**0.1103**		**0.1103**	**0.1103**	**0.0000**	**5,051.631 6**	**5,051.631 6**	**0.1511**		**5,055.409 5**

3.12 Movement and Stockpiling - 2037

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4143	0.7536	12.9475	0.0542	9.0307	0.0208	9.0515	2.3946	0.0191	2.4138		5,478.368 9	5,478.368 9	0.0616	0.1129	5,513.560 4
Total	**1.4143**	**0.7536**	**12.9475**	**0.0542**	**9.0307**	**0.0208**	**9.0515**	**2.3946**	**0.0191**	**2.4138**		**5,478.368 9**	**5,478.368 9**	**0.0616**	**0.1129**	**5,513.560 4**

3.12 Movement and Stockpiling - 2038

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.6978	3.6978	9.5646	0.0445		0.1333	0.1333		0.1333	0.1333		5,051.631 6	5,051.631 6	0.1511		5,055.409 5
Total	**1.6978**	**3.6978**	**9.5646**	**0.0445**		**0.1333**	**0.1333**		**0.1333**	**0.1333**		**5,051.631 6**	**5,051.631 6**	**0.1511**		**5,055.409 5**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.12 Movement and Stockpiling - 2038

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4143	0.7536	12.9475	0.0542	9.0307	0.0208	9.0515	2.3946	0.0191	2.4138		5,478.368 9	5,478.368 9	0.0616	0.1129	5,513.560 4
Total	**1.4143**	**0.7536**	**12.9475**	**0.0542**	**9.0307**	**0.0208**	**9.0515**	**2.3946**	**0.0191**	**2.4138**		**5,478.368 9**	**5,478.368 9**	**0.0616**	**0.1129**	**5,513.560 4**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2670	3.1848	13.2614	0.0445		0.1103	0.1103		0.1103	0.1103	0.0000	5,051.631 6	5,051.631 6	0.1511		5,055.409 5
Total	**1.2670**	**3.1848**	**13.2614**	**0.0445**		**0.1103**	**0.1103**		**0.1103**	**0.1103**	**0.0000**	**5,051.631 6**	**5,051.631 6**	**0.1511**		**5,055.409 5**

3.12 Movement and Stockpiling - 2038

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4143	0.7536	12.9475	0.0542	9.0307	0.0208	9.0515	2.3946	0.0191	2.4138		5,478.368 9	5,478.368 9	0.0616	0.1129	5,513.560 4
Total	**1.4143**	**0.7536**	**12.9475**	**0.0542**	**9.0307**	**0.0208**	**9.0515**	**2.3946**	**0.0191**	**2.4138**		**5,478.368 9**	**5,478.368 9**	**0.0616**	**0.1129**	**5,513.560 4**

3.12 Movement and Stockpiling - 2039

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.6978	3.6978	9.5646	0.0445		0.1333	0.1333		0.1333	0.1333		5,051.631 6	5,051.631 6	0.1511		5,055.409 5
Total	**1.6978**	**3.6978**	**9.5646**	**0.0445**		**0.1333**	**0.1333**		**0.1333**	**0.1333**		**5,051.631 6**	**5,051.631 6**	**0.1511**		**5,055.409 5**

3.12 Movement and Stockpiling - 2039

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4143	0.7536	12.9475	0.0542	9.0307	0.0208	9.0515	2.3946	0.0191	2.4138		5,478.368 9	5,478.368 9	0.0616	0.1129	5,513.560 4
Total	**1.4143**	**0.7536**	**12.9475**	**0.0542**	**9.0307**	**0.0208**	**9.0515**	**2.3946**	**0.0191**	**2.4138**		**5,478.368 9**	**5,478.368 9**	**0.0616**	**0.1129**	**5,513.560 4**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2670	3.1848	13.2614	0.0445		0.1103	0.1103		0.1103	0.1103	0.0000	5,051.631 6	5,051.631 6	0.1511		5,055.409 5
Total	**1.2670**	**3.1848**	**13.2614**	**0.0445**		**0.1103**	**0.1103**		**0.1103**	**0.1103**	**0.0000**	**5,051.631 6**	**5,051.631 6**	**0.1511**		**5,055.409 5**

3.12 Movement and Stockpiling - 2039

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4143	0.7536	12.9475	0.0542	9.0307	0.0208	9.0515	2.3946	0.0191	2.4138		5,478.368 9	5,478.368 9	0.0616	0.1129	5,513.560 4
Total	**1.4143**	**0.7536**	**12.9475**	**0.0542**	**9.0307**	**0.0208**	**9.0515**	**2.3946**	**0.0191**	**2.4138**		**5,478.368 9**	**5,478.368 9**	**0.0616**	**0.1129**	**5,513.560 4**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.9945	1.3323	9.5539	0.0184	0.2816	0.0155	0.2971	0.1122	0.0145	0.1267		1,874.4016	1,874.4016	0.1317	0.0956	1,906.1706
Unmitigated	0.9945	1.3323	9.5539	0.0184	0.2816	0.0155	0.2971	0.1122	0.0145	0.1267		1,874.4016	1,874.4016	0.1317	0.0956	1,906.1706

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Heavy Industry	326.70	326.70	326.70	953,804	953,804
Total	326.70	326.70	326.70	953,804	953,804

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Heavy Industry	9.50	7.30	7.30	59.00	28.00	13.00	92	5	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Heavy Industry	0.518500	0.056626	0.189643	0.140762	0.030399	0.007841	0.010730	0.006132	0.000824	0.000442	0.030440	0.001544	0.006118

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Heavy Industry	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Heavy Industry	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.3075	0.0302	3.3303	2.5000e-004		0.0119	0.0119		0.0119	0.0119		7.1499	7.1499	0.0187		7.6166
Unmitigated	0.3075	0.0302	3.3303	2.5000e-004		0.0119	0.0119		0.0119	0.0119		7.1499	7.1499	0.0187		7.6166

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	0.3075	0.0302	3.3303	2.5000e-004		0.0119	0.0119		0.0119	0.0119		7.1499	7.1499	0.0187		7.6166
Total	**0.3075**	**0.0302**	**3.3303**	**2.5000e-004**		**0.0119**	**0.0119**		**0.0119**	**0.0119**		**7.1499**	**7.1499**	**0.0187**		**7.6166**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	0.3075	0.0302	3.3303	2.5000e-004		0.0119	0.0119		0.0119	0.0119		7.1499	7.1499	0.0187		7.6166
Total	**0.3075**	**0.0302**	**3.3303**	**2.5000e-004**		**0.0119**	**0.0119**		**0.0119**	**0.0119**		**7.1499**	**7.1499**	**0.0187**		**7.6166**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Diablo Canyon Decommissioning Phase 2

South Central Coast Air Basin, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Heavy Industry	32,670.00	1000sqft	750.00	32,670,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.9	**Precipitation Freq (Days)**	37
Climate Zone	4			**Operational Year**	2024
Utility Company					
CO2 Intensity (lb/MWhr)	0	**CH4 Intensity (lb/MWhr)**	0	**N2O Intensity (lb/MWhr)**	0

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase - Timing on Equipment List excel

Off-road Equipment - equipment list

Off-road Equipment - equipment sheet

Off-road Equipment - equipment list - other equipment is batch plant

Off-road Equipment - crushing processing are hydraulic breaker and hammers, other eq fogger mister

Off-road Equipment - equipment list

Off-road Equipment - equipment list

Off-road Equipment - equipment excel

Off-road Equipment - equipment list excel

Off-road Equipment - equipment list

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Off-road Equipment - equipment list excel

Off-road Equipment - equipment list

Trips and VMT - haul length calculated outside caleemod

Demolition -

Grading - Recycleable metal - Mobilization and Site Prep - 823 tons / 2000 tones for acres 0.4115 - this is on demo screen
Hazardous / Regulated Waste - Soil Remediation - 395 tones 0.1975
Clean Debris and Soil - Backfill and Grading of Zones - 1184 tones 0.592

Vehicle Trips - 200 visitors and 5 employees at the marina per day
32670000 sq ft

Area Coating - no architectural coating

Energy Use - No indoor energy usage

Water And Wastewater - negligible indoor water use

Solid Waste - solid waste calculated in phase 2 ouptut excel

Construction Off-road Equipment Mitigation - APM AQ-1,2,3,4,5

Fleet Mix -

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_Nonresidential_Exterior	16335000	0
tblAreaCoating	Area_Nonresidential_Interior	49005000	0
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	7.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstructionPhase	NumDays	800.00	255.00
tblConstructionPhase	NumDays	800.00	574.00
tblConstructionPhase	NumDays	1,240.00	21.00
tblConstructionPhase	NumDays	1,240.00	20.00
tblConstructionPhase	NumDays	1,240.00	46.00
tblConstructionPhase	NumDays	480.00	9.00
tblConstructionPhase	NumDays	480.00	6.00
tblConstructionPhase	NumDays	480.00	18.00
tblConstructionPhase	NumDays	480.00	574.00
tblConstructionPhase	NumDays	480.00	6.00

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblEnergyUse	LightingElect	3.08	0.00
tblEnergyUse	NT24E	3.70	0.00
tblEnergyUse	NT24NG	6.67	0.00
tblEnergyUse	T24E	1.32	0.00
tblEnergyUse	T24NG	19.51	0.00
tblGrading	AcresOfGrading	15.75	2.60
tblGrading	AcresOfGrading	35.88	83.20
tblGrading	AcresOfGrading	35.88	0.00
tblGrading	AcresOfGrading	10.50	0.40
tblGrading	AcresOfGrading	40.25	6.70
tblGrading	AcresOfGrading	15.75	1.30
tblOffRoadEquipment	HorsePower	124.00	260.00
tblOffRoadEquipment	HorsePower	124.00	260.00
tblOffRoadEquipment	HorsePower	203.00	400.00
tblOffRoadEquipment	HorsePower	203.00	400.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	5.00
tblOffRoadEquipment	UsageHours	8.00	7.00
tblOffRoadEquipment	UsageHours	8.00	7.00
tblOffRoadEquipment	UsageHours	8.00	7.00
tblOffRoadEquipment	UsageHours	8.00	7.00
tblSolidWaste	SolidWasteGenerationRate	40,510.80	0.03
tblTripsAndVMT	HaulingTripLength	20.00	0.00

tblTripsAndVMT	HaulingTripNumber	81.00	42.00
tblTripsAndVMT	HaulingTripNumber	0.00	20.00
tblTripsAndVMT	HaulingTripNumber	0.00	60.00
tblTripsAndVMT	VendorTripLength	7.30	13.00
tblTripsAndVMT	VendorTripLength	7.30	13.00
tblTripsAndVMT	VendorTripLength	7.30	13.00
tblTripsAndVMT	VendorTripLength	7.30	13.00
tblTripsAndVMT	VendorTripLength	7.30	13.00
tblTripsAndVMT	VendorTripLength	7.30	13.00
tblTripsAndVMT	VendorTripLength	7.30	13.00
tblTripsAndVMT	VendorTripLength	7.30	13.00
tblTripsAndVMT	VendorTripLength	7.30	13.00
tblTripsAndVMT	VendorTripLength	7.30	13.00
tblTripsAndVMT	VendorTripLength	7.30	13.00
tblTripsAndVMT	VendorTripLength	7.30	13.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	VendorTripNumber	0.00	1.00
tblTripsAndVMT	VendorTripNumber	0.00	3.00
tblTripsAndVMT	VendorTripNumber	0.00	1.00
tblTripsAndVMT	VendorTripNumber	0.00	1.00
tblTripsAndVMT	WorkerTripLength	10.80	22.00
tblTripsAndVMT	WorkerTripLength	10.80	22.00
tblTripsAndVMT	WorkerTripLength	10.80	22.00
tblTripsAndVMT	WorkerTripLength	10.80	22.00
tblTripsAndVMT	WorkerTripLength	10.80	22.00
tblTripsAndVMT	WorkerTripLength	10.80	22.00
tblTripsAndVMT	WorkerTripLength	10.80	22.00
tblTripsAndVMT	WorkerTripLength	10.80	22.00
tblTripsAndVMT	WorkerTripLength	10.80	22.00

tblTripsAndVMT	WorkerTripLength	10.80	22.00
tblTripsAndVMT	WorkerTripLength	10.80	22.00
tblTripsAndVMT	WorkerTripLength	10.80	22.00
tblTripsAndVMT	WorkerTripNumber	38.00	540.00
tblTripsAndVMT	WorkerTripNumber	40.00	547.00
tblTripsAndVMT	WorkerTripNumber	3.00	540.00
tblTripsAndVMT	WorkerTripNumber	10.00	541.25
tblTripsAndVMT	WorkerTripNumber	25.00	542.50
tblTripsAndVMT	WorkerTripNumber	5.00	541.87
tblTripsAndVMT	WorkerTripNumber	5.00	0.00
tblTripsAndVMT	WorkerTripNumber	55.00	540.00
tblTripsAndVMT	WorkerTripNumber	25.00	541.25
tblTripsAndVMT	WorkerTripNumber	20.00	540.00
tblTripsAndVMT	WorkerTripNumber	18.00	541.25
tblTripsAndVMT	WorkerTripNumber	40.00	541.25
tblVehicleTrips	ST_TR	6.42	0.01
tblVehicleTrips	SU_TR	5.09	0.01
tblVehicleTrips	WD_TR	3.93	0.01
tblWater	IndoorWaterUseRate	7,554,937,500.00	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2032	3.9422	13.6297	45.7544	0.1171	9.2571	0.3723	9.6295	2.4311	0.3703	2.8013	0.0000	11,388.3543	11,388.3543	0.2781	0.1360	11,431.8130
2033	3.7600	10.0335	37.8469	0.1078	17.0964	0.3708	17.1271	4.3539	0.3688	4.3827	0.0000	10,584.7565	10,584.7565	0.2709	0.1325	10,631.0135
2034	1.5558	0.9759	13.9854	0.0570	17.0964	0.0292	17.1256	4.3539	0.0275	4.3814	0.0000	5,745.4203	5,745.4203	0.0715	0.1155	5,781.6222
2035	12.2050	23.3460	115.4256	0.3514	18.1937	0.8429	19.0366	4.8141	0.8395	5.6536	0.0000	36,030.0039	36,030.0039	0.9449	0.2416	36,125.6299
2036	5.1362	8.2297	43.5117	0.1504	32.6286	0.2679	32.7395	8.1874	0.2662	8.2966	0.0000	15,883.0598	15,883.0598	0.3894	0.1287	15,931.1482
2037	1.8994	1.8102	15.6803	0.0669	9.0307	0.0589	9.0896	2.3946	0.0572	2.4519	0.0000	6,921.6922	6,921.6922	0.1048	0.1129	6,957.9631
2038	1.8994	1.8102	15.6803	0.0669	9.0307	0.0589	9.0896	2.3946	0.0572	2.4519	0.0000	6,921.6922	6,921.6922	0.1048	0.1129	6,957.9631
2039	1.8994	1.8102	15.6803	0.0669	9.0307	0.0589	9.0896	2.3946	0.0572	2.4519	0.0000	6,921.6922	6,921.6922	0.1048	0.1129	6,957.9631
Maximum	**12.2050**	**23.3460**	**115.4256**	**0.3514**	**32.6286**	**0.8429**	**32.7395**	**8.1874**	**0.8395**	**8.2966**	**0.0000**	**36,030.0039**	**36,030.0039**	**0.9449**	**0.2416**	**36,125.6299**

2.1 Overall Construction (Maximum Daily Emission)

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2032	3.3584	8.3760	47.6300	0.1171	9.1729	0.2977	9.4705	2.4220	0.2956	2.7175	0.0000	11,388.3543	11,388.3543	0.2781	0.1360	11,431.8130
2033	3.2687	8.1326	39.1750	0.1078	17.0118	0.2961	17.0409	4.3448	0.2941	4.3719	0.0000	10,584.7565	10,584.7565	0.2709	0.1325	10,631.0135
2034	1.5397	0.9381	14.0664	0.0570	17.0118	0.0276	17.0395	4.3448	0.0259	4.3706	0.0000	5,745.4203	5,745.4203	0.0715	0.1155	5,781.6222
2035	11.1515	21.0426	118.7694	0.3514	18.1548	0.7514	18.9062	4.8099	0.7480	5.5579	0.0000	36,030.0039	36,030.0039	0.9449	0.2416	36,125.6299
2036	4.9458	7.2024	43.9801	0.1504	32.6286	0.2572	32.7236	8.1874	0.2555	8.2807	0.0000	15,883.0598	15,883.0598	0.3894	0.1287	15,931.1482
2037	1.6499	1.5130	17.8213	0.0669	9.0307	0.0455	9.0763	2.3946	0.0439	2.4385	0.0000	6,921.6922	6,921.6922	0.1048	0.1129	6,957.9631
2038	1.6499	1.5130	17.8213	0.0669	9.0307	0.0455	9.0763	2.3946	0.0439	2.4385	0.0000	6,921.6922	6,921.6922	0.1048	0.1129	6,957.9631
2039	1.6499	1.5130	17.8213	0.0669	9.0307	0.0455	9.0763	2.3946	0.0439	2.4385	0.0000	6,921.6922	6,921.6922	0.1048	0.1129	6,957.9631
Maximum	**11.1515**	**21.0426**	**118.7694**	**0.3514**	**32.6286**	**0.7514**	**32.7236**	**8.1874**	**0.7480**	**8.2807**	**0.0000**	**36,030.0039**	**36,030.0039**	**0.9449**	**0.2416**	**36,125.6299**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**9.55**	**18.52**	**-4.45**	**0.00**	**0.24**	**14.23**	**0.42**	**0.10**	**14.35**	**0.78**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	699.4455	0.0302	3.3303	2.5000e-004		0.0119	0.0119		0.0119	0.0119		7.1499	7.1499	0.0187		7.6166
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.9945	1.3323	9.5539	0.0184	2.0138	0.0155	2.0293	0.5374	0.0145	0.5519		1,874.4016	1,874.4016	0.1317	0.0956	1,906.1706
Total	**700.4399**	**1.3626**	**12.8842**	**0.0187**	**2.0138**	**0.0274**	**2.0411**	**0.5374**	**0.0264**	**0.5637**		**1,881.5515**	**1,881.5515**	**0.1504**	**0.0956**	**1,913.7871**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	699.4455	0.0302	3.3303	2.5000e-004		0.0119	0.0119		0.0119	0.0119		7.1499	7.1499	0.0187		7.6166
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.9945	1.3323	9.5539	0.0184	2.0138	0.0155	2.0293	0.5374	0.0145	0.5519		1,874.4016	1,874.4016	0.1317	0.0956	1,906.1706
Total	**700.4399**	**1.3626**	**12.8842**	**0.0187**	**2.0138**	**0.0274**	**2.0411**	**0.5374**	**0.0264**	**0.5637**		**1,881.5515**	**1,881.5515**	**0.1504**	**0.0956**	**1,913.7871**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2032	12/22/2032	5	255	
2	Mobilization and Site Preparation	Site Preparation	12/23/2032	12/30/2032	5	6	
3	Soil Remediation	Site Preparation	12/31/2032	1/25/2033	5	18	
4	Revegetation	Site Preparation	1/26/2033	4/9/2035	5	574	
5	Mobilization and Site Prep Landscape	Site Preparation	4/10/2035	4/17/2035	5	6	
6	Mass Excavation	Trenching	4/15/2035	3/5/2036	5	233	
7	Backfill Building Foundation	Grading	3/6/2036	4/3/2036	5	21	
8	Backfill Tunnels	Grading	4/4/2036	5/1/2036	5	20	
9	Backfill and Grading of Zones	Grading	5/2/2036	7/4/2036	5	46	
10	Erosion Control and Restoration	Site Preparation	7/7/2036	7/17/2036	5	9	
11	Movement and Stockpiling	Demolition	7/18/2036	9/29/2039	5	574	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Aerial Lifts	1	2.00	63	0.31
Demolition	Crushing/Proc. Equipment	1	8.00	85	0.78
Demolition	Crushing/Proc. Equipment	1	6.00	85	0.78
Demolition	Excavators	2	6.00	158	0.38
Demolition	Forklifts	1	6.00	89	0.20
Demolition	Generator Sets	2	7.00	84	0.74
Demolition	Other Construction Equipment	1	8.00	172	0.42
Demolition	Paving Equipment	1	3.00	132	0.36
Demolition	Rubber Tired Loaders	1	8.00	203	0.36
Demolition	Skid Steer Loaders	2	5.00	65	0.37
Demolition	Welders	2	7.00	46	0.45
Mobilization and Site Preparation	Excavators	2	8.00	158	0.38
Mobilization and Site Preparation	Tractors/Loaders/Backhoes	2	5.00	97	0.37
Soil Remediation	Excavators	3	7.00	158	0.38
Soil Remediation	Graders	2	7.00	187	0.41
Soil Remediation	Off-Highway Tractors	2	7.00	124	0.44
Soil Remediation	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Revegetation	Excavators	1	1.00	158	0.38
Revegetation	Graders	1	1.00	187	0.41
Mobilization and Site Prep Landscape	Excavators	7	8.00	158	0.38
Mobilization and Site Prep Landscape	Graders	4	7.00	187	0.41
Mobilization and Site Prep Landscape	Off-Highway Tractors	4	7.00	124	0.44
Mobilization and Site Prep Landscape	Off-Highway Trucks	3	8.00	402	0.38
Mobilization and Site Prep Landscape	Tractors/Loaders/Backhoes	4	7.00	97	0.37
Mass Excavation	Excavators	5	7.00	158	0.38
Mass Excavation	Off-Highway Trucks	5	8.00	402	0.38
Backfill Building Foundation	Plate Compactors	4	8.00	8	0.43
Backfill Building Foundation	Tractors/Loaders/Backhoes	4	8.00	97	0.37

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Backfill Tunnels	Other Construction Equipment	3	7.00	172	0.42
Backfill Tunnels	Tractors/Loaders/Backhoes	4	7.00	97	0.37
Backfill and Grading of Zones	Graders	2	7.00	187	0.41
Backfill and Grading of Zones	Off-Highway Tractors	7	8.00	260	0.44
Backfill and Grading of Zones	Plate Compactors	7	8.00	8	0.43
Erosion Control and Restoration	Excavators	3	6.00	158	0.38
Erosion Control and Restoration	Graders	4	7.00	187	0.41
Erosion Control and Restoration	Off-Highway Tractors	4	7.00	260	0.44
Erosion Control and Restoration	Off-Highway Trucks	1	8.00	402	0.38
Erosion Control and Restoration	Rollers	2	7.00	80	0.38
Erosion Control and Restoration	Rubber Tired Loaders	2	7.00	400	0.36
Movement and Stockpiling	Rubber Tired Loaders	1	8.00	400	0.36

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	15	540.00	0.00	42.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Mobilization and Site Preparation	4	541.25	0.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Soil Remediation	10	542.50	1.00	20.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Revegetation	2	541.87	0.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Revegetation	2	0.00	0.00	0.00	22.00	13.00	0.00	LD_Mix	HDT_Mix	HHDT
Mobilization and Site Prep Landscape	22	540.00	0.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Mass Excavation	10	541.25	3.00	60.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Backfill Building Foundation	8	540.00	1.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Backfill Tunnels	7	541.25	0.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Backfill and Grading of Zones	16	541.25	1.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Erosion Control and Restoration	16	547.00	2.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Movement and Stockpiling	1	540.00	0.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Demolition - 2032

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0706	0.0000	0.0706	0.0107	0.0000	0.0107			0.0000			0.0000
Off-Road	2.2865	12.7255	31.5701	0.0602		0.2999	0.2999		0.2999	0.2999		5,638.232 3	5,638.232 3	0.2022		5,643.286 8
Total	**2.2865**	**12.7255**	**31.5701**	**0.0602**	**0.0706**	**0.2999**	**0.3705**	**0.0107**	**0.2999**	**0.3106**		**5,638.232 3**	**5,638.232 3**	**0.2022**		**5,643.286 8**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.2 Demolition - 2032

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	3.1000e-004	0.0199	6.8200e-003	8.0000e-005	2.8800e-003	1.5000e-004	3.0300e-003	7.9000e-004	1.5000e-004	9.4000e-004		9.0000	9.0000	8.1000e-004	1.4400e-003	9.4504
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.6553	0.8843	14.1775	0.0568	9.0307	0.0250	9.0558	2.3946	0.0230	2.4177		5,741.1220	5,741.1220	0.0751	0.1211	5,779.0759
Total	**1.6557**	**0.9042**	**14.1844**	**0.0569**	**9.0336**	**0.0252**	**9.0588**	**2.3954**	**0.0232**	**2.4186**		**5,750.1220**	**5,750.1220**	**0.0760**	**0.1225**	**5,788.5263**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0318	0.0000	0.0318	4.8100e-003	0.0000	4.8100e-003			0.0000			0.0000
Off-Road	1.2288	7.4718	33.4456	0.0602		0.1502	0.1502		0.1502	0.1502	0.0000	5,638.2323	5,638.2323	0.2022		5,643.2868
Total	**1.2288**	**7.4718**	**33.4456**	**0.0602**	**0.0318**	**0.1502**	**0.1820**	**4.8100e-003**	**0.1502**	**0.1550**	**0.0000**	**5,638.2323**	**5,638.2323**	**0.2022**		**5,643.2868**

3.2 Demolition - 2032

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	3.1000e-004	0.0199	6.8200e-003	8.0000e-005	2.8800e-003	1.5000e-004	3.0300e-003	7.9000e-004	1.5000e-004	9.4000e-004		9.0000	9.0000	8.1000e-004	1.4400e-003	9.4504
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.6553	0.8843	14.1775	0.0568	9.0307	0.0250	9.0558	2.3946	0.0230	2.4177		5,741.1220	5,741.1220	0.0751	0.1211	5,779.0759
Total	**1.6557**	**0.9042**	**14.1844**	**0.0569**	**9.0336**	**0.0252**	**9.0588**	**2.3954**	**0.0232**	**2.4186**		**5,750.1220**	**5,750.1220**	**0.0760**	**0.1225**	**5,788.5263**

3.3 Mobilization and Site Preparation - 2032

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.6663	2.3968	10.0518	0.0175		0.0725	0.0725		0.0725	0.0725		1,653.2317	1,653.2317	0.0592		1,654.7124
Total	**0.6663**	**2.3968**	**10.0518**	**0.0175**	**0.0000**	**0.0725**	**0.0725**	**0.0000**	**0.0725**	**0.0725**		**1,653.2317**	**1,653.2317**	**0.0592**		**1,654.7124**

3.3 Mobilization and Site Preparation - 2032

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.6592	0.8864	14.2104	0.0569	9.0516	0.0251	9.0767	2.4002	0.0231	2.4233		5,754.4117	5,754.4117	0.0753	0.1213	5,792.4534
Total	**1.6592**	**0.8864**	**14.2104**	**0.0569**	**9.0516**	**0.0251**	**9.0767**	**2.4002**	**0.0231**	**2.4233**		**5,754.4117**	**5,754.4117**	**0.0753**	**0.1213**	**5,792.4534**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.5205	1.9155	10.2654	0.0175		0.0579	0.0579		0.0579	0.0579	0.0000	1,653.2317	1,653.2317	0.0592		1,654.7124
Total	**0.5205**	**1.9155**	**10.2654**	**0.0175**	**0.0000**	**0.0579**	**0.0579**	**0.0000**	**0.0579**	**0.0579**	**0.0000**	**1,653.2317**	**1,653.2317**	**0.0592**		**1,654.7124**

3.3 Mobilization and Site Preparation - 2032

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.6592	0.8864	14.2104	0.0569	9.0516	0.0251	9.0767	2.4002	0.0231	2.4233		5,754.4117	5,754.4117	0.0753	0.1213	5,792.4534
Total	**1.6592**	**0.8864**	**14.2104**	**0.0569**	**9.0516**	**0.0251**	**9.0767**	**2.4002**	**0.0231**	**2.4233**		**5,754.4117**	**5,754.4117**	**0.0753**	**0.1213**	**5,792.4534**

3.4 Soil Remediation - 2032

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.1532	0.0000	0.1532	0.0165	0.0000	0.0165			0.0000			0.0000
Off-Road	2.1833	9.0029	24.0026	0.0510		0.3457	0.3457		0.3457	0.3457		4,825.7992	4,825.7992	0.1932		4,830.6298
Total	**2.1833**	**9.0029**	**24.0026**	**0.0510**	**0.1532**	**0.3457**	**0.4989**	**0.0165**	**0.3457**	**0.3623**		**4,825.7992**	**4,825.7992**	**0.1932**		**4,830.6298**

3.4 Soil Remediation - 2032

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	2.1100e-003	0.1341	0.0460	5.3000e-004	0.0194	1.0400e-003	0.0205	5.3200e-003	1.0000e-003	6.3200e-003		60.7140	60.7140	5.4900e-003	9.7300e-003	63.7524
Vendor	1.2200e-003	0.0633	0.0190	2.8000e-004	0.0120	4.2000e-004	0.0125	3.4600e-003	4.0000e-004	3.8700e-003		31.2212	31.2212	1.6500e-003	4.6300e-003	32.6407
Worker	1.6630	0.8884	14.2432	0.0571	9.0725	0.0252	9.0977	2.4057	0.0231	2.4289		5,767.7013	5,767.7013	0.0755	0.1216	5,805.8309
Total	**1.6663**	**1.0858**	**14.3082**	**0.0579**	**9.1040**	**0.0266**	**9.1306**	**2.4145**	**0.0245**	**2.4391**		**5,859.6365**	**5,859.6365**	**0.0826**	**0.1360**	**5,902.2240**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0689	0.0000	0.0689	7.4400e-003	0.0000	7.4400e-003			0.0000			0.0000
Off-Road	1.6920	7.1020	25.3307	0.0510		0.2710	0.2710		0.2710	0.2710	0.0000	4,825.7992	4,825.7992	0.1932		4,830.6298
Total	**1.6920**	**7.1020**	**25.3307**	**0.0510**	**0.0689**	**0.2710**	**0.3400**	**7.4400e-003**	**0.2710**	**0.2785**	**0.0000**	**4,825.7992**	**4,825.7992**	**0.1932**		**4,830.6298**

3.4 Soil Remediation - 2032

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	2.1100e-003	0.1341	0.0460	5.3000e-004	0.0194	1.0400e-003	0.0205	5.3200e-003	1.0000e-003	6.3200e-003		60.7140	60.7140	5.4900e-003	9.7300e-003	63.7524
Vendor	1.2200e-003	0.0633	0.0190	2.8000e-004	0.0120	4.2000e-004	0.0125	3.4600e-003	4.0000e-004	3.8700e-003		31.2212	31.2212	1.6500e-003	4.6300e-003	32.6407
Worker	1.6630	0.8884	14.2432	0.0571	9.0725	0.0252	9.0977	2.4057	0.0231	2.4289		5,767.7013	5,767.7013	0.0755	0.1216	5,805.8309
Total	**1.6663**	**1.0858**	**14.3082**	**0.0579**	**9.1040**	**0.0266**	**9.1306**	**2.4145**	**0.0245**	**2.4391**		**5,859.6365**	**5,859.6365**	**0.0826**	**0.1360**	**5,902.2240**

3.4 Soil Remediation - 2033

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.1532	0.0000	0.1532	0.0165	0.0000	0.0165			0.0000			0.0000
Off-Road	2.1833	9.0029	24.0026	0.0510		0.3457	0.3457		0.3457	0.3457		4,825.7992	4,825.7992	0.1932		4,830.6298
Total	**2.1833**	**9.0029**	**24.0026**	**0.0510**	**0.1532**	**0.3457**	**0.4989**	**0.0165**	**0.3457**	**0.3623**		**4,825.7992**	**4,825.7992**	**0.1932**		**4,830.6298**

3.4 Soil Remediation - 2033

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	2.0900e-003	0.1323	0.0464	5.2000e-004	0.0194	1.0300e-003	0.0204	5.3200e-003	9.9000e-004	6.3100e-003		59.7667	59.7667	5.5700e-003	9.5900e-003	62.7630
Vendor	1.2000e-003	0.0626	0.0191	2.8000e-004	0.0120	4.2000e-004	0.0125	3.4600e-003	4.0000e-004	3.8600e-003		30.7874	30.7874	1.6700e-003	4.5600e-003	32.1886
Worker	1.5734	0.8357	13.7788	0.0561	9.0725	0.0236	9.0961	2.4057	0.0217	2.4274		5,668.4033	5,668.4033	0.0704	0.1184	5,705.4322
Total	**1.5767**	**1.0306**	**13.8443**	**0.0569**	**9.1040**	**0.0251**	**9.1290**	**2.4145**	**0.0231**	**2.4376**		**5,758.9574**	**5,758.9574**	**0.0777**	**0.1325**	**5,800.3838**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0689	0.0000	0.0689	7.4400e-003	0.0000	7.4400e-003			0.0000			0.0000
Off-Road	1.6920	7.1020	25.3307	0.0510		0.2710	0.2710		0.2710	0.2710	0.0000	4,825.7992	4,825.7992	0.1932		4,830.6298
Total	**1.6920**	**7.1020**	**25.3307**	**0.0510**	**0.0689**	**0.2710**	**0.3400**	**7.4400e-003**	**0.2710**	**0.2785**	**0.0000**	**4,825.7992**	**4,825.7992**	**0.1932**		**4,830.6298**

3.4 Soil Remediation - 2033

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	2.0900e-003	0.1323	0.0464	5.2000e-004	0.0194	1.0300e-003	0.0204	5.3200e-003	9.9000e-004	6.3100e-003		59.7667	59.7667	5.5700e-003	9.5900e-003	62.7630
Vendor	1.2000e-003	0.0626	0.0191	2.8000e-004	0.0120	4.2000e-004	0.0125	3.4600e-003	4.0000e-004	3.8600e-003		30.7874	30.7874	1.6700e-003	4.5600e-003	32.1886
Worker	1.5734	0.8357	13.7788	0.0561	9.0725	0.0236	9.0961	2.4057	0.0217	2.4274		5,668.4033	5,668.4033	0.0704	0.1184	5,705.4322
Total	**1.5767**	**1.0306**	**13.8443**	**0.0569**	**9.1040**	**0.0251**	**9.1290**	**2.4145**	**0.0231**	**2.4376**		**5,758.9574**	**5,758.9574**	**0.0777**	**0.1325**	**5,800.3838**

3.5 Revegetation - 2033

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.1537	0.0000	0.1537	0.0166	0.0000	0.0166			0.0000			0.0000
Off-Road	0.0647	0.1851	0.6391	1.8100e-003		7.1000e-003	7.1000e-003		7.1000e-003	7.1000e-003		171.2819	171.2819	5.7300e-003		171.4251
Total	**0.0647**	**0.1851**	**0.6391**	**1.8100e-003**	**0.1537**	**7.1000e-003**	**0.1608**	**0.0166**	**7.1000e-003**	**0.0237**		**171.2819**	**171.2819**	**5.7300e-003**		**171.4251**

3.5 Revegetation - 2033

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.5716	0.8348	13.7629	0.0560	16.9427	0.0236	16.9662	4.3373	0.0217	4.3590		5,661.868 3	5,661.868 3	0.0703	0.1182	5,698.854 5
Total	**1.5716**	**0.8348**	**13.7629**	**0.0560**	**16.9427**	**0.0236**	**16.9662**	**4.3373**	**0.0217**	**4.3590**		**5,661.868 3**	**5,661.868 3**	**0.0703**	**0.1182**	**5,698.854 5**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0692	0.0000	0.0692	7.4700e-003	0.0000	7.4700e-003			0.0000			0.0000
Off-Road	0.0486	0.1474	0.7201	1.8100e-003		5.4800e-003	5.4800e-003		5.4800e-003	5.4800e-003	0.0000	171.2819	171.2819	5.7300e-003		171.4251
Total	**0.0486**	**0.1474**	**0.7201**	**1.8100e-003**	**0.0692**	**5.4800e-003**	**0.0747**	**7.4700e-003**	**5.4800e-003**	**0.0130**	**0.0000**	**171.2819**	**171.2819**	**5.7300e-003**		**171.4251**

3.5 Revegetation - 2033

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.5716	0.8348	13.7629	0.0560	16.9427	0.0236	16.9662	4.3373	0.0217	4.3590		5,661.868 3	5,661.868 3	0.0703	0.1182	5,698.854 5
Total	**1.5716**	**0.8348**	**13.7629**	**0.0560**	**16.9427**	**0.0236**	**16.9662**	**4.3373**	**0.0217**	**4.3590**		**5,661.868 3**	**5,661.868 3**	**0.0703**	**0.1182**	**5,698.854 5**

3.5 Revegetation - 2034

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.1537	0.0000	0.1537	0.0166	0.0000	0.0166			0.0000			0.0000
Off-Road	0.0647	0.1851	0.6391	1.8100e-003		7.1000e-003	7.1000e-003		7.1000e-003	7.1000e-003		171.2819	171.2819	5.7300e-003		171.4251
Total	**0.0647**	**0.1851**	**0.6391**	**1.8100e-003**	**0.1537**	**7.1000e-003**	**0.1608**	**0.0166**	**7.1000e-003**	**0.0237**		**171.2819**	**171.2819**	**5.7300e-003**		**171.4251**

3.5 Revegetation - 2034

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4911	0.7908	13.3463	0.0551	16.9427	0.0221	16.9648	4.3373	0.0204	4.3577		5,574.1384	5,574.1384	0.0658	0.1155	5,610.1972
Total	**1.4911**	**0.7908**	**13.3463**	**0.0551**	**16.9427**	**0.0221**	**16.9648**	**4.3373**	**0.0204**	**4.3577**		**5,574.1384**	**5,574.1384**	**0.0658**	**0.1155**	**5,610.1972**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0692	0.0000	0.0692	7.4700e-003	0.0000	7.4700e-003			0.0000			0.0000
Off-Road	0.0486	0.1474	0.7201	1.8100e-003		5.4800e-003	5.4800e-003		5.4800e-003	5.4800e-003	0.0000	171.2819	171.2819	5.7300e-003		171.4251
Total	**0.0486**	**0.1474**	**0.7201**	**1.8100e-003**	**0.0692**	**5.4800e-003**	**0.0747**	**7.4700e-003**	**5.4800e-003**	**0.0130**	**0.0000**	**171.2819**	**171.2819**	**5.7300e-003**		**171.4251**

3.5 Revegetation - 2034

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4911	0.7908	13.3463	0.0551	16.9427	0.0221	16.9648	4.3373	0.0204	4.3577		5,574.1384	5,574.1384	0.0658	0.1155	5,610.1972
Total	**1.4911**	**0.7908**	**13.3463**	**0.0551**	**16.9427**	**0.0221**	**16.9648**	**4.3373**	**0.0204**	**4.3577**		**5,574.1384**	**5,574.1384**	**0.0658**	**0.1155**	**5,610.1972**

3.5 Revegetation - 2035

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.1537	0.0000	0.1537	0.0166	0.0000	0.0166			0.0000			0.0000
Off-Road	0.0592	0.1247	0.6373	1.8100e-003		4.6900e-003	4.6900e-003		4.6900e-003	4.6900e-003		171.2819	171.2819	5.1200e-003		171.4100
Total	**0.0592**	**0.1247**	**0.6373**	**1.8100e-003**	**0.1537**	**4.6900e-003**	**0.1584**	**0.0166**	**4.6900e-003**	**0.0213**		**171.2819**	**171.2819**	**5.1200e-003**		**171.4100**

3.5 Revegetation - 2035

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4193	0.7563	12.9925	0.0544	16.9427	0.0209	16.9635	4.3373	0.0192	4.3565		5,497.386 6	5,497.386 6	0.0618	0.1133	5,532.700 2
Total	**1.4193**	**0.7563**	**12.9925**	**0.0544**	**16.9427**	**0.0209**	**16.9635**	**4.3373**	**0.0192**	**4.3565**		**5,497.386 6**	**5,497.386 6**	**0.0618**	**0.1133**	**5,532.700 2**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0692	0.0000	0.0692	7.4700e-003	0.0000	7.4700e-003			0.0000			0.0000
Off-Road	0.0450	0.1082	0.7190	1.8100e-003		3.9000e-003	3.9000e-003		3.9000e-003	3.9000e-003	0.0000	171.2819	171.2819	5.1200e-003		171.4100
Total	**0.0450**	**0.1082**	**0.7190**	**1.8100e-003**	**0.0692**	**3.9000e-003**	**0.0731**	**7.4700e-003**	**3.9000e-003**	**0.0114**	**0.0000**	**171.2819**	**171.2819**	**5.1200e-003**		**171.4100**

3.5 Revegetation - 2035

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4193	0.7563	12.9925	0.0544	16.9427	0.0209	16.9635	4.3373	0.0192	4.3565		5,497.386 6	5,497.386 6	0.0618	0.1133	5,532.700 2
Total	**1.4193**	**0.7563**	**12.9925**	**0.0544**	**16.9427**	**0.0209**	**16.9635**	**4.3373**	**0.0192**	**4.3565**		**5,497.386 6**	**5,497.386 6**	**0.0618**	**0.1133**	**5,532.700 2**

3.6 Mobilization and Site Prep Landscape - 2035

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0707	0.0000	0.0707	7.6300e-003	0.0000	7.6300e-003			0.0000			0.0000
Off-Road	5.6544	15.2440	58.9664	0.1468		0.5552	0.5552		0.5552	0.5552		14,668.57 51	14,668.57 51	0.4939		14,680.92 14
Total	**5.6544**	**15.2440**	**58.9664**	**0.1468**	**0.0707**	**0.5552**	**0.6259**	**7.6300e-003**	**0.5552**	**0.5628**		**14,668.57 51**	**14,668.57 51**	**0.4939**		**14,680.92 14**

3.6 Mobilization and Site Prep Landscape - 2035

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4143	0.7536	12.9475	0.0542	9.0307	0.0208	9.0515	2.3946	0.0191	2.4138		5,478.3689	5,478.3689	0.0616	0.1129	5,513.5604
Total	**1.4143**	**0.7536**	**12.9475**	**0.0542**	**9.0307**	**0.0208**	**9.0515**	**2.3946**	**0.0191**	**2.4138**		**5,478.3689**	**5,478.3689**	**0.0616**	**0.1129**	**5,513.5604**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0318	0.0000	0.0318	3.4400e-003	0.0000	3.4400e-003			0.0000			0.0000
Off-Road	4.7913	13.0866	61.8417	0.1468		0.4734	0.4734		0.4734	0.4734	0.0000	14,668.5751	14,668.5751	0.4939		14,680.9213
Total	**4.7913**	**13.0866**	**61.8417**	**0.1468**	**0.0318**	**0.4734**	**0.5052**	**3.4400e-003**	**0.4734**	**0.4768**	**0.0000**	**14,668.5751**	**14,668.5751**	**0.4939**		**14,680.9213**

3.6 Mobilization and Site Prep Landscape - 2035

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4143	0.7536	12.9475	0.0542	9.0307	0.0208	9.0515	2.3946	0.0191	2.4138		5,478.368 9	5,478.368 9	0.0616	0.1129	5,513.560 4
Total	**1.4143**	**0.7536**	**12.9475**	**0.0542**	**9.0307**	**0.0208**	**9.0515**	**2.3946**	**0.0191**	**2.4138**		**5,478.368 9**	**5,478.368 9**	**0.0616**	**0.1129**	**5,513.560 4**

3.7 Mass Excavation - 2035

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.7147	6.3789	30.4657	0.0952		0.2446	0.2446		0.2446	0.2446		10,288.43 97	10,288.43 97	0.3212		10,296.47 06
Total	**3.7147**	**6.3789**	**30.4657**	**0.0952**		**0.2446**	**0.2446**		**0.2446**	**0.2446**		**10,288.43 97**	**10,288.43 97**	**0.3212**		**10,296.47 06**

3.7 Mass Excavation - 2035

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	4.8000e-004	0.0300	0.0109	1.2000e-004	4.5000e-003	2.4000e-004	4.7300e-003	1.2300e-003	2.2000e-004	1.4600e-003		13.4693	13.4693	1.3200e-003	2.1600e-003	14.1466
Vendor	3.4900e-003	0.1841	0.0575	8.2000e-004	0.0361	1.2300e-003	0.0373	0.0104	1.1800e-003	0.0116		90.0734	90.0734	5.1100e-003	0.0134	94.1804
Worker	1.4176	0.7554	12.9776	0.0543	9.0517	0.0208	9.0725	2.4002	0.0192	2.4194		5,491.0775	5,491.0775	0.0617	0.1132	5,526.3506
Total	**1.4216**	**0.9694**	**13.0461**	**0.0553**	**9.0923**	**0.0223**	**9.1146**	**2.4118**	**0.0206**	**2.4324**		**5,594.6202**	**5,594.6202**	**0.0682**	**0.1287**	**5,634.6776**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.5243	6.2330	30.9341	0.0952		0.2349	0.2349		0.2349	0.2349	0.0000	10,288.4397	10,288.4397	0.3212		10,296.4706
Total	**3.5243**	**6.2330**	**30.9341**	**0.0952**		**0.2349**	**0.2349**		**0.2349**	**0.2349**	**0.0000**	**10,288.4397**	**10,288.4397**	**0.3212**		**10,296.4706**

3.7 Mass Excavation - 2035

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	4.8000e-004	0.0300	0.0109	1.2000e-004	4.5000e-003	2.4000e-004	4.7300e-003	1.2300e-003	2.2000e-004	1.4600e-003		13.4693	13.4693	1.3200e-003	2.1600e-003	14.1466
Vendor	3.4900e-003	0.1841	0.0575	8.2000e-004	0.0361	1.2300e-003	0.0373	0.0104	1.1800e-003	0.0116		90.0734	90.0734	5.1100e-003	0.0134	94.1804
Worker	1.4176	0.7554	12.9776	0.0543	9.0517	0.0208	9.0725	2.4002	0.0192	2.4194		5,491.0775	5,491.0775	0.0617	0.1132	5,526.3506
Total	**1.4216**	**0.9694**	**13.0461**	**0.0553**	**9.0923**	**0.0223**	**9.1146**	**2.4118**	**0.0206**	**2.4324**		**5,594.6202**	**5,594.6202**	**0.0682**	**0.1287**	**5,634.6776**

3.7 Mass Excavation - 2036

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.7147	6.3789	30.4657	0.0952		0.2446	0.2446		0.2446	0.2446		10,288.4397	10,288.4397	0.3212		10,296.4706
Total	**3.7147**	**6.3789**	**30.4657**	**0.0952**		**0.2446**	**0.2446**		**0.2446**	**0.2446**		**10,288.4397**	**10,288.4397**	**0.3212**		**10,296.4706**

3.7 Mass Excavation - 2036

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	4.8000e-004	0.0300	0.0109	1.2000e-004	4.5000e-003	2.4000e-004	4.7300e-003	1.2300e-003	2.2000e-004	1.4600e-003		13.4693	13.4693	1.3200e-003	2.1600e-003	14.1466
Vendor	3.4900e-003	0.1841	0.0575	8.2000e-004	0.0361	1.2300e-003	0.0373	0.0104	1.1800e-003	0.0116		90.0734	90.0734	5.1100e-003	0.0134	94.1804
Worker	1.4176	0.7554	12.9776	0.0543	9.0517	0.0208	9.0725	2.4002	0.0192	2.4194		5,491.0775	5,491.0775	0.0617	0.1132	5,526.3506
Total	**1.4216**	**0.9694**	**13.0461**	**0.0553**	**9.0923**	**0.0223**	**9.1146**	**2.4118**	**0.0206**	**2.4324**		**5,594.6202**	**5,594.6202**	**0.0682**	**0.1287**	**5,634.6776**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.5243	6.2330	30.9341	0.0952		0.2349	0.2349		0.2349	0.2349	0.0000	10,288.4397	10,288.4397	0.3212		10,296.4706
Total	**3.5243**	**6.2330**	**30.9341**	**0.0952**		**0.2349**	**0.2349**		**0.2349**	**0.2349**	**0.0000**	**10,288.4397**	**10,288.4397**	**0.3212**		**10,296.4706**

3.7 Mass Excavation - 2036

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	4.8000e-004	0.0300	0.0109	1.2000e-004	4.5000e-003	2.4000e-004	4.7300e-003	1.2300e-003	2.2000e-004	1.4600e-003		13.4693	13.4693	1.3200e-003	2.1600e-003	14.1466
Vendor	3.4900e-003	0.1841	0.0575	8.2000e-004	0.0361	1.2300e-003	0.0373	0.0104	1.1800e-003	0.0116		90.0734	90.0734	5.1100e-003	0.0134	94.1804
Worker	1.4176	0.7554	12.9776	0.0543	9.0517	0.0208	9.0725	2.4002	0.0192	2.4194		5,491.0775	5,491.0775	0.0617	0.1132	5,526.3506
Total	**1.4216**	**0.9694**	**13.0461**	**0.0553**	**9.0923**	**0.0223**	**9.1146**	**2.4118**	**0.0206**	**2.4324**		**5,594.6202**	**5,594.6202**	**0.0682**	**0.1287**	**5,634.6776**

3.8 Backfill Building Foundation - 2036

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.8137	4.8563	10.2180	0.0171		0.0897	0.0897		0.0897	0.0897		1,576.8307	1,576.8307	0.0726		1,578.6446
Total	**0.8137**	**4.8563**	**10.2180**	**0.0171**	**0.0000**	**0.0897**	**0.0897**	**0.0000**	**0.0897**	**0.0897**		**1,576.8307**	**1,576.8307**	**0.0726**		**1,578.6446**

3.8 Backfill Building Foundation - 2036

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.1600e-003	0.0614	0.0192	2.7000e-004	0.0378	4.1000e-004	0.0382	9.7900e-003	3.9000e-004	0.0102		30.0245	30.0245	1.7000e-003	4.4500e-003	31.3935
Worker	1.4143	0.7536	12.9475	0.0542	32.5907	0.0208	32.6115	8.1776	0.0191	8.1967		5,478.3689	5,478.3689	0.0616	0.1129	5,513.5604
Total	**1.4155**	**0.8150**	**12.9667**	**0.0545**	**32.6286**	**0.0212**	**32.6497**	**8.1874**	**0.0195**	**8.2069**		**5,508.3934**	**5,508.3934**	**0.0633**	**0.1174**	**5,544.9538**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.6394	3.7495	10.0642	0.0171		0.0739	0.0739		0.0739	0.0739	0.0000	1,576.8307	1,576.8307	0.0726		1,578.6446
Total	**0.6394**	**3.7495**	**10.0642**	**0.0171**	**0.0000**	**0.0739**	**0.0739**	**0.0000**	**0.0739**	**0.0739**	**0.0000**	**1,576.8307**	**1,576.8307**	**0.0726**		**1,578.6446**

3.8 Backfill Building Foundation - 2036

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.1600e-003	0.0614	0.0192	2.7000e-004	0.0378	4.1000e-004	0.0382	9.7900e-003	3.9000e-004	0.0102		30.0245	30.0245	1.7000e-003	4.4500e-003	31.3935
Worker	1.4143	0.7536	12.9475	0.0542	32.5907	0.0208	32.6115	8.1776	0.0191	8.1967		5,478.3689	5,478.3689	0.0616	0.1129	5,513.5604
Total	**1.4155**	**0.8150**	**12.9667**	**0.0545**	**32.6286**	**0.0212**	**32.6497**	**8.1874**	**0.0195**	**8.2069**		**5,508.3934**	**5,508.3934**	**0.0633**	**0.1174**	**5,544.9538**

3.9 Backfill Tunnels - 2036

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.0733	4.4868	18.6655	0.0334		0.0878	0.0878		0.0878	0.0878		3,159.7254	3,159.7254	0.0944		3,162.0863
Total	**1.0733**	**4.4868**	**18.6655**	**0.0334**	**0.0000**	**0.0878**	**0.0878**	**0.0000**	**0.0878**	**0.0878**		**3,159.7254**	**3,159.7254**	**0.0944**		**3,162.0863**

3.9 Backfill Tunnels - 2036

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4176	0.7554	12.9775	0.0543	9.0516	0.0208	9.0724	2.4002	0.0192	2.4194		5,491.0503	5,491.0503	0.0617	0.1132	5,526.3232
Total	**1.4176**	**0.7554**	**12.9775**	**0.0543**	**9.0516**	**0.0208**	**9.0724**	**2.4002**	**0.0192**	**2.4194**		**5,491.0503**	**5,491.0503**	**0.0617**	**0.1132**	**5,526.3232**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.8708	3.6147	19.1418	0.0334		0.0759	0.0759		0.0759	0.0759	0.0000	3,159.7254	3,159.7254	0.0944		3,162.0863
Total	**0.8708**	**3.6147**	**19.1418**	**0.0334**	**0.0000**	**0.0759**	**0.0759**	**0.0000**	**0.0759**	**0.0759**	**0.0000**	**3,159.7254**	**3,159.7254**	**0.0944**		**3,162.0863**

3.9 Backfill Tunnels - 2036

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4176	0.7554	12.9775	0.0543	9.0516	0.0208	9.0724	2.4002	0.0192	2.4194		5,491.050 3	5,491.050 3	0.0617	0.1132	5,526.323 2
Total	**1.4176**	**0.7554**	**12.9775**	**0.0543**	**9.0516**	**0.0208**	**9.0724**	**2.4002**	**0.0192**	**2.4194**		**5,491.050 3**	**5,491.050 3**	**0.0617**	**0.1132**	**5,526.323 2**

3.10 Backfill and Grading of Zones - 2036

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.1545	0.0000	0.1545	0.0167	0.0000	0.0167			0.0000			0.0000
Off-Road	0.7445	2.8287	4.1643	0.0176		0.1062	0.1062		0.1062	0.1062		1,586.177 3	1,586.177 3	0.0653		1,587.809 4
Total	**0.7445**	**2.8287**	**4.1643**	**0.0176**	**0.1545**	**0.1062**	**0.2607**	**0.0167**	**0.1062**	**0.1229**		**1,586.177 3**	**1,586.177 3**	**0.0653**		**1,587.809 4**

3.10 Backfill and Grading of Zones - 2036

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.1600e-003	0.0614	0.0192	2.7000e-004	0.0120	4.1000e-004	0.0124	3.4600e-003	3.9000e-004	3.8500e-003		30.0245	30.0245	1.7000e-003	4.4500e-003	31.3935
Worker	1.4176	0.7554	12.9775	0.0543	9.0516	0.0208	9.0724	2.4002	0.0192	2.4194		5,491.0503	5,491.0503	0.0617	0.1132	5,526.3232
Total	**1.4188**	**0.8168**	**12.9967**	**0.0546**	**9.0637**	**0.0212**	**9.0849**	**2.4036**	**0.0196**	**2.4232**		**5,521.0748**	**5,521.0748**	**0.0634**	**0.1176**	**5,557.7167**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0695	0.0000	0.0695	7.5100e-003	0.0000	7.5100e-003			0.0000			0.0000
Off-Road	0.5717	2.3394	4.8549	0.0176		0.0867	0.0867		0.0867	0.0867	0.0000	1,586.1773	1,586.1773	0.0653		1,587.8094
Total	**0.5717**	**2.3394**	**4.8549**	**0.0176**	**0.0695**	**0.0867**	**0.1563**	**7.5100e-003**	**0.0867**	**0.0943**	**0.0000**	**1,586.1773**	**1,586.1773**	**0.0653**		**1,587.8094**

3.10 Backfill and Grading of Zones - 2036

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.1600e-003	0.0614	0.0192	2.7000e-004	0.0120	4.1000e-004	0.0124	3.4600e-003	3.9000e-004	3.8500e-003		30.0245	30.0245	1.7000e-003	4.4500e-003	31.3935
Worker	1.4176	0.7554	12.9775	0.0543	9.0516	0.0208	9.0724	2.4002	0.0192	2.4194		5,491.0503	5,491.0503	0.0617	0.1132	5,526.3232
Total	**1.4188**	**0.8168**	**12.9967**	**0.0546**	**9.0637**	**0.0212**	**9.0849**	**2.4036**	**0.0196**	**2.4232**		**5,521.0748**	**5,521.0748**	**0.0634**	**0.1176**	**5,557.7167**

3.11 Erosion Control and Restoration - 2036

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.1532	0.0000	0.1532	0.0165	0.0000	0.0165			0.0000			0.0000
Off-Road	3.0484	7.3436	24.5583	0.0840		0.2460	0.2460		0.2460	0.2460		8,633.8298	8,633.8298	0.2666		8,640.4947
Total	**3.0484**	**7.3436**	**24.5583**	**0.0840**	**0.1532**	**0.2460**	**0.3992**	**0.0165**	**0.2460**	**0.2625**		**8,633.8298**	**8,633.8298**	**0.2666**		**8,640.4947**

3.11 Erosion Control and Restoration - 2036

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.3300e-003	0.1227	0.0384	5.5000e-004	0.0241	8.2000e-004	0.0249	6.9200e-003	7.8000e-004	7.7100e-003		60.0489	60.0489	3.4100e-003	8.9000e-003	62.7869
Worker	1.4327	0.7634	13.1154	0.0549	9.1478	0.0211	9.1688	2.4257	0.0194	2.4451		5,549.3848	5,549.3848	0.0624	0.1144	5,585.0324
Total	**1.4350**	**0.8861**	**13.1537**	**0.0555**	**9.1718**	**0.0219**	**9.1937**	**2.4326**	**0.0202**	**2.4528**		**5,609.4337**	**5,609.4337**	**0.0658**	**0.1233**	**5,647.8194**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0689	0.0000	0.0689	7.4400e-003	0.0000	7.4400e-003			0.0000			0.0000
Off-Road	2.1763	5.7511	30.4910	0.0840		0.1906	0.1906		0.1906	0.1906	0.0000	8,633.8298	8,633.8298	0.2666		8,640.4947
Total	**2.1763**	**5.7511**	**30.4910**	**0.0840**	**0.0689**	**0.1906**	**0.2595**	**7.4400e-003**	**0.1906**	**0.1980**	**0.0000**	**8,633.8298**	**8,633.8298**	**0.2666**		**8,640.4947**

3.11 Erosion Control and Restoration - 2036

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.3300e-003	0.1227	0.0384	5.5000e-004	0.0241	8.2000e-004	0.0249	6.9200e-003	7.8000e-004	7.7100e-003		60.0489	60.0489	3.4100e-003	8.9000e-003	62.7869
Worker	1.4327	0.7634	13.1154	0.0549	9.1478	0.0211	9.1688	2.4257	0.0194	2.4451		5,549.3848	5,549.3848	0.0624	0.1144	5,585.0324
Total	**1.4350**	**0.8861**	**13.1537**	**0.0555**	**9.1718**	**0.0219**	**9.1937**	**2.4326**	**0.0202**	**2.4528**		**5,609.4337**	**5,609.4337**	**0.0658**	**0.1233**	**5,647.8194**

3.12 Movement and Stockpiling - 2036

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.4851	1.0565	2.7327	0.0127		0.0381	0.0381		0.0381	0.0381		1,443.3233	1,443.3233	0.0432		1,444.4027
Total	**0.4851**	**1.0565**	**2.7327**	**0.0127**		**0.0381**	**0.0381**		**0.0381**	**0.0381**		**1,443.3233**	**1,443.3233**	**0.0432**		**1,444.4027**

3.12 Movement and Stockpiling - 2036

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4143	0.7536	12.9475	0.0542	9.0307	0.0208	9.0515	2.3946	0.0191	2.4138		5,478.3689	5,478.3689	0.0616	0.1129	5,513.5604
Total	**1.4143**	**0.7536**	**12.9475**	**0.0542**	**9.0307**	**0.0208**	**9.0515**	**2.3946**	**0.0191**	**2.4138**		**5,478.3689**	**5,478.3689**	**0.0616**	**0.1129**	**5,513.5604**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.2356	0.7594	4.8737	0.0127		0.0248	0.0248		0.0248	0.0248	0.0000	1,443.3233	1,443.3233	0.0432		1,444.4027
Total	**0.2356**	**0.7594**	**4.8737**	**0.0127**		**0.0248**	**0.0248**		**0.0248**	**0.0248**	**0.0000**	**1,443.3233**	**1,443.3233**	**0.0432**		**1,444.4027**

3.12 Movement and Stockpiling - 2036

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4143	0.7536	12.9475	0.0542	9.0307	0.0208	9.0515	2.3946	0.0191	2.4138		5,478.368 9	5,478.368 9	0.0616	0.1129	5,513.560 4
Total	**1.4143**	**0.7536**	**12.9475**	**0.0542**	**9.0307**	**0.0208**	**9.0515**	**2.3946**	**0.0191**	**2.4138**		**5,478.368 9**	**5,478.368 9**	**0.0616**	**0.1129**	**5,513.560 4**

3.12 Movement and Stockpiling - 2037

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.4851	1.0565	2.7327	0.0127		0.0381	0.0381		0.0381	0.0381		1,443.323 3	1,443.323 3	0.0432		1,444.402 7
Total	**0.4851**	**1.0565**	**2.7327**	**0.0127**		**0.0381**	**0.0381**		**0.0381**	**0.0381**		**1,443.323 3**	**1,443.323 3**	**0.0432**		**1,444.402 7**

3.12 Movement and Stockpiling - 2037

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4143	0.7536	12.9475	0.0542	9.0307	0.0208	9.0515	2.3946	0.0191	2.4138		5,478.368 9	5,478.368 9	0.0616	0.1129	5,513.560 4
Total	**1.4143**	**0.7536**	**12.9475**	**0.0542**	**9.0307**	**0.0208**	**9.0515**	**2.3946**	**0.0191**	**2.4138**		**5,478.368 9**	**5,478.368 9**	**0.0616**	**0.1129**	**5,513.560 4**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.2356	0.7594	4.8737	0.0127		0.0248	0.0248		0.0248	0.0248	0.0000	1,443.323 3	1,443.323 3	0.0432		1,444.402 7
Total	**0.2356**	**0.7594**	**4.8737**	**0.0127**		**0.0248**	**0.0248**		**0.0248**	**0.0248**	**0.0000**	**1,443.323 3**	**1,443.323 3**	**0.0432**		**1,444.402 7**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.12 Movement and Stockpiling - 2037

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4143	0.7536	12.9475	0.0542	9.0307	0.0208	9.0515	2.3946	0.0191	2.4138		5,478.368 9	5,478.368 9	0.0616	0.1129	5,513.560 4
Total	**1.4143**	**0.7536**	**12.9475**	**0.0542**	**9.0307**	**0.0208**	**9.0515**	**2.3946**	**0.0191**	**2.4138**		**5,478.368 9**	**5,478.368 9**	**0.0616**	**0.1129**	**5,513.560 4**

3.12 Movement and Stockpiling - 2038

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.4851	1.0565	2.7327	0.0127		0.0381	0.0381		0.0381	0.0381		1,443.323 3	1,443.323 3	0.0432		1,444.402 7
Total	**0.4851**	**1.0565**	**2.7327**	**0.0127**		**0.0381**	**0.0381**		**0.0381**	**0.0381**		**1,443.323 3**	**1,443.323 3**	**0.0432**		**1,444.402 7**

3.12 Movement and Stockpiling - 2038

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4143	0.7536	12.9475	0.0542	9.0307	0.0208	9.0515	2.3946	0.0191	2.4138		5,478.3689	5,478.3689	0.0616	0.1129	5,513.5604
Total	**1.4143**	**0.7536**	**12.9475**	**0.0542**	**9.0307**	**0.0208**	**9.0515**	**2.3946**	**0.0191**	**2.4138**		**5,478.3689**	**5,478.3689**	**0.0616**	**0.1129**	**5,513.5604**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.2356	0.7594	4.8737	0.0127		0.0248	0.0248		0.0248	0.0248	0.0000	1,443.3233	1,443.3233	0.0432		1,444.4027
Total	**0.2356**	**0.7594**	**4.8737**	**0.0127**		**0.0248**	**0.0248**		**0.0248**	**0.0248**	**0.0000**	**1,443.3233**	**1,443.3233**	**0.0432**		**1,444.4027**

3.12 Movement and Stockpiling - 2038

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4143	0.7536	12.9475	0.0542	9.0307	0.0208	9.0515	2.3946	0.0191	2.4138		5,478.368 9	5,478.368 9	0.0616	0.1129	5,513.560 4
Total	**1.4143**	**0.7536**	**12.9475**	**0.0542**	**9.0307**	**0.0208**	**9.0515**	**2.3946**	**0.0191**	**2.4138**		**5,478.368 9**	**5,478.368 9**	**0.0616**	**0.1129**	**5,513.560 4**

3.12 Movement and Stockpiling - 2039

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.4851	1.0565	2.7327	0.0127		0.0381	0.0381		0.0381	0.0381		1,443.323 3	1,443.323 3	0.0432		1,444.402 7
Total	**0.4851**	**1.0565**	**2.7327**	**0.0127**		**0.0381**	**0.0381**		**0.0381**	**0.0381**		**1,443.323 3**	**1,443.323 3**	**0.0432**		**1,444.402 7**

3.12 Movement and Stockpiling - 2039

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4143	0.7536	12.9475	0.0542	9.0307	0.0208	9.0515	2.3946	0.0191	2.4138		5,478.3689	5,478.3689	0.0616	0.1129	5,513.5604
Total	**1.4143**	**0.7536**	**12.9475**	**0.0542**	**9.0307**	**0.0208**	**9.0515**	**2.3946**	**0.0191**	**2.4138**		**5,478.3689**	**5,478.3689**	**0.0616**	**0.1129**	**5,513.5604**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.2356	0.7594	4.8737	0.0127		0.0248	0.0248		0.0248	0.0248	0.0000	1,443.3233	1,443.3233	0.0432		1,444.4027
Total	**0.2356**	**0.7594**	**4.8737**	**0.0127**		**0.0248**	**0.0248**		**0.0248**	**0.0248**	**0.0000**	**1,443.3233**	**1,443.3233**	**0.0432**		**1,444.4027**

3.12 Movement and Stockpiling - 2039

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4143	0.7536	12.9475	0.0542	9.0307	0.0208	9.0515	2.3946	0.0191	2.4138		5,478.3689	5,478.3689	0.0616	0.1129	5,513.5604
Total	**1.4143**	**0.7536**	**12.9475**	**0.0542**	**9.0307**	**0.0208**	**9.0515**	**2.3946**	**0.0191**	**2.4138**		**5,478.3689**	**5,478.3689**	**0.0616**	**0.1129**	**5,513.5604**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.9945	1.3323	9.5539	0.0184	2.0138	0.0155	2.0293	0.5374	0.0145	0.5519		1,874.4016	1,874.4016	0.1317	0.0956	1,906.1706
Unmitigated	0.9945	1.3323	9.5539	0.0184	2.0138	0.0155	2.0293	0.5374	0.0145	0.5519		1,874.4016	1,874.4016	0.1317	0.0956	1,906.1706

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Heavy Industry	326.70	326.70	326.70	953,804	953,804
Total	326.70	326.70	326.70	953,804	953,804

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Heavy Industry	9.50	7.30	7.30	59.00	28.00	13.00	92	5	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Heavy Industry	0.518500	0.056626	0.189643	0.140762	0.030399	0.007841	0.010730	0.006132	0.000824	0.000442	0.030440	0.001544	0.006118

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Heavy Industry	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Heavy Industry	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	699.4455	0.0302	3.3303	2.5000e-004		0.0119	0.0119		0.0119	0.0119		7.1499	7.1499	0.0187		7.6166
Unmitigated	699.4455	0.0302	3.3303	2.5000e-004		0.0119	0.0119		0.0119	0.0119		7.1499	7.1499	0.0187		7.6166

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	699.1380					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	0.3075	0.0302	3.3303	2.5000e-004		0.0119	0.0119		0.0119	0.0119		7.1499	7.1499	0.0187		7.6166
Total	**699.4455**	**0.0302**	**3.3303**	**2.5000e-004**		**0.0119**	**0.0119**		**0.0119**	**0.0119**		**7.1499**	**7.1499**	**0.0187**		**7.6166**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	699.1380					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	0.3075	0.0302	3.3303	2.5000e-004		0.0119	0.0119		0.0119	0.0119		7.1499	7.1499	0.0187		7.6166
Total	**699.4455**	**0.0302**	**3.3303**	**2.5000e-004**		**0.0119**	**0.0119**		**0.0119**	**0.0119**		**7.1499**	**7.1499**	**0.0187**		**7.6166**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Appendix D3

CSLC Full Removal Alternative
AQ and GHG Emissions

Appendix D3.1

Alt 8 Summary AQ and GHG Emissions

AQ Emissions from Alternative 8 in SLO

Phase 1						
	NOx	ROG	PM10 Total	PM2.5 Total	CO	SO2
Year	lb/day					
Alternative 8 emissions not included in Proposed Project						
Land	51.18	6.75	6.05	2.59	100.08	0.18
Marine	257.13	25.50	12.76	9.12	216.63	0.29
Daily Max	257.13	25.50	12.76	9.12	216.63	0.29
Alternative 8 emissions in Proposed Project						
	341.50	28.96	28.50	13.61	463.37	82.21
Total Maximum Daily Emissions in Alt 8	598.63	54.45	41.26	22.73	680.00	82.50

Phase 2						
	NOx	ROG	PM10 Total	PM2.5 Total	CO	SO2
Year	lb/day					
Alternative 8 emissions not included in Proposed Project						
Land	51.13	6.74	10.84	2.59	99.98	0.19
Marine	257.12	29.37	22.53	10.51	244.99	0.39
Daily Max	257.12	29.37	22.53	10.51	244.99	0.39
Alternative 8 emissions in Proposed Project						
	19.70	8.72	32.94	8.38	85.91	0.25
Total Maximum Daily Emissions in Alt 8, Phase 2	276.82	38.09	55.47	18.89	330.90	0.64

Phase 1						
	Nox + ROG	Exhaust PM10	Fugative PM10	Nox + ROG	Exhaust PM10	Fugative PM10
Alternative 7 emissions not included in Proposed Project						
Year	pounds/day			tons/quarter		
Land	57.9280	2.2405	4.6497	2.6357	0.1019	0.2116
Marine	282.6249	13.0000	11.6248	12.8594	0.5915	0.5289
Alternative 7 emissions in Proposed Project						
				11.9171	0.0899	0.5212
Total Maximum Quarterly Emissions in Alt 8				24.78	0.68	1.05

Phase 2						
	Nox + ROG	Exhaust PM10	Fugative PM10	Nox + ROG	Exhaust PM10	Fugative PM10
Alternative 8 emissions not included in Proposed Project						
Year	pounds/day			tons/quarter		
Land	57.86	2.24	9.91	2.63	0.10	0.45
Marine	286.48	22.53	21.10	13.04	1.02	0.96
Alternative 8 emissions in Proposed Project						
				0.78	0.02	0.54
Total Maximum Quarterly Emissions in Alt 8				13.82	1.04	1.50

Rail Emissions for Alternative 8						
	NOx	ROG	PM10	PM2.5	CO	SOx
	lbs/day					
SBCAPCD	7.44	0.78	0.58	0.20	24.70	0.06
VCAPCD	0.58	0.02	0.17	0.01	0.21	0.00
MDAQMD	2.47	0.06	0.71	0.05	0.88	0.00

Additional GHG Emissions from Alternative 7 not included in Proposed Project

	CO_2e
	MT total
Demolition	10470
Rail	8935
Marine	132
Total	19536
Total Phase 1	5355
Total Phase 2	14181
Yearly Phase 2	2142.16
Yearly Phase 2	4051.68

Mass Conversion

453.592	grams/lb
2000	lb/ton
0.90719	metric ton/ton
1000000	g/metric ton (MT)
91	days/quarter

*Data used in these calculations comes from Anchor QEA, 2022a and Anchor QEA, 2022b

Appendix D3.2

Alt 8 Marine Emissions Calculations

Breakwater, Intake Structure and Intake Tunnel Demolition Estimated Materials and Demolition Debris Quantities and Transport Trips	Miles from DCPP to Southern SLO County Border				80	Marine Air Quality (in SLO)				Marine GHG (full trip)		
Activity	**Days in Activity**	**Barge Trips**	**Barge Miles**	**Miles / Barge Trip**	**Miles/ Barge Trip in SLO**	**Activity Time**	**Main Engine HP-hr**	**Auxiliary Engine HP-hr**	**Trips per Day**	**Activity Time**	**Main Engine HP-hr**	**Auxiliary Engine HP-hr**
						hours/RT	hp-hr/RT	hp-hr/RT	trips/day	hours/RT	hp-hr/RT	hp-hr/RT
Breakwater Demolition	***1045***	1	400	400	160	9	20095	1288	9.57E-04	23	50238	3221
Coffer Dam Construction for Intake Structure Demolition	***261***	30	12153	405	160	9	20095	1288	1.15E-01	23	50879	3262
Intake Structure Demolition	***500***	22	8800	400	160	9	20095	1288	7.00E-02	23	50238	3221
Intake Structure Tunnels Removal		13	5221	402	160	9	20095	1288	-	23	50441	3234
Coffer Dam Removal	***261***	0	0	0	160	9	20095	1288	0.00E+00	0.00	0.00E+00	0.00E+00

Cells A46:D48 "10.Barge" from Attachment 1 Live AQIA file
4. Average ocean tugboat horsepower taken from Tables 3.4 and 3.5 in the 2019 Port of Long Beach Air Emissions Inventory (Starcrest, 2020)

Auxiliary	139	hp
Propulsion	2168	hp

5. Average speed of tugboat assumed to be: 15 knots

Speed conversion used

1 knot
1.15078 mph

Emission Factors

Harbor Craft Type	Engine Type	NOx	VOC	PM10	PM2.5	DPM	CO	SOx	CO_2e
		g/hp-hr							
Harbor Tugboat	Auxiliary	3.61	0.56	0.14	0.14	0.14	2.78	0.00	331.36
Harbor Tugboat	Propulsion	2.15	0.23	0.08	0.07	0.08	1.59	0.00	184.95
Ocean Tugboat	Auxiliary	2.32	0.21	0.09	0.09	0.09	2.06	0.00	255.16
Ocean Tugboat	Propulsion	4.54	0.42	0.16	0.15	0.16	2.64	0.00	362.92

Emission Calculations

Waste Route Destination	Harbor Craft Type	Engine Type	Round Trip Emissions									Daily Emissions (one RT max per day)						
			NOx	VOC	PM10	PM2.5	DPM	CO	SOx	CO_2e	CO_2e	NOx	VOC	PM10	PM2.5	DPM	CO	SOx
			ton/RT							MT/RT	MT total	lb/day						
Breakwater Demolition	Ocean tugboat	Auxiliary	0.003	0.000	0.000	0.000	0.000	0.003	0.000	0.822	0.822	6.587	0.610	0.244	0.244	0.244	5.855	0.000
Breakwater Demolition	Ocean tugboat	Propulsion	0.101	0.009	0.004	0.003	0.004	0.059	0.000	1.169	1.000	201.012	18.770	7.167	6.598	7.167	117.058	0.114
Coffer Dam Construction	Ocean tugboat	Auxiliary	0.003	0.000	0.000	0.000	0.000	0.003	0.000	0.832	30.000	6.587	0.610	0.244	0.244	0.244	5.855	0.000
Coffer Dam Construction	Ocean tugboat	Propulsion	0.101	0.009	0.004	0.003	0.004	0.059	0.000	1.184	30.000	201.012	18.770	7.167	6.598	7.167	117.058	0.114
Intake Structure	Ocean tugboat	Auxiliary	0.003	0.000	0.000	0.000	0.000	0.003	0.000	1.647	35.000	6.587	0.610	0.244	0.244	0.244	5.855	0.000
Intake Structure	Ocean tugboat	Propulsion	0.101	0.009	0.004	0.003	0.004	0.059	0.000	2.343	35.000	201.012	18.770	7.167	6.598	7.167	117.058	0.114
Coffer Dam Removal	Ocean tugboat	Auxiliary	0.003	0.000	0.000	0.000	0.000	0.003	0.000	0.000	0.000	6.587	0.610	0.244	0.244	0.244	5.855	0.000
Coffer Dam Removal	Ocean tugboat	Propulsion	0.101	0.009	0.004	0.003	0.004	0.059	0.000	0.000	0.000	201.012	18.770	7.167	6.598	7.167	117.058	0.114

Mass Conversion	
453.592	grams/lb
2000	lb/ton
0.90719	metric ton/ton
1000000	g/metric ton (MT)

Marine Emissions in Alternative 8 not included in Proposed Project

Waste Route Destination	Harbor Craft Type	Engine Type	Daily Emissions (one RT max per day)						
			NOx	VOC	PM10	PM2.5	CO	SOx	DPM
			lb/day						
Breakwater Demolition	Ocean tugboat	Auxiliary	6.59	0.61	0.24	0.24	5.86	0.00	0.24
	Ocean tugboat	Propulsion	201.01	18.77	7.17	6.60	117.06	0.11	7.17
		Total	**207.60**	**19.38**	**7.41**	**6.84**	**122.91**	**0.11**	**7.41**
Coffer Dam Construction	Ocean tugboat	Auxiliary	6.59	0.61	0.24	0.24	5.86	0.00	0.24
	Ocean tugboat	Propulsion	201.01	18.77	7.17	6.60	117.06	0.11	7.17
		Total	**207.60**	**19.38**	**7.41**	**6.84**	**122.91**	**0.11**	**7.41**
Intake Structure	Ocean tugboat	Auxiliary	6.59	0.61	0.24	0.24	5.86	0.00	0.24
	Ocean tugboat	Propulsion	201.01	18.77	7.17	6.60	117.06	0.11	7.17
		Total	**207.60**	**19.38**	**7.41**	**6.84**	**122.91**	**0.11**	**7.41**
Coffer Dam Removal	Ocean tugboat	Auxiliary	6.59	0.61	0.24	0.24	5.86	0.00	0.24
	Ocean tugboat	Propulsion	201.01	18.77	7.17	6.60	117.06	0.11	7.17
		Total	**207.60**	**19.38**	**7.41**	**6.84**	**122.91**	**0.11**	**7.41**

Appendix D3.3

Alt 8 Truck Emissions Calculations

	Days	Truck Trips	Barge Trips	Truck Miles	Barge Miles	Miles / Truck Trip	Miles / Barge Trip	Total Train Trips	Train Miles
Breakwater Demolition	1045	26050	1	1562978	400	60	400	231	89749
Coffer Dam Construction for Intake Structure Demolition	261	378	30	59622	12153	158	405	1	900
Intake Structure Demolition	500	3750	22	225000	8800	60	400	20	17,000
Intake Structure Tunnels Removal		957	13	72895	5221	76	402	9	8000
Coffer Dam Removal	261	4326	0	28832	0	7	0		

*Information from DCPP Intake Structure Volume and Transport Estimates excel sheet

Maximum Daily Trips for Traffic								
Breakwater Demolition	Truck Trips	Total Truck Trips			Contingency of 15%			
	1293	26050	1071.06117	24.3216735	56.1323045	1458	days	57 trips per day equipment and haul
	2376					35461		1200 employee trips
	2888							
	4856					40.45	1320	
	14637						122	truck trips total phase 2
Cofferdam Construction						0.083676269		
	72	378	15.5416937	24.3216735				
	292							
	13							
	1							
Intake Structure Demolition								
	3750	3750	154.183469	24.3216735				
Intake Structure Tunnel Removal								
	646	957	39.3476213	24.3216735				
	266							
	45							
Coffer Dam Removal								
	72	4326	177.86605	24.3216735				
	4254							

Appendix D3.4

Alt 8 Rail Emissions Calculations

Breakwater, Intake Structure and Intake Tunnel Demolition Estimated Materials and Demolition Debris Quantities and Transport Trips

Activity	Days in Activity	Rail					
		Total Train Trips	Train Miles	Total Train Weight (tons per trip)	Miles/ RT SBCAPCD	Miles/ RT VCAPCD	Miles/RT MDAQMD
Breakwater Demolition	***1045***	231	89749	3000	238	116	486
Coffer Dam Construction for Intake Structure Demolition	***261***	1	900	3000	238	116	486
Intake Structure	***500***	29	25000	3000	238	116	486
Coffer Dam Removal	***261***	0	0	0	0	0	0

Emission Factors

Table 9.4 Locomotive Emission Factors

Engine Type	Unit	NOx	ROG	PM10	PM2.5	CO	SOx	CO_2e
Large Line Haul	g/gal	74.00	2.74	1.60	1.55	26.62	0.10	10301.30
Large Line Haul	g/ton-mile	0.19	0.01	0.00	0.00	0.07	0.00	25.75
Railcar Mover	g/bhp-hr	1.00	0.08	0.02	0.01	1.83	--	--
Railcar Mover	g/gal	15.20	1.28	0.23	0.22	27.82	0.10	10301.30

*Attachment 1 Live AQIA File Sheet 9. Rail_Outside SLO and SB

Notes:

1. Weight conversions

453.592	g/lb
2000	lb/ton
907184	g/ton
1000000	g/metric ton (MT)

Emission Calculations

Alternative 8 Rail Emissions not Included in Proposed Project

Rail Haul Emissions SBCAPCD							
Waste Type	Daily Emissions						
	NOx	ROG	PM10	PM2.5	CO	SOx	CO_2e
	lbs/day						MT/year
Breakwater Demolition	2.79E-01	1.03E-02	6.03E-03	5.84E-03	1.00E-01	3.61E-04	6933.99
Coffer Dam Construction	1.12E+00	2.88E-02	2.26E-02	2.34E-02	4.01E-01	1.45E-03	69.53
Intake Structure Demolition	5.82E-01	9.64E-04	3.43E-01	1.22E-02	2.10E-01	7.55E-04	1931.49
Coffer Dam Removal	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00
Maximum	1.12	0.03	0.34	0.02	0.40	0.00	8935.01

Rail Haul Emissions VCAPCD						
Waste Type	Daily Emissions					
	NOx	ROG	PM10	PM2.5	CO	SOx
	lbs/day					
Breakwater Demolition	1.36E-01	5.03E-03	2.94E-03	2.85E-03	4.89E-02	1.76E-04
Coffer Dam Construction	5.44E-01	1.40E-02	1.10E-02	1.14E-02	1.96E-01	7.05E-04
Intake Structure Demolition	2.84E-01	4.70E-04	1.67E-01	5.95E-03	1.02E-01	3.68E-04
Coffer Dam Removal	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Maximum	0.54	0.01	0.17	0.01	0.20	0.00

Rail Haul Emissions MDAQMD						
Waste Type	Daily Emissions					
	NOx	ROG	PM10	PM2.5	CO	SOx
	lbs/day					
Breakwater Demolition	5.69E-01	2.11E-02	1.23E-02	1.19E-02	2.05E-01	7.38E-04
Coffer Dam Construction	2.28E+00	5.88E-02	4.61E-02	4.78E-02	8.20E-01	2.95E-03
Intake Structure Demolition	1.19E+00	1.97E-03	7.01E-01	2.49E-02	4.28E-01	1.54E-03
Coffer Dam Removal	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Maximum	2.28	0.06	0.70	0.05	0.82	0.00

Proposed Project Phase I Rail Emissions						
Santa Barbara County Air Pollution Control District (SBCAPCD)	6.3	0.8	0.2	0.2	24.3	0.1
Ventura County Air Pollution Control District (VCAPCD)	0.034	0.001	0.001	0.001	0.012	0.001
Mojave Desert Air Quality Management District (MDAQMD)	0.191	0.006	0.005	0.004	0.058	0.001

Total Rail Emissions for Alternative 8						
Santa Barbara County Air Pollution Control District (SBCAPCD)	7.42	0.83	0.54	0.22	24.70	0.10
Ventura County Air Pollution Control District (VCAPCD)	0.58	0.02	0.17	0.01	0.21	0.00
Mojave Desert Air Quality Management District (MDAQMD)	2.47	0.06	0.71	0.05	0.88	0.00

Appendix D3.5

Alt 8 CalEEMod Output Files

Land Overall Construction (Maximum Daily Emission)

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Year	lb/day									
2027	1.3809	12.2388	18.8636	0.0343	0.3263	0.4985	0.8249	0.0868	0.4753	0.5621
2028	6.7519	51.1761	100.0773	0.1782	1.9880	2.2405	4.2285	0.4576	2.1368	2.5943
2029	6.7372	51.1251	99.9817	0.1779	4.6497	2.2400	6.0494	0.8240	2.1363	2.5939
2030	4.7900	30.4248	74.0819	0.1665	5.2353	0.7373	5.9726	0.9818	0.7353	1.7171
2031	6.7378	32.6157	74.3588	0.1902	9.9146	0.9260	10.8406	1.6591	0.9248	2.5839
2032	6.7269	32.5623	74.3144	0.1898	9.9146	0.9256	10.8402	1.6591	0.9244	2.5835
Maximum Phase 1	6.7519	51.1761	100.0773	0.1782	4.6497	2.2405	6.0494	0.8240	2.1368	2.5943
Maximum Phase 2	6.7378	51.1251	99.9817	0.1902	9.9146	2.2400	10.8406	1.6591	2.1363	2.5939

Land Overall Construction

	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	MT/yr					
2027	0.0000	392.6477	392.6477	0.0748	2.2300e-003	395.18
2028	0.0000	2,036.8069	2,036.8069	0.4231	0.0163	2052.23
2029	0.0000	1,539.6651	1,539.6651	0.2941	0.0231	1553.90
2030	0.0000	1,917.3251	1,917.3251	0.0799	0.0458	1932.96
2031	0.0000	2,254.9787	2,254.9787	0.0908	0.0277	2265.51
2032	0.0000	2,259.4119	2,259.4119	0.0913	0.0274	2269.85
Total	0.0000		**3,030.2886**	0.5878	0.0458	**10469.63**

Marine Overall Construction (Maximum Daily Emission)

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Year	lb/day									
2027	1.3779	12.0468	18.8073	0.0335	0.3010	0.4971	0.7981	0.0798	0.4739	0.5537
2028	6.7263	49.5289	99.5749	0.1716	1.7659	2.2277	3.9936	0.3968	2.1245	2.5213
2029	6.7121	49.5166	99.4729	0.1714	4.2140	2.2274	5.5892	0.7046	2.1243	2.5210
2030	4.7098	25.3040	72.4125	0.1459	4.5150	0.6973	5.2123	0.7845	0.6971	1.4815
2031	9.9883	48.5231	122.0772	0.2762	13.6937	1.4213	15.1150	2.2446	1.4210	3.6656
2032	6.6796	29.5574	73.2835	0.1779	9.4797	0.9022	10.3818	1.5400	0.9020	2.4419
Maximum Phase 1	6.7263	49.5289	99.5749	0.1716	4.2140	2.2277	5.5892	0.7046	2.1245	2.5213
Maximum Phase 2	9.9883	49.5166	122.0772	0.2762	13.6937	2.2274	15.1150	2.2446	2.1243	3.6656

Marine Overall Construction

	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	MT/yr					
2027	0.0000	382.2775	382.2775	0.0741	5.8000e-004	384.3009
2028	0.0000	1,948.0743	1,948.0743	0.4163	2.0600e-003	1,959.10
2029	0.0000	1,404.2440	1,404.2440	0.2831	1.4200e-003	1,411.74
2030	0.0000	1,640.9227	1,640.9227	0.0565	1.4800e-003	1,642.78
2031	0.0000	2,556.5633	2,556.5633	0.0934	1.8800e-003	2,559.46
2032	0.0000	2,097.7842	2,097.7842	0.0766	1.4400e-003	2,100.13
Total	0.0000	382.2775	382.2775	1.0000	0.0000	**10,057.50**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Diablo Canyon Decommissioning Alternative 8

South Central Coast Air Basin, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Heavy Industry	32,670.00	1000sqft	750.00	32,670,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.9	**Precipitation Freq (Days)**	37
Climate Zone	4			**Operational Year**	2024
Utility Company					
CO2 Intensity (lb/MWhr)	0	**CH4 Intensity (lb/MWhr)**	0	**N2O Intensity (lb/MWhr)**	0

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase - Estimated timeline Alt 8 conceptual schedule

Off-road Equipment - equipment list

Off-road Equipment - coffer dam equipment

Off-road Equipment - coffer removal

Off-road Equipment - estimated demolition equipment

Off-road Equipment - estimated construction equipment

Off-road Equipment - estimated demolition equipment

Trips and VMT - Trip Estimates

Demolition -

Grading - Grading tab

Vehicle Trips - no operational

Vehicle Emission Factors - no operational

Vehicle Emission Factors -

Vehicle Emission Factors -

Road Dust - no operational

Consumer Products - no operational

Area Coating - no architectural coating

Energy Use - no operational

Water And Wastewater - no indoor water use

Solid Waste - no op

Construction Off-road Equipment Mitigation - APM AQ 1-5

Fleet Mix - no operational

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_EF_Nonresidential_Exterior	250	0
tblAreaCoating	Area_EF_Nonresidential_Interior	250	0
tblAreaCoating	Area_EF_Parking	250	0
tblAreaCoating	Area_EF_Residential_Exterior	250	0
tblAreaCoating	Area_EF_Residential_Interior	250	0
tblAreaCoating	Area_Nonresidential_Exterior	16335000	0
tblAreaCoating	Area_Nonresidential_Interior	49005000	0
tblAreaCoating	ReapplicationRatePercent	10	0
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	7.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstructionPhase	NumDays	480.00	261.00
tblConstructionPhase	NumDays	800.00	370.00
tblConstructionPhase	NumDays	800.00	522.00
tblConstructionPhase	NumDays	800.00	261.00
tblConstructionPhase	NumDays	800.00	523.00
tblConsumerProducts	ROG_EF	2.14E-05	0
tblConsumerProducts	ROG_EF_Degreaser	3.542E-07	0
tblConsumerProducts	ROG_EF_PesticidesFertilizers	5.152E-08	0
tblEnergyUse	LightingElect	3.08	0.00
tblEnergyUse	NT24E	3.70	0.00
tblEnergyUse	NT24NG	6.67	0.00
tblEnergyUse	T24E	1.32	0.00
tblEnergyUse	T24NG	19.51	0.00
tblOffRoadEquipment	HorsePower	97.00	124.00
tblOffRoadEquipment	HorsePower	97.00	158.00
tblOffRoadEquipment	LoadFactor	0.37	0.44
tblOffRoadEquipment	LoadFactor	0.37	0.38
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	3.00

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	3.00
tblRoadDust	MeanVehicleSpeed	40	0
tblRoadDust	MobileAverageVehicleWeight	2.4	0
tblRoadDust	RoadSiltLoading	0.1	0
tblSolidWaste	SolidWasteGenerationRate	40,510.80	0.00
tblTripsAndVMT	HaulingTripNumber	0.00	378.00
tblTripsAndVMT	HaulingTripNumber	2,337.00	4,707.00
tblTripsAndVMT	HaulingTripNumber	19,028.00	13,025.00
tblTripsAndVMT	HaulingTripNumber	0.00	4,254.00
tblTripsAndVMT	HaulingTripNumber	44,971.00	13,025.00
tblTripsAndVMT	VendorTripLength	7.30	13.00
tblTripsAndVMT	VendorTripLength	7.30	13.00
tblTripsAndVMT	VendorTripLength	7.30	13.00
tblTripsAndVMT	VendorTripLength	7.30	13.00
tblTripsAndVMT	VendorTripLength	7.30	13.00
tblTripsAndVMT	WorkerTripLength	10.80	22.00
tblTripsAndVMT	WorkerTripLength	10.80	22.00
tblTripsAndVMT	WorkerTripLength	10.80	22.00
tblTripsAndVMT	WorkerTripLength	10.80	22.00
tblTripsAndVMT	WorkerTripLength	10.80	22.00
tblVehicleTrips	ST_TR	6.42	0.00
tblVehicleTrips	SU_TR	5.09	0.00
tblVehicleTrips	WD_TR	3.93	0.00
tblWater	ElectricityIntensityFactorForWastewaterTreatment	1,911.00	0.00
tblWater	ElectricityIntensityFactorToDistribute	1,272.00	0.00
tblWater	ElectricityIntensityFactorToSupply	2,117.00	0.00
tblWater	ElectricityIntensityFactorToTreat	111.00	0.00
tblWater	IndoorWaterUseRate	7,554,937,500.00	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2027	1.4901	13.5966	18.7332	0.0343	0.3263	0.5554	0.8817	0.0868	0.5272	0.6139	0.0000	3,315.4738	3,315.4738	0.6321	0.0190	3,336.9293
2028	8.7346	74.0048	90.6025	0.1782	2.7565	3.1052	5.8616	0.5740	2.9328	3.5067	0.0000	17,266.7409	17,266.7409	3.5880	0.1382	17,397.6321
2029	8.7200	73.9538	90.5070	0.1779	9.0847	3.1046	10.7618	1.4955	2.9323	3.5063	0.0000	17,229.6600	17,229.6600	3.5884	0.2397	17,359.5217
2030	5.5543	33.0457	72.2546	0.1665	9.6704	0.8322	10.5025	1.6533	0.8302	2.4835	0.0000	16,193.3928	16,193.3928	0.6746	0.3869	16,325.5551
2031	7.4428	35.0032	73.1494	0.1902	20.3767	1.0015	21.3782	3.2432	1.0003	4.2435	0.0000	19,044.9087	19,044.9087	0.7667	0.2347	19,134.0052
2032	7.4318	34.9499	73.1050	0.1898	20.3767	1.0010	21.3777	3.2432	0.9998	4.2430	0.0000	19,009.5758	19,009.5758	0.7679	0.2305	19,097.4717
Maximum	**8.7346**	**74.0048**	**90.6025**	**0.1902**	**20.3767**	**3.1052**	**21.3782**	**3.2432**	**2.9328**	**4.2435**	**0.0000**	**19,044.9087**	**19,044.9087**	**3.5884**	**0.3869**	**19,134.0052**

2.1 Overall Construction (Maximum Daily Emission)

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2027	1.3809	12.2388	18.8636	0.0343	0.3263	0.4985	0.8249	0.0868	0.4753	0.5621	0.0000	3,315.4738	3,315.4738	0.6321	0.0190	3,336.9293
2028	6.7519	51.1761	100.0773	0.1782	1.9880	2.2405	4.2285	0.4576	2.1368	2.5943	0.0000	17,266.7409	17,266.7409	3.5880	0.1382	17,397.6321
2029	6.7372	51.1251	99.9817	0.1779	4.6497	2.2400	6.0494	0.8240	2.1363	2.5939	0.0000	17,229.6600	17,229.6600	3.5884	0.2397	17,359.5217
2030	4.7900	30.4248	74.0819	0.1665	5.2353	0.7373	5.9726	0.9818	0.7353	1.7171	0.0000	16,193.3928	16,193.3928	0.6746	0.3869	16,325.5550
2031	6.7378	32.6157	74.3588	0.1902	9.9146	0.9260	10.8406	1.6591	0.9248	2.5839	0.0000	19,044.9087	19,044.9087	0.7667	0.2347	19,134.0052
2032	6.7269	32.5623	74.3144	0.1898	9.9146	0.9256	10.8402	1.6591	0.9244	2.5835	0.0000	19,009.5757	19,009.5757	0.7679	0.2305	19,097.4717
Maximum	**6.7519**	**51.1761**	**100.0773**	**0.1902**	**9.9146**	**2.2405**	**10.8406**	**1.6591**	**2.1368**	**2.5943**	**0.0000**	**19,044.9087**	**19,044.9087**	**3.5884**	**0.3869**	**19,134.0052**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**15.87**	**20.57**	**-5.58**	**0.00**	**48.83**	**21.17**	**45.23**	**44.95**	**20.49**	**32.06**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.3075	0.0302	3.3303	2.5000e-004		0.0119	0.0119		0.0119	0.0119		7.1499	7.1499	0.0187		7.6166
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.3075**	**0.0302**	**3.3303**	**2.5000e-004**	**0.0000**	**0.0119**	**0.0119**	**0.0000**	**0.0119**	**0.0119**		**7.1499**	**7.1499**	**0.0187**	**0.0000**	**7.6166**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.3075	0.0302	3.3303	2.5000e-004		0.0119	0.0119		0.0119	0.0119		7.1499	7.1499	0.0187		7.6166
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.3075**	**0.0302**	**3.3303**	**2.5000e-004**	**0.0000**	**0.0119**	**0.0119**	**0.0000**	**0.0119**	**0.0119**		**7.1499**	**7.1499**	**0.0187**	**0.0000**	**7.6166**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Coffer Dam Construction	Site Preparation	1/1/2027	12/31/2027	5	261	
2	Intake Structure	Demolition	1/1/2028	6/1/2029	5	370	
3	Eastern Breakwater	Demolition	6/2/2029	12/31/2030	5	522	
4	Coffer Dam Removal	Demolition	1/1/2030	12/31/2030	5	261	
5	Western Breakwater	Demolition	1/1/2031	12/31/2032	5	523	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Coffer Dam Construction	Cranes	1	8.00	231	0.29
Coffer Dam Construction	Pumps	2	8.00	84	0.74
Coffer Dam Construction	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Intake Structure	Concrete/Industrial Saws	3	8.00	81	0.73
Intake Structure	Crushing/Proc. Equipment	3	8.00	85	0.78
Intake Structure	Crushing/Proc. Equipment	3	8.00	85	0.78

Intake Structure	Excavators	3	8.00	158	0.38
Intake Structure	Graders	3	8.00	187	0.41
Intake Structure	Other Construction Equipment	3	8.00	172	0.42
Intake Structure	Rubber Tired Dozers	3	8.00	247	0.40
Intake Structure	Tractors/Loaders/Backhoes	3	8.00	124	0.44
Intake Structure	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Eastern Breakwater	Concrete/Industrial Saws	1	8.00	81	0.73
Eastern Breakwater	Crushing/Proc. Equipment	2	8.00	85	0.78
Eastern Breakwater	Crushing/Proc. Equipment	1	8.00	85	0.78
Eastern Breakwater	Excavators	2	8.00	158	0.38
Eastern Breakwater	Generator Sets	2	8.00	84	0.74
Eastern Breakwater	Other Construction Equipment	2	8.00	172	0.42
Eastern Breakwater	Rubber Tired Dozers	2	8.00	247	0.40
Eastern Breakwater	Skid Steer Loaders	2	8.00	65	0.37
Coffer Dam Removal	Cranes	1	8.00	231	0.29
Coffer Dam Removal	Pumps	2	8.00	84	0.74
Coffer Dam Removal	Tractors/Loaders/Backhoes	4	8.00	158	0.38
Western Breakwater	Concrete/Industrial Saws	3	8.00	81	0.73
Western Breakwater	Cranes	1	8.00	231	0.29
Western Breakwater	Crushing/Proc. Equipment	3	8.00	85	0.78
Western Breakwater	Excavators	3	8.00	158	0.38
Western Breakwater	Off-Highway Trucks	3	8.00	402	0.38
Western Breakwater	Other Construction Equipment	3	8.00	172	0.42
Western Breakwater	Rubber Tired Dozers	3	8.00	247	0.40
Western Breakwater	Tractors/Loaders/Backhoes	3	8.00	97	0.37

Trips and VMT

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Coffer Dam Construction	7	18.00	0.00	378.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Intake Structure	27	68.00	0.00	4,707.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Eastern Breakwater	14	35.00	0.00	13,025.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Coffer Dam Removal	7	18.00	0.00	4,254.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Western Breakwater	22	55.00	0.00	13,025.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Coffer Dam Construction - 2027

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.4136	13.3606	18.0859	0.0314		0.5528	0.5528		0.5247	0.5247		3,013.118 8	3,013.118 8	0.6219		3,028.667 0
Total	**1.4136**	**13.3606**	**18.0859**	**0.0314**	**0.0000**	**0.5528**	**0.5528**	**0.0000**	**0.5247**	**0.5247**		**3,013.118 8**	**3,013.118 8**	**0.6219**		**3,028.667 0**

3.2 Coffer Dam Construction - 2027

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	2.9600e-003	0.1920	0.0563	7.8000e-004	0.0253	1.4800e-003	0.0268	6.9300e-003	1.4200e-003	8.3400e-003		87.6431	87.6431	6.4700e-003	0.0140	91.9796
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0735	0.0440	0.5910	2.1200e-003	0.3010	1.1600e-003	0.3022	0.0798	1.0700e-003	0.0809		214.7120	214.7120	3.7300e-003	4.9600e-003	216.2826
Total	**0.0765**	**0.2360**	**0.6473**	**2.9000e-003**	**0.3263**	**2.6400e-003**	**0.3290**	**0.0868**	**2.4900e-003**	**0.0892**		**302.3550**	**302.3550**	**0.0102**	**0.0190**	**308.2622**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.3044	12.0028	18.2163	0.0314		0.4959	0.4959		0.4728	0.4728	0.0000	3,013.1188	3,013.1188	0.6219		3,028.6670
Total	**1.3044**	**12.0028**	**18.2163**	**0.0314**	**0.0000**	**0.4959**	**0.4959**	**0.0000**	**0.4728**	**0.4728**	**0.0000**	**3,013.1188**	**3,013.1188**	**0.6219**		**3,028.6670**

3.2 Coffer Dam Construction - 2027

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	2.9600e-003	0.1920	0.0563	7.8000e-004	0.0253	1.4800e-003	0.0268	6.9300e-003	1.4200e-003	8.3400e-003		87.6431	87.6431	6.4700e-003	0.0140	91.9796
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0735	0.0440	0.5910	2.1200e-003	0.3010	1.1600e-003	0.3022	0.0798	1.0700e-003	0.0809		214.7120	214.7120	3.7300e-003	4.9600e-003	216.2826
Total	**0.0765**	**0.2360**	**0.6473**	**2.9000e-003**	**0.3263**	**2.6400e-003**	**0.3290**	**0.0868**	**2.4900e-003**	**0.0892**		**302.3550**	**302.3550**	**0.0102**	**0.0190**	**308.2622**

3.3 Intake Structure - 2028

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					1.3972	0.0000	1.3972	0.2116	0.0000	0.2116			0.0000			0.0000
Off-Road	8.4456	72.2056	87.9834	0.1637		3.0883	3.0883		2.9168	2.9168		15,724.7013	15,724.7013	3.5168		15,812.6218
Total	**8.4456**	**72.2056**	**87.9834**	**0.1637**	**1.3972**	**3.0883**	**4.4854**	**0.2116**	**2.9168**	**3.1284**		**15,724.7013**	**15,724.7013**	**3.5168**		**15,812.6218**

3.3 Intake Structure - 2028

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0256	1.6472	0.5024	6.6800e-003	0.2221	0.0128	0.2349	0.0609	0.0122	0.0731		752.8081	752.8081	0.0583	0.1204	790.1501
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.2635	0.1520	2.1168	7.8100e-003	1.1372	4.1000e-003	1.1413	0.3016	3.7800e-003	0.3053		789.2316	789.2316	0.0129	0.0178	794.8602
Total	**0.2891**	**1.7992**	**2.6191**	**0.0145**	**1.3593**	**0.0169**	**1.3762**	**0.3624**	**0.0160**	**0.3784**		**1,542.0397**	**1,542.0397**	**0.0712**	**0.1382**	**1,585.0103**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.6287	0.0000	0.6287	0.0952	0.0000	0.0952			0.0000			0.0000
Off-Road	6.4628	49.3769	97.4582	0.1637		2.2236	2.2236		2.1208	2.1208	0.0000	15,724.7012	15,724.7012	3.5168		15,812.6218
Total	**6.4628**	**49.3769**	**97.4582**	**0.1637**	**0.6287**	**2.2236**	**2.8523**	**0.0952**	**2.1208**	**2.2160**	**0.0000**	**15,724.7012**	**15,724.7012**	**3.5168**		**15,812.6218**

3.3 Intake Structure - 2028

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0256	1.6472	0.5024	6.6800e-003	0.2221	0.0128	0.2349	0.0609	0.0122	0.0731		752.8081	752.8081	0.0583	0.1204	790.1501
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.2635	0.1520	2.1168	7.8100e-003	1.1372	4.1000e-003	1.1413	0.3016	3.7800e-003	0.3053		789.2316	789.2316	0.0129	0.0178	794.8602
Total	**0.2891**	**1.7992**	**2.6191**	**0.0145**	**1.3593**	**0.0169**	**1.3762**	**0.3624**	**0.0160**	**0.3784**		**1,542.0397**	**1,542.0397**	**0.0712**	**0.1382**	**1,585.0103**

3.3 Intake Structure - 2029

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					1.3972	0.0000	1.3972	0.2116	0.0000	0.2116			0.0000			0.0000
Off-Road	8.4456	72.2056	87.9834	0.1637		3.0883	3.0883		2.9168	2.9168		15,724.7013	15,724.7013	3.5168		15,812.6218
Total	**8.4456**	**72.2056**	**87.9834**	**0.1637**	**1.3972**	**3.0883**	**4.4854**	**0.2116**	**2.9168**	**3.1284**		**15,724.7013**	**15,724.7013**	**3.5168**		**15,812.6218**

3.3 Intake Structure - 2029

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0251	1.6086	0.5088	6.5000e-003	0.2221	0.0125	0.2346	0.0609	0.0120	0.0728		735.4573	735.4573	0.0597	0.1177	772.0325
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.2493	0.1396	2.0148	7.6100e-003	1.1372	3.8300e-003	1.1410	0.3016	3.5300e-003	0.3051		769.5015	769.5015	0.0119	0.0170	774.8675
Total	**0.2744**	**1.7482**	**2.5236**	**0.0141**	**1.3593**	**0.0163**	**1.3757**	**0.3624**	**0.0155**	**0.3779**		**1,504.9588**	**1,504.9588**	**0.0716**	**0.1347**	**1,546.8999**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.6287	0.0000	0.6287	0.0952	0.0000	0.0952			0.0000			0.0000
Off-Road	6.4628	49.3769	97.4582	0.1637		2.2236	2.2236		2.1208	2.1208	0.0000	15,724.7012	15,724.7012	3.5168		15,812.6218
Total	**6.4628**	**49.3769**	**97.4582**	**0.1637**	**0.6287**	**2.2236**	**2.8523**	**0.0952**	**2.1208**	**2.2160**	**0.0000**	**15,724.7012**	**15,724.7012**	**3.5168**		**15,812.6218**

3.3 Intake Structure - 2029

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					lb/day								lb/day			
Hauling	0.0251	1.6086	0.5088	6.5000e-003	0.2221	0.0125	0.2346	0.0609	0.0120	0.0728		735.4573	735.4573	0.0597	0.1177	772.0325
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.2493	0.1396	2.0148	7.6100e-003	1.1372	3.8300e-003	1.1410	0.3016	3.5300e-003	0.3051		769.5015	769.5015	0.0119	0.0170	774.8675
Total	**0.2744**	**1.7482**	**2.5236**	**0.0141**	**1.3593**	**0.0163**	**1.3757**	**0.3624**	**0.0155**	**0.3779**		**1,504.9588**	**1,504.9588**	**0.0716**	**0.1347**	**1,546.8999**

3.4 Eastern Breakwater - 2029

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					lb/day								lb/day			
Fugitive Dust					8.0637	0.0000	8.0637	1.2210	0.0000	1.2210			0.0000			0.0000
Off-Road	4.3853	37.7589	47.1873	0.0844		1.6506	1.6506		1.5679	1.5679		8,085.1208	8,085.1208	1.5563		8,124.0285
Total	**4.3853**	**37.7589**	**47.1873**	**0.0844**	**8.0637**	**1.6506**	**9.7143**	**1.2210**	**1.5679**	**2.7888**		**8,085.1208**	**8,085.1208**	**1.5563**		**8,124.0285**

3.4 Eastern Breakwater - 2029

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0492	3.1550	0.9979	0.0128	0.4357	0.0245	0.4602	0.1194	0.0235	0.1428		1,442.5212	1,442.5212	0.1171	0.2309	1,514.2595
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1283	0.0719	1.0370	3.9200e-003	0.5853	1.9700e-003	0.5873	0.1552	1.8200e-003	0.1570		396.0670	396.0670	6.1300e-003	8.7500e-003	398.8288
Total	**0.1775**	**3.2269**	**2.0349**	**0.0167**	**1.0210**	**0.0265**	**1.0475**	**0.2746**	**0.0253**	**0.2999**		**1,838.5881**	**1,838.5881**	**0.1232**	**0.2397**	**1,913.0883**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					3.6287	0.0000	3.6287	0.5494	0.0000	0.5494			0.0000			0.0000
Off-Road	3.7827	32.6730	49.0961	0.0844		1.3732	1.3732		1.3035	1.3035	0.0000	8,085.1208	8,085.1208	1.5563		8,124.0285
Total	**3.7827**	**32.6730**	**49.0961**	**0.0844**	**3.6287**	**1.3732**	**5.0019**	**0.5494**	**1.3035**	**1.8529**	**0.0000**	**8,085.1208**	**8,085.1208**	**1.5563**		**8,124.0285**

3.4 Eastern Breakwater - 2029

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0492	3.1550	0.9979	0.0128	0.4357	0.0245	0.4602	0.1194	0.0235	0.1428		1,442.5212	1,442.5212	0.1171	0.2309	1,514.2595
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1283	0.0719	1.0370	3.9200e-003	0.5853	1.9700e-003	0.5873	0.1552	1.8200e-003	0.1570		396.0670	396.0670	6.1300e-003	8.7500e-003	398.8288
Total	**0.1775**	**3.2269**	**2.0349**	**0.0167**	**1.0210**	**0.0265**	**1.0475**	**0.2746**	**0.0253**	**0.2999**		**1,838.5881**	**1,838.5881**	**0.1232**	**0.2397**	**1,913.0883**

3.4 Eastern Breakwater - 2030

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.0637	0.0000	8.0637	1.2210	0.0000	1.2210			0.0000			0.0000
Off-Road	3.7853	21.2422	46.4819	0.0945		0.5974	0.5974		0.5974	0.5974		8,946.7002	8,946.7002	0.3357		8,955.0921
Total	**3.7853**	**21.2422**	**46.4819**	**0.0945**	**8.0637**	**0.5974**	**8.6611**	**1.2210**	**0.5974**	**1.8184**		**8,946.7002**	**8,946.7002**	**0.3357**		**8,955.0921**

3.4 Eastern Breakwater - 2030

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0485	3.0975	1.0098	0.0125	0.4357	0.0242	0.4599	0.1194	0.0231	0.1425		1,413.0527	1,413.0527	0.1194	0.2263	1,483.4863
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1212	0.0664	0.9919	3.8300e-003	0.5853	1.8400e-003	0.5872	0.1552	1.7000e-003	0.1569		386.9604	386.9604	5.6600e-003	8.4000e-003	389.6061
Total	**0.1697**	**3.1639**	**2.0017**	**0.0163**	**1.0210**	**0.0260**	**1.0470**	**0.2746**	**0.0248**	**0.2994**		**1,800.0130**	**1,800.0130**	**0.1251**	**0.2347**	**1,873.0924**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					3.6287	0.0000	3.6287	0.5494	0.0000	0.5494			0.0000			0.0000
Off-Road	3.1843	18.8977	47.7848	0.0945		0.5173	0.5173		0.5173	0.5173	0.0000	8,946.7002	8,946.7002	0.3357		8,955.0921
Total	**3.1843**	**18.8977**	**47.7848**	**0.0945**	**3.6287**	**0.5173**	**4.1459**	**0.5494**	**0.5173**	**1.0667**	**0.0000**	**8,946.7002**	**8,946.7002**	**0.3357**		**8,955.0921**

3.4 Eastern Breakwater - 2030

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0485	3.0975	1.0098	0.0125	0.4357	0.0242	0.4599	0.1194	0.0231	0.1425		1,413.052 7	1,413.052 7	0.1194	0.2263	1,483.486 3
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1212	0.0664	0.9919	3.8300e-003	0.5853	1.8400e-003	0.5872	0.1552	1.7000e-003	0.1569		386.9604	386.9604	5.6600e-003	8.4000e-003	389.6061
Total	**0.1697**	**3.1639**	**2.0017**	**0.0163**	**1.0210**	**0.0260**	**1.0470**	**0.2746**	**0.0248**	**0.2994**		**1,800.013 0**	**1,800.013 0**	**0.1251**	**0.2347**	**1,873.092 4**

3.5 Coffer Dam Removal - 2030

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5053	6.5822	22.6012	0.0457		0.1920	0.1920		0.1920	0.1920		4,324.657 8	4,324.657 8	0.1329		4,327.980 5
Total	**1.5053**	**6.5822**	**22.6012**	**0.0457**		**0.1920**	**0.1920**		**0.1920**	**0.1920**		**4,324.657 8**	**4,324.657 8**	**0.1329**		**4,327.980 5**

3.5 Coffer Dam Removal - 2030

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0317	2.0233	0.6596	8.1400e-003	0.2846	0.0158	0.3004	0.0780	0.0151	0.0931		923.0136	923.0136	0.0780	0.1478	969.0212
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0623	0.0341	0.5101	1.9700e-003	0.3010	9.5000e-004	0.3020	0.0798	8.7000e-004	0.0807		199.0082	199.0082	2.9100e-003	4.3200e-003	200.3689
Total	**0.0940**	**2.0574**	**1.1698**	**0.0101**	**0.5856**	**0.0167**	**0.6024**	**0.1578**	**0.0160**	**0.1738**		**1,122.0218**	**1,122.0218**	**0.0809**	**0.1522**	**1,169.3901**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3420	6.3059	23.1257	0.0457		0.1773	0.1773		0.1773	0.1773	0.0000	4,324.6577	4,324.6577	0.1329		4,327.9805
Total	**1.3420**	**6.3059**	**23.1257**	**0.0457**		**0.1773**	**0.1773**		**0.1773**	**0.1773**	**0.0000**	**4,324.6577**	**4,324.6577**	**0.1329**		**4,327.9805**

3.5 Coffer Dam Removal - 2030

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0317	2.0233	0.6596	8.1400e-003	0.2846	0.0158	0.3004	0.0780	0.0151	0.0931		923.0136	923.0136	0.0780	0.1478	969.0212
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0623	0.0341	0.5101	1.9700e-003	0.3010	9.5000e-004	0.3020	0.0798	8.7000e-004	0.0807		199.0082	199.0082	2.9100e-003	4.3200e-003	200.3689
Total	**0.0940**	**2.0574**	**1.1698**	**0.0101**	**0.5856**	**0.0167**	**0.6024**	**0.1578**	**0.0160**	**0.1738**		**1,122.0218**	**1,122.0218**	**0.0809**	**0.1522**	**1,169.3901**

3.6 Western Breakwater - 2031

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					19.0220	0.0000	19.0220	2.8802	0.0000	2.8802			0.0000			0.0000
Off-Road	7.2159	31.8549	70.6301	0.1721		0.9751	0.9751		0.9751	0.9751		17,063.9907	17,063.9907	0.6371		17,079.9185
Total	**7.2159**	**31.8549**	**70.6301**	**0.1721**	**19.0220**	**0.9751**	**19.9970**	**2.8802**	**0.9751**	**3.8552**		**17,063.9907**	**17,063.9907**	**0.6371**		**17,079.9185**

3.6 Western Breakwater - 2031

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0478	3.0517	1.0203	0.0122	0.4349	0.0237	0.4586	0.1191	0.0227	0.1418		1,384.788 9	1,384.788 9	0.1213	0.2219	1,453.957 0
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1790	0.0966	1.4990	5.9000e-003	0.9198	2.7200e-003	0.9225	0.2439	2.5100e-003	0.2464		596.1291	596.1291	8.2400e-003	0.0127	600.1297
Total	**0.2268**	**3.1483**	**2.5193**	**0.0181**	**1.3547**	**0.0264**	**1.3811**	**0.3630**	**0.0252**	**0.3882**		**1,980.918 0**	**1,980.918 0**	**0.1296**	**0.2347**	**2,054.086 7**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.5599	0.0000	8.5599	1.2961	0.0000	1.2961			0.0000			0.0000
Off-Road	6.5110	29.4674	71.8395	0.1721		0.8996	0.8996		0.8996	0.8996	0.0000	17,063.99 07	17,063.99 07	0.6371		17,079.91 85
Total	**6.5110**	**29.4674**	**71.8395**	**0.1721**	**8.5599**	**0.8996**	**9.4595**	**1.2961**	**0.8996**	**2.1957**	**0.0000**	**17,063.99 07**	**17,063.99 07**	**0.6371**		**17,079.91 85**

3.6 Western Breakwater - 2031

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0478	3.0517	1.0203	0.0122	0.4349	0.0237	0.4586	0.1191	0.0227	0.1418		1,384.788 9	1,384.788 9	0.1213	0.2219	1,453.957 0
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1790	0.0966	1.4990	5.9000e-003	0.9198	2.7200e-003	0.9225	0.2439	2.5100e-003	0.2464		596.1291	596.1291	8.2400e-003	0.0127	600.1297
Total	**0.2268**	**3.1483**	**2.5193**	**0.0181**	**1.3547**	**0.0264**	**1.3811**	**0.3630**	**0.0252**	**0.3882**		**1,980.918 0**	**1,980.918 0**	**0.1296**	**0.2347**	**2,054.086 7**

3.6 Western Breakwater - 2032

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					19.0220	0.0000	19.0220	2.8802	0.0000	2.8802			0.0000			0.0000
Off-Road	7.2159	31.8549	70.6301	0.1721		0.9751	0.9751		0.9751	0.9751		17,063.99 07	17,063.99 07	0.6371		17,079.91 85
Total	**7.2159**	**31.8549**	**70.6301**	**0.1721**	**19.0220**	**0.9751**	**19.9970**	**2.8802**	**0.9751**	**3.8552**		**17,063.99 07**	**17,063.99 07**	**0.6371**		**17,079.91 85**

3.6 Western Breakwater - 2032

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0473	3.0049	1.0309	0.0120	0.4349	0.0234	0.4583	0.1192	0.0224	0.1416		1,360.841 1	1,360.841 1	0.1232	0.2182	1,428.943 6
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1686	0.0901	1.4440	5.7800e-003	0.9198	2.5500e-003	0.9223	0.2439	2.3500e-003	0.2463		584.7439	584.7439	7.6500e-003	0.0123	588.6096
Total	**0.2159**	**3.0950**	**2.4749**	**0.0177**	**1.3547**	**0.0260**	**1.3807**	**0.3631**	**0.0248**	**0.3878**		**1,945.585 0**	**1,945.585 0**	**0.1308**	**0.2305**	**2,017.553 2**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.5599	0.0000	8.5599	1.2961	0.0000	1.2961			0.0000			0.0000
Off-Road	6.5110	29.4674	71.8395	0.1721		0.8996	0.8996		0.8996	0.8996	0.0000	17,063.99 07	17,063.99 07	0.6371		17,079.91 85
Total	**6.5110**	**29.4674**	**71.8395**	**0.1721**	**8.5599**	**0.8996**	**9.4595**	**1.2961**	**0.8996**	**2.1957**	**0.0000**	**17,063.99 07**	**17,063.99 07**	**0.6371**		**17,079.91 85**

3.6 Western Breakwater - 2032

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0473	3.0049	1.0309	0.0120	0.4349	0.0234	0.4583	0.1192	0.0224	0.1416		1,360.841 1	1,360.841 1	0.1232	0.2182	1,428.943 6
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1686	0.0901	1.4440	5.7800e-003	0.9198	2.5500e-003	0.9223	0.2439	2.3500e-003	0.2463		584.7439	584.7439	7.6500e-003	0.0123	588.6096
Total	**0.2159**	**3.0950**	**2.4749**	**0.0177**	**1.3547**	**0.0260**	**1.3807**	**0.3631**	**0.0248**	**0.3878**		**1,945.585 0**	**1,945.585 0**	**0.1308**	**0.2305**	**2,017.553 2**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Heavy Industry	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Heavy Industry	9.50	7.30	7.30	59.00	28.00	13.00	92	5	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Heavy Industry	0.518500	0.056626	0.189643	0.140762	0.030399	0.007841	0.010730	0.006132	0.000824	0.000442	0.030440	0.001544	0.006118

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Heavy Industry	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Heavy Industry	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.3075	0.0302	3.3303	2.5000e-004		0.0119	0.0119		0.0119	0.0119		7.1499	7.1499	0.0187		7.6166
Unmitigated	0.3075	0.0302	3.3303	2.5000e-004		0.0119	0.0119		0.0119	0.0119		7.1499	7.1499	0.0187		7.6166

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	0.3075	0.0302	3.3303	2.5000e-004		0.0119	0.0119		0.0119	0.0119		7.1499	7.1499	0.0187		7.6166
Total	**0.3075**	**0.0302**	**3.3303**	**2.5000e-004**		**0.0119**	**0.0119**		**0.0119**	**0.0119**		**7.1499**	**7.1499**	**0.0187**		**7.6166**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	0.3075	0.0302	3.3303	2.5000e-004		0.0119	0.0119		0.0119	0.0119		7.1499	7.1499	0.0187		7.6166
Total	**0.3075**	**0.0302**	**3.3303**	**2.5000e-004**		**0.0119**	**0.0119**		**0.0119**	**0.0119**		**7.1499**	**7.1499**	**0.0187**		**7.6166**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Diablo Canyon Decommissioning Alternative 8

South Central Coast Air Basin, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Heavy Industry	32,670.00	1000sqft	750.00	32,670,000.00	0

1.2 Other Project Characteristics

Urbanization Urban

Wind Speed (m/s) 2.9

Precipitation Freq (Days) 37

Climate Zone 4

Operational Year 2024

Utility Company

CO2 Intensity (lb/MWhr) 0

CH4 Intensity (lb/MWhr) 0

N2O Intensity (lb/MWhr) 0

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase - Estimated timeline Alt 8 conceptual schedule

Off-road Equipment - equipment list

Off-road Equipment - coffer dam equipment

Off-road Equipment - coffer removal

Off-road Equipment - estimated demolition equipment

Off-road Equipment - estimated construction equipment

Off-road Equipment - estimated demolition equipment

Trips and VMT - Trip Estimates

Demolition -

Grading - Grading tab

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Vehicle Trips - no operational

Vehicle Emission Factors - no operational

Vehicle Emission Factors -

Vehicle Emission Factors -

Road Dust - no operational

Consumer Products - no operational

Area Coating - no architectural coating

Energy Use - no operational

Water And Wastewater - no indoor water use

Solid Waste - no op

Construction Off-road Equipment Mitigation - APM AQ 1-5

Fleet Mix - no operational

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_EF_Nonresidential_Exterior	250	0
tblAreaCoating	Area_EF_Nonresidential_Interior	250	0
tblAreaCoating	Area_EF_Parking	250	0
tblAreaCoating	Area_EF_Residential_Exterior	250	0
tblAreaCoating	Area_EF_Residential_Interior	250	0
tblAreaCoating	Area_Nonresidential_Exterior	16335000	0
tblAreaCoating	Area_Nonresidential_Interior	49005000	0
tblAreaCoating	ReapplicationRatePercent	10	0
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	7.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstructionPhase	NumDays	480.00	261.00
tblConstructionPhase	NumDays	800.00	370.00
tblConstructionPhase	NumDays	800.00	522.00
tblConstructionPhase	NumDays	800.00	261.00
tblConstructionPhase	NumDays	800.00	523.00
tblConsumerProducts	ROG_EF	2.14E-05	0
tblConsumerProducts	ROG_EF_Degreaser	3.542E-07	0
tblConsumerProducts	ROG_EF_PesticidesFertilizers	5.152E-08	0
tblEnergyUse	LightingElect	3.08	0.00
tblEnergyUse	NT24E	3.70	0.00
tblEnergyUse	NT24NG	6.67	0.00
tblEnergyUse	T24E	1.32	0.00
tblEnergyUse	T24NG	19.51	0.00
tblOffRoadEquipment	HorsePower	97.00	124.00
tblOffRoadEquipment	HorsePower	97.00	158.00
tblOffRoadEquipment	LoadFactor	0.37	0.44
tblOffRoadEquipment	LoadFactor	0.37	0.38
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	3.00

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	3.00
tblRoadDust	MeanVehicleSpeed	40	0
tblRoadDust	MobileAverageVehicleWeight	2.4	0
tblRoadDust	RoadSiltLoading	0.1	0
tblSolidWaste	SolidWasteGenerationRate	40,510.80	0.00
tblTripsAndVMT	HaulingTripNumber	0.00	378.00
tblTripsAndVMT	HaulingTripNumber	2,337.00	4,707.00
tblTripsAndVMT	HaulingTripNumber	19,028.00	13,025.00
tblTripsAndVMT	HaulingTripNumber	0.00	4,254.00
tblTripsAndVMT	HaulingTripNumber	44,971.00	13,025.00
tblTripsAndVMT	VendorTripLength	7.30	13.00
tblTripsAndVMT	VendorTripLength	7.30	13.00
tblTripsAndVMT	VendorTripLength	7.30	13.00
tblTripsAndVMT	VendorTripLength	7.30	13.00
tblTripsAndVMT	VendorTripLength	7.30	13.00
tblTripsAndVMT	WorkerTripLength	10.80	22.00
tblTripsAndVMT	WorkerTripLength	10.80	22.00
tblTripsAndVMT	WorkerTripLength	10.80	22.00
tblTripsAndVMT	WorkerTripLength	10.80	22.00
tblTripsAndVMT	WorkerTripLength	10.80	22.00
tblVehicleTrips	ST_TR	6.42	0.00
tblVehicleTrips	SU_TR	5.09	0.00
tblVehicleTrips	WD_TR	3.93	0.00
tblWater	ElectricityIntensityFactorForWastewaterTreatment	1,911.00	0.00
tblWater	ElectricityIntensityFactorToDistribute	1,272.00	0.00
tblWater	ElectricityIntensityFactorToSupply	2,117.00	0.00
tblWater	ElectricityIntensityFactorToTreat	111.00	0.00
tblWater	IndoorWaterUseRate	7,554,937,500.00	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2027	0.1934	1.7743	2.4443	4.4800e-003	0.0417	0.0725	0.1141	0.0111	0.0688	0.0799	0.0000	392.6481	392.6481	0.0748	2.2300e-003	395.1847
2028	1.1319	9.6206	11.7767	0.0232	0.3545	0.4037	0.7582	0.0737	0.3813	0.4549	0.0000	2,036.8091	2,036.8091	0.4231	0.0163	2,052.2318
2029	0.8217	7.1623	8.6926	0.0174	0.8343	0.2974	1.1317	0.1437	0.2816	0.4253	0.0000	1,539.6667	1,539.6667	0.2941	0.0231	1,553.9023
2030	0.7225	4.3135	9.4269	0.0217	1.2576	0.1086	1.3662	0.2147	0.1083	0.3230	0.0000	1,917.3270	1,917.3270	0.0799	0.0458	1,932.9580
2031	0.9689	4.5684	9.5442	0.0248	2.6554	0.1307	2.7861	0.4223	0.1305	0.5529	0.0000	2,254.9811	2,254.9811	0.0908	0.0277	2,265.5165
2032	0.9713	4.5788	9.5750	0.0249	2.6656	0.1311	2.7967	0.4239	0.1310	0.5549	0.0000	2,259.4143	2,259.4143	0.0913	0.0274	2,269.8477
Maximum	**1.1319**	**9.6206**	**11.7767**	**0.0249**	**2.6656**	**0.4037**	**2.7967**	**0.4239**	**0.3813**	**0.5549**	**0.0000**	**2,259.4143**	**2,259.4143**	**0.4231**	**0.0458**	**2,269.8477**

2.1 Overall Construction

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2027	0.1792	1.5971	2.4613	4.4800e-003	0.0417	0.0651	0.1067	0.0111	0.0620	0.0731	0.0000	392.6477	392.6477	0.0748	2.2300e-003	395.1843
2028	0.8741	6.6529	13.0084	0.0232	0.2546	0.2913	0.5459	0.0586	0.2778	0.3363	0.0000	2,036.8069	2,036.8069	0.4231	0.0163	2,052.2296
2029	0.6671	5.5227	9.3578	0.0174	0.4572	0.2289	0.6861	0.0866	0.2178	0.3044	0.0000	1,539.6651	1,539.6651	0.2941	0.0231	1,553.9007
2030	0.6228	3.9715	9.6654	0.0217	0.6789	0.0962	0.7751	0.1271	0.0960	0.2230	0.0000	1,917.3251	1,917.3251	0.0799	0.0458	1,932.9561
2031	0.8769	4.2568	9.7020	0.0248	1.2901	0.1209	1.4110	0.2156	0.1207	0.3363	0.0000	2,254.9787	2,254.9787	0.0908	0.0277	2,265.5141
2032	0.8789	4.2661	9.7334	0.0249	1.2951	0.1213	1.4163	0.2164	0.1211	0.3375	0.0000	2,259.4119	2,259.4119	0.0913	0.0274	2,269.8452
Maximum	**0.8789**	**6.6529**	**13.0084**	**0.0249**	**1.2951**	**0.2913**	**1.4163**	**0.2164**	**0.2778**	**0.3375**	**0.0000**	**2,259.4119**	**2,259.4119**	**0.4231**	**0.0458**	**2,269.8452**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**14.78**	**17.96**	**-4.80**	**0.00**	**48.55**	**19.27**	**44.81**	**44.52**	**18.71**	**32.63**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
20	**10-26-2026**	**1-25-2027**	0.1347	0.1216
21	**1-26-2027**	**4-25-2027**	0.4847	0.4376
22	**4-26-2027**	**7-25-2027**	0.4896	0.4419
23	**7-26-2027**	**10-25-2027**	0.4952	0.4470
24	**10-26-2027**	**1-25-2028**	1.0997	0.8431

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

25	**1-26-2028**	**4-25-2028**	2.6880	1.8817
26	**4-26-2028**	**7-25-2028**	2.6854	1.8790
27	**7-26-2028**	**10-25-2028**	2.7159	1.9007
28	**10-26-2028**	**1-25-2029**	2.7180	1.9028
29	**1-26-2029**	**4-25-2029**	2.6564	1.8589
30	**4-26-2029**	**7-25-2029**	1.9669	1.5293
31	**7-26-2029**	**10-25-2029**	1.4934	1.3065
32	**10-26-2029**	**1-25-2030**	1.4346	1.2682
33	**1-26-2030**	**4-25-2030**	1.2388	1.1300
34	**4-26-2030**	**7-25-2030**	1.2476	1.1376
35	**7-26-2030**	**10-25-2030**	1.2632	1.1520
36	**10-26-2030**	**1-25-2031**	1.3026	1.1940
37	**1-26-2031**	**4-25-2031**	1.3631	1.2637
38	**4-26-2031**	**7-25-2031**	1.3749	1.2744
39	**7-26-2031**	**10-25-2031**	1.3913	1.2896
40	**10-26-2031**	**1-25-2032**	1.3941	1.2925
41	**1-26-2032**	**4-25-2032**	1.3762	1.2757
42	**4-26-2032**	**7-25-2032**	1.3729	1.2724
43	**7-26-2032**	**9-30-2032**	1.0108	0.9368
		Highest	2.7180	1.9028

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0277	2.7200e-003	0.2997	2.0000e-005		1.0700e-003	1.0700e-003		1.0700e-003	1.0700e-003	0.0000	0.5838	0.5838	1.5200e-003	0.0000	0.6219
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0277**	**2.7200e-003**	**0.2997**	**2.0000e-005**	**0.0000**	**1.0700e-003**	**1.0700e-003**	**0.0000**	**1.0700e-003**	**1.0700e-003**	**0.0000**	**0.5838**	**0.5838**	**1.5200e-003**	**0.0000**	**0.6219**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0277	2.7200e-003	0.2997	2.0000e-005		1.0700e-003	1.0700e-003		1.0700e-003	1.0700e-003	0.0000	0.5838	0.5838	1.5200e-003	0.0000	0.6219
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0277**	**2.7200e-003**	**0.2997**	**2.0000e-005**	**0.0000**	**1.0700e-003**	**1.0700e-003**	**0.0000**	**1.0700e-003**	**1.0700e-003**	**0.0000**	**0.5838**	**0.5838**	**1.5200e-003**	**0.0000**	**0.6219**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Coffer Dam Construction	Site Preparation	1/1/2027	12/31/2027	5	261	
2	Intake Structure	Demolition	1/1/2028	6/1/2029	5	370	
3	Eastern Breakwater	Demolition	6/2/2029	12/31/2030	5	522	

4	Coffer Dam Removal	Demolition	1/1/2030	12/31/2030	5	261	
5	Western Breakwater	Demolition	1/1/2031	12/31/2032	5	523	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Coffer Dam Construction	Cranes	1	8.00	231	0.29
Coffer Dam Construction	Pumps	2	8.00	84	0.74
Coffer Dam Construction	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Intake Structure	Concrete/Industrial Saws	3	8.00	81	0.73
Intake Structure	Crushing/Proc. Equipment	3	8.00	85	0.78
Intake Structure	Crushing/Proc. Equipment	3	8.00	85	0.78
Intake Structure	Excavators	3	8.00	158	0.38
Intake Structure	Graders	3	8.00	187	0.41
Intake Structure	Other Construction Equipment	3	8.00	172	0.42
Intake Structure	Rubber Tired Dozers	3	8.00	247	0.40
Intake Structure	Tractors/Loaders/Backhoes	3	8.00	124	0.44
Intake Structure	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Eastern Breakwater	Concrete/Industrial Saws	1	8.00	81	0.73
Eastern Breakwater	Crushing/Proc. Equipment	2	8.00	85	0.78
Eastern Breakwater	Crushing/Proc. Equipment	1	8.00	85	0.78
Eastern Breakwater	Excavators	2	8.00	158	0.38
Eastern Breakwater	Generator Sets	2	8.00	84	0.74
Eastern Breakwater	Other Construction Equipment	2	8.00	172	0.42

Eastern Breakwater	Rubber Tired Dozers	2	8.00	247	0.40
Eastern Breakwater	Skid Steer Loaders	2	8.00	65	0.37
Coffer Dam Removal	Cranes	1	8.00	231	0.29
Coffer Dam Removal	Pumps	2	8.00	84	0.74
Coffer Dam Removal	Tractors/Loaders/Backhoes	4	8.00	158	0.38
Western Breakwater	Concrete/Industrial Saws	3	8.00	81	0.73
Western Breakwater	Cranes	1	8.00	231	0.29
Western Breakwater	Crushing/Proc. Equipment	3	8.00	85	0.78
Western Breakwater	Excavators	3	8.00	158	0.38
Western Breakwater	Off-Highway Trucks	3	8.00	402	0.38
Western Breakwater	Other Construction Equipment	3	8.00	172	0.42
Western Breakwater	Rubber Tired Dozers	3	8.00	247	0.40
Western Breakwater	Tractors/Loaders/Backhoes	3	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Coffer Dam Construction	7	18.00	0.00	378.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Intake Structure	27	68.00	0.00	4,707.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Eastern Breakwater	14	35.00	0.00	13,025.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Coffer Dam Removal	7	18.00	0.00	4,254.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Western Breakwater	22	55.00	0.00	13,025.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Coffer Dam Construction - 2027

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1845	1.7436	2.3602	4.1000e-003		0.0721	0.0721		0.0685	0.0685	0.0000	356.7159	356.7159	0.0736	0.0000	358.5567
Total	**0.1845**	**1.7436**	**2.3602**	**4.1000e-003**	**0.0000**	**0.0721**	**0.0721**	**0.0000**	**0.0685**	**0.0685**	**0.0000**	**356.7159**	**356.7159**	**0.0736**	**0.0000**	**358.5567**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	4.0000e-004	0.0251	7.3000e-003	1.0000e-004	3.2400e-003	1.9000e-004	3.4300e-003	8.9000e-004	1.8000e-004	1.0700e-003	0.0000	10.3703	10.3703	7.7000e-004	1.6600e-003	10.8834
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.5500e-003	5.5800e-003	0.0768	2.8000e-004	0.0384	1.5000e-004	0.0386	0.0102	1.4000e-004	0.0103	0.0000	25.5620	25.5620	4.3000e-004	5.8000e-004	25.7446
Total	**8.9500e-003**	**0.0307**	**0.0841**	**3.8000e-004**	**0.0417**	**3.4000e-004**	**0.0420**	**0.0111**	**3.2000e-004**	**0.0114**	**0.0000**	**35.9322**	**35.9322**	**1.2000e-003**	**2.2400e-003**	**36.6280**

3.2 Coffer Dam Construction - 2027

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1702	1.5664	2.3772	4.1000e-003		0.0647	0.0647		0.0617	0.0617	0.0000	356.7155	356.7155	0.0736	0.0000	358.5562
Total	**0.1702**	**1.5664**	**2.3772**	**4.1000e-003**	**0.0000**	**0.0647**	**0.0647**	**0.0000**	**0.0617**	**0.0617**	**0.0000**	**356.7155**	**356.7155**	**0.0736**	**0.0000**	**358.5562**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	4.0000e-004	0.0251	7.3000e-003	1.0000e-004	3.2400e-003	1.9000e-004	3.4300e-003	8.9000e-004	1.8000e-004	1.0700e-003	0.0000	10.3703	10.3703	7.7000e-004	1.6600e-003	10.8834
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.5500e-003	5.5800e-003	0.0768	2.8000e-004	0.0384	1.5000e-004	0.0386	0.0102	1.4000e-004	0.0103	0.0000	25.5620	25.5620	4.3000e-004	5.8000e-004	25.7446
Total	**8.9500e-003**	**0.0307**	**0.0841**	**3.8000e-004**	**0.0417**	**3.4000e-004**	**0.0420**	**0.0111**	**3.2000e-004**	**0.0114**	**0.0000**	**35.9322**	**35.9322**	**1.2000e-003**	**2.2400e-003**	**36.6280**

3.3 Intake Structure - 2028

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1816	0.0000	0.1816	0.0275	0.0000	0.0275	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.0979	9.3867	11.4378	0.0213		0.4015	0.4015		0.3792	0.3792	0.0000	1,854.4772	1,854.4772	0.4148	0.0000	1,864.8460
Total	**1.0979**	**9.3867**	**11.4378**	**0.0213**	**0.1816**	**0.4015**	**0.5831**	**0.0275**	**0.3792**	**0.4067**	**0.0000**	**1,854.4772**	**1,854.4772**	**0.4148**	**0.0000**	**1,864.8460**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.4400e-003	0.2147	0.0649	8.7000e-004	0.0283	1.6600e-003	0.0300	7.7700e-003	1.5900e-003	9.3600e-003	0.0000	88.7326	88.7326	6.8800e-003	0.0142	93.1344
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0305	0.0192	0.2739	1.0200e-003	0.1446	5.3000e-004	0.1451	0.0384	4.9000e-004	0.0389	0.0000	93.5993	93.5993	1.4900e-003	2.0600e-003	94.2515
Total	**0.0339**	**0.2339**	**0.3388**	**1.8900e-003**	**0.1729**	**2.1900e-003**	**0.1751**	**0.0462**	**2.0800e-003**	**0.0483**	**0.0000**	**182.3320**	**182.3320**	**8.3700e-003**	**0.0163**	**187.3858**

3.3 Intake Structure - 2028

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0817	0.0000	0.0817	0.0124	0.0000	0.0124	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.8402	6.4190	12.6696	0.0213		0.2891	0.2891		0.2757	0.2757	0.0000	1,854.475 0	1,854.475 0	0.4148	0.0000	1,864.843 8
Total	**0.8402**	**6.4190**	**12.6696**	**0.0213**	**0.0817**	**0.2891**	**0.3708**	**0.0124**	**0.2757**	**0.2881**	**0.0000**	**1,854.475 0**	**1,854.475 0**	**0.4148**	**0.0000**	**1,864.843 8**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.4400e-003	0.2147	0.0649	8.7000e-004	0.0283	1.6600e-003	0.0300	7.7700e-003	1.5900e-003	9.3600e-003	0.0000	88.7326	88.7326	6.8800e-003	0.0142	93.1344
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0305	0.0192	0.2739	1.0200e-003	0.1446	5.3000e-004	0.1451	0.0384	4.9000e-004	0.0389	0.0000	93.5993	93.5993	1.4900e-003	2.0600e-003	94.2515
Total	**0.0339**	**0.2339**	**0.3388**	**1.8900e-003**	**0.1729**	**2.1900e-003**	**0.1751**	**0.0462**	**2.0800e-003**	**0.0483**	**0.0000**	**182.3320**	**182.3320**	**8.3700e-003**	**0.0163**	**187.3858**

3.3 Intake Structure - 2029

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0768	0.0000	0.0768	0.0116	0.0000	0.0116	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.4645	3.9713	4.8391	9.0100e-003		0.1699	0.1699		0.1604	0.1604	0.0000	784.5865	784.5865	0.1755	0.0000	788.9733
Total	**0.4645**	**3.9713**	**4.8391**	**9.0100e-003**	**0.0768**	**0.1699**	**0.2467**	**0.0116**	**0.1604**	**0.1721**	**0.0000**	**784.5865**	**784.5865**	**0.1755**	**0.0000**	**788.9733**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.4300e-003	0.0887	0.0278	3.6000e-004	0.0120	6.9000e-004	0.0127	3.2900e-003	6.6000e-004	3.9500e-003	0.0000	36.6751	36.6751	2.9800e-003	5.8700e-003	38.4991
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0122	7.4700e-003	0.1103	4.2000e-004	0.0612	2.1000e-004	0.0614	0.0163	1.9000e-004	0.0164	0.0000	38.6097	38.6097	5.8000e-004	8.3000e-004	38.8727
Total	**0.0136**	**0.0962**	**0.1381**	**7.8000e-004**	**0.0732**	**9.0000e-004**	**0.0741**	**0.0195**	**8.5000e-004**	**0.0204**	**0.0000**	**75.2847**	**75.2847**	**3.5600e-003**	**6.7000e-003**	**77.3717**

3.3 Intake Structure - 2029

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0346	0.0000	0.0346	5.2400e-003	0.0000	5.2400e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.3555	2.7157	5.3602	9.0100e-003		0.1223	0.1223		0.1166	0.1166	0.0000	784.5856	784.5856	0.1755	0.0000	788.9724
Total	**0.3555**	**2.7157**	**5.3602**	**9.0100e-003**	**0.0346**	**0.1223**	**0.1569**	**5.2400e-003**	**0.1166**	**0.1219**	**0.0000**	**784.5856**	**784.5856**	**0.1755**	**0.0000**	**788.9724**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.4300e-003	0.0887	0.0278	3.6000e-004	0.0120	6.9000e-004	0.0127	3.2900e-003	6.6000e-004	3.9500e-003	0.0000	36.6751	36.6751	2.9800e-003	5.8700e-003	38.4991
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0122	7.4700e-003	0.1103	4.2000e-004	0.0612	2.1000e-004	0.0614	0.0163	1.9000e-004	0.0164	0.0000	38.6097	38.6097	5.8000e-004	8.3000e-004	38.8727
Total	**0.0136**	**0.0962**	**0.1381**	**7.8000e-004**	**0.0732**	**9.0000e-004**	**0.0741**	**0.0195**	**8.5000e-004**	**0.0204**	**0.0000**	**75.2847**	**75.2847**	**3.5600e-003**	**6.7000e-003**	**77.3717**

3.4 Eastern Breakwater - 2029

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.6088	0.0000	0.6088	0.0922	0.0000	0.0922	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.3311	2.8508	3.5626	6.3700e-003		0.1246	0.1246		0.1184	0.1184	0.0000	553.7697	553.7697	0.1066	0.0000	556.4346
Total	**0.3311**	**2.8508**	**3.5626**	**6.3700e-003**	**0.6088**	**0.1246**	**0.7334**	**0.0922**	**0.1184**	**0.2106**	**0.0000**	**553.7697**	**553.7697**	**0.1066**	**0.0000**	**556.4346**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.8600e-003	0.2388	0.0749	9.6000e-004	0.0323	1.8500e-003	0.0341	8.8600e-003	1.7700e-003	0.0106	0.0000	98.7461	98.7461	8.0300e-003	0.0158	103.6572
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.6100e-003	5.2800e-003	0.0779	3.0000e-004	0.0432	1.5000e-004	0.0434	0.0115	1.4000e-004	0.0116	0.0000	27.2797	27.2797	4.1000e-004	5.9000e-004	27.4655
Total	**0.0125**	**0.2440**	**0.1528**	**1.2600e-003**	**0.0755**	**2.0000e-003**	**0.0775**	**0.0203**	**1.9100e-003**	**0.0223**	**0.0000**	**126.0257**	**126.0257**	**8.4400e-003**	**0.0164**	**131.1227**

3.4 Eastern Breakwater - 2029

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.2740	0.0000	0.2740	0.0415	0.0000	0.0415	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2856	2.4668	3.7068	6.3700e-003		0.1037	0.1037		0.0984	0.0984	0.0000	553.7691	553.7691	0.1066	0.0000	556.4339
Total	**0.2856**	**2.4668**	**3.7068**	**6.3700e-003**	**0.2740**	**0.1037**	**0.3776**	**0.0415**	**0.0984**	**0.1399**	**0.0000**	**553.7691**	**553.7691**	**0.1066**	**0.0000**	**556.4339**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.8600e-003	0.2388	0.0749	9.6000e-004	0.0323	1.8500e-003	0.0341	8.8600e-003	1.7700e-003	0.0106	0.0000	98.7461	98.7461	8.0300e-003	0.0158	103.6572
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.6100e-003	5.2800e-003	0.0779	3.0000e-004	0.0432	1.5000e-004	0.0434	0.0115	1.4000e-004	0.0116	0.0000	27.2797	27.2797	4.1000e-004	5.9000e-004	27.4655
Total	**0.0125**	**0.2440**	**0.1528**	**1.2600e-003**	**0.0755**	**2.0000e-003**	**0.0775**	**0.0203**	**1.9100e-003**	**0.0223**	**0.0000**	**126.0257**	**126.0257**	**8.4400e-003**	**0.0164**	**131.1227**

3.4 Eastern Breakwater - 2030

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.0523	0.0000	1.0523	0.1593	0.0000	0.1593	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.4940	2.7721	6.0659	0.0123		0.0780	0.0780		0.0780	0.0780	0.0000	1,059.1785	1,059.1785	0.0397	0.0000	1,060.1719
Total	**0.4940**	**2.7721**	**6.0659**	**0.0123**	**1.0523**	**0.0780**	**1.1303**	**0.1593**	**0.0780**	**0.2373**	**0.0000**	**1,059.1785**	**1,059.1785**	**0.0397**	**0.0000**	**1,060.1719**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	6.5700e-003	0.4051	0.1310	1.6300e-003	0.0558	3.1500e-003	0.0589	0.0153	3.0100e-003	0.0183	0.0000	167.1918	167.1918	0.0142	0.0268	175.5261
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0140	8.4200e-003	0.1288	5.0000e-004	0.0747	2.4000e-004	0.0749	0.0198	2.2000e-004	0.0201	0.0000	46.0681	46.0681	6.5000e-004	9.8000e-004	46.3758
Total	**0.0206**	**0.4135**	**0.2598**	**2.1300e-003**	**0.1305**	**3.3900e-003**	**0.1339**	**0.0352**	**3.2300e-003**	**0.0384**	**0.0000**	**213.2599**	**213.2599**	**0.0148**	**0.0278**	**221.9019**

3.4 Eastern Breakwater - 2030

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.4735	0.0000	0.4735	0.0717	0.0000	0.0717	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.4156	2.4661	6.2359	0.0123		0.0675	0.0675		0.0675	0.0675	0.0000	1,059.1772	1,059.1772	0.0397	0.0000	1,060.1707
Total	**0.4156**	**2.4661**	**6.2359**	**0.0123**	**0.4735**	**0.0675**	**0.5410**	**0.0717**	**0.0675**	**0.1392**	**0.0000**	**1,059.1772**	**1,059.1772**	**0.0397**	**0.0000**	**1,060.1707**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	6.5700e-003	0.4051	0.1310	1.6300e-003	0.0558	3.1500e-003	0.0589	0.0153	3.0100e-003	0.0183	0.0000	167.1918	167.1918	0.0142	0.0268	175.5261
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0140	8.4200e-003	0.1288	5.0000e-004	0.0747	2.4000e-004	0.0749	0.0198	2.2000e-004	0.0201	0.0000	46.0681	46.0681	6.5000e-004	9.8000e-004	46.3758
Total	**0.0206**	**0.4135**	**0.2598**	**2.1300e-003**	**0.1305**	**3.3900e-003**	**0.1339**	**0.0352**	**3.2300e-003**	**0.0384**	**0.0000**	**213.2599**	**213.2599**	**0.0148**	**0.0278**	**221.9019**

3.5 Coffer Dam Removal - 2030

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1964	0.8590	2.9495	5.9600e-003		0.0251	0.0251		0.0251	0.0251	0.0000	511.9859	511.9859	0.0157	0.0000	512.3793
Total	**0.1964**	**0.8590**	**2.9495**	**5.9600e-003**		**0.0251**	**0.0251**		**0.0251**	**0.0251**	**0.0000**	**511.9859**	**511.9859**	**0.0157**	**0.0000**	**512.3793**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	4.2900e-003	0.2646	0.0856	1.0600e-003	0.0364	2.0600e-003	0.0385	0.0100	1.9700e-003	0.0120	0.0000	109.2106	109.2106	9.2400e-003	0.0175	114.6546
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.2200e-003	4.3300e-003	0.0662	2.6000e-004	0.0384	1.2000e-004	0.0385	0.0102	1.1000e-004	0.0103	0.0000	23.6922	23.6922	3.4000e-004	5.0000e-004	23.8504
Total	**0.0115**	**0.2689**	**0.1518**	**1.3200e-003**	**0.0749**	**2.1800e-003**	**0.0770**	**0.0202**	**2.0800e-003**	**0.0223**	**0.0000**	**132.9027**	**132.9027**	**9.5800e-003**	**0.0180**	**138.5050**

3.5 Coffer Dam Removal - 2030

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1751	0.8229	3.0179	5.9600e-003		0.0231	0.0231		0.0231	0.0231	0.0000	511.9853	511.9853	0.0157	0.0000	512.3787
Total	**0.1751**	**0.8229**	**3.0179**	**5.9600e-003**		**0.0231**	**0.0231**		**0.0231**	**0.0231**	**0.0000**	**511.9853**	**511.9853**	**0.0157**	**0.0000**	**512.3787**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	4.2900e-003	0.2646	0.0856	1.0600e-003	0.0364	2.0600e-003	0.0385	0.0100	1.9700e-003	0.0120	0.0000	109.2106	109.2106	9.2400e-003	0.0175	114.6546
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.2200e-003	4.3300e-003	0.0662	2.6000e-004	0.0384	1.2000e-004	0.0385	0.0102	1.1000e-004	0.0103	0.0000	23.6922	23.6922	3.4000e-004	5.0000e-004	23.8504
Total	**0.0115**	**0.2689**	**0.1518**	**1.3200e-003**	**0.0749**	**2.1800e-003**	**0.0770**	**0.0202**	**2.0800e-003**	**0.0223**	**0.0000**	**132.9027**	**132.9027**	**9.5800e-003**	**0.0180**	**138.5050**

3.6 Western Breakwater - 2031

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.4824	0.0000	2.4824	0.3759	0.0000	0.3759	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.9417	4.1571	9.2172	0.0225		0.1273	0.1273		0.1273	0.1273	0.0000	2,020.1651	2,020.1651	0.0754	0.0000	2,022.0507
Total	**0.9417**	**4.1571**	**9.2172**	**0.0225**	**2.4824**	**0.1273**	**2.6096**	**0.3759**	**0.1273**	**0.5031**	**0.0000**	**2,020.1651**	**2,020.1651**	**0.0754**	**0.0000**	**2,022.0507**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	6.4800e-003	0.3991	0.1323	1.5900e-003	0.0557	3.0900e-003	0.0588	0.0153	2.9600e-003	0.0182	0.0000	163.8460	163.8460	0.0144	0.0263	172.0305
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0207	0.0123	0.1946	7.7000e-004	0.1174	3.6000e-004	0.1177	0.0312	3.3000e-004	0.0315	0.0000	70.9701	70.9701	9.5000e-004	1.4800e-003	71.4353
Total	**0.0272**	**0.4113**	**0.3270**	**2.3600e-003**	**0.1731**	**3.4500e-003**	**0.1765**	**0.0465**	**3.2900e-003**	**0.0498**	**0.0000**	**234.8161**	**234.8161**	**0.0153**	**0.0277**	**243.4658**

3.6 Western Breakwater - 2031

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.1171	0.0000	1.1171	0.1691	0.0000	0.1691	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.8497	3.8455	9.3750	0.0225		0.1174	0.1174		0.1174	0.1174	0.0000	2,020.1627	2,020.1627	0.0754	0.0000	2,022.0483
Total	**0.8497**	**3.8455**	**9.3750**	**0.0225**	**1.1171**	**0.1174**	**1.2345**	**0.1691**	**0.1174**	**0.2865**	**0.0000**	**2,020.1627**	**2,020.1627**	**0.0754**	**0.0000**	**2,022.0483**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	6.4800e-003	0.3991	0.1323	1.5900e-003	0.0557	3.0900e-003	0.0588	0.0153	2.9600e-003	0.0182	0.0000	163.8460	163.8460	0.0144	0.0263	172.0305
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0207	0.0123	0.1946	7.7000e-004	0.1174	3.6000e-004	0.1177	0.0312	3.3000e-004	0.0315	0.0000	70.9701	70.9701	9.5000e-004	1.4800e-003	71.4353
Total	**0.0272**	**0.4113**	**0.3270**	**2.3600e-003**	**0.1731**	**3.4500e-003**	**0.1765**	**0.0465**	**3.2900e-003**	**0.0498**	**0.0000**	**234.8161**	**234.8161**	**0.0153**	**0.0277**	**243.4658**

3.6 Western Breakwater - 2032

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.4919	0.0000	2.4919	0.3773	0.0000	0.3773	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.9453	4.1730	9.2526	0.0225		0.1277	0.1277		0.1277	0.1277	0.0000	2,027.905 2	2,027.905 2	0.0757	0.0000	2,029.798 0
Total	**0.9453**	**4.1730**	**9.2526**	**0.0225**	**2.4919**	**0.1277**	**2.6196**	**0.3773**	**0.1277**	**0.5050**	**0.0000**	**2,027.905 2**	**2,027.905 2**	**0.0757**	**0.0000**	**2,029.798 0**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	6.4300e-003	0.3944	0.1342	1.5700e-003	0.0559	3.0700e-003	0.0590	0.0153	2.9300e-003	0.0183	0.0000	161.6277	161.6277	0.0147	0.0259	169.7169
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0196	0.0115	0.1882	7.6000e-004	0.1178	3.3000e-004	0.1182	0.0313	3.1000e-004	0.0316	0.0000	69.8815	69.8815	8.9000e-004	1.4400e-003	70.3328
Total	**0.0260**	**0.4058**	**0.3224**	**2.3300e-003**	**0.1737**	**3.4000e-003**	**0.1771**	**0.0466**	**3.2400e-003**	**0.0499**	**0.0000**	**231.5092**	**231.5092**	**0.0155**	**0.0274**	**240.0496**

3.6 Western Breakwater - 2032

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.1214	0.0000	1.1214	0.1698	0.0000	0.1698	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.8529	3.8602	9.4110	0.0225		0.1179	0.1179		0.1179	0.1179	0.0000	2,027.9027	2,027.9027	0.0757	0.0000	2,029.7956
Total	**0.8529**	**3.8602**	**9.4110**	**0.0225**	**1.1214**	**0.1179**	**1.2392**	**0.1698**	**0.1179**	**0.2876**	**0.0000**	**2,027.9027**	**2,027.9027**	**0.0757**	**0.0000**	**2,029.7956**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	6.4300e-003	0.3944	0.1342	1.5700e-003	0.0559	3.0700e-003	0.0590	0.0153	2.9300e-003	0.0183	0.0000	161.6277	161.6277	0.0147	0.0259	169.7169
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0196	0.0115	0.1882	7.6000e-004	0.1178	3.3000e-004	0.1182	0.0313	3.1000e-004	0.0316	0.0000	69.8815	69.8815	8.9000e-004	1.4400e-003	70.3328
Total	**0.0260**	**0.4058**	**0.3224**	**2.3300e-003**	**0.1737**	**3.4000e-003**	**0.1771**	**0.0466**	**3.2400e-003**	**0.0499**	**0.0000**	**231.5092**	**231.5092**	**0.0155**	**0.0274**	**240.0496**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Heavy Industry	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Heavy Industry	9.50	7.30	7.30	59.00	28.00	13.00	92	5	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Heavy Industry	0.518500	0.056626	0.189643	0.140762	0.030399	0.007841	0.010730	0.006132	0.000824	0.000442	0.030440	0.001544	0.006118

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Heavy Industry	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Heavy Industry	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Heavy Industry	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Heavy Industry	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0277	2.7200e-003	0.2997	2.0000e-005		1.0700e-003	1.0700e-003		1.0700e-003	1.0700e-003	0.0000	0.5838	0.5838	1.5200e-003	0.0000	0.6219
Unmitigated	0.0277	2.7200e-003	0.2997	2.0000e-005		1.0700e-003	1.0700e-003		1.0700e-003	1.0700e-003	0.0000	0.5838	0.5838	1.5200e-003	0.0000	0.6219

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0277	2.7200e-003	0.2997	2.0000e-005		1.0700e-003	1.0700e-003		1.0700e-003	1.0700e-003	0.0000	0.5838	0.5838	1.5200e-003	0.0000	0.6219
Total	**0.0277**	**2.7200e-003**	**0.2997**	**2.0000e-005**		**1.0700e-003**	**1.0700e-003**		**1.0700e-003**	**1.0700e-003**	**0.0000**	**0.5838**	**0.5838**	**1.5200e-003**	**0.0000**	**0.6219**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0277	2.7200e-003	0.2997	2.0000e-005		1.0700e-003	1.0700e-003		1.0700e-003	1.0700e-003	0.0000	0.5838	0.5838	1.5200e-003	0.0000	0.6219
Total	**0.0277**	**2.7200e-003**	**0.2997**	**2.0000e-005**		**1.0700e-003**	**1.0700e-003**		**1.0700e-003**	**1.0700e-003**	**0.0000**	**0.5838**	**0.5838**	**1.5200e-003**	**0.0000**	**0.6219**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Heavy Industry	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Heavy Industry	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Heavy Industry	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Heavy Industry	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Diablo Canyon Decommissioning Alternative 8

South Central Coast Air Basin, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Heavy Industry	32,670.00	1000sqft	750.00	32,670,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.9	**Precipitation Freq (Days)**	37
Climate Zone	4			**Operational Year**	2024
Utility Company					
CO2 Intensity (lb/MWhr)	0	**CH4 Intensity (lb/MWhr)**	0	**N2O Intensity (lb/MWhr)**	0

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase - Estimated timeline Alt 8 conceptual schedule

Off-road Equipment - equipment list

Off-road Equipment - coffer dam equipment

Off-road Equipment - coffer removal

Off-road Equipment - estimated demolition equipment

Off-road Equipment - estimated construction equipment

Off-road Equipment - estimated demolition equipment

Trips and VMT - Trip Estimates

Demolition -

Grading - Grading tab

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Vehicle Trips - no operational

Vehicle Emission Factors - no operational

Vehicle Emission Factors -

Vehicle Emission Factors -

Road Dust - no operational

Consumer Products - no operational

Area Coating - no architectural coating

Energy Use - no operational

Water And Wastewater - no indoor water use

Solid Waste - no op

Construction Off-road Equipment Mitigation - APM AQ 1-5

Fleet Mix - no operational

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_EF_Nonresidential_Exterior	250	0
tblAreaCoating	Area_EF_Nonresidential_Interior	250	0
tblAreaCoating	Area_EF_Parking	250	0
tblAreaCoating	Area_EF_Residential_Exterior	250	0
tblAreaCoating	Area_EF_Residential_Interior	250	0
tblAreaCoating	Area_Nonresidential_Exterior	16335000	0
tblAreaCoating	Area_Nonresidential_Interior	49005000	0
tblAreaCoating	ReapplicationRatePercent	10	0
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	7.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00

Diablo Canyon Decommissioning Alternative 8 - South Central Coast Air Basin, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstructionPhase	NumDays	800.00	370.00
tblConstructionPhase	NumDays	800.00	522.00
tblConstructionPhase	NumDays	800.00	261.00
tblConstructionPhase	NumDays	800.00	523.00
tblConstructionPhase	NumDays	480.00	261.00
tblConsumerProducts	ROG_EF	2.14E-05	0
tblConsumerProducts	ROG_EF_Degreaser	3.542E-07	0
tblConsumerProducts	ROG_EF_PesticidesFertilizers	5.152E-08	0
tblEnergyUse	LightingElect	3.08	0.00
tblEnergyUse	NT24E	3.70	0.00
tblEnergyUse	NT24NG	6.67	0.00
tblEnergyUse	T24E	1.32	0.00
tblEnergyUse	T24NG	19.51	0.00
tblOffRoadEquipment	HorsePower	97.00	124.00
tblOffRoadEquipment	HorsePower	97.00	158.00
tblOffRoadEquipment	LoadFactor	0.37	0.44
tblOffRoadEquipment	LoadFactor	0.37	0.38
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	3.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	3.00
tblRoadDust	MeanVehicleSpeed	40	0
tblRoadDust	MobileAverageVehicleWeight	2.4	0
tblRoadDust	RoadSiltLoading	0.1	0
tblSolidWaste	SolidWasteGenerationRate	40,510.80	0.00
tblTripsAndVMT	HaulingTripNumber	2,337.00	0.00
tblTripsAndVMT	HaulingTripNumber	19,028.00	0.00
tblTripsAndVMT	HaulingTripNumber	44,971.00	0.00
tblTripsAndVMT	VendorTripLength	7.30	13.00
tblTripsAndVMT	VendorTripLength	7.30	13.00
tblTripsAndVMT	VendorTripLength	7.30	13.00
tblTripsAndVMT	VendorTripLength	7.30	13.00
tblTripsAndVMT	VendorTripLength	7.30	13.00
tblTripsAndVMT	WorkerTripLength	10.80	22.00
tblTripsAndVMT	WorkerTripLength	10.80	22.00
tblTripsAndVMT	WorkerTripLength	10.80	22.00
tblTripsAndVMT	WorkerTripLength	10.80	22.00
tblTripsAndVMT	WorkerTripLength	10.80	22.00
tblVehicleTrips	ST_TR	6.42	0.00
tblVehicleTrips	SU_TR	5.09	0.00
tblVehicleTrips	WD_TR	3.93	0.00
tblWater	ElectricityIntensityFactorForWastewaterTreatment	1,911.00	0.00
tblWater	ElectricityIntensityFactorToDistribute	1,272.00	0.00
tblWater	ElectricityIntensityFactorToSupply	2,117.00	0.00
tblWater	ElectricityIntensityFactorToTreat	111.00	0.00
tblWater	IndoorWaterUseRate	7,554,937,500.00	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2027	1.4871	13.4046	18.6769	0.0335	0.3010	0.5539	0.8550	0.0798	0.5258	0.6056	0.0000	3,227.8307	3,227.8307	0.6257	4.9600e-003	3,244.9497
2028	8.7091	72.3576	90.1002	0.1716	2.5344	3.0924	5.6267	0.5131	2.9206	3.4337	0.0000	16,513.9328	16,513.9328	3.5298	0.0178	16,607.4820
2029	8.6949	72.3453	89.9982	0.1714	8.6490	3.0921	10.3016	1.3762	2.9203	3.4334	0.0000	16,494.2028	16,494.2028	3.5287	0.0170	16,587.4893
2030	5.4742	27.9249	70.5851	0.1459	8.9501	0.7922	9.7423	1.4560	0.7920	2.2480	0.0000	13,857.3265	13,857.3265	0.4772	0.0127	13,873.0475
2031	11.2942	53.2552	119.5649	0.2762	28.5908	1.5769	30.1677	4.5002	1.5766	6.0768	0.0000	26,986.1749	26,986.1749	0.9863	0.0208	27,017.0410
2032	7.3845	31.9450	72.0741	0.1779	19.9418	0.9776	20.9194	3.1241	0.9774	4.1015	0.0000	17,648.7346	17,648.7346	0.6448	0.0123	17,668.5281
Maximum	**11.2942**	**72.3576**	**119.5649**	**0.2762**	**28.5908**	**3.0924**	**30.1677**	**4.5002**	**2.9206**	**6.0768**	**0.0000**	**26,986.1749**	**26,986.1749**	**3.5298**	**0.0208**	**27,017.0410**

2.1 Overall Construction (Maximum Daily Emission)

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2027	1.3779	12.0468	18.8073	0.0335	0.3010	0.4971	0.7981	0.0798	0.4739	0.5537	0.0000	3,227.830 7	3,227.830 7	0.6257	4.9600e-003	3,244.949 7
2028	6.7263	49.5289	99.5749	0.1716	1.7659	2.2277	3.9936	0.3968	2.1245	2.5213	0.0000	16,513.93 28	16,513.93 28	3.5298	0.0178	16,607.48 20
2029	6.7121	49.5166	99.4729	0.1714	4.2140	2.2274	5.5892	0.7046	2.1243	2.5210	0.0000	16,494.20 28	16,494.20 28	3.5287	0.0170	16,587.48 93
2030	4.7098	25.3040	72.4125	0.1459	4.5150	0.6973	5.2123	0.7845	0.6971	1.4815	0.0000	13,857.32 65	13,857.32 65	0.4772	0.0127	13,873.04 75
2031	9.9883	48.5231	122.0772	0.2762	13.6937	1.4213	15.1150	2.2446	1.4210	3.6656	0.0000	26,986.17 49	26,986.17 49	0.9863	0.0208	27,017.04 10
2032	6.6796	29.5574	73.2835	0.1779	9.4797	0.9022	10.3818	1.5400	0.9020	2.4419	0.0000	17,648.73 46	17,648.73 46	0.6448	0.0123	17,668.52 80
Maximum	**9.9883**	**49.5289**	**122.0772**	**0.2762**	**13.6937**	**2.2277**	**15.1150**	**2.2446**	**2.1245**	**3.6656**	**0.0000**	**26,986.17 49**	**26,986.17 49**	**3.5298**	**0.0208**	**27,017.04 10**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**15.91**	**20.93**	**-5.34**	**0.00**	**50.75**	**20.94**	**47.06**	**47.96**	**20.28**	**33.74**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.3075	0.0302	3.3303	2.5000e-004		0.0119	0.0119		0.0119	0.0119		7.1499	7.1499	0.0187		7.6166
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.3075**	**0.0302**	**3.3303**	**2.5000e-004**	**0.0000**	**0.0119**	**0.0119**	**0.0000**	**0.0119**	**0.0119**		**7.1499**	**7.1499**	**0.0187**	**0.0000**	**7.6166**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.3075	0.0302	3.3303	2.5000e-004		0.0119	0.0119		0.0119	0.0119		7.1499	7.1499	0.0187		7.6166
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.3075**	**0.0302**	**3.3303**	**2.5000e-004**	**0.0000**	**0.0119**	**0.0119**	**0.0000**	**0.0119**	**0.0119**		**7.1499**	**7.1499**	**0.0187**	**0.0000**	**7.6166**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Coffer Dam Construction	Site Preparation	1/1/2027	12/31/2027	5	261	
2	Intake Structure	Demolition	1/1/2028	6/1/2029	5	370	
3	Eastern Breakwater	Demolition	6/2/2029	6/3/2031	5	522	
4	Coffer Dam Removal	Demolition	1/1/2030	12/31/2030	5	261	
5	Western Breakwater	Demolition	1/1/2031	12/31/2032	5	523	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Coffer Dam Construction	Cranes	1	8.00	231	0.29
Coffer Dam Construction	Pumps	2	8.00	84	0.74
Coffer Dam Construction	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Intake Structure	Concrete/Industrial Saws	3	8.00	81	0.73
Intake Structure	Crushing/Proc. Equipment	3	8.00	85	0.78
Intake Structure	Crushing/Proc. Equipment	3	8.00	85	0.78

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Intake Structure	Excavators	3	8.00	158	0.38
Intake Structure	Graders	3	8.00	187	0.41
Intake Structure	Other Construction Equipment	3	8.00	172	0.42
Intake Structure	Rubber Tired Dozers	3	8.00	247	0.40
Intake Structure	Tractors/Loaders/Backhoes	3	8.00	124	0.44
Intake Structure	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Eastern Breakwater	Concrete/Industrial Saws	1	8.00	81	0.73
Eastern Breakwater	Crushing/Proc. Equipment	2	8.00	85	0.78
Eastern Breakwater	Crushing/Proc. Equipment	1	8.00	85	0.78
Eastern Breakwater	Excavators	2	8.00	158	0.38
Eastern Breakwater	Generator Sets	2	8.00	84	0.74
Eastern Breakwater	Other Construction Equipment	2	8.00	172	0.42
Eastern Breakwater	Rubber Tired Dozers	2	8.00	247	0.40
Eastern Breakwater	Skid Steer Loaders	2	8.00	65	0.37
Coffer Dam Removal	Cranes	1	8.00	231	0.29
Coffer Dam Removal	Pumps	2	8.00	84	0.74
Coffer Dam Removal	Tractors/Loaders/Backhoes	4	8.00	158	0.38
Western Breakwater	Concrete/Industrial Saws	3	8.00	81	0.73
Western Breakwater	Cranes	1	8.00	231	0.29
Western Breakwater	Crushing/Proc. Equipment	3	8.00	85	0.78
Western Breakwater	Excavators	3	8.00	158	0.38
Western Breakwater	Off-Highway Trucks	3	8.00	402	0.38
Western Breakwater	Other Construction Equipment	3	8.00	172	0.42
Western Breakwater	Rubber Tired Dozers	3	8.00	247	0.40
Western Breakwater	Tractors/Loaders/Backhoes	3	8.00	97	0.37

Trips and VMT

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Coffer Dam Construction	7	18.00	0.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Intake Structure	27	68.00	0.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Eastern Breakwater	14	35.00	0.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Coffer Dam Removal	7	18.00	0.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Western Breakwater	22	55.00	0.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Coffer Dam Construction - 2027

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.4136	13.3606	18.0859	0.0314		0.5528	0.5528		0.5247	0.5247		3,013.1188	3,013.1188	0.6219		3,028.6670
Total	**1.4136**	**13.3606**	**18.0859**	**0.0314**	**0.0000**	**0.5528**	**0.5528**	**0.0000**	**0.5247**	**0.5247**		**3,013.1188**	**3,013.1188**	**0.6219**		**3,028.6670**

3.2 Coffer Dam Construction - 2027

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0735	0.0440	0.5910	2.1200e-003	0.3010	1.1600e-003	0.3022	0.0798	1.0700e-003	0.0809		214.7120	214.7120	3.7300e-003	4.9600e-003	216.2826
Total	**0.0735**	**0.0440**	**0.5910**	**2.1200e-003**	**0.3010**	**1.1600e-003**	**0.3022**	**0.0798**	**1.0700e-003**	**0.0809**		**214.7120**	**214.7120**	**3.7300e-003**	**4.9600e-003**	**216.2826**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.3044	12.0028	18.2163	0.0314		0.4959	0.4959		0.4728	0.4728	0.0000	3,013.1188	3,013.1188	0.6219		3,028.6670
Total	**1.3044**	**12.0028**	**18.2163**	**0.0314**	**0.0000**	**0.4959**	**0.4959**	**0.0000**	**0.4728**	**0.4728**	**0.0000**	**3,013.1188**	**3,013.1188**	**0.6219**		**3,028.6670**

3.2 Coffer Dam Construction - 2027

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0735	0.0440	0.5910	2.1200e-003	0.3010	1.1600e-003	0.3022	0.0798	1.0700e-003	0.0809		214.7120	214.7120	3.7300e-003	4.9600e-003	216.2826
Total	**0.0735**	**0.0440**	**0.5910**	**2.1200e-003**	**0.3010**	**1.1600e-003**	**0.3022**	**0.0798**	**1.0700e-003**	**0.0809**		**214.7120**	**214.7120**	**3.7300e-003**	**4.9600e-003**	**216.2826**

3.3 Intake Structure - 2028

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					1.3972	0.0000	1.3972	0.2116	0.0000	0.2116			0.0000			0.0000
Off-Road	8.4456	72.2056	87.9834	0.1637		3.0883	3.0883		2.9168	2.9168		15,724.7013	15,724.7013	3.5168		15,812.6218
Total	**8.4456**	**72.2056**	**87.9834**	**0.1637**	**1.3972**	**3.0883**	**4.4854**	**0.2116**	**2.9168**	**3.1284**		**15,724.7013**	**15,724.7013**	**3.5168**		**15,812.6218**

3.3 Intake Structure - 2028

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.2635	0.1520	2.1168	7.8100e-003	1.1372	4.1000e-003	1.1413	0.3016	3.7800e-003	0.3053		789.2316	789.2316	0.0129	0.0178	794.8602
Total	**0.2635**	**0.1520**	**2.1168**	**7.8100e-003**	**1.1372**	**4.1000e-003**	**1.1413**	**0.3016**	**3.7800e-003**	**0.3053**		**789.2316**	**789.2316**	**0.0129**	**0.0178**	**794.8602**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.6287	0.0000	0.6287	0.0952	0.0000	0.0952			0.0000			0.0000
Off-Road	6.4628	49.3769	97.4582	0.1637		2.2236	2.2236		2.1208	2.1208	0.0000	15,724.7012	15,724.7012	3.5168		15,812.6218
Total	**6.4628**	**49.3769**	**97.4582**	**0.1637**	**0.6287**	**2.2236**	**2.8523**	**0.0952**	**2.1208**	**2.2160**	**0.0000**	**15,724.7012**	**15,724.7012**	**3.5168**		**15,812.6218**

3.3 Intake Structure - 2028

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.2635	0.1520	2.1168	7.8100e-003	1.1372	4.1000e-003	1.1413	0.3016	3.7800e-003	0.3053		789.2316	789.2316	0.0129	0.0178	794.8602
Total	**0.2635**	**0.1520**	**2.1168**	**7.8100e-003**	**1.1372**	**4.1000e-003**	**1.1413**	**0.3016**	**3.7800e-003**	**0.3053**		**789.2316**	**789.2316**	**0.0129**	**0.0178**	**794.8602**

3.3 Intake Structure - 2029

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					1.3972	0.0000	1.3972	0.2116	0.0000	0.2116			0.0000			0.0000
Off-Road	8.4456	72.2056	87.9834	0.1637		3.0883	3.0883		2.9168	2.9168		15,724.7013	15,724.7013	3.5168		15,812.6218
Total	**8.4456**	**72.2056**	**87.9834**	**0.1637**	**1.3972**	**3.0883**	**4.4854**	**0.2116**	**2.9168**	**3.1284**		**15,724.7013**	**15,724.7013**	**3.5168**		**15,812.6218**

3.3 Intake Structure - 2029

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.2493	0.1396	2.0148	7.6100e-003	1.1372	3.8300e-003	1.1410	0.3016	3.5300e-003	0.3051		769.5015	769.5015	0.0119	0.0170	774.8675
Total	**0.2493**	**0.1396**	**2.0148**	**7.6100e-003**	**1.1372**	**3.8300e-003**	**1.1410**	**0.3016**	**3.5300e-003**	**0.3051**		**769.5015**	**769.5015**	**0.0119**	**0.0170**	**774.8675**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.6287	0.0000	0.6287	0.0952	0.0000	0.0952			0.0000			0.0000
Off-Road	6.4628	49.3769	97.4582	0.1637		2.2236	2.2236		2.1208	2.1208	0.0000	15,724.7012	15,724.7012	3.5168		15,812.6218
Total	**6.4628**	**49.3769**	**97.4582**	**0.1637**	**0.6287**	**2.2236**	**2.8523**	**0.0952**	**2.1208**	**2.2160**	**0.0000**	**15,724.7012**	**15,724.7012**	**3.5168**		**15,812.6218**

3.3 Intake Structure - 2029

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.2493	0.1396	2.0148	7.6100e-003	1.1372	3.8300e-003	1.1410	0.3016	3.5300e-003	0.3051		769.5015	769.5015	0.0119	0.0170	774.8675
Total	**0.2493**	**0.1396**	**2.0148**	**7.6100e-003**	**1.1372**	**3.8300e-003**	**1.1410**	**0.3016**	**3.5300e-003**	**0.3051**		**769.5015**	**769.5015**	**0.0119**	**0.0170**	**774.8675**

3.4 Eastern Breakwater - 2029

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.0637	0.0000	8.0637	1.2210	0.0000	1.2210			0.0000			0.0000
Off-Road	4.3853	37.7589	47.1873	0.0844		1.6506	1.6506		1.5679	1.5679		8,085.1208	8,085.1208	1.5563		8,124.0285
Total	**4.3853**	**37.7589**	**47.1873**	**0.0844**	**8.0637**	**1.6506**	**9.7143**	**1.2210**	**1.5679**	**2.7888**		**8,085.1208**	**8,085.1208**	**1.5563**		**8,124.0285**

3.4 Eastern Breakwater - 2029

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1283	0.0719	1.0370	3.9200e-003	0.5853	1.9700e-003	0.5873	0.1552	1.8200e-003	0.1570		396.0670	396.0670	6.1300e-003	8.7500e-003	398.8288
Total	**0.1283**	**0.0719**	**1.0370**	**3.9200e-003**	**0.5853**	**1.9700e-003**	**0.5873**	**0.1552**	**1.8200e-003**	**0.1570**		**396.0670**	**396.0670**	**6.1300e-003**	**8.7500e-003**	**398.8288**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					3.6287	0.0000	3.6287	0.5494	0.0000	0.5494			0.0000			0.0000
Off-Road	3.7827	32.6730	49.0961	0.0844		1.3732	1.3732		1.3035	1.3035	0.0000	8,085.1208	8,085.1208	1.5563		8,124.0285
Total	**3.7827**	**32.6730**	**49.0961**	**0.0844**	**3.6287**	**1.3732**	**5.0019**	**0.5494**	**1.3035**	**1.8529**	**0.0000**	**8,085.1208**	**8,085.1208**	**1.5563**		**8,124.0285**

3.4 Eastern Breakwater - 2029

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					lb/day								lb/day			
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1283	0.0719	1.0370	3.9200e-003	0.5853	1.9700e-003	0.5873	0.1552	1.8200e-003	0.1570		396.0670	396.0670	6.1300e-003	8.7500e-003	398.8288
Total	**0.1283**	**0.0719**	**1.0370**	**3.9200e-003**	**0.5853**	**1.9700e-003**	**0.5873**	**0.1552**	**1.8200e-003**	**0.1570**		**396.0670**	**396.0670**	**6.1300e-003**	**8.7500e-003**	**398.8288**

3.4 Eastern Breakwater - 2030

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					lb/day								lb/day			
Fugitive Dust					8.0637	0.0000	8.0637	1.2210	0.0000	1.2210			0.0000			0.0000
Off-Road	3.7853	21.2422	46.4819	0.0945		0.5974	0.5974		0.5974	0.5974		8,946.7002	8,946.7002	0.3357		8,955.0921
Total	**3.7853**	**21.2422**	**46.4819**	**0.0945**	**8.0637**	**0.5974**	**8.6611**	**1.2210**	**0.5974**	**1.8184**		**8,946.7002**	**8,946.7002**	**0.3357**		**8,955.0921**

3.4 Eastern Breakwater - 2030

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1212	0.0664	0.9919	3.8300e-003	0.5853	1.8400e-003	0.5872	0.1552	1.7000e-003	0.1569		386.9604	386.9604	5.6600e-003	8.4000e-003	389.6061
Total	**0.1212**	**0.0664**	**0.9919**	**3.8300e-003**	**0.5853**	**1.8400e-003**	**0.5872**	**0.1552**	**1.7000e-003**	**0.1569**		**386.9604**	**386.9604**	**5.6600e-003**	**8.4000e-003**	**389.6061**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					3.6287	0.0000	3.6287	0.5494	0.0000	0.5494			0.0000			0.0000
Off-Road	3.1843	18.8977	47.7848	0.0945		0.5173	0.5173		0.5173	0.5173	0.0000	8,946.7002	8,946.7002	0.3357		8,955.0921
Total	**3.1843**	**18.8977**	**47.7848**	**0.0945**	**3.6287**	**0.5173**	**4.1459**	**0.5494**	**0.5173**	**1.0667**	**0.0000**	**8,946.7002**	**8,946.7002**	**0.3357**		**8,955.0921**

3.4 Eastern Breakwater - 2030

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1212	0.0664	0.9919	3.8300e-003	0.5853	1.8400e-003	0.5872	0.1552	1.7000e-003	0.1569		386.9604	386.9604	5.6600e-003	8.4000e-003	389.6061
Total	**0.1212**	**0.0664**	**0.9919**	**3.8300e-003**	**0.5853**	**1.8400e-003**	**0.5872**	**0.1552**	**1.7000e-003**	**0.1569**		**386.9604**	**386.9604**	**5.6600e-003**	**8.4000e-003**	**389.6061**

3.4 Eastern Breakwater - 2031

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.0637	0.0000	8.0637	1.2210	0.0000	1.2210			0.0000			0.0000
Off-Road	3.7853	21.2422	46.4819	0.0945		0.5974	0.5974		0.5974	0.5974		8,946.7002	8,946.7002	0.3357		8,955.0921
Total	**3.7853**	**21.2422**	**46.4819**	**0.0945**	**8.0637**	**0.5974**	**8.6611**	**1.2210**	**0.5974**	**1.8184**		**8,946.7002**	**8,946.7002**	**0.3357**		**8,955.0921**

3.4 Eastern Breakwater - 2031

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1139	0.0615	0.9539	3.7500e-003	0.5853	1.7300e-003	0.5871	0.1552	1.6000e-003	0.1568		379.3549	379.3549	5.2500e-003	8.1000e-003	381.9007
Total	**0.1139**	**0.0615**	**0.9539**	**3.7500e-003**	**0.5853**	**1.7300e-003**	**0.5871**	**0.1552**	**1.6000e-003**	**0.1568**		**379.3549**	**379.3549**	**5.2500e-003**	**8.1000e-003**	**381.9007**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					3.6287	0.0000	3.6287	0.5494	0.0000	0.5494			0.0000			0.0000
Off-Road	3.1843	18.8977	47.7848	0.0945		0.5173	0.5173		0.5173	0.5173	0.0000	8,946.7002	8,946.7002	0.3357		8,955.0921
Total	**3.1843**	**18.8977**	**47.7848**	**0.0945**	**3.6287**	**0.5173**	**4.1459**	**0.5494**	**0.5173**	**1.0667**	**0.0000**	**8,946.7002**	**8,946.7002**	**0.3357**		**8,955.0921**

3.4 Eastern Breakwater - 2031

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1139	0.0615	0.9539	3.7500e-003	0.5853	1.7300e-003	0.5871	0.1552	1.6000e-003	0.1568		379.3549	379.3549	5.2500e-003	8.1000e-003	381.9007
Total	**0.1139**	**0.0615**	**0.9539**	**3.7500e-003**	**0.5853**	**1.7300e-003**	**0.5871**	**0.1552**	**1.6000e-003**	**0.1568**		**379.3549**	**379.3549**	**5.2500e-003**	**8.1000e-003**	**381.9007**

3.5 Coffer Dam Removal - 2030

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5053	6.5822	22.6012	0.0457		0.1920	0.1920		0.1920	0.1920		4,324.6578	4,324.6578	0.1329		4,327.9805
Total	**1.5053**	**6.5822**	**22.6012**	**0.0457**		**0.1920**	**0.1920**		**0.1920**	**0.1920**		**4,324.6578**	**4,324.6578**	**0.1329**		**4,327.9805**

3.5 Coffer Dam Removal - 2030

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0623	0.0341	0.5101	1.9700e-003	0.3010	9.5000e-004	0.3020	0.0798	8.7000e-004	0.0807		199.0082	199.0082	2.9100e-003	4.3200e-003	200.3689
Total	**0.0623**	**0.0341**	**0.5101**	**1.9700e-003**	**0.3010**	**9.5000e-004**	**0.3020**	**0.0798**	**8.7000e-004**	**0.0807**		**199.0082**	**199.0082**	**2.9100e-003**	**4.3200e-003**	**200.3689**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3420	6.3059	23.1257	0.0457		0.1773	0.1773		0.1773	0.1773	0.0000	4,324.6577	4,324.6577	0.1329		4,327.9805
Total	**1.3420**	**6.3059**	**23.1257**	**0.0457**		**0.1773**	**0.1773**		**0.1773**	**0.1773**	**0.0000**	**4,324.6577**	**4,324.6577**	**0.1329**		**4,327.9805**

3.5 Coffer Dam Removal - 2030

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0623	0.0341	0.5101	1.9700e-003	0.3010	9.5000e-004	0.3020	0.0798	8.7000e-004	0.0807		199.0082	199.0082	2.9100e-003	4.3200e-003	200.3689
Total	**0.0623**	**0.0341**	**0.5101**	**1.9700e-003**	**0.3010**	**9.5000e-004**	**0.3020**	**0.0798**	**8.7000e-004**	**0.0807**		**199.0082**	**199.0082**	**2.9100e-003**	**4.3200e-003**	**200.3689**

3.6 Western Breakwater - 2031

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					19.0220	0.0000	19.0220	2.8802	0.0000	2.8802			0.0000			0.0000
Off-Road	7.2159	31.8549	70.6301	0.1721		0.9751	0.9751		0.9751	0.9751		17,063.9907	17,063.9907	0.6371		17,079.9185
Total	**7.2159**	**31.8549**	**70.6301**	**0.1721**	**19.0220**	**0.9751**	**19.9970**	**2.8802**	**0.9751**	**3.8552**		**17,063.9907**	**17,063.9907**	**0.6371**		**17,079.9185**

3.6 Western Breakwater - 2031

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1790	0.0966	1.4990	5.9000e-003	0.9198	2.7200e-003	0.9225	0.2439	2.5100e-003	0.2464		596.1291	596.1291	8.2400e-003	0.0127	600.1297
Total	**0.1790**	**0.0966**	**1.4990**	**5.9000e-003**	**0.9198**	**2.7200e-003**	**0.9225**	**0.2439**	**2.5100e-003**	**0.2464**		**596.1291**	**596.1291**	**8.2400e-003**	**0.0127**	**600.1297**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.5599	0.0000	8.5599	1.2961	0.0000	1.2961			0.0000			0.0000
Off-Road	6.5110	29.4674	71.8395	0.1721		0.8996	0.8996		0.8996	0.8996	0.0000	17,063.9907	17,063.9907	0.6371		17,079.9185
Total	**6.5110**	**29.4674**	**71.8395**	**0.1721**	**8.5599**	**0.8996**	**9.4595**	**1.2961**	**0.8996**	**2.1957**	**0.0000**	**17,063.9907**	**17,063.9907**	**0.6371**		**17,079.9185**

3.6 Western Breakwater - 2031

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1790	0.0966	1.4990	5.9000e-003	0.9198	2.7200e-003	0.9225	0.2439	2.5100e-003	0.2464		596.1291	596.1291	8.2400e-003	0.0127	600.1297
Total	**0.1790**	**0.0966**	**1.4990**	**5.9000e-003**	**0.9198**	**2.7200e-003**	**0.9225**	**0.2439**	**2.5100e-003**	**0.2464**		**596.1291**	**596.1291**	**8.2400e-003**	**0.0127**	**600.1297**

3.6 Western Breakwater - 2032

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					19.0220	0.0000	19.0220	2.8802	0.0000	2.8802			0.0000			0.0000
Off-Road	7.2159	31.8549	70.6301	0.1721		0.9751	0.9751		0.9751	0.9751		17,063.9907	17,063.9907	0.6371		17,079.9185
Total	**7.2159**	**31.8549**	**70.6301**	**0.1721**	**19.0220**	**0.9751**	**19.9970**	**2.8802**	**0.9751**	**3.8552**		**17,063.9907**	**17,063.9907**	**0.6371**		**17,079.9185**

3.6 Western Breakwater - 2032

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1686	0.0901	1.4440	5.7800e-003	0.9198	2.5500e-003	0.9223	0.2439	2.3500e-003	0.2463		584.7439	584.7439	7.6500e-003	0.0123	588.6096
Total	**0.1686**	**0.0901**	**1.4440**	**5.7800e-003**	**0.9198**	**2.5500e-003**	**0.9223**	**0.2439**	**2.3500e-003**	**0.2463**		**584.7439**	**584.7439**	**7.6500e-003**	**0.0123**	**588.6096**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.5599	0.0000	8.5599	1.2961	0.0000	1.2961			0.0000			0.0000
Off-Road	6.5110	29.4674	71.8395	0.1721		0.8996	0.8996		0.8996	0.8996	0.0000	17,063.9907	17,063.9907	0.6371		17,079.9185
Total	**6.5110**	**29.4674**	**71.8395**	**0.1721**	**8.5599**	**0.8996**	**9.4595**	**1.2961**	**0.8996**	**2.1957**	**0.0000**	**17,063.9907**	**17,063.9907**	**0.6371**		**17,079.9185**

3.6 Western Breakwater - 2032

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1686	0.0901	1.4440	5.7800e-003	0.9198	2.5500e-003	0.9223	0.2439	2.3500e-003	0.2463		584.7439	584.7439	7.6500e-003	0.0123	588.6096
Total	**0.1686**	**0.0901**	**1.4440**	**5.7800e-003**	**0.9198**	**2.5500e-003**	**0.9223**	**0.2439**	**2.3500e-003**	**0.2463**		**584.7439**	**584.7439**	**7.6500e-003**	**0.0123**	**588.6096**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Heavy Industry	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Heavy Industry	9.50	7.30	7.30	59.00	28.00	13.00	92	5	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Heavy Industry	0.518500	0.056626	0.189643	0.140762	0.030399	0.007841	0.010730	0.006132	0.000824	0.000442	0.030440	0.001544	0.006118

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Heavy Industry	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Heavy Industry	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.3075	0.0302	3.3303	2.5000e-004		0.0119	0.0119		0.0119	0.0119		7.1499	7.1499	0.0187		7.6166
Unmitigated	0.3075	0.0302	3.3303	2.5000e-004		0.0119	0.0119		0.0119	0.0119		7.1499	7.1499	0.0187		7.6166

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	0.3075	0.0302	3.3303	2.5000e-004		0.0119	0.0119		0.0119	0.0119		7.1499	7.1499	0.0187		7.6166
Total	**0.3075**	**0.0302**	**3.3303**	**2.5000e-004**		**0.0119**	**0.0119**		**0.0119**	**0.0119**		**7.1499**	**7.1499**	**0.0187**		**7.6166**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	0.3075	0.0302	3.3303	2.5000e-004		0.0119	0.0119		0.0119	0.0119		7.1499	7.1499	0.0187		7.6166
Total	**0.3075**	**0.0302**	**3.3303**	**2.5000e-004**		**0.0119**	**0.0119**		**0.0119**	**0.0119**		**7.1499**	**7.1499**	**0.0187**		**7.6166**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Diablo Canyon Decommissioning Alternative 8

South Central Coast Air Basin, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Heavy Industry	32,670.00	1000sqft	750.00	32,670,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.9	**Precipitation Freq (Days)**	37
Climate Zone	4			**Operational Year**	2024
Utility Company					
CO2 Intensity (lb/MWhr)	0	**CH4 Intensity (lb/MWhr)**	0	**N2O Intensity (lb/MWhr)**	0

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase - Estimated timeline Alt 8 conceptual schedule

Off-road Equipment - equipment list

Off-road Equipment - coffer dam equipment

Off-road Equipment - coffer removal

Off-road Equipment - estimated demolition equipment

Off-road Equipment - estimated construction equipment

Off-road Equipment - estimated demolition equipment

Trips and VMT - Trip Estimates

Demolition -

Grading - Grading tab

Diablo Canyon Decommissioning Alternative 8 - South Central Coast Air Basin, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Vehicle Trips - no operational

Vehicle Emission Factors - no operational

Vehicle Emission Factors -

Vehicle Emission Factors -

Road Dust - no operational

Consumer Products - no operational

Area Coating - no architectural coating

Energy Use - no operational

Water And Wastewater - no indoor water use

Solid Waste - no op

Construction Off-road Equipment Mitigation - APM AQ 1-5

Fleet Mix - no operational

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_EF_Nonresidential_Exterior	250	0
tblAreaCoating	Area_EF_Nonresidential_Interior	250	0
tblAreaCoating	Area_EF_Parking	250	0
tblAreaCoating	Area_EF_Residential_Exterior	250	0
tblAreaCoating	Area_EF_Residential_Interior	250	0
tblAreaCoating	Area_Nonresidential_Exterior	16335000	0
tblAreaCoating	Area_Nonresidential_Interior	49005000	0
tblAreaCoating	ReapplicationRatePercent	10	0
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	7.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstructionPhase	NumDays	800.00	370.00
tblConstructionPhase	NumDays	800.00	522.00
tblConstructionPhase	NumDays	800.00	261.00
tblConstructionPhase	NumDays	800.00	523.00
tblConstructionPhase	NumDays	480.00	261.00
tblConsumerProducts	ROG_EF	2.14E-05	0
tblConsumerProducts	ROG_EF_Degreaser	3.542E-07	0
tblConsumerProducts	ROG_EF_PesticidesFertilizers	5.152E-08	0
tblEnergyUse	LightingElect	3.08	0.00
tblEnergyUse	NT24E	3.70	0.00
tblEnergyUse	NT24NG	6.67	0.00
tblEnergyUse	T24E	1.32	0.00
tblEnergyUse	T24NG	19.51	0.00
tblOffRoadEquipment	HorsePower	97.00	124.00
tblOffRoadEquipment	HorsePower	97.00	158.00
tblOffRoadEquipment	LoadFactor	0.37	0.44
tblOffRoadEquipment	LoadFactor	0.37	0.38
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	3.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	3.00
tblRoadDust	MeanVehicleSpeed	40	0
tblRoadDust	MobileAverageVehicleWeight	2.4	0
tblRoadDust	RoadSiltLoading	0.1	0
tblSolidWaste	SolidWasteGenerationRate	40,510.80	0.00
tblTripsAndVMT	HaulingTripNumber	2,337.00	0.00
tblTripsAndVMT	HaulingTripNumber	19,028.00	0.00
tblTripsAndVMT	HaulingTripNumber	44,971.00	0.00
tblTripsAndVMT	VendorTripLength	7.30	13.00
tblTripsAndVMT	VendorTripLength	7.30	13.00
tblTripsAndVMT	VendorTripLength	7.30	13.00
tblTripsAndVMT	VendorTripLength	7.30	13.00
tblTripsAndVMT	VendorTripLength	7.30	13.00
tblTripsAndVMT	WorkerTripLength	10.80	22.00
tblTripsAndVMT	WorkerTripLength	10.80	22.00
tblTripsAndVMT	WorkerTripLength	10.80	22.00
tblTripsAndVMT	WorkerTripLength	10.80	22.00
tblTripsAndVMT	WorkerTripLength	10.80	22.00
tblVehicleTrips	ST_TR	6.42	0.00
tblVehicleTrips	SU_TR	5.09	0.00
tblVehicleTrips	WD_TR	3.93	0.00
tblWater	ElectricityIntensityFactorForWastewaterTreatment	1,911.00	0.00
tblWater	ElectricityIntensityFactorToDistribute	1,272.00	0.00
tblWater	ElectricityIntensityFactorToSupply	2,117.00	0.00
tblWater	ElectricityIntensityFactorToTreat	111.00	0.00
tblWater	IndoorWaterUseRate	7,554,937,500.00	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2027	0.1930	1.7491	2.4370	4.3800e-003	0.0384	0.0723	0.1107	0.0102	0.0686	0.0788	0.0000	382.2779	382.2779	0.0741	5.8000e-004	384.3013
2028	1.1284	9.4059	11.7118	0.0223	0.3262	0.4020	0.7282	0.0659	0.3797	0.4456	0.0000	1,948.0765	1,948.0765	0.4163	2.0600e-003	1,959.0975
2029	0.8164	6.8349	8.5899	0.0161	0.7900	0.2948	1.0849	0.1315	0.2791	0.4107	0.0000	1,404.2456	1,404.2456	0.2831	1.4200e-003	1,411.7461
2030	0.7117	3.6438	9.2104	0.0191	1.1654	0.1034	1.2688	0.1894	0.1034	0.2927	0.0000	1,640.9246	1,640.9246	0.0565	1.4800e-003	1,642.7774
2031	1.1761	5.3409	12.0206	0.0286	3.0747	0.1606	3.2353	0.4826	0.1605	0.6431	0.0000	2,556.5663	2,556.5663	0.0934	1.8800e-003	2,559.4607
2032	0.9648	4.1845	9.4407	0.0233	2.6097	0.1281	2.7378	0.4086	0.1280	0.5366	0.0000	2,097.7866	2,097.7866	0.0766	1.4400e-003	2,100.1308
Maximum	**1.1761**	**9.4059**	**12.0206**	**0.0286**	**3.0747**	**0.4020**	**3.2353**	**0.4826**	**0.3797**	**0.6431**	**0.0000**	**2,556.5663**	**2,556.5663**	**0.4163**	**2.0600e-003**	**2,559.4607**

2.1 Overall Construction

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2027	0.1788	1.5720	2.4540	4.3800e-003	0.0384	0.0649	0.1033	0.0102	0.0618	0.0721	0.0000	382.2775	382.2775	0.0741	5.8000e-004	384.3009
2028	0.8707	6.4382	12.9435	0.0223	0.2263	0.2896	0.5159	0.0508	0.2762	0.3270	0.0000	1,948.0743	1,948.0743	0.4163	2.0600e-003	1,959.0952
2029	0.6618	5.1953	9.2552	0.0161	0.4129	0.2263	0.6393	0.0744	0.2154	0.2898	0.0000	1,404.2440	1,404.2440	0.2831	1.4200e-003	1,411.7445
2030	0.6119	3.3018	9.4489	0.0191	0.5867	0.0910	0.6777	0.1018	0.0910	0.1927	0.0000	1,640.9227	1,640.9227	0.0565	1.4800e-003	1,642.7755
2031	1.0511	4.9004	12.2500	0.0286	1.4655	0.1463	1.6118	0.2389	0.1463	0.3852	0.0000	2,556.5633	2,556.5633	0.0934	1.8800e-003	2,559.4577
2032	0.8725	3.8717	9.5992	0.0233	1.2392	0.1182	1.3574	0.2011	0.1182	0.3192	0.0000	2,097.7842	2,097.7842	0.0766	1.4400e-003	2,100.1284
Maximum	**1.0511**	**6.4382**	**12.9435**	**0.0286**	**1.4655**	**0.2896**	**1.6118**	**0.2389**	**0.2762**	**0.3852**	**0.0000**	**2,556.5633**	**2,556.5633**	**0.4163**	**2.0600e-003**	**2,559.4577**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**14.90**	**18.87**	**-4.76**	**0.00**	**50.42**	**19.36**	**46.48**	**47.43**	**18.81**	**34.12**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
20	**10-26-2026**	**1-25-2027**	0.1330	0.1199
21	**1-26-2027**	**4-25-2027**	0.4785	0.4314
22	**4-26-2027**	**7-25-2027**	0.4835	0.4358
23	**7-26-2027**	**10-25-2027**	0.4889	0.4407
24	**10-26-2027**	**1-25-2028**	1.0801	0.8235

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

25	**1-26-2028**	**4-25-2028**	2.6342	1.8278
26	**4-26-2028**	**7-25-2028**	2.6328	1.8264
27	**7-26-2028**	**10-25-2028**	2.6623	1.8470
28	**10-26-2028**	**1-25-2029**	2.6634	1.8481
29	**1-26-2029**	**4-25-2029**	2.6044	1.8069
30	**4-26-2029**	**7-25-2029**	1.8863	1.4487
31	**7-26-2029**	**10-25-2029**	1.3907	1.2037
32	**10-26-2029**	**1-25-2030**	1.3114	1.1451
33	**1-26-2030**	**4-25-2030**	1.0732	0.9644
34	**4-26-2030**	**7-25-2030**	1.0842	0.9742
35	**7-26-2030**	**10-25-2030**	1.0964	0.9852
36	**10-26-2030**	**1-25-2031**	1.3755	1.2406
37	**1-26-2031**	**4-25-2031**	2.0742	1.8802
38	**4-26-2031**	**7-25-2031**	1.6282	1.4867
39	**7-26-2031**	**10-25-2031**	1.2919	1.1903
40	**10-26-2031**	**1-25-2032**	1.2927	1.1911
41	**1-26-2032**	**4-25-2032**	1.2779	1.1774
42	**4-26-2032**	**7-25-2032**	1.2770	1.1765
43	**7-26-2032**	**9-30-2032**	0.9402	0.8662
		Highest	2.6634	1.8802

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0277	2.7200e-003	0.2997	2.0000e-005		1.0700e-003	1.0700e-003		1.0700e-003	1.0700e-003	0.0000	0.5838	0.5838	1.5200e-003	0.0000	0.6219
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0277**	**2.7200e-003**	**0.2997**	**2.0000e-005**	**0.0000**	**1.0700e-003**	**1.0700e-003**	**0.0000**	**1.0700e-003**	**1.0700e-003**	**0.0000**	**0.5838**	**0.5838**	**1.5200e-003**	**0.0000**	**0.6219**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0277	2.7200e-003	0.2997	2.0000e-005		1.0700e-003	1.0700e-003		1.0700e-003	1.0700e-003	0.0000	0.5838	0.5838	1.5200e-003	0.0000	0.6219
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0277**	**2.7200e-003**	**0.2997**	**2.0000e-005**	**0.0000**	**1.0700e-003**	**1.0700e-003**	**0.0000**	**1.0700e-003**	**1.0700e-003**	**0.0000**	**0.5838**	**0.5838**	**1.5200e-003**	**0.0000**	**0.6219**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Coffer Dam Construction	Site Preparation	1/1/2027	12/31/2027	5	261	
2	Intake Structure	Demolition	1/1/2028	6/1/2029	5	370	
3	Eastern Breakwater	Demolition	6/2/2029	6/3/2031	5	522	

4	Coffer Dam Removal	Demolition	1/1/2030	12/31/2030	5	261	
5	Western Breakwater	Demolition	1/1/2031	12/31/2032	5	523	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Coffer Dam Construction	Cranes	1	8.00	231	0.29
Coffer Dam Construction	Pumps	2	8.00	84	0.74
Coffer Dam Construction	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Intake Structure	Concrete/Industrial Saws	3	8.00	81	0.73
Intake Structure	Crushing/Proc. Equipment	3	8.00	85	0.78
Intake Structure	Crushing/Proc. Equipment	3	8.00	85	0.78
Intake Structure	Excavators	3	8.00	158	0.38
Intake Structure	Graders	3	8.00	187	0.41
Intake Structure	Other Construction Equipment	3	8.00	172	0.42
Intake Structure	Rubber Tired Dozers	3	8.00	247	0.40
Intake Structure	Tractors/Loaders/Backhoes	3	8.00	124	0.44
Intake Structure	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Eastern Breakwater	Concrete/Industrial Saws	1	8.00	81	0.73
Eastern Breakwater	Crushing/Proc. Equipment	2	8.00	85	0.78
Eastern Breakwater	Crushing/Proc. Equipment	1	8.00	85	0.78
Eastern Breakwater	Excavators	2	8.00	158	0.38
Eastern Breakwater	Generator Sets	2	8.00	84	0.74
Eastern Breakwater	Other Construction Equipment	2	8.00	172	0.42

Eastern Breakwater	Rubber Tired Dozers	2	8.00	247	0.40
Eastern Breakwater	Skid Steer Loaders	2	8.00	65	0.37
Coffer Dam Removal	Cranes	1	8.00	231	0.29
Coffer Dam Removal	Pumps	2	8.00	84	0.74
Coffer Dam Removal	Tractors/Loaders/Backhoes	4	8.00	158	0.38
Western Breakwater	Concrete/Industrial Saws	3	8.00	81	0.73
Western Breakwater	Cranes	1	8.00	231	0.29
Western Breakwater	Crushing/Proc. Equipment	3	8.00	85	0.78
Western Breakwater	Excavators	3	8.00	158	0.38
Western Breakwater	Off-Highway Trucks	3	8.00	402	0.38
Western Breakwater	Other Construction Equipment	3	8.00	172	0.42
Western Breakwater	Rubber Tired Dozers	3	8.00	247	0.40
Western Breakwater	Tractors/Loaders/Backhoes	3	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Coffer Dam Construction	7	18.00	0.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Intake Structure	27	68.00	0.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Eastern Breakwater	14	35.00	0.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Coffer Dam Removal	7	18.00	0.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT
Western Breakwater	22	55.00	0.00	0.00	22.00	13.00	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Coffer Dam Construction - 2027

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1845	1.7436	2.3602	4.1000e-003		0.0721	0.0721		0.0685	0.0685	0.0000	356.7159	356.7159	0.0736	0.0000	358.5567
Total	**0.1845**	**1.7436**	**2.3602**	**4.1000e-003**	**0.0000**	**0.0721**	**0.0721**	**0.0000**	**0.0685**	**0.0685**	**0.0000**	**356.7159**	**356.7159**	**0.0736**	**0.0000**	**358.5567**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.5500e-003	5.5800e-003	0.0768	2.8000e-004	0.0384	1.5000e-004	0.0386	0.0102	1.4000e-004	0.0103	0.0000	25.5620	25.5620	4.3000e-004	5.8000e-004	25.7446
Total	**8.5500e-003**	**5.5800e-003**	**0.0768**	**2.8000e-004**	**0.0384**	**1.5000e-004**	**0.0386**	**0.0102**	**1.4000e-004**	**0.0103**	**0.0000**	**25.5620**	**25.5620**	**4.3000e-004**	**5.8000e-004**	**25.7446**

3.2 Coffer Dam Construction - 2027

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1702	1.5664	2.3772	4.1000e-003		0.0647	0.0647		0.0617	0.0617	0.0000	356.7155	356.7155	0.0736	0.0000	358.5562
Total	**0.1702**	**1.5664**	**2.3772**	**4.1000e-003**	**0.0000**	**0.0647**	**0.0647**	**0.0000**	**0.0617**	**0.0617**	**0.0000**	**356.7155**	**356.7155**	**0.0736**	**0.0000**	**358.5562**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.5500e-003	5.5800e-003	0.0768	2.8000e-004	0.0384	1.5000e-004	0.0386	0.0102	1.4000e-004	0.0103	0.0000	25.5620	25.5620	4.3000e-004	5.8000e-004	25.7446
Total	**8.5500e-003**	**5.5800e-003**	**0.0768**	**2.8000e-004**	**0.0384**	**1.5000e-004**	**0.0386**	**0.0102**	**1.4000e-004**	**0.0103**	**0.0000**	**25.5620**	**25.5620**	**4.3000e-004**	**5.8000e-004**	**25.7446**

3.3 Intake Structure - 2028

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1816	0.0000	0.1816	0.0275	0.0000	0.0275	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.0979	9.3867	11.4378	0.0213		0.4015	0.4015		0.3792	0.3792	0.0000	1,854.4772	1,854.4772	0.4148	0.0000	1,864.8460
Total	**1.0979**	**9.3867**	**11.4378**	**0.0213**	**0.1816**	**0.4015**	**0.5831**	**0.0275**	**0.3792**	**0.4067**	**0.0000**	**1,854.4772**	**1,854.4772**	**0.4148**	**0.0000**	**1,864.8460**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0305	0.0192	0.2739	1.0200e-003	0.1446	5.3000e-004	0.1451	0.0384	4.9000e-004	0.0389	0.0000	93.5993	93.5993	1.4900e-003	2.0600e-003	94.2515
Total	**0.0305**	**0.0192**	**0.2739**	**1.0200e-003**	**0.1446**	**5.3000e-004**	**0.1451**	**0.0384**	**4.9000e-004**	**0.0389**	**0.0000**	**93.5993**	**93.5993**	**1.4900e-003**	**2.0600e-003**	**94.2515**

3.3 Intake Structure - 2028

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0817	0.0000	0.0817	0.0124	0.0000	0.0124	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.8402	6.4190	12.6696	0.0213		0.2891	0.2891		0.2757	0.2757	0.0000	1,854.4750	1,854.4750	0.4148	0.0000	1,864.8438
Total	**0.8402**	**6.4190**	**12.6696**	**0.0213**	**0.0817**	**0.2891**	**0.3708**	**0.0124**	**0.2757**	**0.2881**	**0.0000**	**1,854.4750**	**1,854.4750**	**0.4148**	**0.0000**	**1,864.8438**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0305	0.0192	0.2739	1.0200e-003	0.1446	5.3000e-004	0.1451	0.0384	4.9000e-004	0.0389	0.0000	93.5993	93.5993	1.4900e-003	2.0600e-003	94.2515
Total	**0.0305**	**0.0192**	**0.2739**	**1.0200e-003**	**0.1446**	**5.3000e-004**	**0.1451**	**0.0384**	**4.9000e-004**	**0.0389**	**0.0000**	**93.5993**	**93.5993**	**1.4900e-003**	**2.0600e-003**	**94.2515**

3.3 Intake Structure - 2029

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0768	0.0000	0.0768	0.0116	0.0000	0.0116	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.4645	3.9713	4.8391	9.0100e-003		0.1699	0.1699		0.1604	0.1604	0.0000	784.5865	784.5865	0.1755	0.0000	788.9733
Total	**0.4645**	**3.9713**	**4.8391**	**9.0100e-003**	**0.0768**	**0.1699**	**0.2467**	**0.0116**	**0.1604**	**0.1721**	**0.0000**	**784.5865**	**784.5865**	**0.1755**	**0.0000**	**788.9733**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0122	7.4700e-003	0.1103	4.2000e-004	0.0612	2.1000e-004	0.0614	0.0163	1.9000e-004	0.0164	0.0000	38.6097	38.6097	5.8000e-004	8.3000e-004	38.8727
Total	**0.0122**	**7.4700e-003**	**0.1103**	**4.2000e-004**	**0.0612**	**2.1000e-004**	**0.0614**	**0.0163**	**1.9000e-004**	**0.0164**	**0.0000**	**38.6097**	**38.6097**	**5.8000e-004**	**8.3000e-004**	**38.8727**

3.3 Intake Structure - 2029

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0346	0.0000	0.0346	5.2400e-003	0.0000	5.2400e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.3555	2.7157	5.3602	9.0100e-003		0.1223	0.1223		0.1166	0.1166	0.0000	784.5856	784.5856	0.1755	0.0000	788.9724
Total	**0.3555**	**2.7157**	**5.3602**	**9.0100e-003**	**0.0346**	**0.1223**	**0.1569**	**5.2400e-003**	**0.1166**	**0.1219**	**0.0000**	**784.5856**	**784.5856**	**0.1755**	**0.0000**	**788.9724**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0122	7.4700e-003	0.1103	4.2000e-004	0.0612	2.1000e-004	0.0614	0.0163	1.9000e-004	0.0164	0.0000	38.6097	38.6097	5.8000e-004	8.3000e-004	38.8727
Total	**0.0122**	**7.4700e-003**	**0.1103**	**4.2000e-004**	**0.0612**	**2.1000e-004**	**0.0614**	**0.0163**	**1.9000e-004**	**0.0164**	**0.0000**	**38.6097**	**38.6097**	**5.8000e-004**	**8.3000e-004**	**38.8727**

3.4 Eastern Breakwater - 2029

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.6088	0.0000	0.6088	0.0922	0.0000	0.0922	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.3311	2.8508	3.5626	6.3700e-003		0.1246	0.1246		0.1184	0.1184	0.0000	553.7697	553.7697	0.1066	0.0000	556.4346
Total	**0.3311**	**2.8508**	**3.5626**	**6.3700e-003**	**0.6088**	**0.1246**	**0.7334**	**0.0922**	**0.1184**	**0.2106**	**0.0000**	**553.7697**	**553.7697**	**0.1066**	**0.0000**	**556.4346**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.6100e-003	5.2800e-003	0.0779	3.0000e-004	0.0432	1.5000e-004	0.0434	0.0115	1.4000e-004	0.0116	0.0000	27.2797	27.2797	4.1000e-004	5.9000e-004	27.4655
Total	**8.6100e-003**	**5.2800e-003**	**0.0779**	**3.0000e-004**	**0.0432**	**1.5000e-004**	**0.0434**	**0.0115**	**1.4000e-004**	**0.0116**	**0.0000**	**27.2797**	**27.2797**	**4.1000e-004**	**5.9000e-004**	**27.4655**

3.4 Eastern Breakwater - 2029

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.2740	0.0000	0.2740	0.0415	0.0000	0.0415	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2856	2.4668	3.7068	6.3700e-003		0.1037	0.1037		0.0984	0.0984	0.0000	553.7691	553.7691	0.1066	0.0000	556.4339
Total	**0.2856**	**2.4668**	**3.7068**	**6.3700e-003**	**0.2740**	**0.1037**	**0.3776**	**0.0415**	**0.0984**	**0.1399**	**0.0000**	**553.7691**	**553.7691**	**0.1066**	**0.0000**	**556.4339**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.6100e-003	5.2800e-003	0.0779	3.0000e-004	0.0432	1.5000e-004	0.0434	0.0115	1.4000e-004	0.0116	0.0000	27.2797	27.2797	4.1000e-004	5.9000e-004	27.4655
Total	**8.6100e-003**	**5.2800e-003**	**0.0779**	**3.0000e-004**	**0.0432**	**1.5000e-004**	**0.0434**	**0.0115**	**1.4000e-004**	**0.0116**	**0.0000**	**27.2797**	**27.2797**	**4.1000e-004**	**5.9000e-004**	**27.4655**

3.4 Eastern Breakwater - 2030

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.0523	0.0000	1.0523	0.1593	0.0000	0.1593	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.4940	2.7721	6.0659	0.0123		0.0780	0.0780		0.0780	0.0780	0.0000	1,059.1785	1,059.1785	0.0397	0.0000	1,060.1719
Total	**0.4940**	**2.7721**	**6.0659**	**0.0123**	**1.0523**	**0.0780**	**1.1303**	**0.1593**	**0.0780**	**0.2373**	**0.0000**	**1,059.1785**	**1,059.1785**	**0.0397**	**0.0000**	**1,060.1719**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0140	8.4200e-003	0.1288	5.0000e-004	0.0747	2.4000e-004	0.0749	0.0198	2.2000e-004	0.0201	0.0000	46.0681	46.0681	6.5000e-004	9.8000e-004	46.3758
Total	**0.0140**	**8.4200e-003**	**0.1288**	**5.0000e-004**	**0.0747**	**2.4000e-004**	**0.0749**	**0.0198**	**2.2000e-004**	**0.0201**	**0.0000**	**46.0681**	**46.0681**	**6.5000e-004**	**9.8000e-004**	**46.3758**

3.4 Eastern Breakwater - 2030

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.4735	0.0000	0.4735	0.0717	0.0000	0.0717	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.4156	2.4661	6.2359	0.0123		0.0675	0.0675		0.0675	0.0675	0.0000	1,059.1772	1,059.1772	0.0397	0.0000	1,060.1707
Total	**0.4156**	**2.4661**	**6.2359**	**0.0123**	**0.4735**	**0.0675**	**0.5410**	**0.0717**	**0.0675**	**0.1392**	**0.0000**	**1,059.1772**	**1,059.1772**	**0.0397**	**0.0000**	**1,060.1707**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0140	8.4200e-003	0.1288	5.0000e-004	0.0747	2.4000e-004	0.0749	0.0198	2.2000e-004	0.0201	0.0000	46.0681	46.0681	6.5000e-004	9.8000e-004	46.3758
Total	**0.0140**	**8.4200e-003**	**0.1288**	**5.0000e-004**	**0.0747**	**2.4000e-004**	**0.0749**	**0.0198**	**2.2000e-004**	**0.0201**	**0.0000**	**46.0681**	**46.0681**	**6.5000e-004**	**9.8000e-004**	**46.3758**

3.4 Eastern Breakwater - 2031

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.4435	0.0000	0.4435	0.0672	0.0000	0.0672	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2082	1.1683	2.5565	5.2000e-003		0.0329	0.0329		0.0329	0.0329	0.0000	446.3971	446.3971	0.0168	0.0000	446.8158
Total	**0.2082**	**1.1683**	**2.5565**	**5.2000e-003**	**0.4435**	**0.0329**	**0.4764**	**0.0672**	**0.0329**	**0.1000**	**0.0000**	**446.3971**	**446.3971**	**0.0168**	**0.0000**	**446.8158**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.5500e-003	3.2900e-003	0.0522	2.1000e-004	0.0315	1.0000e-004	0.0316	8.3600e-003	9.0000e-005	8.4500e-003	0.0000	19.0341	19.0341	2.6000e-004	4.0000e-004	19.1589
Total	**5.5500e-003**	**3.2900e-003**	**0.0522**	**2.1000e-004**	**0.0315**	**1.0000e-004**	**0.0316**	**8.3600e-003**	**9.0000e-005**	**8.4500e-003**	**0.0000**	**19.0341**	**19.0341**	**2.6000e-004**	**4.0000e-004**	**19.1589**

3.4 Eastern Breakwater - 2031

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1996	0.0000	0.1996	0.0302	0.0000	0.0302	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1751	1.0394	2.6282	5.2000e-003		0.0285	0.0285		0.0285	0.0285	0.0000	446.3965	446.3965	0.0168	0.0000	446.8152
Total	**0.1751**	**1.0394**	**2.6282**	**5.2000e-003**	**0.1996**	**0.0285**	**0.2280**	**0.0302**	**0.0285**	**0.0587**	**0.0000**	**446.3965**	**446.3965**	**0.0168**	**0.0000**	**446.8152**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.5500e-003	3.2900e-003	0.0522	2.1000e-004	0.0315	1.0000e-004	0.0316	8.3600e-003	9.0000e-005	8.4500e-003	0.0000	19.0341	19.0341	2.6000e-004	4.0000e-004	19.1589
Total	**5.5500e-003**	**3.2900e-003**	**0.0522**	**2.1000e-004**	**0.0315**	**1.0000e-004**	**0.0316**	**8.3600e-003**	**9.0000e-005**	**8.4500e-003**	**0.0000**	**19.0341**	**19.0341**	**2.6000e-004**	**4.0000e-004**	**19.1589**

3.5 Coffer Dam Removal - 2030

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1964	0.8590	2.9495	5.9600e-003		0.0251	0.0251		0.0251	0.0251	0.0000	511.9859	511.9859	0.0157	0.0000	512.3793
Total	**0.1964**	**0.8590**	**2.9495**	**5.9600e-003**		**0.0251**	**0.0251**		**0.0251**	**0.0251**	**0.0000**	**511.9859**	**511.9859**	**0.0157**	**0.0000**	**512.3793**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.2200e-003	4.3300e-003	0.0662	2.6000e-004	0.0384	1.2000e-004	0.0385	0.0102	1.1000e-004	0.0103	0.0000	23.6922	23.6922	3.4000e-004	5.0000e-004	23.8504
Total	**7.2200e-003**	**4.3300e-003**	**0.0662**	**2.6000e-004**	**0.0384**	**1.2000e-004**	**0.0385**	**0.0102**	**1.1000e-004**	**0.0103**	**0.0000**	**23.6922**	**23.6922**	**3.4000e-004**	**5.0000e-004**	**23.8504**

3.5 Coffer Dam Removal - 2030

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1751	0.8229	3.0179	5.9600e-003		0.0231	0.0231		0.0231	0.0231	0.0000	511.9853	511.9853	0.0157	0.0000	512.3787
Total	**0.1751**	**0.8229**	**3.0179**	**5.9600e-003**		**0.0231**	**0.0231**		**0.0231**	**0.0231**	**0.0000**	**511.9853**	**511.9853**	**0.0157**	**0.0000**	**512.3787**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.2200e-003	4.3300e-003	0.0662	2.6000e-004	0.0384	1.2000e-004	0.0385	0.0102	1.1000e-004	0.0103	0.0000	23.6922	23.6922	3.4000e-004	5.0000e-004	23.8504
Total	**7.2200e-003**	**4.3300e-003**	**0.0662**	**2.6000e-004**	**0.0384**	**1.2000e-004**	**0.0385**	**0.0102**	**1.1000e-004**	**0.0103**	**0.0000**	**23.6922**	**23.6922**	**3.4000e-004**	**5.0000e-004**	**23.8504**

3.6 Western Breakwater - 2031

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.4824	0.0000	2.4824	0.3759	0.0000	0.3759	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.9417	4.1571	9.2172	0.0225		0.1273	0.1273		0.1273	0.1273	0.0000	2,020.1651	2,020.1651	0.0754	0.0000	2,022.0507
Total	**0.9417**	**4.1571**	**9.2172**	**0.0225**	**2.4824**	**0.1273**	**2.6096**	**0.3759**	**0.1273**	**0.5031**	**0.0000**	**2,020.1651**	**2,020.1651**	**0.0754**	**0.0000**	**2,022.0507**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0207	0.0123	0.1946	7.7000e-004	0.1174	3.6000e-004	0.1177	0.0312	3.3000e-004	0.0315	0.0000	70.9701	70.9701	9.5000e-004	1.4800e-003	71.4353
Total	**0.0207**	**0.0123**	**0.1946**	**7.7000e-004**	**0.1174**	**3.6000e-004**	**0.1177**	**0.0312**	**3.3000e-004**	**0.0315**	**0.0000**	**70.9701**	**70.9701**	**9.5000e-004**	**1.4800e-003**	**71.4353**

3.6 Western Breakwater - 2031

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.1171	0.0000	1.1171	0.1691	0.0000	0.1691	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.8497	3.8455	9.3750	0.0225		0.1174	0.1174		0.1174	0.1174	0.0000	2,020.1627	2,020.1627	0.0754	0.0000	2,022.0483
Total	**0.8497**	**3.8455**	**9.3750**	**0.0225**	**1.1171**	**0.1174**	**1.2345**	**0.1691**	**0.1174**	**0.2865**	**0.0000**	**2,020.1627**	**2,020.1627**	**0.0754**	**0.0000**	**2,022.0483**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0207	0.0123	0.1946	7.7000e-004	0.1174	3.6000e-004	0.1177	0.0312	3.3000e-004	0.0315	0.0000	70.9701	70.9701	9.5000e-004	1.4800e-003	71.4353
Total	**0.0207**	**0.0123**	**0.1946**	**7.7000e-004**	**0.1174**	**3.6000e-004**	**0.1177**	**0.0312**	**3.3000e-004**	**0.0315**	**0.0000**	**70.9701**	**70.9701**	**9.5000e-004**	**1.4800e-003**	**71.4353**

3.6 Western Breakwater - 2032

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.4919	0.0000	2.4919	0.3773	0.0000	0.3773	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.9453	4.1730	9.2526	0.0225		0.1277	0.1277		0.1277	0.1277	0.0000	2,027.905 2	2,027.905 2	0.0757	0.0000	2,029.798 0
Total	**0.9453**	**4.1730**	**9.2526**	**0.0225**	**2.4919**	**0.1277**	**2.6196**	**0.3773**	**0.1277**	**0.5050**	**0.0000**	**2,027.905 2**	**2,027.905 2**	**0.0757**	**0.0000**	**2,029.798 0**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0196	0.0115	0.1882	7.6000e-004	0.1178	3.3000e-004	0.1182	0.0313	3.1000e-004	0.0316	0.0000	69.8815	69.8815	8.9000e-004	1.4400e-003	70.3328
Total	**0.0196**	**0.0115**	**0.1882**	**7.6000e-004**	**0.1178**	**3.3000e-004**	**0.1182**	**0.0313**	**3.1000e-004**	**0.0316**	**0.0000**	**69.8815**	**69.8815**	**8.9000e-004**	**1.4400e-003**	**70.3328**

3.6 Western Breakwater - 2032

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.1214	0.0000	1.1214	0.1698	0.0000	0.1698	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.8529	3.8602	9.4110	0.0225		0.1179	0.1179		0.1179	0.1179	0.0000	2,027.9027	2,027.9027	0.0757	0.0000	2,029.7956
Total	**0.8529**	**3.8602**	**9.4110**	**0.0225**	**1.1214**	**0.1179**	**1.2392**	**0.1698**	**0.1179**	**0.2876**	**0.0000**	**2,027.9027**	**2,027.9027**	**0.0757**	**0.0000**	**2,029.7956**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0196	0.0115	0.1882	7.6000e-004	0.1178	3.3000e-004	0.1182	0.0313	3.1000e-004	0.0316	0.0000	69.8815	69.8815	8.9000e-004	1.4400e-003	70.3328
Total	**0.0196**	**0.0115**	**0.1882**	**7.6000e-004**	**0.1178**	**3.3000e-004**	**0.1182**	**0.0313**	**3.1000e-004**	**0.0316**	**0.0000**	**69.8815**	**69.8815**	**8.9000e-004**	**1.4400e-003**	**70.3328**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Heavy Industry	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Heavy Industry	9.50	7.30	7.30	59.00	28.00	13.00	92	5	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Heavy Industry	0.518500	0.056626	0.189643	0.140762	0.030399	0.007841	0.010730	0.006132	0.000824	0.000442	0.030440	0.001544	0.006118

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Heavy Industry	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Heavy Industry	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Heavy Industry	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Heavy Industry	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0277	2.7200e-003	0.2997	2.0000e-005		1.0700e-003	1.0700e-003		1.0700e-003	1.0700e-003	0.0000	0.5838	0.5838	1.5200e-003	0.0000	0.6219
Unmitigated	0.0277	2.7200e-003	0.2997	2.0000e-005		1.0700e-003	1.0700e-003		1.0700e-003	1.0700e-003	0.0000	0.5838	0.5838	1.5200e-003	0.0000	0.6219

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0277	2.7200e-003	0.2997	2.0000e-005		1.0700e-003	1.0700e-003		1.0700e-003	1.0700e-003	0.0000	0.5838	0.5838	1.5200e-003	0.0000	0.6219
Total	**0.0277**	**2.7200e-003**	**0.2997**	**2.0000e-005**		**1.0700e-003**	**1.0700e-003**		**1.0700e-003**	**1.0700e-003**	**0.0000**	**0.5838**	**0.5838**	**1.5200e-003**	**0.0000**	**0.6219**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0277	2.7200e-003	0.2997	2.0000e-005		1.0700e-003	1.0700e-003		1.0700e-003	1.0700e-003	0.0000	0.5838	0.5838	1.5200e-003	0.0000	0.6219
Total	**0.0277**	**2.7200e-003**	**0.2997**	**2.0000e-005**		**1.0700e-003**	**1.0700e-003**		**1.0700e-003**	**1.0700e-003**	**0.0000**	**0.5838**	**0.5838**	**1.5200e-003**	**0.0000**	**0.6219**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Heavy Industry	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Heavy Industry	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Heavy Industry	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Heavy Industry	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Appendix E

Biological Resources

E1 Noxious and Invasive Plant Species Within
or Near the DCPP Project Site
E2 Regional Special-Status Species Tables
E3 Special-Status Species Accounts
E4 Aquatic Resources Delineation Report

Appendix E1

Noxious and Invasive Plant Species Within or Near the DCPP Project Site

Appendix E1
Noxious and Invasive Plant Species Within or Near the DCPP Project Site

The threat level of each species, as designated by the California Invasive Plant Council (Cal-IPC) is as follows:

- **High** – These species have severed ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment. Most are widely distributed ecologically.
- **Moderate** – These species have substantial and apparent, but generally not severe, ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal, though establishment is generally dependent upon ecological disturbance. Ecological amplitude and distribution may range from limited to widespread.
- **Limited** – These species are not invasive but their ecological impacts are minor on a statewide level or there was not enough information to justify a higher score. Their reproductive biology and other attributes result in low to moderate rates of invasiveness. Ecological amplitude and distribution are generally limited, but these species may be locally persistent and problematic.
- **Watch** – These species are not currently invasive in California. Assessment has found them to be a high risk for becoming invasive in the future.

Several nonnative plant species were identified in the Project area during 2020 and 2021 surveys. A total of 57 of these are considered noxious or invasive weeds by the CAL-IPC. Table E1-1 lists the noxious and invasive plant species that were identified in the Project area along with the current threat levels as defined by CAL-IPC.

Table E1-1. Noxious and Invasive Plant Species Identified in the Project Area

Scientific Name	Common Name	Location	Threat Level
Ailanthus altissima	Tree-of-heaven	SMVR-SB	Moderate
Asphodelus fistulosus	Onion weed	DCPP	Moderate
Atriplex semibaccata	Australian saltbush	DCPP SMVR-SB	Moderate
Avena barbata	Slender oat	DCPP SMVR-SB SMVR-SM	Moderate
Avena fatua	Wild oat	DCPP SMVR-SB	Moderate
Brachypodium distachyon	Annual false-brome	DCPP SMVR-SM	Moderate

Table E1-1. Noxious and Invasive Plant Species Identified in the Project Area

Scientific Name	Common Name	Location	Threat Level
Brassica nigra	Black mustard	DCPP SMVR-SB	Moderate
Brassica rapa	Field mustard	DCPP SMVR-SB	Limited
Bromus diandrus	Ripgut brome	DCPP SMVR-SB SMVR-SM	Moderate
Bromus hordeaceus	Soft brome	DCPP SMVR-SB	Limited
Carduus pycnocephalus	Italian thistle	DCPP SMVR-SB SMVR-SM	Moderate
Carduus tenuiflorus	Slenderflower thistle	DCPP	Limited
Carpobrotus chilensis	Sea fig	DCPP	Moderate
Carpobrotus edulis	Highway iceplant	SMVR-SB SMVR-SM	High
Centaurea melitensis	Tocalote	DCPP SMVR-SB SMVR-SM	Moderate
Cirsium vulgare	Bull thistle	DCPP SMVR-SB	Moderate
Conium maculatum	Poison hemlock	DCPP SMVR-SB SMVR-SM	Moderate
Cortaderia jubata	Jubatagrass	DCPP	High
Cotula coronopifolia	Common brassbuttons	SMVR-SM	Limited
Cynara cardunculus	Artichoke thistle	DCPP	Moderate
Cynodon dactylon	Bermuda grass	DCPP SMVR-SB	Moderate
Cynosurus echinatus	Hedgehog dogtail	DCPP	Moderate
Dactylis glomerata	Orchard grass	DCPP	Limited
Erodium cicutarium	Redstem filaree	DCPP SMVR-SB SMVR-SM	Limited
Eucalyptus globulus	Blue gum	SMVR-SB	Limited
Festuca myuros	Rat-tail fescue	DCPP SMVR-SB SMVR-SM	Moderate

Table E1-1. Noxious and Invasive Plant Species Identified in the Project Area

Scientific Name	Common Name	Location	Threat Level
Festuca perennis	Italian ryegrass	DCPP SMVR-SB	Moderate
Foeniculum vulgare	Fennel	DCPP SMVR-SB	Moderate
Geranium dissectum	Cutleaf geranium	DCPP	Limited
Glebionis coronaria	Garland chrysanthemum	DCPP	Limited
Helminthotheca echiodes	Bristly ox-tongue	DCPP SMVR-SB	Limited
Hirschfeldia incana	Short-pod mustard	DCPP SMVR-SB SMVR-SM	Moderate
Hordeum marinum	Mediterranean barley	DCPP	Moderate
Hordeum murinum	Hare barley	DCPP SMVR-SB SMVR-SM	Moderate
Hypochaeris glabra	Smooth cat's-ear	DCPP	Limited
Lepidium latifolium	Perennial pepperweed	SMVR-SB	High
Lobularia maritima	Sweet alyssum	SMVR-SB	Limited
Marrubium vulgare	Horehound	DCPP	Limited
Medicago polymorpha	California burclover	DCPP SMVR-SB	Limited
Nicotiana glauca	Tree tobacco	DCPP	Moderate
Oxalis pes-caprae	Bermuda buttercup	DCPP SMVR-SB	Moderate
Pennisetum clandestinum	Kikuyugrass	DCPP	Limited
Pennisetum villosum	Feathertop	DCPP	Watch
Plantago lanceolata	English plantain	DCPP SMVR-SB	Limited
Phalaris aquatica	Harding grass	DCPP	Moderate
Polypogon monspeliensis	Rabbitsfoot grass	DCPP	Limited
Raphanus sativus	Wild radish	DCPP SMVR-SB SMVR-SM	Limited
Rumex crispus	Curly dock	DCPP SMVR-SB	Limited

Table E1-1. Noxious and Invasive Plant Species Identified in the Project Area

Scientific Name	Common Name	Location	Threat Level
Salsola tragus	Russian thistle	DCPP SMVR-SM	Limited
Schinus molle	Peruvian pepper tree	SMVR-SB	Limited
Schismus arabicus	Mediterranean grass	SMVR-SM	Limited
Silybum marianum	Milk thistle	DCPP SMVR-SB	Limited
Sinapus arvensis	Wild mustard	DCPP	Limited
Stipa miliacea var. miliacea	Smilo grass	DCPP SMVR-SB	Limited
Tetragonia tetragonioides	New Zealand spinach	DCPP	Limited
Torilis arvensis	Hedgeparsley	DCPP	Moderate
Trifolium hirtum	Rose clover	DCPP	Limited

Source: CAL-IPC, 2022.

References

CAL-IPC (California Invasive Plant Council). 2022. The CAL-IPC Inventory Database. California Invasive Plant Council, Berkeley, CA. Search conducted March 1, 2022. https://www.cal-ipc.org/plants/inventory/.

Appendix E2

Regional Special-Status Species Tables

Appendix E2
Regional Special-Status Species Tables

The tables in this appendix identify special-status plants and wildlife (terrestrial and marine) known in the region and summarize the species' habitat and distribution, conservation status, and their potential to occur. The tables are found on the following pages.

The potential to occur is based on the five criteria below.

Present	Observed during Proposed Project-specific surveys or recently documented and habitat conditions remain unchanged from the time of the record
High	Known records within 10 miles of the Proposed Project area AND suitable habitat is present, but not detected during Project-specific surveys
Moderate	Proposed Project area is within species' known geographic range, but no known records, and suitable habitat is present OR known records within 10 miles of the Proposed Project area and marginal habitat is present
Low	No known records in Proposed Project area and habitat is marginal OR the species is conspicuous and was not detected during biological surveys
Unlikely	No known records within 10 miles of the Proposed Project area or the site lacks suitable habitat requirements

Table Notes:

- Federal Rankings: FE = Federally Endangered; FT = Federally Threatened; BCC = USFWS Birds of Conservation Concern
- State Rankings: SE = State Endangered; ST = State Threatened; SSC = California Species of Special Concern; SR = State Rare; FP = California Department of Fish and Wildlife (CDFW) Fully Protected, WL = CDFW Watch List, SA = CDFW Special Animal.
- California Rare Plant Ranks (CRPR)
  - CRPR 1A = Presumed extinct in California;
  - CRPR 1B = Rare or endangered in California and elsewhere;
  - CRPR 2 = Rare or endangered in California, more common elsewhere;
  - CRPR 3 = More information needed;
  - CRPR 4 = Limited distribution (Watch List).
  - CRPR Sub-categories: .1 = Seriously endangered in California (over 80 percent of occurrences threatened/high degree and immediacy of threat); .2 = Fairly endangered in California (20 to 80 percent occurrences threatened); .3 = Not very endangered in California (less than 20 percent of occurrences threatened or no current threats known).

Table E2-1. Regional Special-Status Plants

Scientific Name	Common Name	Status	Blooming	Habitat	Likelihood of Occurrence
Agrostis hooveri	Hoover's bent grass	1B.2	Feb – Oct	Sandy sites within chaparral, montane woodland, closed-cone coniferous forest, valley, and foothill grassland. 60-765 m.	**DCPP: Moderate -** Suitable habitat present. Recent reported 2-miles from site Proposed Project site.
					PBR: Moderate – Suitable habitat present. Recent reported records near Proposed Project site. A historic record is located adjacent to site
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
Aphanisma blitoides	Aphanisma	1B.2	Jun – Sep	Coastal scrub, bluffs, saline sand; <200 m.	**DCPP Unlikely -** Suitable habitat present, outside of geographical range of species. No reported records near Proposed Project site.
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.
Arctostaphylos luciana	Santa Lucia manzanita	1B.2	Jan – Mar	Shale outcrops, slopes, and upland chaparral near the coast. 100 – 800 m.	**DCPP: Unlikely -** Suitable habitat present, outside of geographical range of species. No reported records near Proposed Project site.
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.
Arctostaphylos morroensis	Morro manzanita	FT, 1B.1	Jan – Mar	Stabilized sand dunes, sandstones, chaparral. < 200 m.	**DCPP: Unlikely -** Suitable habitat present, outside of geographical range of species. No reported records near Proposed Project site.
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.

Table E2-1. Regional Special-Status Plants

Scientific Name	Common Name	Status	Blooming	Habitat	Likelihood of Occurrence
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.
Arctostaphylos osoensis	Oso manzanita	1B.2	Dec –Feb	Dacite (volcanic) outcrops, chaparral. 50 – 375 m.	**DCPP: Unlikely -** Suitable habitat present, outside of geographical range of species. No reported records near Proposed Project site.
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.
Arctostaphylos pechoensis	Pecho manzanita	1B.2	Jan – Mar	Shale outcrops, chaparral, conifer forest. < 500 m.	**DCPP: High-** Suitable habitat present. Reported records of species at Proposed Project site.
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.
Arctostaphylos pilosula	Santa Margarita manzanita	1B.2	Dec –Mar	Shale outcrops, slopes, chaparral. 30 – 1,250 m.	**DCPP: Moderate-** Suitable habitat present. Multiple records of species within 5 miles of Proposed Project site.
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.
Arctostaphylos purissima	La Purisima manzanita	1B.1	Feb – Sep	Sandstone outcrops, sandy soil. Chaparral, coastal scrub. 60-470 m.	**DCPP: Unlikely –** Suitable habitat present. No reported records near Proposed Project site. Nearest occurrence is 20 miles away near Santa Maria.

Table E2-1. Regional Special-Status Plants

Scientific Name	Common Name	Status	Blooming	Habitat	Likelihood of Occurrence
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.
Arctostaphylos refugioensis	Refugio manzanita	1B.2	Mar – Oct	On sandstone. Chaparral. 60-765 m.	**DCPP: Unlikely –** Suitable habitat present. Outside of geographical range of species. No reported records near Proposed Project site.
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.
Arctostaphylos rudis	Sand mesa manzanita	1B.2	Nov – Feb	Sandy soils, chaparral. < 380 m.	**DCPP: Low-** Suitable habitat present. Nearest records are 15 miles southeast of Proposed Project site near Arroyo Grande.
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.
Arctostaphylos tomentosa* ssp. *daciticola	Dacite manzanita	1B.1	Dec –Mar	Only known from one site in SLO County on dacite porphyry buttes. Chaparral, cismontane woodland. About 120m.	**DCPP: Unlikely –** No suitable habitat present. Species requires very specific site conditions. No reported records near Proposed Project site. Nearest records are 9 miles from Proposed Project site.
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.

Table E2-1. Regional Special-Status Plants

Scientific Name	Common Name	Status	Blooming	Habitat	Likelihood of Occurrence
Arenaria paludicola	Marsh sandwort	FE, SE, 1B.1	May – Aug	Growing up through dense mats of *Typha, Juncus, Scirpus,* etc. in freshwater marsh. Sandy soil. 3-170 m.	**DCPP: Low –** Marginal habitat present. No reported records near Proposed Project site. Nearest record is 7 miles from Proposed Project site at Morro Bay.
					PBR: Low – Marginal habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.
Astragalus didymocarpus* var. *milesianus	Miles' milk-vetch	1B.2	Mar – May	Grassy areas near the coast, clay soils in coastal scrub. < 400 m.	**DCPP: Low –** Suitable habitat present. No reported records near Proposed Project site. Nearest record is located 9 miles to east near San Luis Obispo.
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.
Astragalus nuttallii* var. *nuttallii	Ocean bluff milkvetch	4.2	Jan – Nov	Rock, sandy areas, bluffs; < 250 m	**DCPP: Present –** *A. nuttallii* observed during 2020 surveys and subspecies assumed to be present based on proximity of known population located immediately north of site (PG&E, 2020; 2022a).
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.
Atriplex coulteri	Coulter's saltbush	1B.2	Mar –Oct	Alkaline or clay soils, open sites, scrub, coastal bluff scrub. < 500 m.	**DCPP: High –** Suitable habitat present. Reported records located at Proposed Project site. Occurrence is less than 1 mile north of Proposed Project site.
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.

Table E2-1. Regional Special-Status Plants

Scientific Name	Common Name	Status	Blooming	Habitat	Likelihood of Occurrence
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.
Atriplex serenana* var. *davidsonii	Davidson's saltscale	1B.2	Apr –Oct	Coastal bluffs less < 200 m.	**DCPP: Low –** Suitable habitat present. No reported records near Proposed Project site. Nearest record is 22 miles south of Proposed Project site. Near
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely –No reported records in the vicinity of Proposed Project site.
Bahiopsis laciniata	San Diego County viguiera	4.3	Feb - Aug	Coastal scrub, chaparral slopes. 90 --750 m.	**DCPP: Present –** Occurrence considered anomalous since site is well outside of known range. Plant was likely artificially dispersed to site.
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.
Calochortus obispoensis	San Luis mariposa-lily	1B.2	May – July	Dry serpentine, generally open chaparral. 100 – 500 m.	**DCPP: Moderate –** Suitable habitat present. Records less than 7 miles northwest of Proposed Project site.
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.
Calochortus simulans	La Panza mariposa-lily	1B.3	Apr – July	Sand (often granitic),	**DCPP: Unlikely –** No suitable habitat present. No reported records near Proposed Project site.

Table E2-1. Regional Special-Status Plants

Scientific Name	Common Name	Status	Blooming	Habitat	Likelihood of Occurrence
				grassland, and yellow pine forest. 1,100 m.	**PBR: Unlikely –** No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.
Calystegia subacaulis* ssp. *episcopalis	Cambria morning-glory	4.2	Apr – June	Dry, open grassland, scrub, and woodland. 500 m.	**DCPP: Moderate–** Suitable habitat present. Records less than 6 miles northeast of Proposed Project site.
					PBR: Low – Marginal habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No reported records in the vicinity of Proposed Project site.
Camissoniopsis hardhamiae	Hardham's evening-primrose	1B.2	Mar - May	Sandy soil, limestone; disturbed or burned areas in oak woodland and chaparral. 240 – 600 m.	**DCPP: Low–** Marginal habitat present. Records located 9 miles north of Proposed Project site.
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.
Carex obispoensis	San Luis Obispo sedge	1B.2	Mar – Jun	Springs and stream sides in chaparral, generally on serpentine soils. 800 m.	**DCPP: Moderate–** Suitable habitat present. Records 5 miles north of Proposed Project site.
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.

Table E2-1. Regional Special-Status Plants

Scientific Name	Common Name	Status	Blooming	Habitat	Likelihood of Occurrence
Caulanthus californicus	California jewelflower	FE, SE, 1B.1	Feb - May	Chenopod scrub, pinyon and juniper woodland, valley and foothill grassland; 60 – 1000 m.	**DCPP: Unlikely –** No suitable habitat present. No reported records near Proposed Project site.
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.
Castilleja densiflora* var. *obispoensis	San Luis Obispo owl's-clover	1B.2	Mar – Jun	Coastal grassland, meadows, and seeps; sometimes in serpentine. < 400 m.	**DCPP: Moderate–** Suitable habitat present. Multiple records 5 miles north of Proposed Project site.
					PBR: Moderate – Suitable habitat present. Recent reported records near Proposed Project site. A historic record is located adjacent to site
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.
Ceanothus cuneatus* var. *fascicularis	Lompoc ceanothus	4.2	Feb – May	Sandy chaparral. 10-340 m	**DCPP: High –** Suitable habitat present. Species is documented along access road 1 mile east of Proposed Project site.
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.
Ceanothus impressus* var. *impressus	Santa Barbara ceanothus	1B.2	Apr – Jun	Sandy chaparral. 10-340 m	**DCPP: Unlikely –** Suitable habitat present. Outside of geographical range of species. No reported records near Proposed Project site.
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.

Table E2-1. Regional Special-Status Plants

Scientific Name	Common Name	Status	Blooming	Habitat	Likelihood of Occurrence
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.
Ceanothus impressus* var. *nipomensis	Nipomo Mesa ceanothus	1B.2	Feb – Apr	Sandy substrates, flats, canyons. < 200 m.	**DCPP: Moderate–** Suitable habitat present. Multiple records 5 miles north of Proposed Project site.
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.
Ceanothus thyrsiflorus* var. *obispoensis	San Luis Obispo ceanothus	1B.1	Feb – Jun	Dacite substrates in association with chaparral, cismontane woodland. 140 – 225 meters.	**DCPP: Unlikely –** No suitable habitat present. No reported records near Proposed Project site.
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.
Centromadia parryi* ssp. *congdonii	Congdon's tarplant	1B.1	Jun – Oct	Terraces, swales in floodplains, grassland, and disturbed sites. < 300 m.	**DCPP: Moderate –** Suitable habitat is present. Records less than 8 miles northeast of Proposed Project site.
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely –No suitable habitat present. No reported records at Proposed Project site.
Chenopodium littoreum	Coastal goosefoot	1B.2	Jun – Oct	Generally sandy soils, dunes. < 40 m.	**DCPP: Unlikely –** No suitable habitat present. No reported records near Proposed Project site.
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.

Table E2-1. Regional Special-Status Plants

Scientific Name	Common Name	Status	Blooming	Habitat	Likelihood of Occurrence
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.
Chlorogalum pomeridianum* var. *minus	Dwarf soaproot	1B.2	May – Jul	Serpentine outcrops in chaparral. < 750 m.	**DCPP: Unlikely –** No suitable habitat present. No reported records near Proposed Project site.
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.
Chloropyron maritimum* ssp. *maritimum	Salt marsh bird's-beak	FE, SE, 1B.2	May – Oct	Coastal salt marsh. < 10 m.	**DCPP: Unlikely –** No suitable habitat present. No reported records near Proposed Project site.
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.
Chloropyron maritimum* ssp. *palustre	Point Reyes salty bird's-beak	1B.2	Jun – Oct	Marshes and swamps. 0 – 10 m.	**DCPP: Unlikely –** No suitable habitat present. No reported records near Proposed Project site.
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.
Chorizanthe aphanantha	Irish Hills spineflower	1B.1	Apr – Jul	Serpentine soils in scrub and chaparral. 100 –370	**DCPP: Unlikely –** No suitable habitat present. No reported records near Proposed Project site.

Table E2-1. Regional Special-Status Plants

Scientific Name	Common Name	Status	Blooming	Habitat	Likelihood of Occurrence
				m.	**PBR: Unlikely –** No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.
Chorizanthe breweri	Brewer's spineflower	1B.3	Mar – Jul	Gravel or rocky areas, in serpentine soil. < 60 – 800 m.	**DCPP: Unlikely –** No suitable habitat present. No reported records near Proposed Project site.
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.
Chorizanthe rectispina	Straight-awned spineflower	1B.3	May – Jul	Sand or gravel. 200 – 600 m.	**DCPP: Low –** Suitable habitat present. No reported records near Proposed Project site. Nearest records are located 14 miles to the southeast in Arroyo Grande.
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.
Cicuta maculata* var. *bolanderi	Bolander's water-hemlock	2B.1	Jun – Aug	Coastal, saltmarsh < 200 m	**DCPP: Unlikely –** No suitable habitat present. No reported records near Proposed Project site.
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.

Table E2-1. Regional Special-Status Plants

Scientific Name	Common Name	Status	Blooming	Habitat	Likelihood of Occurrence
Cirsium fontinale* var. *obispoense	Chorro Creek bog thistle	FE, SE, 1B.2	Mar –Oct	Serpentine seeps and streams. < 350 m.	**DCPP: Unlikely –** No suitable habitat present. No reported records near Proposed Project site.
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.
Cirsium occidentale* var. *compactum	Compact cobwebby thistle	1B.2	Apr – Jun	Coastal Strand, Northern Coastal Scrub, Coastal Sage Scrub, Chaparral, Coastal Prairie within dunes	**DCPP: Unlikely –** No suitable habitat present. No reported records near Proposed Project site.
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.
Cirsium occidentale* var. *lucianum	Cuesta Ridge thistle	1B.2	Apr – Jul	Chaparral, woodland, or forest openings, often on serpentine. 500 – 750 m.	**DCPP: Unlikely –** Suitable habitat present. No reported records near Proposed Project site. Nearest records is located 15 miles to the east
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.
Cirsium rhothophilum	Surf thistle	ST 1B.2	Apr – Aug	Low, shifting dunes and bluffs. < 20 m.	**DCPP: Unlikely –** No suitable habitat present. No reported records near Proposed Project site.
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.

Table E2-1. Regional Special-Status Plants

Scientific Name	Common Name	Status	Blooming	Habitat	Likelihood of Occurrence
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.
Cirsium scariosum* var. *loncholepis	La Graciosa thistle	FE, ST, 1B.1	Apr – Jul	Marshes, dune wetlands. < 50 m.	**DCPP: Unlikely –** Suitable habitat present. Outside of geographical range of species. No reported records near Proposed Project site.
					PBR: Low– Marginal habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.
Cladium californicum	California saw-grass	2B.2	Jun –Sep	Generally alkaline marshes, swamps. < 2,150 m.	**DCPP: Unlikely –** No suitable habitat present. No reported records near Proposed Project site.
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.
Cladonia firma	Popcorn lichen	2B.1	n/a	On soil and detritus on stabilized sand dunes, in pure stands or intermixed with other lichens and mosses forming biotic soil crusts, covering areas up to several meters. 30-80 m.	**DCPP: Unlikely –** No suitable habitat present. No reported records near Proposed Project site.
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.
Clarkia speciosa* ssp. *immaculata	PBR clarkia	FE SR, 1B.2	May – Jul	On ancient sand dunes not far from the coast. Sandy soils; openings. 30-185 m. Chaparral,	**DCPP: Unlikely –** No suitable habitat present. No reported records near Proposed Project site.
					PBR: Low – Marginal habitat present. Several recent reported records near Proposed Project site.

Table E2-1. Regional Special-Status Plants

Scientific Name	Common Name	Status	Blooming	Habitat	Likelihood of Occurrence
				cismontane woodland, valley, and foothill grassland.	**SMVR-SB: Unlikely –** No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.
Clinopodium mimuloides	Monkey-flower savory	4.2	Jun - Oct	Moist places, stream banks, chaparral, woodland. 400 – 1,800 m.	**DCPP: Moderate –** Suitable habitat present. No reported records near Proposed Project site. Nearest records are 8 miles northeast of the Proposed Project site.
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.
Cordylanthus rigidus* ssp. *littoralis	Seaside bird's-beak	SE, 1B.1	Apr – Oct	Closed-cone coniferous forest, chaparral (maritime), cismontane woodland, coastal dunes, coastal scrub.	**DCPP: Unlikely –** No suitable habitat present. No reported records near Proposed Project site.
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.
Deinandra increscens* ssp. *villosa	Gaviota tarplant	FE, SE, 1B.1	Mar – Oct	Known from coastal terrace near Gaviota; sandy blowouts amid sandy loam soil; grassland/coast scrub ecotone. 10-430 m.	**DCPP: Unlikely –** Marginal habitat present. Outside of geographical range of the species. No reported records near Proposed Project site.
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.
Deinandra paniculata	Paniculate tarplant	4.2	May – Nov	Grassland, open chaparral and	**DCPP: Moderate –** Suitable habitat present. No reported records near Proposed Project site. Nearest records are 8 miles northeast of the Proposed Project site.

Table E2-1. Regional Special-Status Plants

Scientific Name	Common Name	Status	Blooming	Habitat	Likelihood of Occurrence
				woodland, disturbed areas, often in sandy soils. < 1,320 m.	**PBR: Moderate –** Suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.
Delphinium parryi* ssp. *blochmaniae	Dune larkspur	1B.2	Apr – May	Coastal chaparral, sand. < 200 m.	**DCPP: Unlikely –** No suitable habitat present. No reported records near Proposed Project site.
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.
Delphinium parryi* ssp. *eastwoodiae	Eastwood's larkspur	1B.2	Mar – May	Coastal chaparral, grassland, on serpentine. 100 – 500 m.	**DCPP: Unlikely –** No suitable habitat present. No reported records near Proposed Project site.
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.
Delphinium umbraculorum	Umbrella larkspur	1B.3	Apr – Jun	Shaded or sunny slopes in chaparral or woodland. 400 – 1,600 m.	**DCPP: Moderate –** Suitable habitat present. No reported records near Proposed Project site. Nearest records are 6 miles east of the Proposed Project site.
					PBR: Unlikely – No suitable habitat present. No reported records at Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.

Table E2-1. Regional Special-Status Plants

Scientific Name	Common Name	Status	Blooming	Habitat	Likelihood of Occurrence
Dithyrea maritima	Beach spectaclepod	ST 1B.1	Mar - Aug	Seashores, coastal sand dunes. < 50 m.	**DCPP: Unlikely –** No suitable habitat present. No reported records near Proposed Project site.
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.
Dudleya abramsii* ssp. *bettinae	Betty's dudleya	1B.2	May – Jul	Rocky outcrops in serpentine grassland. 50 –180 m.	**DCPP: Unlikely –** No suitable habitat present. No reported records near Proposed Project site.
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.
Dudleya abramsii* ssp. *murina	Mouse-gray dudleya	1B.3	Apr – Jun	Open, rocky slopes, often in shallow serpentine or clay–dominated soil. < 450 m.	**DCPP: Unlikely –** No suitable habitat present. No reported records near Proposed Project site.
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.
Dudleya blochmaniae* ssp. *blochmaniae	Blochman's dudleya	1B.1	Apr – Jun	Open, rocky slopes, often in shallow serpentine or clay–dominated soil. < 450 m.	**DCPP: Low–** Marginal habitat present. No reported records near Proposed Project site. Nearest records are located 14 miles east of the Proposed Project site.
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.

Table E2-1. Regional Special-Status Plants

Scientific Name	Common Name	Status	Blooming	Habitat	Likelihood of Occurrence
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.
Erigeron blochmaniae	Blochman's leafy daisy	1B.2	Jun – Oct	Sand dunes and hills, coastal dunes, and coastal scrub. < 70 m.	**DCPP: Unlikely –** No suitable habitat present. No reported records near Proposed Project site.
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Low – Marginal habitat present. A record located 1.3 miles east of the Proposed Project site.
					SMVR-SM: Low – Marginal habitat present. A record located 1.5 miles east of the Proposed Project site.
Eriodictyon altissimum	Indian Knob mountainbalm	FE, SE, 1B.1	Mar – Jun	Sandstone ridges and chaparral. < 270 m.	**DCPP: Unlikely –** No suitable habitat present. No reported records near Proposed Project site.
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.
Eriodictyon capitatum	Lompoc yerba santa	FE, SR, 1B.2	May - Aug	Sandy soils on terraces. Closed-cone coniferous forest, chaparral, coastal bluff scrub, oak woodland. 60-505 m.	**DCPP: Unlikely –** No suitable habitat present. Outside of geographical range of species. No reported records near Proposed Project site.
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.
Eryngium aristulatum* var. *hooveri	Hoover's button-celery	1B.1	July	Vernal pools and seasonal wetlands, occasionally alkaline. < 50 m.	**DCPP: Low –** Marginal habitat present. No reported records near Proposed Project site. Nearest records are located 8 miles east of the Proposed Project site.
					PBR: Low – Marginal habitat present. No reported records near Proposed Project site.

Table E2-1. Regional Special-Status Plants

Scientific Name	Common Name	Status	Blooming	Habitat	Likelihood of Occurrence
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.
Extriplex joaquinana	San Joaquin spearscale	1B.2	Apr –Sep	Alkaline soils. < 840 m.	**DCPP: Unlikely –** No suitable habitat present. No reported records near Proposed Project site.
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.
Fritillaria ojaiensis	Ojai fritillary	1B.2	Feb – May	Rocky slopes, river basins often in serpentine. 300 – 500 m.	**DCPP: Low –** Marginal habitat present. No reported records near Proposed Project site. Nearest record is located 7 miles northeast of the Proposed Project site.
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.
Horkelia cuneata* var. *puberula	Mesa horkelia	1B.1	Mar – Jul	Dry, sandy, coastal chaparral. 70 – 870 m.	**DCPP: Moderate** – Suitable habitat present. No reported records near Proposed Project site. Nearest record is located within 5 miles of the Proposed Project site.
					PBR: Low – Marginal habitat present. Historic record located adjacent to Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.
Horkelia cuneata* var. *sericea	Kellogg's horkelia	1B.1	Apr – Aug	Old dunes, coastal sand hills. < 200 m.	**DCPP: Unlikely –** No suitable habitat present. No reported records near Proposed Project site

Table E2-1. Regional Special-Status Plants

Scientific Name	Common Name	Status	Blooming	Habitat	Likelihood of Occurrence
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.
Lasthenia californica* ssp. *macrantha	Perennial goldfields	1B.2	Mar – Aug	Grassland, dunes along immediate coast. < 500 m.	**DCPP: Moderate –** Suitable habitat present. A record is located 3 miles north of the Proposed Project site.
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.
Lasthenia glabrata* ssp. *coulteri	Coulter's goldfields	1B.1	Apr – May	Saline places, vernal pools. < 1,000 m.	**DCPP: Low –** Marginal habitat present. A record is in Morro Bay 7 miles north of the Proposed Project site.
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.
Layia carnosa	Beach layia	FE, SE, 1B.1	Mar – Jul	Coastal dunes, coastal scrub (sandy). 0 – 60 m.	**DCPP: Unlikely –** No suitable habitat present. No reported records near Proposed Project site.
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.

Table E2-1. Regional Special-Status Plants

Scientific Name	Common Name	Status	Blooming	Habitat	Likelihood of Occurrence
Layia heterotricha	Pale-yellow layia	1B.1	Mar – Jun	Cismontane woodland, coastal scrub, pinyon and juniper woodland, valley and foothill grassland. 300 – 1705 m.	**DCPP: Unlikely –** No suitable habitat present. No reported records near Proposed Project site.
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.
Layia jonesii	Jones' layia	1B.2	Mar – May	Open serpentine or clayey slopes. < 300 m.	**DCPP: Moderate –** Suitable habitat present. A record is located 8 miles northeast of the Proposed Project site.
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.
Lupinus ludovicianus	San Luis Obispo County lupine	1B.2	Apr – Jul	Open, grassy areas on limestone, in oak woodland. 50–500 m.	**DCPP: Unlikely –** No suitable habitat present. No reported records near Proposed Project site
					PBR: Low – Suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.
Lupinus nipomensis	Nipomo Mesa lupine	FE, SE, 1B.1	Mar – May	Stable dunes. < 25 m.	**DCPP: Unlikely –** No suitable habitat present. No reported records near Proposed Project site
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.

Table E2-1. Regional Special-Status Plants

Scientific Name	Common Name	Status	Blooming	Habitat	Likelihood of Occurrence
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.
Malacothamnus gracilis	Slender bush-mallow	1B.1	May - Oct	Dry, rocky slopes. Chaparral 150-335 m.	**DCPP: Unlikely –** No suitable habitat present. No reported records near Proposed Project site
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.
Monardella palmeri	Palmer's monardella	1B.2	Jun – Aug	Chaparral and forest on serpentine. 200 – 800 m.	**DCPP: Unlikely –** No suitable habitat present. No reported records near Proposed Project site
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.
Monardella sinuata* ssp. *sinuata	Southern curly-leaved monardella	1B.2	Apr – Sep	Sandy soils, coastal strand, dune and sagebrush scrub, coastal chaparral, and oak woodland. < 300 m.	**DCPP: Moderate –** Suitable habitat present. No reported records near Proposed Project site. Nearest record is located 11 miles east near PBR Beach.
					PBR: Moderate – Suitable habitat present. Recent reported records near Proposed Project site. A historic record is located adjacent to site
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.
Monardella undulata* ssp. *crispa	Crisp monardella	1B.2	Apr – Nov	Active dunes. < 100 m.	**DCPP: Unlikely –** No suitable habitat present. No reported records near Proposed Project site
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.

Table E2-1. Regional Special-Status Plants

Scientific Name	Common Name	Status	Blooming	Habitat	Likelihood of Occurrence
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.
Monardella undulata* ssp. *undulata	San Luis Obispo monardella	1B.2	Apr – Sep	Stabilized dunes, coastal scrub, stabilized sandy soils. < 200 m.	**DCPP: Low –** Marginal habitat present. No reported records near Proposed Project site. Near records are located 13 miles to southeast in Grover Beach.
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No records in the vicinity Proposed Project site.
Monolopia gracilens	Woodland woollythreads	1B.2	Mar – Jul	Serpentine grassland, open chaparral, oak woodland. 100 – 1,200 m.	**DCPP: High –** Suitable habitat present. Record is located along access road within 3 miles of the Proposed Project site.
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
Muhlenbergia utilis	Aparejo grass	2B.2	Oct – Mar	Wet sites along streams, ponds. 250 – 1,000 m.	**DCPP: Moderate –** Suitable habitat present. Record is located along access road within 12 miles of the Proposed Project site.
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
Nasturtium gambelii	Gambel's water cress	FE, ST, 1B.1	May – Aug	Marshes, streambanks, lake margins. < 350 m.	**DCPP: Low–** Suitable habitat present. No reported records near Proposed Project site. Occurrences restricted to lakes within and south of the Oceano dunes

Table E2-1. Regional Special-Status Plants

Scientific Name	Common Name	Status	Blooming	Habitat	Likelihood of Occurrence
					PBR: Low – Marginal habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
Navarretia fossalis	Spreading navarretia	FT, 1B.1	Apr - Jun	Chenopod scrub, marshes and swamps (shallow freshwater), playas, vernal pools. 30 – 655 m.	**DCPP: Unlikely –** No suitable habitat present. No reported records near Proposed Project site.
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.
Nemacaulis denudata* var. *denudata	Coast woolly-heads	1B.2	Mar - Aug	Beaches, dune scrub. < 100 m.	**DCPP: Unlikely –** No suitable habitat present. No reported records near Proposed Project site.
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
Nemacladus secundiflorus* var. *robbinsii	Robbins' nemacladus	1B.2	Apr – Jun	Chaparral, valley and foothill grassland. 350 – 1700 m.	**DCPP: Unlikely –** No suitable habitat present. No reported records near Proposed Project site.
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.

Table E2-1. Regional Special-Status Plants

Scientific Name	Common Name	Status	Blooming	Habitat	Likelihood of Occurrence
Orobanche parishii* ssp. *brachyloba	Short-lobed broomrape	4.2	Apr - Oct	Sandy soil near beaches; reported to grow on *Isocoma menziesii* and other shrubs. 3-305 m.	**DCPP: Unlikely –** No suitable habitat present. No reported records near Proposed Project site.
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
Piperia michaelii	Michael's rein orchid	4.2	Apr –Aug	Generally dry sites, coastal scrub, woodland, and mixed–evergreen or closed-cone pine forest. < 700 m.	**DCPP: Moderate –** Suitable habitat present. Records are located within 5 mile of Proposed Project site at Montaña de Oro State Park.
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
Plagiobothrys uncinatus	Hooked popcornflower	1B.2	Apr – May	Chaparral, canyon sides, rocky outcrops; ± fire follower. 300 – 600 m.	**DCPP: Low –** Suitable habitat present. No reported records near Proposed Project site. Nearest record is located 15 miles northeast of the Proposed Project site.
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
Poa diaboli	Diablo Canyon blue grass	1B.2	Mar – Apr	Thin soils on Edna shale slopes, upper coastal scrub, live-oak woodland, Bishop pine forest, near coast. 120 – 400 m.	**DCPP: High –** Suitable habitat present. Records are located within 1 mile of Proposed Project site.
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.

Table E2-1. Regional Special-Status Plants

Scientific Name	Common Name	Status	Blooming	Habitat	Likelihood of Occurrence
					SMVR-SM: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
Sanicula hoffmannii	Hoffman's sanicle	4.3	Mar – May	Shrubby coastal hills, pine woodland. < 500 m.	**DCPP: Present –** Observed in a variety of upland habitats during surveys (PG&E, 2020; 2022a).
					PBR: Low – Suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
Sanicula maritima	Adobe sanicle	SR, 1B.1	Apr – May	Coastal, grassy, open wet meadows, ravines. ± 150 m.	**DCPP: Moderate –** Suitable habitat present. Records are located within 9 miles north of the Proposed Project site.
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
Scrophularia atrata	Black-flowered figwort	1B.2	Apr – Jul	Calcium, diatom–rich soils. Elevation < 400 m.	**DCPP: Moderate –** Suitable habitat present. Records are located within 7 miles east of the Proposed Project site.
					PBR: Present – Species was observed on site during surveys (PG&E, 2020).
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
Senecio aphanactis	Chaparral ragwort	2B.2	Feb – May	Alkaline flats, dry open rocky areas; 10 – 550 m.	**DCPP: High –** Suitable habitat present. Records are located within 7 miles east of the Proposed Project site.
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.

Table E2-1. Regional Special-Status Plants

Scientific Name	Common Name	Status	Blooming	Habitat	Likelihood of Occurrence
					SMVR-SM: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
Sidalcea hickmanii* ssp. *anomala	Cuesta Pass checkerbloom	1B.2	May – Jun	Closed-cone coniferous forest, chaparral. 600 – 800 m.	**DCPP: Unlikely –** No suitable habitat present. No reported records near Proposed Project site.
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.
Streptanthus albidus* ssp *peramoenus	Most beautiful jewelflower	1B.2	Apr - Sep	Serpentine outcrops, on ridges and slopes in Chaparral, valley and foothill grassland, cismontane woodland. 90-1040 m.	**DCPP: Unlikely –** No suitable habitat present. No reported records near Proposed Project site.
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
Suaeda californica	California seablite	FE 1B.1	Jul – Oct	Margins of coastal salt marshes. < 5 m.	**DCPP: Unlikely –** No suitable habitat present. No reported records near Proposed Project site.
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
Sulcaria isidiifera	Splitting yarn lichen	1B.1	n/a	On branches of oaks and shrubs in old growth coastal scrub. 20-55 m	**DCPP: Low –**Marginal suitable habitat present. No reported records near Proposed Project site. Nearest record is located 3 miles north of the Proposed Project site.
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.

Table E2-1. Regional Special-Status Plants

Scientific Name	Common Name	Status	Blooming	Habitat	Likelihood of Occurrence
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
Sulcaria spiralifera	Twisted horsehair lichen	1B.2	n/a	Coastal dunes	**DCPP: Unlikely –** No suitable habitat present. No reported records near Proposed Project site.
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records at Proposed Project site.
Symphyotrichum defoliatum	San Bernardino aster	1B.2	Jul – Nov	Grassland, disturbed places. < 2,050 m	**DCPP: Unlikely –** Suitable habitat present. No reported records near Proposed Project site. known range does not include coastal San Luis Obispo County.
					PBR: Low – Suitable habitat present. Reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
Trifolium hydrophilum	Saline clover	1B.2	Apr – Jun	Fresh or salt marshes, open areas in alkaline soils, vernal pools. < 300 m.	**DCPP: Moderate –** Suitable habitat present. Nearest record is located 4 miles of the Proposed Project site.
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
Tropidocarpum capparideum	Caper–fruited tropidocarpum	1B.1	Mar - Apr	Alkaline soils, low hills, valleys. < 400 m.	**DCPP: Unlikely –**Marginal habitat present. No reported records near Proposed Project site.

Table E2-1. Regional Special-Status Plants

Scientific Name	Common Name	Status	Blooming	Habitat	Likelihood of Occurrence
					PBR: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SB: Unlikely – No suitable habitat present. No reported records near Proposed Project site.
					SMVR-SM: Unlikely – No suitable habitat present. No reported records near Proposed Project site.

Sources: CCH, 2022; CDFW, 2022a; CDFW, 2022b; CNPS, 2022

Table E2-2. Regional Special-Status Wildlife (Terrestrial)

Scientific Name	Common Name	Status	Habitat	Likelihood of Occurrence
Invertebrates				
Bombus crotchii	Crotch's bumble bee	SA	Occurs in open grassland and scrub habitats in coastal California east to the Sierra-Cascade crest and south to Mexico. Nests in small burrows in the ground.	**DCPP: Low –** Suitable habitat present. Nearest recent record (2019) located near Highway 166 approximately 40 miles southeast of site.
				PBR: Low – Suitable habitat present. Nearest recent record (2019) located near Highway 166 approximately 26 miles east of site.
				SMVR-SB: Low – Marginal habitat present. Nearest recent record (2017) located along Santa Agueda Creek approximately 30 miles southeast of site.
				SMVR-SM: Low – Marginal habitat present. Nearest recent record (2017) located along Santa Agueda Creek approximately 30 miles southeast of site.
Branchinecta lynchi	Vernal pool fairy shrimp	FT	Endemic to the grasslands of the Central Valley, Central Coast mountains, and South Coast mountains, in small, clear-water sandstone-depression pools and grassed swales, earth slump, or basalt-flow depression pools.	**DCPP: Unlikely –** No suitable habitat present. Nearest recent record (2013) located east of Highway 101 approximately 11 miles east of site.
				PBR: Unlikely – No suitable habitat present. Nearest recent record (2013) located along edge of southeast San Luis Obispo approximately 7 miles north of site.
				SMVR-SB: Unlikely – No suitable habitat present. Nearest record (2006) located at Santa Maria Public Airport approximately 3 miles southeast of site.
				SMVR-SM: Unlikely – No suitable habitat present. Nearest record (2006) located at Santa Maria Public Airport approximately 3 miles south of site.

Table E2-2. Regional Special-Status Wildlife (Terrestrial)

Scientific Name	Common Name	Status	Habitat	Likelihood of Occurrence
***Danaus plexippus* pop. 1**	Monarch - California overwintering population	FC	Roosts located in wind-protected tree groves (eucalyptus, Monterey pine, cypress), with nectar and water sources nearby.	**DCPP: Low –** No suitable roosting habitat present; however, may occur during migration to nearby roosting sites. Nearest recent record (2014) located approximately 4 miles north near Montana de Oro State Park.
				PBR: High – Suitable roosting habitat present. Nearest recent record (2014) located along Price Canyon Road approximately 0.25-mile south of site.
				SMVR-SB: High – Suitable roosting habitat present in eucalyptus groves on site. Several records identified around Santa Maria within 5 miles of site.
				SMVR-SM: Low – No suitable roosting habitat present; however, may occur during migration to nearby roosting sites. Several records identified around Santa Maria within 5 miles of site.
Helminthoglypta walkeriana	Morro shoulderband (=banded dune) snail	FE	Restricted to the coastal strand in the immediate vicinity of Morro Bay. Inhabits the duff beneath *Haplopappus, Salvia, Dudleya*, and *Mesembryanthemum* within coastal dunes and coastal scrub.	**DCPP: Low –** No suitable habitat present and site is outside of known geographical range of the species. Several recent records located in and around Montana de Oro State Park within 10 miles north of site.
				PBR: Unlikely – No suitable habitat present and site is outside of known geographical range of the species. Nearest recent records located in and around Montana de Oro State Park approximately 17 miles northwest of site.
				SMVR- SB: Unlikely – No suitable habitat present and site is outside of geographical range of the species. Nearest recent records located in and around Montana de Oro State Park over 30 miles northwest of site.

Table E2-2. Regional Special-Status Wildlife (Terrestrial)

Scientific Name	Common Name	Status	Habitat	Likelihood of Occurrence
				SMVR-SM: Unlikely – No suitable habitat present and site is outside of geographical range of the species. Nearest recent records located in and around Montana de Oro State Park over 30 miles northwest of site.
Fish				
Gasterosteus aculeatus williamsoni	Unarmored three spine stickleback	FE, SE, FP	Requires cool (<24 C), clear water with abundant vegetation in backwaters, and among emergent vegetation at the stream edge in small Southern California streams.	**DCPP: Unlikely –** Suitable habitat present. No recorded records within the vicinity of the Proposed Project site. Nearest record is in San Antonio Creek, Vandenberg on Airforce Base 30 miles south.
				PBR: Unlikely – N No suitable habitat present. No recorded records within the vicinity of the Proposed Project site.
				SMVR-SB: Unlikely – No suitable habitat present. No recorded records within the vicinity of the Proposed Project site.
				SMVR-SM: Unlikely – No suitable habitat present. No recorded records within the vicinity of the Proposed Project site.
Gila orcuttii	Arroyo chub	SSC	Require slow water stream sections with mud or sand bottoms. Feeds heavily on aquatic vegetation and associated invertebrates. Native to streams from Malibu Creek to San Luis Rey River basin. Introduced into streams in Santa Clara, Ventura, Santa Ynez, Mojave, and San Diego River basins.	**DCPP: Unlikely –** Suitable habitat present in Diablo Creek. Proposed Project site at the northern extent of the species range. No recorded records within the vicinity of the Proposed Project site.
				PBR: Unlikely – No suitable habitat present. No recorded records within the vicinity of the Proposed Project site.
				SMVR-SB: Unlikely – No suitable habitat present. No recorded records within the vicinity of the Proposed Project site.

Table E2-2. Regional Special-Status Wildlife (Terrestrial)

Scientific Name	Common Name	Status	Habitat	Likelihood of Occurrence
				SMVR-SM: Unlikely – No suitable habitat present. No recorded records within the vicinity of the Proposed Project site.
***Oncorhynchus mykiss irideus* pop. 9**	Steelhead - south-central California coast DPS	FT	DPS includes naturally spawned anadromous steelhead originating below natural and manmade impassable barriers from the Pajaro River to the Santa Maria River.	**DCPP: Present –** Suitable habitat present in Diablo Creek. Species observed during surveys in 2020 (PG&E, 2020).
				PBR: Unlikely – No suitable habitat present. The species is documented to occur in PBR Creek adjacent to the Proposed Project site.
				SMVR-SB: Unlikely – No suitable habitat present. No recorded records within the vicinity of the Proposed Project site.
				SMVR-SM: Unlikely – No suitable habitat present. No recorded records within the vicinity of the Proposed Project site.
Amphibians				
***Ambystoma californiense* pop. 2**	California tiger salamander - Santa Barbara County DPS	FE, ST, WL	Lives in vacant or mammal-occupied burrows throughout most of the year; in grassland, savanna, or open woodland habitats. Need underground refuges, especially ground squirrel burrows, and vernal pools or other seasonal water sources for breeding.	**DCPP: Low –** Not observed during habitat assessments (PG&E, 2022b). Marginal aquatic and upland habitat present at Diablo Creek and suitable aquatic and upland habitat present at Tom's Pond. Nearest record located approximately 25 miles southeast in Santa Maria, but large data gap in Project area.
				PBR: Unlikely – No suitable aquatic or upland habitat present and site is outside of known geographic range of the species. Nearest records located around Santa Maria approximately 19 miles south of site.

Table E2-2. Regional Special-Status Wildlife (Terrestrial)

Scientific Name	Common Name	Status	Habitat	Likelihood of Occurrence
				SMVR-SB: Low – No suitable aquatic habitat and marginal upland habitat present. Intensive disturbance between site and source populations inhibits dispersal. Not observed during 2021 reconnaissance surveys. Nearest known breeding pond (GUAD-3) located approximately 1 mile southeast of site (PG&E, 2022c).
				SMVR-SM: Low – No suitable aquatic habitat and marginal upland habitat present. Intensive disturbance between site and source populations inhibits dispersal. Not observed during 2021 reconnaissance surveys. Nearest known breeding pond (SAMA-2) located approximately 3 miles south of site (PG&E, 2022d).
Anaxyrus californicus	Arroyo toad	FE, SSC	Rivers with sandy banks, willows, cottonwoods, and sycamores; loose, gravelly areas of streams in valley-foothill and desert riparian, and desert wash habitats	**DCPP: Unlikely –** No suitable habitat present and site is outside of the known geographic range of the species. Nearest record (1992) located along the Santa Maria River approximately 45 miles southeast of site.
				PBR: Unlikely – No suitable habitat present and site is outside of the known geographic range of the species. Nearest record (1992) located along the Santa Maria River approximately 26 miles southeast of site.
				SMVR-SB: Unlikely – No suitable habitat present. Nearest record (1992) located along the Santa Maria River approximately 12 miles east of site.
				SMVR-SM: Unlikely – No suitable habitat present. Nearest record (1992) located along the Santa Maria River approximately 10 miles southeast of site.

Table E2-2. Regional Special-Status Wildlife (Terrestrial)

Scientific Name	Common Name	Status	Habitat	Likelihood of Occurrence
Batrachoseps minor	Lesser slender salamander	SSC	Endemic to California where it occurs in chaparral and woodlands along the southern end of the Coast Ranges.	**DCPP: Low –** Suitable habitat present. Nearest recent records are located approximately 18 miles northeast on the Los Padres National Forest (2008) and approximately 26 miles east along Trout Creek. Although no known records within 10 miles of the site, the record near Hi Mountain Campground may represent a southern expansion of the current range.
				PBR: Unlikely – Marginal habitat present and site is outside of known geographic range of the species. Nearest recent record (2020) located along Trout Creek approximately 15 miles northeast of site.
				SMVR-SM: Unlikely – No suitable habitat present and site is outside of the known geographic range of the species.
				SMVR-SB: Unlikely – No suitable habitat present and site is outside of the known geographic range of the species.
Rana boylii	Foothill yellow-legged frog	SE, SSC	Partly shaded, shallow streams and riffles with a rocky substrate in a variety of habitats. Needs at least some cobble-sized substrate for egg-laying. Needs at least 15 weeks to attain metamorphosis.	**DCPP: Unlikely –** No suitable habitat present. Nearest records occur along Reservoir Canyon approximately 13 miles east of the site; however, these populations are presumed extirpated.
				PBR: Unlikely – No suitable habitat present. Nearest record is located along Arroyo Grande Creek approximately 6 miles east of the site; however, records indicate that the species is extirpated.
				SMVR-SB: Unlikely – No suitable habitat present. Nearest record (1940) is located along Alamo Creek approximately 14 miles northeast of site; however, records indicate that the species is extirpated.

Table E2-2. Regional Special-Status Wildlife (Terrestrial)

Scientific Name	Common Name	Status	Habitat	Likelihood of Occurrence
				SMVR-SB: Unlikely – No suitable habitat present. Nearest record (1940) is located along Alamo Creek approximately 11 miles northeast of site; however, records indicate that the species is extirpated.
Rana draytonii	California red-legged frog	FT, SSC	Lowlands and foothills in or near sources of water with shrubby or emergent riparian vegetation. Requires 11-20 weeks of permanent water for larval development. Must have access to estivation habitat	**DCPP: Present –** Species observed within Diablo Creek at outlet pool culvert of 230 kV yard and Tom's Pond during surveys (PG&E 2020; 2022e). Suitable breeding habitat present in Diablo Creek and suitable aestivation sites present throughout vegetated upland areas.
				PBR: High – Suitable breeding and upland habitat present. Nearest record (2005) located adjacent to PBR Creek just over 1 mile north of site.
				SMVR-SB: Low – No suitable breeding habitat present and marginal upland aestivation habitat present. Multiple records located within 1-mile of the Proposed Project site.
				SMVR-SM: High – No suitable breeding habitat present. Suitable upland aestivation habitat present. Recent record located within 0.2-miles of the Proposed Project site in Hobbs Basin.
Spea hammondii	Western spadefoot	SSC	Occurs primarily in grassland habitats but can be found in valley-foothill hardwood woodlands. Vernal pools are essential for breeding and egg-laying.	**DCPP: Unlikely –** Nearest recent record (2017) located approximately 30 miles southeast near Suey Creek. Suitable breeding habitat is not present.
				PBR: Unlikely – North of known range Marginal habitat present. No records present within the vicinity of the Proposed Project site.
				SMVR-SB: Low – No suitable breeding habitat present and marginal upland habitat present. Nearest recent record (2019) located along foothills of the Casmalia Hills approximately 2 miles south of site.

Table E2-2. Regional Special-Status Wildlife (Terrestrial)

Scientific Name	Common Name	Status	Habitat	Likelihood of Occurrence
				SMVR-SM: Low – Marginal aquatic habitat located adjacent to site and marginal upland habitat present at site. Nearest record (2011) located east of Highway 101 approximately 3.5 miles southeast of site.
Taricha torosa	Coast Range newt	SSC	Lives in terrestrial habitats and will migrate over 1 km to breed in ponds, reservoirs, and slow-moving streams.	**DCPP: Low –** Suitable breeding habitat present in Diablo Creek and suitable aestivation sites present in adjacent upland habitat; however, nearest record (2003) located near Water Canyon approximately 16 miles northeast of site. Not observed during surveys.
				PBR: Unlikely – No suitable breeding habitat present and marginal upland habitat present adjacent to PBR Creek. Nearest record (2003) located near Water Canyon approximately 14.5 miles north of site. Not observed during surveys.
				SMVR-SB: Unlikely – No suitable habitat present and site is outside of known geographic range of the species. No records within 10 miles of site.
				SMVR-SM: Unlikely – No suitable habitat present and site is outside of known geographic range of the species. No records within 10 miles of site.
Reptiles				
Anniella pulchra	California legless lizard	SSC	Sandy or loose loamy soils with a high moisture content under sparse vegetation in chaparral, coastal dunes, and coastal scrub.	**DCPP: High –** Suitable habitat present. Nearest recent record (2020) located approximately 3 miles upstream in Diablo Canyon. Several additional records within 10 miles of site.
				PBR: High – Suitable habitat present. Nearest recent record (2018) located in unnamed canyon approximately 1 mile northeast of site.

Table E2-2. Regional Special-Status Wildlife (Terrestrial)

Scientific Name	Common Name	Status	Habitat	Likelihood of Occurrence
				SMVR-SB: High – Suitable habitat is present in areas with loose soils. Multiple records located within 10 miles with nearest record (1986) located near Guadalupe Lake approximately 1 mile southeast of site.
				SMVR-SB: High – Suitable habitat is present in areas with loose soils. Multiple records located within 10 miles with nearest record (2010) located near Black Road approximately 1 mile west of site.
Emys marmorata	Western pond turtle	SSC	Perennial ponds, marshes, rivers, streams, and irrigation ditches, usually with aquatic vegetation and basking sites, below 6,000 feet elevation. Needs basking sites and suitable (sandy banks or grassy open fields) upland habitat up to 0.5 km from water for egg-laying.	**DCPP: Moderate –** Not observed during surveys; however, suitable habitat is present in Diablo Creek. Nearest recent record (2004) located along Islay Creek approximately 4 miles north of site.
				PBR: High – Suitable aquatic habitat adjacent to site and suitable upland habitat present at site. Nearest records located along PBR Creek immediately adjacent to site.
				SMVR-SB: Low – No suitable aquatic habitat and marginal upland aestivation and egg laying sites present. Nearest record (1995) located near Black Road approximately 1 mile southeast of site.
				SMVR-SB: High – Suitable aquatic habitat located adjacent to site and suitable upland aestivation and egg laying sites present. Nearest record (1995) located near Black Road approximately 2 miles southwest of site.
Phrynosoma blainvillii	Coast horned lizard	SSC	Most common in lowlands along sandy washes with scattered low bushes. Open areas for sunning, bushes for cover, loose soil for burial, and native ants for diet.	**DCPP: High –** Suitable habitat is present. Nearest recent record (2021) located north of Diablo Canyon Road approximately 2 miles southeast of site.
				PBR: Unlikely – No suitable habitat present. Nearest recent record (2020) located in Newsom Canyon approximately 5.5 miles east of site.

Table E2-2. Regional Special-Status Wildlife (Terrestrial)

Scientific Name	Common Name	Status	Habitat	Likelihood of Occurrence
				SMVR-SB: Low – Marginal habitat present. Nearest recent record (2021) located near intersection of Betteravia Road and Highway 101 approximately 5.5 miles east of site.
				SMVR-SM: Low – Marginal habitat present. Nearest recent record (2021) located near intersection of Betteravia Road and Highway 101 approximately 3 miles southeast of site.
Thamnophis hammondii	Two-striped gartersnake	SSC	Highly aquatic, found in or near permanent fresh water. Often along streams with rocky beds and riparian growth from sea level to about 2,150 m elevation.	**DCPP: Moderate –** Suitable habitat present along Diablo Creek and Drainage 1 at site. Nearest recent record (2019) located near Edna Ranch Road approximately 16 miles east of site.
				PBR: Moderate – Suitable aquatic habitat present along PBR Creek. Nearest recent record (2019) located near Edna Ranch approximately 6 miles northeast of site.
				SMVR-SB: Unlikely – No suitable habitat present. Nearest record (2008) located north of Guadalupe-Nipomo Dunes Preserve approximately 8 miles northwest of site.
				SMVR-SM: Low – Marginal habitat present adjacent to site. Nearest record (2008) located north of Guadalupe-Nipomo Dunes Preserve approximately 10 miles northwest of site.
Birds				
Agelaius tricolor	Tricolored blackbird	SSC	Needs nest sites near open, fresh water, protected habitat (such as cattails or tall rushes), and suitable feeding areas (e.g., pastures, rice fields, or grassland).	**DCPP: Unlikely (Nesting)/Unlikely (Foraging) –** No suitable nesting and marginal foraging habitat present. Nearest recent record (2020) located near See Canyon Road approximately 8 miles southeast of site.

Table E2-2. Regional Special-Status Wildlife (Terrestrial)

Scientific Name	Common Name	Status	Habitat	Likelihood of Occurrence
				PBR: Unlikely (Nesting)/Unlikely (Foraging) – No suitable habitat present. Nearest record (1996) located off Corbett Canyon Road approximately 4 miles northeast of site.
				SMVR- SB: Unlikely (Nesting)/Unlikely (Foraging) – No suitable nesting or foraging habitat present. Nearest recent record (2021) located near Black Road and Highway 101 approximately 2.5 miles south of site.
				SMVR-SM: Unlikely (Nesting)/Low (Foraging) – No suitable nesting habitat and marginal foraging habitat present. Nearest recent record (2021) located near Black Road and Highway 101 approximately 4 miles south of site.
Aquila chrysaetos	Golden eagle	FP, WL, BCC	Semi-open and open habitats including tundra, open coniferous forest, and grasslands. Common in mountain areas but also found around wetlands and estuarine areas. Very large nests commonly on cliff edges.	**DCPP: Unlikely (Nesting)/High (Foraging) –** Suitable nesting habitat is not present; however, suitable foraging habitat occurs throughout the general area. Nearest recent record (2016) identified a foraging individual located at western end of Crowbar Canyon approximately 1 mile north of site.
				PBR: Unlikely (Nesting)/Low (Foraging) – No suitable breeding habitat and marginal foraging habitat present. No nesting records within 10 miles of site.
				SMVR-SB: Unlikely (Nesting)/Low (Foraging) – No suitable nesting habitat present. Suitable foraging habitat present. No nesting records within 10 miles of site.
				SMVR-SM: Unlikely (Nesting)/Low (Foraging) – No suitable nesting habitat present. Suitable foraging habitat present. No nesting records within 10 miles of site.

Table E2-2. Regional Special-Status Wildlife (Terrestrial)

Scientific Name	Common Name	Status	Habitat	Likelihood of Occurrence
Asio otus	Long-eared owl	SSC	May be found breeding along the Pacific in southern California to Mexico. Much more broadly distributed across North America during the non-breeding season. Nests in dense conifer, oak, riparian, pinyon-juniper, and desert woodlands that are either open or adjacent to foraging habitat that includes grasslands, meadows, or shrublands.	**DCPP: Low (Nesting)/Low (Foraging) -** Marginal nesting and foraging habitat present. Nearest recent record (2016) located near Pozo approximately 21 miles northeast of site.
				PBR: Low (Nesting)/Low (Foraging) – Marginal nesting and foraging habitat present. Nearest recent record (2016) located in Garcia Mountains approximately 16 miles northeast of site.
				SMVR-SB: Unlikely (Nesting)/Unlikely (Foraging) – No suitable nesting or foraging habitat present. Nearest recent record (2017) located in the Caliente Range approximately 36 miles northeast of site.
				SMVR-SM: Unlikely (Nesting)/Unlikely (Foraging) – No suitable nesting or foraging habitat present. Nearest recent record (2017) located in the Caliente Range approximately 32.5 miles northeast of site.
Athene cunicularia	Burrowing owl	SSC, BCC	Open, dry annual, or perennial grasslands, deserts, and scrublands with low-growing vegetation. Subterranean nester. Dependent on the presence of California ground squirrel burrows.	**DCPP: Unlikely (Nesting)/High (Overwintering) –** Nearest recent records (2015, 2016) identified overwintering individuals located near Pecho Valley Road approximately 1 mile northwest. No nesting records within 10 miles of site. Suitable overwintering habitat present.
				PBR: Unlikely (Nesting)/Moderate (Overwintering) – No suitable habitat present. Nearest recent record (2013) located near Tank Farm Road approximately 7 miles north of site.
				SMVR-SB: Unlikely (Nesting)/High (Overwintering) – Suitable over wintering habitat present. Recent record located 1 mile east of the Proposed Project site.

Table E2-2. Regional Special-Status Wildlife (Terrestrial)

Scientific Name	Common Name	Status	Habitat	Likelihood of Occurrence
				SMVR-SM: Unlikely (Nesting)/High (Overwintering) – Suitable over wintering habitat present. Recent records located 2 mile west of the Proposed Project site.
Botaurus lentiginosus	American bittern	SA	Uncommon and local in marshes. In winter, moves to areas where water bodies do not freeze, especially near the coast where they may occasionally use brackish marshes.	**DCPP: Unlikely (Nesting)/Unlikely (Wintering) -** No suitable nesting or wintering habitat present. Nearest recent record (2022) located at Oso Flaco Lake approximately 18 miles southeast of the site.
				PBR: Unlikely (Nesting)/Unlikely (Wintering) – No suitable nesting or wintering habitat present. Nearest recent record (2022) located at Oso Flaco Lake approximately 12 miles east of site.
				SMVR-SB: Unlikely (Nesting)/Unlikely (Wintering) – No suitable nesting or wintering habitat present. Nearest recent record (2022) located at Oso Flaco Lake approximately 10 miles northwest of site.
				SMVR-SM: Unlikely (Nesting)/Unlikely (Wintering) – No suitable nesting or wintering habitat present. Nearest recent record (2022) located at Oso Flaco Lake approximately 11 miles northwest of site.
Brachyramphus marmoratus	Marbled murrelet	FT, SE	Breeds in coniferous forests near the coast where it nests high in treetops. Winters at sea.	**DCPP: Unlikely (Nesting)/Unlikely (Wintering) –** No nesting habitat present. Nearest recent record (2021) located in winter near Spyglass Ridge approximately 11 miles southeast of site.
				PBR: Unlikely (Nesting)/Unlikely (Wintering) – No nesting habitat present. Nearest recent record (2021) located in winter approximately 2 miles northeast of site.
				SMVR-SB: Unlikely (Nesting)/Unlikely (Wintering) – No suitable habitat present and site is outside of the known geographic range of the species. No records within 10 miles of site.

Table E2-2. Regional Special-Status Wildlife (Terrestrial)

Scientific Name	Common Name	Status	Habitat	Likelihood of Occurrence
				SMVR-SM: Unlikely (Nesting)/Unlikely (Wintering) – No suitable habitat present and site is outside of the known geographic range of the species. No records within 10 miles of site.
Buteo swainsoni	Swainson's hawk	ST, BCC	Breeds in grasslands with scattered trees, juniper-sage flats, riparian areas, savannahs, and agricultural or ranch lands with groves or lines of trees. Prefers agricultural areas for foraging.	**DCPP: Unlikely (Nesting)/Unlikely (Foraging) –** Site is located outside of the current breeding range of the species and no suitable habitat present. Nearest recent record (2022) located near California Polytechnic State University approximately 12 miles northeast of site.
				PBR: Unlikely (Nesting)/Unlikely (Foraging) – Site is located outside of the current breeding range of the species and no suitable habitat present. Nearest recent record (2022) located near California Polytechnic State University approximately 11 miles north of site.
				SMVR-SB: Unlikely (Nesting)/Unlikely (Foraging) – Site is located outside of the current breeding range of the species and no suitable habitat present. Nearest recent record (2021) located near New Cuyama approximately 46 miles east of site.
				SMVR-SM: Unlikely (Nesting)/Unlikely (Foraging) – Site is located outside of the current breeding range of the species and no suitable habitat present. Nearest recent record (2021) located near New Cuyama approximately 43 miles east of site.
Charadrius nivosus nivosus	Western snowy plover	FT, SSC, BCC	Sandy beaches, salt pond levees, and shores of large alkali lakes. Needs sandy, gravelly, or friable soils for nesting. Forage on invertebrates in wet sand and edges of salt marshes, salt ponds, and lagoons.	**DCPP: Unlikely (Nesting)/Unlikely (Foraging) –** No suitable breeding or foraging habitat present. Nearest recent record (2016) located along the Morro Bay shoreline approximately 6 miles north of site.

Table E2-2. Regional Special-Status Wildlife (Terrestrial)

Scientific Name	Common Name	Status	Habitat	Likelihood of Occurrence
				PBR: Unlikely (Nesting)/Unlikely (Foraging) – No suitable breeding or foraging habitat present. Nearest recent record (2016) located along the shoreline of PBR Beach approximately 1 mile southwest of site.
				SMVR-SB: Unlikely (Nesting)/Unlikely (Foraging) – No suitable breeding or foraging habitat present. Nearest recent record (2016) located along the shoreline of Oceano Dunes State Vehicular Recreational Area approximately 10 miles northwest of site.
				SMVR-SM: Unlikely (Nesting)/Unlikely (Foraging) – No suitable breeding or foraging habitat present. Nearest recent record (2016) located along the shoreline of Oceano Dunes State Vehicular Recreational Area approximately 11 miles northwest of site.
Circus hudsonius	Northern harrier	SSC	Prefers open country, grasslands, steppes, wetlands, meadows, agricultural fields. Roosts and nests on the ground in shrubby vegetation often at the edges of marshes. Permanent resident of coastal areas in California.	**DCPP: Unlikely (Nesting)/Moderate (Foraging) –** No suitable nesting habitat and suitable foraging habitat present. Nearest recent record (2021) located near Corallina Cove approximately 4 miles northwest of site. Site is outside of the
				PBR: Unlikely (Nesting)/Moderate (Foraging) – No suitable nesting habitat and suitable foraging habitat present. Nearest recent record (2021) located within the PBR Dunes Natural Preserve located approximately 3 miles south of site.
				SMVR-SB: Unlikely (Nesting)/Moderate (Foraging) – No suitable nesting habitat and suitable foraging habitat present. Nearest recent record (2022) located along Bull Canyon Road approximately 8 miles northeast of site.

Table E2-2. Regional Special-Status Wildlife (Terrestrial)

Scientific Name	Common Name	Status	Habitat	Likelihood of Occurrence
				SMVR-SM: Unlikely (Nesting)/Moderate (Foraging) – No suitable nesting habitat and suitable foraging habitat present. Nearest recent record (2022) located along Bull Canyon Road approximately 5 miles northeast of site.
Coccyzus americanus occidentalis	Western yellow-billed cuckoo	FT, SE, BCC	Dense woodlands and low foliage near slow moving water bodies. Forages in cottonwood trees and builds nests in trees and shrubs. Current CA range limited to Sacramento and Kern Rivers.	**DCPP: Unlikely (Nesting)/Unlikely (Foraging) –** No suitable breeding or foraging habitat present. Site is outside of current known range for the species. No recent records within 10 miles of site.
				PBR: Unlikely (Nesting)/Unlikely (Foraging) – No suitable breeding or foraging habitat present. Site is outside of current known range for the species. No recent records within 10 miles of site.
				SMVR-SB: Unlikely (Nesting)/Unlikely (Foraging) – No suitable breeding or foraging habitat present. Site is outside of current known range for the species. No recent records within 10 miles of site.
				SMVR-SM: Unlikely (Nesting)/Unlikely (Foraging) – No suitable breeding or foraging habitat present. Site is outside of current known range for the species. No recent records within 10 miles of site.
Elanus leucurus	White-tailed kite	FP	Open grasslands, meadows, or marshes for foraging close to isolated, dense-topped trees for nesting and perching.	**DCPP: Moderate (Nesting)/Moderate (Foraging) –** Suitable breeding and foraging habitat present. Nearest record (1997) located near Camp San Luis Obispo approximately 10 miles northeast of site.
				PBR: Unlikely (Nesting)/Low (Foraging) - No suitable breeding habitat present. Suitable foraging habitat present. Nearest recent record (2017) located near Islay Hill Park located approximately 7 miles north of site.

Table E2-2. Regional Special-Status Wildlife (Terrestrial)

Scientific Name	Common Name	Status	Habitat	Likelihood of Occurrence
				SMVR-SB: Unlikely (Nesting)/High (Foraging) – No suitable nesting habitat present. Suitable foraging habitat present. No nesting records in the vicinity of the Proposed Project site. Multiple foraging observation within the vicinity of the Proposed Project.
				SMVR-SM: Unlikely (Nesting)/High (Foraging) – No suitable nesting habitat present. Suitable foraging habitat present. No nesting records in the vicinity of the Proposed Project site. Multiple foraging observation within the vicinity of the Proposed Project.
Empidonax traillii extimus	Southwestern willow flycatcher	FE, SE		**DCPP: Unlikely (Nesting)/Unlikely (Foraging) –** Nearest record (1989) located along the Santa Ynez River over 50 miles southeast of site. Marginal breeding and foraging habitat present.
				PBR: Unlikely (Nesting)/Unlikely (Foraging) – Marginal breeding and foraging habitat present along PBR Creek adjacent to site. Nearest record (1989) located along the Santa Ynez River approximately 43 miles southeast of site.
				SMVR-SB: Unlikely (Nesting)/Unlikely (Foraging) -
				SMVR-SM: Unlikely (Nesting)/Unlikely (Foraging)
Falco peregrinus anatum	American peregrine falcon	FP	Found near water, forages for shorebirds and ducks on shorelines and mudflats. Nests on buildings, water towers, cliffs, power pylons, and other tall structures.	**DCPP: Present –** Species observed perched north of Diablo Creek at site (PG&E, 2020). Suitable terrestrial breeding habitat present along adjacent cliffs; however, suitable foraging habitat present throughout site and surrounding open space.

Table E2-2. Regional Special-Status Wildlife (Terrestrial)

Scientific Name	Common Name	Status	Habitat	Likelihood of Occurrence
				PBR: Unlikely (Nesting)/Moderate (Foraging) – No suitable breeding habitat present. Suitable foraging habitat present. Nearest recent record (2013) located along the shore near Guadalupe Nipomo Dunes Preserve approximately 12 miles south of site.
				SMVR-SB: Unlikely (Nesting)/High (Foraging) – No suitable nesting habitat present. Suitable foraging habitat present. No nesting records in the vicinity of the Proposed Project site. Multiple foraging observation within the vicinity of the Proposed Project.
				SMVR-SM: Unlikely (Nesting)/High (Foraging) – No suitable nesting habitat present. Suitable foraging habitat present. No nesting records in the vicinity of the Proposed Project site. Multiple foraging observation within the vicinity of the Proposed Project.
Gymnogyps californianus	California condor	FE, SE, FP	Nests in caves, crevices, behind rock slabs, or on large ledges on high sandstone cliffs. Requires vast expanses of open savannah, grasslands, and foothill chaparral with cliffs, large trees and snags for roosting.	**DCPP: Unlikely (Nesting)/Low (Foraging) –** No suitable breeding habitat present. May occur as a rare forager in open space areas surrounding site. Nearest recent record (2018) located at Laguna Lake Park Open Space approximately 10 miles northeast of site.
				PBR: Unlikely (Nesting)/Low (Foraging) – No suitable breeding habitat present. May occur as a rare forager in open spaces around site. Nearest recent record (2018) located at Laguna Lake Park Open Space approximately 9 miles north of site.
				SMVR-SB: Unlikely (Nesting)/Low (Foraging)
				SMVR-SM: Unlikely (Nesting)/Low (Foraging)

Table E2-2. Regional Special-Status Wildlife (Terrestrial)

Scientific Name	Common Name	Status	Habitat	Likelihood of Occurrence
Haliaeetus leucocephalus	Bald eagle	SE, FP	Habitat includes rivers and lakes with adjacent woodlands. Large bodies of water are always associated with breeding populations.	**DCPP: Unlikely (Nesting)/Moderate (Foraging) –** No suitable breeding habitat present; however, may forage throughout the general area. Several recent records located along southern shore of Morro Bay less than five miles from site.
				PBR: Unlikely (Nesting)/Low (Foraging) – No suitable breeding or foraging habitat present. Nearest recent record (2022) located at Lopez Lake approximately 10 miles northeast of site.
				SMVR-SB: Unlikely (Nesting)/Low (Foraging)
				SMVR-SM: Unlikely (Nesting)/Low (Foraging)
Lanius ludovicianus	Loggerhead shrike	SSC BCC	Broken woodlands, savannah, pinyon-juniper, Joshua tree, and riparian woodlands, desert oases, scrub and washes. Prefers open country for hunting, with perches for scanning, and dense shrubs and brush for nesting.	**DCPP: Low (Nesting)/Moderate (Foraging) –** Marginal nesting habitat present; however, may forage throughout the general region. Nearest recent record (2019) located in Los Osos Valley approximately 8 miles northeast of site.
				PBR: Low (Nesting)/Moderate (Foraging) – No suitable breeding habitat present; however, may forage throughout the general region. Nearest recent record (2021) located near PBR Dunes Natural Preserve approximately 4.5 miles south of site.
				SMVR-SB: Low (Nesting)/Moderate (Foraging) – Marginal breeding and foraging habitat present. Several recent breeding season records are located within 5 miles of the Proposed Project site.
				SMVR-SM: Low (Nesting)/Moderate (Foraging) – Marginal breeding and foraging habitat present. Several recent breeding season records are located within 3 miles of the Proposed Project site.

Table E2-2. Regional Special-Status Wildlife (Terrestrial)

Scientific Name	Common Name	Status	Habitat	Likelihood of Occurrence
Laterallus jamaicensis coturniculus	California black rail	FE, SE, BCC	Inhabits freshwater marshes, wet meadows and shallow margins of saltwater marshes bordering larger bays. Needs water depths of about 1 inch that do not fluctuate during the year and dense vegetation for nesting habitat.	**DCPP: Unlikely (Nesting)/Unlikely (Foraging) –** No suitable habitat present. Nearest record (2009) located along southern shoreline of Morro Bay approximately 8 miles north of site.
				PBR: Unlikely (Nesting)/Unlikely (Foraging) – No suitable habitat present. Nearest record (1966) located around several lakes adjacent to PBR Dunes Natural Preserve located approximately 5.5 miles south of site. No recent records within 10 miles of site.
				SMVR-SB: Unlikely (Nesting)/Unlikely (Foraging) – No suitable breeding or foraging habitat present. No recent record located within the vicinity of the Proposed Project site.
				SMVR-SM: Unlikely (Nesting)/Unlikely (Foraging) – No suitable breeding or foraging habitat present. No recent record located within the vicinity of the Proposed Project site.
Pelecanus occidentalis	Brown pelican	FP	Estuarine, marine subtidal, and marine pelagic waters along the California coast. Breeds on the Channel Islands.	**DCPP: Present –** Species observed flying along the coastal bluffs immediately adjacent to site during surveys (PG&E, 2020). Site is outside of known breeding range and marginal foraging habitat present.
				PBR: Unlikely (Nesting)/Unlikely (Foraging) – No suitable nesting or foraging habitat present. Nearest recent record (2016) located in foothills adjacent to Spyglass Ridge approximately 3 miles northwest of site. May be observed at site during flight.
				SMVR-SB: Unlikely (Nesting)/Unlikely (Foraging) – No suitable breeding or foraging habitat present. No recent record located within the vicinity of the Proposed Project site.

Table E2-2. Regional Special-Status Wildlife (Terrestrial)

Scientific Name	Common Name	Status	Habitat	Likelihood of Occurrence
				SMVR-SM: Unlikely (Nesting)/Unlikely (Foraging) – No suitable breeding or foraging habitat present. No recent record located within the vicinity of the Proposed Project site.
Progne subis	Purple martin	SSC	Summer resident, breeding in low-elevation coniferous forests and woodlands. Nests in cavities of trees or manmade structures.	**DCPP: Unlikely (Nesting)/Unlikely (Foraging) –** No suitable nesting or foraging habitat present. Nearest record (2003) located near Trout Creek approximately 19 miles northeast of site.
				PBR: Unlikely (Nesting)/Unlikely (Foraging) – No suitable nesting or foraging habitat present. Nearest record (2003) located near Trout Creek approximately 15 miles north of site.
				SMVR-SB: Unlikely (Nesting)/Unlikely (Foraging) – No suitable breeding or foraging habitat present. No recent records located within the vicinity of the Proposed Project site.
				SMVR-SM: Unlikely (Nesting)/Unlikely (Foraging) - No suitable breeding or foraging habitat present. No recent records located within the vicinity of the Proposed Project site.
Rallus obsoletus obsoletus	California Ridgway's rail	FE, SE, FP	Found in salt marshes traversed by tidal sloughs, where cordgrass and pickleweed are the dominant vegetation. Requires dense growth of either pickleweed or cordgrass for nesting or escape cover; feeds on mollusks and crustaceans.	**DCPP: Unlikely (Nesting)/Unlikely (Foraging) –** No suitable breeding or foraging habitat present. No recent record located within the vicinity of the Proposed Project site.
				PBR: Unlikely (Nesting)/Unlikely (Foraging) – No suitable breeding or foraging habitat present. No recent record located within the vicinity of the Proposed Project site.
				SMVR-SB: Unlikely (Nesting)/Unlikely (Foraging) – No suitable breeding or foraging habitat present. No recent record located within the vicinity of the Proposed Project site.

Table E2-2. Regional Special-Status Wildlife (Terrestrial)

Scientific Name	Common Name	Status	Habitat	Likelihood of Occurrence
				SMVR-SM: Unlikely (Nesting)/Unlikely (Foraging) – No suitable breeding or foraging habitat present. No recent record located within the vicinity of the Proposed Project site.
Setophaga petechia	Yellow warbler	SSC	Riparian plant associations preferring willows, cottonwoods, aspens, sycamores, and alders for nesting and foraging.	**DCPP: Unlikely (Nesting)/Unlikely (Foraging) –** Marginal breeding and foraging habitat present. Nearest record (1999) located along the Sisquoc River approximately 40 miles southeast of site.
				PBR: Unlikely (Nesting)/Unlikely (Foraging) – Marginal nesting and foraging habitat present. Nearest record (1999) located along the Sisquoc River approximately 28 miles southeast of site.
				SMVR-SB: Unlikely (Nesting)/Unlikely (Foraging) - No suitable breeding or foraging habitat present. No recent records located within the vicinity of the Proposed Project site.
				SMVR-SM: Unlikely (Nesting)/Unlikely (Foraging) - No suitable breeding or foraging habitat present. No recent records located within the vicinity of the Proposed Project site.
Sternula antillarum browni	California least tern	FE, SE, FP	Nests along the coast from San Francisco Bay to northern Baja California. Colonial breeder on bare or sparsely vegetated, flat substrates, sand beaches, alkali flats, landfills, or paved areas.	**DCPP: Unlikely (Nesting)/Low (Foraging) –** Nearest recent record (2021) located approximately 4.5 miles southeast of site; however, no suitable breeding or foraging habitat present. May forage offshore near site.
				PBR: Unlikely (Nesting)/Unlikely (Foraging) – No suitable nesting or foraging habitat present. Nearest recent record (2021) located at PBR Preserve approximately 1 mile northwest of site. May be observed in flight.
				SMVR-SB: Unlikely (Nesting)/Unlikely (Foraging) – No suitable breeding or foraging habitat present. No recent record located within the vicinity of the Proposed Project site.

Table E2-2. Regional Special-Status Wildlife (Terrestrial)

Scientific Name	Common Name	Status	Habitat	Likelihood of Occurrence
				SMVR-SM: Unlikely (Nesting)/Unlikely (Foraging) – No suitable breeding or foraging habitat present. No recent record located within the vicinity of the Proposed Project site.
Vireo bellii pusillus	Least Bell's vireo	FE, SE		**DCPP: Unlikely (Nesting)/Unlikely (Foraging) –** Marginal nesting and foraging habitat present. No records within 10 miles of site.
				PBR: Unlikely (Nesting)/Unlikely (Foraging) – Marginal nesting and foraging habitat present. No records within 10 miles of site.
				SMVR-SB: Unlikely (Nesting)/Unlikely (Foraging) - No suitable breeding or foraging habitat present. No recent records located within the vicinity of the Proposed Project site.
				SMVR-SM: Unlikely (Nesting)/Unlikely (Foraging) - No suitable breeding or foraging habitat present. No recent records located within the vicinity of the Proposed Project site.
Mammals				
Antrozous pallidus	Pallid bat	SSC	Deserts, grasslands, shrublands, woodlands, and forests. Most common in open, dry habitats with rocky areas for roosting. May roost in old buildings and bridges. Very sensitive to disturbance of roosting sites.	**DCPP: Moderate –** Suitable roosting habitat present in structures at site. Nearest record (2000) located within developed area of San Luis Obispo approximately 12 miles northeast of site.
				PBR: Low – Marginal roosting habitat present. Nearest record (2000) located within developed area of San Luis Obispo approximately 9 miles north of site.
				SMVR-SB: Low – Marginal roosting habitat present. Suitable foraging habitat present. No recent record located within the vicinity of the Proposed Project site.

Table E2-2. Regional Special-Status Wildlife (Terrestrial)

Scientific Name	Common Name	Status	Habitat	Likelihood of Occurrence
				SMVR-SM: Low – Marginal roosting habitat present. Suitable foraging habitat present. No recent record located within the vicinity of the Proposed Project site.
Bassariscus astutus	Ringtail	FP	Rocky outcrops, canyons, or talus slopes in deserts, chaparral; woodlands of oak, pinyon pine, and juniper; montane conifer forests; and especially riparian for the abundant prey. From sea level up to 9,500 ft. (2,900 m) but most common below 4,600 ft. Nest in rock recesses, logs, tree hollows, and man-made enclosures.	**DCPP: Moderate –** Highly elusive and wide-ranging species that is not tracked by CDFW. Suitable habitat along Diablo Creek and adjacent uplands.
				PBR: Low – Marginal habitat along Pismo Creek and adjacent uplands.
				SMVR-SB: Unlikely – No suitable habitat.
				SMVR-SM: Unlikely – No suitable habitat.
Corynorhinus townsendii	Townsend's big-eared bat	SSC	Occurs throughout California in a wide variety of habitats. Most common in mesic sites. Roosts in the open, hanging from walls and ceilings. Roosting sites limiting. Extremely sensitive to human disturbance.	**DCPP: Moderate –**Suitable roosting habitat in structures at site. Nearest recent record (2017) located near Johnson Ranch Open Space approximately 10 miles east of site.
				PBR: High – Suitable roosting and foraging habitat present. Nearest record (1992) located in developed area of PBR Beach approximately 2 miles northwest of site.
				SMVR-SB: Low – Potential roosting and foraging habitat present. No recent record located within the vicinity of the Proposed Project site.
				SMVR-SM: Low – Potential roosting and foraging habitat present. No recent record located within the vicinity of the Proposed Project site.
Dipodomys heermanni morroensis	Morro Bay kangaroo rat	FE, SE, FP	Coastal sage scrub on the south side of Morro Bay. Needs sandy soil, but not active dunes, prefers early seral stages.	**DCPP: Unlikely –**No suitable habitat present. Nearest record (1983) located in Montana de Oro State Park approximately 5 miles north of site; however, this represents the southern extent of this highly localized species' range.

Table E2-2. Regional Special-Status Wildlife (Terrestrial)

Scientific Name	Common Name	Status	Habitat	Likelihood of Occurrence
				PBR: Unlikely– No suitable habitat present. Proposed Project site is located outside of the geographical range of the species. Nearest record (1983) located in Montana de Oro State Park approximately 17 miles northwest of site.
				SMVR-SB: Unlikely– No suitable habitat present. Proposed Project site is located outside of the geographical range of the species. No records within the vicinity of the Proposed Project site.
				SMVRS-SM: Unlikely– No suitable habitat present. Proposed Project site is located outside of the geographical range of the species. No records within the vicinity of the Proposed Project site.
Dipodomys ingens	Giant kangaroo rat	FE, SE		**DCPP: Unlikely –** Site is outside of the known range for the species. Nearest recent record (2019) located along the foothills adjacent to Carrizo Plain National Monument approximately 50 miles east of site.
				PBR: Unlikely – Site is outside of the known range for the species. Nearest records located within Carrizo Plain National Monument approximately 50 miles east of site.
				SMVR-SB: Unlikely – No suitable habitat present and outside of known range.
				SMVR-SM: Unlikely – No suitable habitat present and outside of known range.
Eumops perotis californicus	Western mastiff bat	SSC	Open, semi-arid to arid habitats, including conifer and deciduous woodlands, coastal scrub, grasslands, and chaparral. Roosts in	**DCPP: Moderate –** Suitable roosting habitat in structures at site. Nearest record (1991) located in eastern San Luis Obispo approximately 13 miles northeast of site.

Table E2-2. Regional Special-Status Wildlife (Terrestrial)

Scientific Name	Common Name	Status	Habitat	Likelihood of Occurrence
			crevices in cliff faces, high buildings, trees, tunnels.	**PBR: Low –** Marginal roosting habitat present. Nearest record (1991) located in eastern San Luis Obispo approximately 9.5 miles north of site.
				SMVR-SB: Low – Potential roosting and foraging habitat present. No recent record located within the vicinity of the Proposed Project site.
				SMVR-SM: Low – Potential roosting and foraging habitat present. No recent record located within the vicinity of the Proposed Project site.
Lasiurus blossevillii	Western red bat	SSC	Roosts in habitat bordering forests, rivers, cultivated fields, and urban areas. Prefers streamside habitats dominated by cottonwoods, oaks, sycamores, and walnuts.	**DCPP: Unlikely –** Marginal roosting habitat present. Nearest record (1998) located along Salinas River approximately 27 miles east of site.
				PBR: Unlikely – Marginal roosting habitat present. Nearest record (1998) located along Salina River approximately 17 miles northeast of site.
				SMVR-SB: Unlikely – No known records within vicinity of site.
				SMVR-SM: Unlikely – No known records within vicinity of site.
Lasiurus cinereus	Hoary bat	SA	Prefers open habitats or habitat mosaics, with access to trees for cover and open areas or habitat edges for feeding. Roosts in dense foliage of medium to large trees. Feeds primarily on moths. Requires water.	**DCPP: Unlikely –** Marginal roosting and foraging habitat present. Nearest record (1998) located at Vandenberg Air Force Base approximately 32 miles south of site.
				PBR: Unlikely – No suitable roosting or foraging habitat present. Nearest record (1998) located at Vandenberg Air Force Base approximately 25 miles south of site.
				SMVR-SB: Low – Potential roosting and foraging habitat present. No recent record located within the vicinity of the Proposed Project site.

Table E2-2. Regional Special-Status Wildlife (Terrestrial)

Scientific Name	Common Name	Status	Habitat	Likelihood of Occurrence
				SMVR-SM: Low – Potential foraging habitat present. No recent record located within the vicinity of the Proposed Project site.
Neotoma lepida intermedia	San Diego desert woodrat	SSC	Coastal scrub from San Diego to San Luis Obispo Counties. Requires moderate to dense canopies preferred as well as like rocky cliffs and outcrops.	**DCPP: Present –** Suitable habitat and several middens observed at site during 2020 surveys (PG&E, 2020).
				PBR: Present – Suitable habitat and several middens observed at site during 2020 surveys (PG&E, 2020).
				SMVR-SB: Unlikely– No suitable habitat present. No recent records within the vicinity of the Proposed Project site.
				SMVR-SM: Unlikely– No suitable habitat present. No recent records within the vicinity of the Proposed Project site.
Nyctinomops macrotis	Big free-tailed bat	SSC	Prefers roosting sites associated with high cliffs or rocky outcrops but will use buildings or suitable trees. Feeds principally on large moths.	**DCPP: Moderate –** Suitable roosting habitat present in structures at site. Nearest record (1981) located along southern end of Morro Bay approximately 7 miles north of site.
				PBR: Unlikely– Marginal roosting habitat present in structures near site. Nearest record (1981) located along southern end of Morro Bay approximately 17 miles northwest of site.
				SMVR-SB: Unlikely– No suitable roosting habitat present. No recent records within the vicinity of the Proposed Project site.
				SMVR-SM: Unlikely– No suitable roosting habitat present. No recent records within the vicinity of the Proposed Project site.
Puma concolor	Mountain lion – Southern	SC	Uses a variety of habitat within range; prefer expansive, intact, heterogenous habitat.	**DCPP: Low –** Suitable habitat present. No recent records within vicinity of the Proposed Project site.

Table E2-2. Regional Special-Status Wildlife (Terrestrial)

Scientific Name	Common Name	Status	Habitat	Likelihood of Occurrence
	California/Central Coast ESU			**PBR: Unlikely –** No suitable habitat and site is surrounded by development.
				SMVR-SB: Unlikely – No suitable habitat and site is surrounded by development.
				SMVR-SM: Unlikely – No suitable habitat and site is surrounded by development.
Taxidea taxus	American badger	SSC	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils. Needs sufficient food, friable soils, and open, uncultivated ground. Preys on burrowing rodents. Digs burrows.	**DCPP: Moderate** – Suitable habitat in open spaces surrounding site. Nearest record (2008) located north of Los Osos Valley Road approximately 8 miles north of site. However, species has been observed closer to site by PG&E staff.
				PBR: Moderate – Marginal habitat present; however, species may occur during wide-ranging movement. Nearest record (2002) located along Price Canyon Road approximately 2 miles north of site.
				SMVR-SB: Unlikely– No suitable habitat present. Recent records located within 2 miles of the Proposed Project site.
				SMVR-SM: Unlikely– No suitable habitat present. No recent records within the vicinity of the Proposed Project site.
Vulpes macrotis mutica	San Joaquin kit fox	FE, ST	Annual grasslands or grassy open stages with scattered shrubby vegetation. Needs loose-textured sandy soils for burrowing and suitable prey base.	**DCPP: Unlikely –** Marginal habitat present. Site is outside of the known range of this species.
				PBR: Unlikely – No suitable habitat present. Site is outside of the known range of this species.
				SMVR-SB: Unlikely – No suitable habitat present. Site is outside of known range of this species.
				SMVR-SM: Unlikely – No suitable habitat present. Site is outside of known range of this species.

Sources: CDFW, 2022a; CDFW, 2022b; eBird, 2022; iNaturalist, 2022

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_____. 2022a. Addendum to the Diablo Canyon Decommissioning Terrestrial Biological Resources Assessment, San Luis Obispo County, California. Prepared for PG&E by Terra Verde Environmental Consulting, LLC, June 16, 2022.

_____. 2022b. Site Assessment for California Tiger Salamander (Ambystoma californiense) Diablo Canyon Power Plant, San Luis Obispo County, California. Prepared for PG&E and Terra Verde Environmental Consulting, LLC by Storrer Environmental Services. August 15.

_____. 2022c. Site Assessment for California Tiger Salamander (Ambystoma californiense) Santa Maria Valley Railyard – Santa Barbara (SMVR-SB) (APN 113-210-001), Santa Barbara County, California. Prepared for PG&E and Terra Verde Environmental Consulting, LLC by Storrer Environmental Services, January 4. Provided as Enclosure 1 in response to Data Request Set #3 (PG&E Letter DCL-22-008 February 3, 2022).

_____. 2022d. Site Assessment for California Tiger Salamander (Ambystoma californiense) Santa Maria Valley Railyard – Santa Maria (SMVR-SM) (APN 117-820-016), Santa Barbara County, California. Prepared for PG&E and Terra Verde Environmental Consulting, LLC by Storrer Environmental Services, January 4. Provided as Enclosure 1 in response to Data Request Set #3 (PG&E Letter DCL-22-008 February 3, 2022).

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Appendix E3

Special-Status Species Accounts

Appendix E3
Special-Status Species Accounts

PLANTS PRESENT OR WITH A LOW TO HIGH POTENTIAL TO OCCUR

Hoover's Bent Grass (*Agrostis hooveri*)

Status: Hoover's bent grass has a CRPR of 1B.2. This species is not federally, or State listed as threatened or endangered

General Distribution: Native to California and has been documented within Santa Barbara and San Luis Obispo Counties from Solvang to Morro Bay at elevations between 200 and 2,000 ft. elev. (CNPS, 2022).

Habitat and Habitat Associations: This species is generally associated with dry sandy soils in closed-cone coniferous forests, chaparral, cismontane woodland, and valley and foothill grassland

Natural History: Hoover's bent grass is a perennial herb that blooms from April through July (CNPS, 2022).

Threats: Threats to this species include development, vegetation clearing, and non-native plants (CNPS, 2022).

Pecho manzanita (*Arctostaphylos pechoensis*)

Status: Pecho manzanita has a CRPR of 1B.2. This species is not federally, or State listed as threatened or endangered.

General Distribution: Native to California and has been documented in the Pecho Hills area in San Luis Obispo County at elevations between 400 and 2,800 ft. elev. (Hickman, 1993).

Habitat and Habitat Associations: This species is generally associated with siliceous shale in closed-cone coniferous forest, chaparral, and coastal scrub.

Natural History: Pecho manzanita is a shrub that blooms from November through March (CNPS, 2022).

Threats: Threats to this species include urbanization.

Santa Margarita Manzanita (*Arctostaphylos pilosula*)

Status: Santa Margarita manzanita has a CRPR of 1B.2. This species is not federally, or State listed as threatened or endangered.

General Distribution: Native to California and has been documented on the Central Coast (Pismo Beach Area) and in the Outer South Coast Ranges (Santa Lucia and La Panza Ranges) in San Luis Obispo County at elevations up to 1,000 ft. elev. (Hickman, 1993).

Habitat and Habitat Associations: This species is generally associated with chaparral and closed-cone coniferous forest.

Natural History: Santa Margarita manzanita is a shrub that blooms from December through March (Hickman, 1993).

Threats: Threats to this species include development and urbanization.

Sand mesa manzanita (*Arctostaphylos rudis*)

Status: Sand mesa manzanita has a CRPR of 1B.2. This species is not federally, or State listed as threatened or endangered.

General Distribution: Native to California and has been documented along the Central Coast ranges in San Luis Obispo County and Santa Barbara Counties at elevations up to 1,100 ft. elev. (CNPS, 2022).

Habitat and Habitat Associations: This species is generally associated with sandy soils in maritime chaparral and coastal scrub.

Natural History: Sand mesa manzanita is a perennial evergreen shrub that blooms from November through February (CNPS, 2022).

Threats: Threats to this species include agriculture, road construction, road maintenance, oil extraction, and possibly development.

Marsh sandwort (*Arenaria paludicola*)

Status: Marsh sandwort is state and federally listed as endangered and has CRPR of 1B.1.

General Distribution: Historically, it occurred in widely scattered locations along the Pacific Coast and a few inland locations including Hollywood and San Bernardino (Mason 1957; Munz 1974). The only known extant California occurrences are in San Luis Obispo County (CNPS, 2022). It occurs at elevations below 1,000 ft. elev.

Habitat and Habitat Associations: This species is generally associated with sandy openings of perennial freshwater marshes and swamps

Natural History: It is a perennial herb, arising from stolons, with narrow leaves and small white flowers. It blooms between May and August. (CNPS, 2022).

Threats: Threats to this species include habitat loss, altered hydrologic regimes, and competition with invasive weedy plants (USFWS 1997).

Ocean bluff milkvetch (*Astragalus nuttallii* var. *nuttallii*)

Status: Ocean bluff milkvetch has a CRPR of 4.2. This species is not federally, or State listed as threatened or endangered.

General Distribution: Native to California and has been documented in coastal areas from the San Francisco Bay south to Santa Barbara County at elevations up to 400 ft. elev. (CNPS, 2022).

Habitat and Habitat Associations: This species is generally associated with coastal bluff scrub and coastal dunes.

Natural History: Ocean bluff milkvetch is a perennial herb that blooms from January through November (CNPS, 2022).

Threats: Threats to this species include foot traffic and road maintenance.

Coulter's saltbush (*Atriplex coulteri*)

Status: Coulter's saltbush is a CRPR List 1B.2 species. This species is not federally, or State listed as threatened or endangered.

General Distribution: Coulter's saltbush is described in some references as a coastal species of dunes and bluffs, distributed from northern Baja California to Santa Barbara County. It also has been reported from inland valleys in Riverside and San Bernardino counties.

Habitat and Habitat Associations: Coulter's saltbush is found along coastal dunes and alkaline flats below 1,500 ft. elev.

Natural History: Coulter's saltbush is a perennial herb that blooms from March through October (CNPS, 2022).

Threats: This species is threatened by development, and feral herbivores.

Davidson's saltbush (*Atriplex serenana* var. *davidsonii*)

Status: Davidson's saltbush has a CRPR of 1B.2. This species is not federally, or State listed as threatened or endangered

General Distribution: Native to California Baja California and has been documented the coast from Santa Barbara County to Baja California, and inland to western Riverside County at elevations up to 650 ft. elev. (CNPS, 2022). Many of its historic locations have been extirpated (CNPS, 2022)

Habitat and Habitat Associations: This species is generally associated alkaline soils within coastal bluff scrub and coastal scrub.

Natural History: Davidson's saltbush is an annual herb that blooms from April through October following rains during spring, summer, or fall (CNPS, 2022).

Threats: There are no persistent threats identified for this species.

San Diego County viguiera (*Bahiopsis laciniata*)

Status: San Diego County viguiera has a CRPR of 4.3. This species is not federally, or State listed as threatened or endangered.

General Distribution: Native to California and Sonora, Mexica. In California it has been documented along the coast from Orange County south to San Diego and western Riverside Counties at elevations up to 2,500 ft. elev. (CNPS, 2022).

Habitat and Habitat Associations: This species is generally associated with chaparral and coastal scrub.

Natural History: San Diego County viguiera is a perennial shrub that blooms from February through June (CNPS, 2022).

Threats: Threats to this species include development and urbanization.

San Luis mariposa-lily (*Calochortus obispoensis*)

Status: San Luis mariposa-lily has a CRPR of 1B.2. This species is not federally, or State listed as threatened or endangered.

General Distribution: Native to California and has been documented on the Central Coast (Pismo Beach Area) and in the Outer South Coast Ranges (Santa Lucia) in San Luis Obispo County at elevations up to 2,400 ft. elev. (CNPS, 2022).

Habitat and Habitat Associations: This species is generally associated with serpentine soils within chaparral, cismontane woodland, coastal scrub, and valley and foothill grassland.

Natural History: San Luis mariposa-lily is a perennial bulbiferous herb that blooms from May through July (CNPS, 2022).

Threats: Threats to this species include grazing, development, pipeline construction, road construction, and recreational activities. The species is also potentially threatened by vegetation/fuel management and mining (CNPS, 2022).

Cambria morning-glory (*Calystegia subacaulis* ssp. *episcopalis*)

Status: Cambria morning-glory has a CRPR of 4.2. This species is not federally, or State listed as threatened or endangered.

General Distribution: Native to California and has been documented on the Central Coast and in the Coast Ranges in San Luis Obispo County at elevations up to 1,700 ft. elev. (CNPS, 2022).

Habitat and Habitat Associations: This species is generally associated with clay soils in chaparral, cismontane woodland, coastal prairie, and valley and foothill grassland.

Natural History: Cambria morning-glory is a perennial rhizomatous herb that blooms from March through July (Hickman, 1993).

Threats: This species is threatened by development and possibly threatened by alteration of fire regimes, feral pigs, grazing, mining, trampling, military activities, non-native plants, vehicles, and pipeline construction (CNPS, 2022).

Hardham's evening-primrose (*Camissoniopsis hardhamiae*)

Status: Hardham's evening-primrose has a CRPR of 1B.2. This species is not federally, or State listed as threatened or endangered.

General Distribution: Native to California and has only been documented in San Luis Obispo County at elevations between 400 and 3,100 ft. elev. (CNPS, 2022).

Habitat and Habitat Associations: This species is generally associated with burned areas or disturbed areas with carbonate or sandy soils within chaparral and cismontane woodland.

Natural History: Hardham's evening-primrose is an annual herb that blooms from March through May (Hickman, 1993).

Threats: Threats to this species include road construction, grazing, mining, military activities, non-native plants, road maintenance, and vehicles (CNPS, 2022).

San Luis Obispo sedge (*Carex obispoensis*)

Status: San Luis Obispo sedge has a CRPR of 1B.2. This species is not federally, or State listed as threatened or endangered.

General Distribution: Native to California and has been documented in coastal areas from Monterey County south to San Diego County at elevations up to 2,700 ft. elev. (CNPS, 2022).

Habitat and Habitat Associations: This species is generally associated with seeps in areas with clay, gabbroic, and serpentine soils within closed-cone coniferous forest, chaparral, coastal prairie, coastal scrub, and valley and foothill grassland

Natural History: San Luis Obispo sedge is a perennial herb that blooms from April through June (Hickman, 1993).

Threats: Threats to this species include grazing, non-native plants, military activities, and mining. Possibly threatened by recreational activities (CNPS, 2022).

San Luis Obispo owl's-clover (*Castilleja densiflora* var. *obispoensis*)

Status: San Luis Obispo owl's-clover has a CRPR of 1B.2. This species is not federally, or State listed as threatened or endangered.

General Distribution: Native to California and has been documented on the Central Coast (Pismo Beach Area) and in the Outer South Coast Ranges (Santa Lucia and La Panza Ranges) in San Luis Obispo County at elevations up to 1,400 ft. elev. (CNPS, 2022).

Habitat and Habitat Associations: This species is generally associated with serpentine soils within meadows, seeps, valley and foothill grassland.

Natural History: San Luis Obispo owl's-clover is a hemiparasitic annual herb that blooms from March through May (Hickman, 1993).

Threats: Threats to this species include development and grazing (CNPS, 2022).

Lompoc ceanothus (*Ceanothus cuneatus* var. *fascicularis*)

Status: Lompoc ceanothus has a CRPR of 4.2. This species is not federally, or State listed as threatened or endangered.

General Distribution: Native to California and has been documented to occur in coastal areas of San Luis Obispo and Santa Barbara Counties at elevations up to 1,300 ft. elev. (CNPS, 2022).

Habitat and Habitat Associations: This species is generally associated with sandy soils in chaparral.

Natural History: Lompoc ceanothus is a perennial evergreen shrub that blooms from February through April (Hickman, 1993).

Threats: This species is threatened by non-native plants (CNPS, 2022).

Nipomo Mesa ceanothus (*Ceanothus impressus* var. *nipomensis*)

Status: Nipomo Mesa ceanothus has a CRPR of 1B.2. This species is not federally, or State listed as threatened or endangered.

General Distribution: Native to California and is endemic to San has been documented on the Central Coast (Pismo Beach Area) in San Luis Obispo County at elevations up to 800 ft. elev. (CNPS, 2022).

Habitat and Habitat Associations: This species is generally associated with sandy soils within chaparral.

Natural History: Nipomo Mesa ceanothus is a shrub that blooms from February through April (Hickman, 1993).

Threats: Threats to this species include development and non-native plants (CNPS, 2022).

Congdon's tarplant (*Centromadia parryi* ssp. *congdonii*)

Status: Congdon's tarplant has a CRPR of 1B.1. This species is not federally, or State listed as threatened or endangered.

General Distribution: Native to California and has been documented in the coastal area from Contra Costa County south to in San Luis Obispo County at elevations up to 800 ft. elev. (CNPS, 2022).

Habitat and Habitat Associations: This species is generally associated with alkaline soils within valley and foothill grassland.

Natural History: Congdon's tarplant is an annual herb that blooms from May through October (Hickman, 1993).

Threats: Threats to this species include development and possibly grazing and non-native plants(CNPS, 2022).

Chorizanthe spinosa (Mojave spineflower)

Status: Mojave spineflower has a CRPR 4.2. This species is not federally, or State listed as threatened or endangered.

General Distribution: Prostrate spineflower is native to California and Baja California, and has been found to occur in Los Angeles, Orange, Riverside, Santa Barbara, San Bernardino, San Diego, San Luis Obispo, and Ventura counties at elevations up to 800 meters AMSL (Hickman, 1993).

Habitat and Habitat Associations: This species is associated with chaparral, valley grassland, pinyon-juniper woodland, and coastal sage scrub habitats.

Natural History: Mojave spineflower (*Chorizanthe spinosa*) is a low growing, spreading, spiny annual herb found in shrublands throughout much of the western Mojave Desert in sometimes alkaline soils of playas on Joshua tree woodlands. Depending on rainfall, it flowers between March and July and probably does not germinate at all in dry years. California Native Plant Society considers it a species of limited distribution (List 4) and notes that it may be threatened by land use changes and vehicles.

Threats: California Native Plant Society considers it a species of limited distribution (List 4) and notes that it may be threatened by land use changes and vehicles (CNPS, 2022).

La Graciosa thistle (*Cirsium scariosum* var. *loncholepis*)

Status: La Graciosa thistle is listed as federally endangered, and State threatened. It has CRPR of 1B.1.

General Distribution: Native to California and has been documented in the Central Coast (Santa Maria) Area) in San Luis Obispo County at elevations up to 700 ft. elev. (CNPS, 2022).

Habitat and Habitat Associations: This species is generally associated with mesic, sandy soils within cismontane woodland, coastal dunes, coastal scrub, brackish marshes, and valley and foothill grassland.

Natural History: La Graciosa thistle is a perennial herb that blooms from May through August (Hickman, 1993).

Threats: Threats to this species include development, vehicles, groundwater pumping, non-native plants, and possibly grazing.

Pismo clarkia (*Clarkia speciosa* ssp. *immaculata*)

Status: Pismo clarkia is listed as federally endangered and State rare. It has a CRPR of 1B.1.

General Distribution: Native to California and has been documented on the Central Coast (Pismo Beach Area) in San Luis Obispo County at elevations up to 600 ft. elev. (CNPS, 2022).

Habitat and Habitat Associations: This species is generally associated with sandy soils within openings of chaparral, cismontane woodland, and valley and foothill grassland.

Natural History: Pismo clarkia is an annual herb that blooms from March through July (Hickman, 1993).

Threats: Threats to this species include development, road maintenance, and possibly by grazing (CNPS, 2022).

Monkey-flower savory (*Clinopodium mimuloides*)

Status: Monkey-flower savory has a CRPR of 1B.2. This species is not federally, or State listed as threatened or endangered.

General Distribution: Native to California and has been documented in the Coast Ranges from Monterey County south to Los Angeles County at elevations between 1,000 and 5,900 ft. elev. (CNPS, 2022).

Habitat and Habitat Associations: This species is generally associated with mesic areas and streambanks within chaparral and closed-cone coniferous forest.

Natural History: Monkey-flower savory is a perennial herb that blooms from June through October (Hickman, 1993).

Threats: Threats to this species have been identified.

Paniculate tarplant (*Deinandra paniculata*)

Status: Paniculate tarplant has a CRPR of 4.2. This species is not federally, or State listed as threatened or endangered.

General Distribution: Native to California and has been documented to occur on the Coast Ranges from San Luis Obispo County south to San Diego County at elevations up to 3,100 ft. elev. (CNPS, 2022).

Habitat and Habitat Associations: This species is generally associated within vernally mesic or sandy areas of coastal scrub, vernal pools, and valley and foothill grassland.

Natural History: Paniculate tarplant is an annual herb that blooms from April through November (Hickman, 1993).

Threats: Threats to this species include development and possibly road widening (CNPS, 2022).

Umbrella larkspur (*Delphinium umbraculorum*)

Status: Umbrella larkspur has a CRPR of 1B.2. This species is not federally, or State listed as threatened or endangered.

General Distribution: Native to California and has been documented within the Central Coast (Pismo Beach Area) and in the Outer South Coast Ranges (Santa Lucia and La Panza Ranges) in San Luis Obispo County at elevations up to 1,000 ft. elev. (Hickman, 1993).

Habitat and Habitat Associations: This species is generally associated with chaparral and closed-cone coniferous forest.

Natural History: Umbrella larkspur is shrub that blooms from December through March (Hickman, 1993).

Threats: Threats to this species include development and urbanization.

Blochman's dudleya (*Dudleya blochmaniae* ssp. *blochmaniae*)

Status: Blochman's dudleya has a CRPR of 1B.1. This species is not federally, or State listed as threatened or endangered.

General Distribution: Native to California and has been documented in coastal areas from San Luis Obispo County south to San Diego County at elevations up to 1,500 ft. elev. (CNPS, 2022).

Habitat and Habitat Associations: This species is generally associated with rocky areas within clay or serpentine soils within coastal bluff scrub, chaparral, coastal scrub, and valley and foothill grassland.

Natural History: Blochman's dudleya is a perennial herb that blooms from April through June (Hickman, 1993).

Threats: Threats to this species include development, grazing, trampling, erosion, and non-native plants.

Blochman's leafy daisy (*Erigeron blochmaniae*)

Status: Blochman's leafy daisy has a CRPR of 1B.2. This species is not federally, or State listed as threatened or endangered.

General Distribution: Native to California and has been documented to occur in the coastal areas of San Luis Obispo County at elevations up to 150 ft. elev. (CNPS, 2022).

Habitat and Habitat Associations: This species is generally associated within coastal dune and coastal scrub.

Natural History: Blochman's leafy daisy is shrub that blooms from December through March (Hickman, 1993).

Threats: Threats to this species include development, non-native plants, and vehicles.

Hoover's button-celery (*Eryngium aristulatum* var. *hooveri*)

Status: Hoover's button-celery has a CRPR of 1B.1. This species is not federally, or State listed as threatened or endangered.

General Distribution: Native to California and has been documented to occur in the coastal areas Alameda County south to San Luis Obispo County at elevations up to 150 ft. elev. (CNPS, 2022).

Habitat and Habitat Associations: This species is generally associated with vernal pools.

Natural History: Hoover's button-celery is an annual/perennial herb that blooms during July (Hickman, 1993).

Threats: Threats to this species include agriculture, overgrazing, and urbanization (CNPS, 2022).

Ojai fritillary (*Fritillaria ojaiensis*)

Status: Ojai fritillary has a CRPR of 1B.2. This species is not federally, or State listed as threatened or endangered.

General Distribution: Native to California and has been documented on occur in the Coastal Ranges from Monterey County south to Ventura County at elevations between 700 and 3,300 ft. elev. (CNPS, 2022).

Habitat and Habitat Associations: This species is generally associated with rocky areas within mesic broadleafed upland forest, chaparral, cismontane woodland, and lower montane coniferous forest.

Natural History: Ojai fritillary is shrub that blooms from December through March (Hickman, 1993).

Threats: Threats to this species include road maintenance and recreational activities.

Mesa horkelia (*Horkelia cuneata* ssp. *puberula*)

Status: Mesa horkelia has a CRPR of 1B.1. This species is not federally, or State listed as threatened or endangered.

General Distribution: Native to California and has been documented to occur along the coast from San Luis Obispo to San Diego Counties and rarely inland to San Bernardino and Riverside Counties. at elevations up to 2,700 ft. elev. (CNPS, 2022).

Habitat and Habitat Associations: This species is generally associated with gravelly and sandy soils with maritime chaparral, cismontane woodland, and coastal scrub.

Natural History: Mesa horkelia is a perennial herb that blooms from February through July (Hickman, 1993).

Threats: Species is threatened by habitat conversion.

Perennial goldfields (*Lasthenia californica* ssp. *macrantha*)

Status: Perennial goldfields has a CRPR of 1B.2. This species is not federally, or State listed as threatened or endangered.

General Distribution: Native to California and has been documented on occur in coastal arears from Del Norte County south to San Luis Obispo County at elevations up to 1,700 ft. elev. (CNPS, 2022).

Habitat and Habitat Associations: This species is generally associated with coastal bluff scrub, coastal dunes, and coastal scrub.

Natural History: Perennial goldfields is a perennial herb that blooms from January through November (Hickman, 1993).

Threats: Threats to this species include competition from non-native plants, recreational activities, and potentially trail construction and foot traffic (CNPS, 2022).

Lasthenia glabrata ssp. *coulteri* (Coulter's goldfields)

Status: Coulter's goldfields is a CRPR List 1B.1 species. This species is not federally, or State listed as threatened or endangered.

General Distribution: Coulter's goldfields is endemic to California, from Tehama County to Baja California, and inland to western San Bernardino and Riverside Counties.

Habitat and Habitat Associations: Coulter's goldfields occurs in salt marshes, playas, vernal pools, and coastal habitats at elevations up to approximately 3600 feet AMSL.

Natural History: Coulter's goldfields is annual herb that blooms from February through June.

Threats: This species has been threatened by urbanization, agriculture, road maintenance, and potentially threatened by foot traffic and drought.

Jones' layia (*Layia jonesii*)

Status: Jones' layia has a CRPR of 1B.2. This species is not federally, or State listed as threatened or endangered.

General Distribution: Native to California and has been documented in coastal areas from Cambria to Pismo Beach in San Luis Obispo County at elevations up to 1,300 ft. elev. (CNPS, 2022).

Habitat and Habitat Associations: This species is generally associated with clay and serpentine soils within chaparral and valley and foothill grassland.

Natural History: Jones' layia is an annual herb that blooms from March through May (Hickman, 1993).

Threats: Threats to this species include grazing, non-native plants, military activities, feral pigs, frequent wildfires, and trampling (CNPS, 2022).

Southern curly-leaved monardella (*Monardella sinuata* ssp. *sinuata*)

Status: Southern curly-leaved monardella has a CRPR of 1B.2. This species is not federally, or State listed as threatened or endangered.

General Distribution: Native to California and has been documented in the coastal areas of San Luis Obispo County at elevations up to 1,000 ft. elev. (CNPS, 2022).

Habitat and Habitat Associations: This species is generally associated with sandy soils in openings of coastal scrub, coastal dunes, chaparral and cismontane woodland.

Natural History: Southern curly-leaved monardella is an annual herb that blooms from April through September (Hickman, 1993).

Threats: Threats to this species include development, habitat loss, habitat fragmentation, vehicles, foot traffic, and recreational activities (CNPS, 2022).

San Luis Obispo monardella (*Monardella undulata* ssp. *undulata*)

Status: San Luis Obispo monardella has a CRPR of 1B.2. This species is not federally, or State listed as threatened or endangered.

General Distribution: Native to California and has been documented in the Satna Maria area of San Luis Obispo County at elevations up to 700 ft. elev. (CNPS, 2022).

Habitat and Habitat Associations: This species is generally associated with sandy soils in coastal dunes and coastal scrub.

Natural History: San Luis Obispo monardella is a perennial herb that blooms from May through September (Hickman, 1993).

Threats: Threats to this species include coastal development, vehicles, and non-native plants (CNPS, 2022).

Woodland woollythreads (*Monolopia gracilens*)

Status: Woodland woollythreads has a CRPR of 1B.2. This species is not federally, or State listed as threatened or endangered.

General Distribution: Native to California and has been documented to occur in coastal areas from Contra Costa County south to San Luis Obispo County at elevations up to 4,000 ft. elev. (CNPS, 2022).

Habitat and Habitat Associations: This species is generally associated with openings on serpentine soils within broad-leafed upland forest, chaparral, cismontane woodland, North Coast coniferous forest, valley and foothill grassland.

Natural History: Woodland woollythreads is an annual herb that blooms from March through July (Hickman, 1993).

Threats: Threats to this species include development, road maintenance, road widening, and possibly logging (CNPS, 2022).

Aparejo grass (*Muhlenbergia utilis*)

Status: Aparejo grass has a CRPR of 2B.2. This species is not federally, or State listed as threatened or endangered.

General Distribution: Native to California east to Texas and has been documented on occur throughout central and southern California at elevations up to 7,700 ft. elev. (CNPS, 2022).

Habitat and Habitat Associations: This species is generally associated alkaline and serpentine soils within chaparral, cismontane woodland, coastal scrub, meadows, and marshes.

Natural History: Aparejo grass is a perennial herb that blooms from March through October (CNPS, 2022).

Threats: Threats to this species include development and potentially grazing (CNPS, 2022).

Gambel's water cress (*Nasturtium gambelii*)

Status: Gambel's water cress is listed as federally endangered, and State threatened. It has a CRPR of 1B.1. This species is not federally, or State listed as threatened or endangered.

General Distribution: Native to California and has been documented to occur in coastal areas from San Luis Obispo County south to Orange County and inland to San Bernardino County at elevations up to 1,100 ft. elev. (CNPS, 2022).

Habitat and Habitat Associations: This species is generally associated with brackish and freshwater marshes.

Natural History: Gambel's water cress is a perennial herb that blooms from April through October (Hickman, 1993).

Threats: Threats to this species include habitat loss, erosion, and non-native plants (CNPS, 2022).

Michael's rein orchid (*Piperia michaelii*)

Status: Michael's rein orchid has a CRPR of 4.2. This species is not federally, or State listed as threatened or endangered.

General Distribution: Native to California and has been documented from Lake County south to Ventura at elevations up to 3,000 ft. elev. (Hickman, 1993).

Habitat and Habitat Associations: This species is generally associated with chaparral and closed-cone coniferous forest.

Natural History: Michael's rein orchid is shrub that blooms from December through March (Hickman, 1993).

Threats: Possibly threatened by road widening (CNPS, 2022).

Hooked popcornflower (*Plagiobothrys uncinatus*)

Status: Hooked popcornflower has a CRPR of 1B.2. This species is not federally, or State listed as threatened or endangered.

General Distribution: Native to California and has been documented to occur in the Central Coast in Monterey County and San Luis Obispo County at elevations up to 2,500 ft. elev. (Hickman, 1993).

Habitat and Habitat Associations: This species is generally associated with sandy soils in chaparral, cismontane woodland, and valley and foothill grassland.

Natural History: Hooked popcornflower is shrub that blooms from December through March (Hickman, 1993).

Threats: Threats to the species have not been identified (CNPS, 2022).

Diablo Canyon blue grass (*Poa diaboli*)

Status: Diablo Canyon blue grass has a CRPR of 1B.2. This species is not federally, or State listed as threatened or endangered.

General Distribution: Native to California and has been documented to occur in the Montana de Oro State Park area of San Luis Obispo County and elevations between 400 and 1,300 ft. elev. (CNDDB, 2022).

Habitat and Habitat Associations: This species is generally associated with burned areas and shale closed-cone coniferous forest, chaparral, cismontane woodland, and coastal scrub.

Natural History: Diablo Canyon blue is a perennial herb is shrub that blooms from March through April (Hickman, 1993).

Threats: Threats to the species have not been identified (CNPS, 2022).

Hoffman's sanicle (*Sanicula hoffmannii*)

Status: Hoffman's sanicle has a CRPR of 4.3. This species is not federally, or State listed as threatened or endangered.

General Distribution: Native to California and has been documented to in coastal areas from San Mateo County south to Santa Barbara County at elevations between 100 and 1,000 ft. elev. (CNPS, 2022).

Habitat and Habitat Associations: This species is generally associated with clay and serpentine soils in broad-leafed upland forest, coastal bluff scrub, chaparral, cismontane woodland, coastal scrub, and lower montane coniferous forest.

Natural History: Hoffman's sanicle is a perennial herb that blooms from March through May (Hickman, 1993).

Threats: Threats to this species include development and possibly logging (CNPS, 2022).

Adobe sanicle (*Sanicula maritima*)

Status: Adobe sanicle is listed as State rare and has a CRPR of 1B.1. This species is not federally listed as threatened or endangered.

General Distribution: Native to California and has been documented to occur in coastal areas from San Francisco County south to San Luis Obispo County at elevations between 100 and 800 ft. elev. (CNPS, 2022).

Habitat and Habitat Associations: This species is generally associated with clay and serpentine soils in chaparral, coastal prairies, meadows, and valley and foothill grassland (CNPS, 2022).

Natural History: Adobe sanicle is a perennial herb that blooms from February through May (Hickman, 1993).

Threats: Threats to this species include foot traffic, non-native plants, recreational activities, trampling, and urbanization (CNPS, 2022).

Black flowered figwort (*Scrophularia atrata*)

Status: Black flowered figwort has a CRPR of 1B.2. This species is not federally, or State listed as threatened or endangered.

General Distribution: Native to California and has been documented on the Central Coast and Outer South Coast Ranges in Santa Barbara and San Luis Obispo Counties at elevations up to 1,600 ft. elev. (Hickman, 1993).

Habitat and Habitat Associations: This species is generally associated with chaparral, coastal dunes, coastal scrub, closed-cone coniferous forest, and riparian scrub habitats.

Natural History: This species is a perennial herb that blooms from March through July (Hickman, 1993).

Threats: Threats to this species include development and urbanization.

Chaparral ragwort (*Senecio aphanactis*)

Status: Chaparral ragwort has a CRPR of 2B.2. This species is not federally, or State listed as threatened or endangered.

General Distribution: Native to California and has been documented in scattered locations in western California, from the San Francisco Bay area south through the coast and Central Valley, into Baja California. at elevations up to 2,600 ft. elev. (Hickman, 1993).

Habitat and Habitat Associations: This species is generally associated with alkaline or clay soils around vernal pools or playas within grassland, woodland, or coastal sage scrub. coniferous forest.

Natural History: Chaparral ragwort is shrub that blooms from January through April (Hickman, 1993).

Threats: Threats to this species include development and urbanization.

Splitting yarn lichen (*Sulcaria isidiifera*)

Status: Splitting yarn lichen has a CRPR of 1B.2. This species is not federally, or State listed as threatened or endangered.

General Distribution: Native to California and has been documented on the Central Coast (Pismo Beach Area) and in the Outer South Coast Ranges (Santa Lucia and La Panza Ranges) in San Luis Obispo County at elevations up to 1,000 ft. elev. (Hickman, 1993).

Habitat and Habitat Associations: This species is generally associated with chaparral and closed-cone coniferous forest.

Natural History: Splitting yarn lichen is shrub that blooms from December through March (Hickman, 1993).

Threats: Threats to this species include development and urbanization.

San Bernardino Aster (*Symphyotrichum defoliatum*)

Status: San Bernardino aster has a CRPR of 1B.2. This species is not federally, or State listed as threatened or endangered.

General Distribution: Native to California and has been documented on occur San Luis Obispo County south to San Diego County at elevations up to 6,700 ft. elev. (CNPS, 2022).

Habitat and Habitat Associations: This species is generally associated with ditches, streams, springs within cismontane woodland, coastal scrub, lower montane coniferous forest, meadows, marshes, and valley and foothill grassland.

Natural History: San Bernardino aster is a perennial herb that blooms from July through November (Hickman, 1993).

Threats: Threats to this species include development, flood control improvements, and various other land use changes. Most known extant occurrences are in the mountains and foothills away from the extensively developed parts of southern California.

Saline clover (*Trifolium hydrophilum*)

Status: Saline clover manzanita has a CRPR of 1B.2. This species is not federally, or State listed as threatened or endangered.

General Distribution: Native to California and has been documented from Sonoma County south to San Luis Obispo County at elevations up to 1,000 ft. elev. (Hickman, 1993).

Habitat and Habitat Associations: This species is generally associated with vernal pools, marshes, mesic areas of valley and foothill grassland with alkaline soils.

Natural History: Saline clover is an annual herb that blooms from April through June (Hickman, 1993).

Threats: Threats to this species include development, trampling, road construction, and vehicles.

Invertebrates

Crotch bumble bee (*Bombus crotchii*)

Status: The Crotch's bumblebee is considered a State candidate species. It is not listed as federally threatened, or endangered.

General Distribution: This species occurs primarily in California, mostly concentrated in the Central Valley, but found along the Pacific Coast and adjacent ranges and into the deserts.

Habitat and Habitat Associations: Crotch's bumblebee is associated with grass and shrublands that are hotter and dryer than habitats typically occupied by other bumblebee species.

Natural History: Crotch's bumble bee is known to be a short-tongued species and prefers plants including milkweeds, lupines, phacelias, sages, poppies, and buckwheats. This species frequently nest underground in abandoned rodent nests but can also be found above ground utilizing tufts of grass, old bird nests, rock piles, and cavities in dead trees. Workers are active April through August, whereas the queen is active from March till May.

Threats: Threats to this species include habitat loss and degradation, climate change, pesticide use, and competition from non-native bees.

Monarch butterfly (*Danaus plexippus*)

Status: The monarch butterfly is a federal Candidate for listing under the ESA and is CDFW Special Animal. This taxon is not State listed as threatened or endangered.

General Distribution: Winter roost sites extend along the coast from northern Mendocino to Baja California, Mexico.

Habitat and Habitat Associations: The monarch butterfly requires roosting habitat located in wind-protected tree groves (eucalyptus, Monterey pine, cypress), with nectar and water sources nearby

Natural History: The larval host plant is milkweed (*Asclepias* spp.). In the western U.S., the widely distributed narrow-leaved milkweed (*A. fascicularis*) and showy milkweed (A. speciosa) are commonly used. Spring and summer breeding areas are found throughout most of California (except for the northwest) where milkweed and nectar plants are available. In southern California, breeding is generally in more coastal locations, but records exist in all non-desert areas.

The monarch butterfly is notable for its long-distance multi-generational annual migrations. Most of the western U.S. population migrates to California to winter within a coastal strip from Los Angeles to Monterey. Overwintering sites are generally located within a mile of the coast and typically consist of groves of trees of mixed height and diameter, including non-native eucalyptus, with an understory of shrubs and young trees. These sites are used as communal roosts and may host tens, hundreds, or thousands of butterflies. Monarchs generally begin arriving at overwintering sites in California in mid-October, although some may arrive as early as September. In February and March, monarchs breed at the roost site before dispersing to suitable habitat to lay their eggs.

The adult monarch feeds on flower nectar and winter-blooming food plants must be available near the winter roost. Also, the monarch requires specific microclimatic conditions in the winter roost and is particularly sensitive to any disturbance or modification to overwintering sites, including trimming or removal of trees.

Monarch populations have undergone a severe decline in recent decades due to loss of milkweed breeding habitat, loss of overwintering habitat, and use of insecticides. Overwintering sites in California are protected, to a certain extent, by State and local laws (IELP, 2012). The United States, Canada, and

Mexico have joined together to create the North American Monarch Conservation Plan (CEC, 2008), a long-term cooperative strategy to conserve the monarch butterfly and its unique migratory phenomenon.

Threats: Threats to this species include development and urbanization.

Morro shoulderband (*Helminthoglypta walkeriana*)

Status: The Morro shoulderband is listed as threatened under the ESA and is CDFW Special Animal. This taxon is not State listed as threatened or endangered.

General Distribution: Endemic to San Luis Obispo County in the central coastal region of California. It only occurs on Baywood fine sands soil type within an estimated 6,520 acres (2,638 hectares) located in and around the community of Los Osos and the City of Morro Bay (USFWS, 2022).

Habitat and Habitat Associations: Its primary habitat consists of coastal dunes, coastal scrub, and maritime chaparral within Baywood fine sands soil type with 10% slopes with dense layers of leaf litter. They also occur suburban landscaped habitats, fields, and often in high concentrations within non-native plants, such as veldt grass (*Ehrharta calycina*) and ice plant (*Carpobrotus edulis*) (USFWS, 2022).

Natural History: The Morro shoulderband spends most of the year aestivating and is generally only active during the rainy season, which in coastal San Luis Obispo County is between October and April. After the first rains of the rainy season, they emerge to find food and reproduce (USFWS, 2022). They are most active in the early evening, night, and early morning when the humidity levels are at the highest. Selection of aestivation locations is opportunistic and vary from native and non-native plants, dense areas of leaf litter and grass, and lower outer branches of shrubs. Helminthoglypta species can survive aestivation up to 170 days and lose as much as 40 percent of their body weight Morro shoulderband snails typically eat dead plant material and the fungus associated with detritus. Reproduction occurs during the rainy season when moisture conditions are suitable for feeding activity. Eggs are deposited in shallow holes in the soil below the leaf litter and hatch approximately 6 months later (USFWS, 2022).

Threats: The Morro shoulderband is threatened by habitat destruction resulting from development and habitat degradation from non-native plant species.

Fish

Tidewater goby (*Eucyclogobius newberryi*)

Status: The tidewater goby is a federally endangered species and is designated as a species of special concern by CDFW.

General Distribution: The tidewater goby is endemic to California, ranging from northern Del Norte County south to San Diego County.

Habitat and Habitat Associations: The habitat requirements for this species are coastal lagoons, and the uppermost brackish zone of larger estuaries in water that is generally less than 1 meter deep. Tidewater goby's are rarely found in marine or freshwater habitats (USFWS, 2005).

Natural History: The tidewater goby is a small fish that is grey-brown, and rarely exceeds 2 inches in length. It has large pectoral fins, and two dorsal fins. The males are nearly transparent and generally remain near their burrows, whereas the females develop darker colors. These fish are found in water with approximately 1/3 the salinity of the ocean, but occasionally migrate upstream into freshwater.

Male gobies dig burrows in clean coarse sand in April or May. Females spar with each other for access to males with burrow to lay their eggs. Female can lay up to 500 eggs per clutch and have up to 12 clutches per year. The males tend to the eggs in their burrows for 9-11 days until they hatch. Most tidewater gobies live for one year, and reproduction can occur at various times through the year. Reproduction will occur when water temperatures are between 9 and 25 degrees Celsius, and the salinity is between 2 and 27 parts per thousand (USFWS, 2005).

Threats: Threats identified for tidewater gobies include the destruction or modification of habitat from coastal development, channelization, water diversions, and groundwater over drafting. Other threats may include discharge from agriculture, increased sedimentation, summer breaching of lagoons, and vehicular activity near lagoons.

Southern Steelhead -Central California Coast DPS (*Oncorhynchus mykiss*)

Status: The Central California Coast Distinct Population Segment (DPS) was listed by the NMFS as federally threatened on August 18, 1997 (62 FR 43937). The most recent critical habitat was designated in September 2005.

General Distribution: The central California coast DPS occurs in from the Russian River (Sonoma and Mendocino counties) to Aptos Creek (Santa Cruz County), and the drainages of San Francisco, San Pablo, and Suisun Bays eastward to Chipps Island at the confluence of the Sacramento and San Joaquin Rivers. Tributary streams to Suisun Marsh including Suisun Creek, Green Valley Creek, and an unnamed tributary to Cordelia Slough (commonly referred to as Red Top Creek), excluding the Sacramento-San Joaquin River Basin, as well as two artificial propagation programs: the Don Clausen Fish Hatchery, and Kingfisher Flat Hatchery/Scott Creek (Monterey Bay Salmon and Trout Project) steelhead hatchery programs (NMFS, 2006).

Habitat and Habitat Associations: The habitat requirements for steelhead in freshwater streams are often dictated by life history stages (Bjornn and Reiser, 1991). During adult and juvenile migrations, adequate discharge amounts, water temperatures, and water chemistry become important habitat variables. Fluctuations of these variables can result in a delay or complete halt in the upstream migration of adults towards spawning grounds and downstream migration of juveniles towards brackish and saltwater habitats. Suitable spawning habitat requires efficient water depths and flow velocities as primary elements; however, water temperature and turbidity are also important factors. Juvenile steelhead require living space (different combinations of water depth and velocity), shelter from predators and harsh environmental conditions, food resources, and suitable water quality and quantity for growth and survival during the summer and winter months (NMFS, 2002).

Natural History: Southern steelhead and rainbow trout represent two life history patterns of the same species. The former represents anadromy and the latter represents freshwater residency. It is common to find populations exhibiting both life history strategies within the same river system. Fish that exhibit one life history strategy can produce offspring that exhibit the other strategy.

Southern steelhead are lightly to heavily spotted with small black spots on a lighter background; the dorsal, caudal, and adipose fins have these spots as well. Juvenile and larger freshwater resident fish have a red to pink stripe down the mid-sides, hence the name for the freshwater populations. The sea run fish are larger, lack the pink stripe, and present an overall silvery appearance with a "steely" blue-grey color dorsally. The inside of the mouth is entirely white in contrast to the other Pacific salmonid species, and they have a stronger tail stock and smaller anal fin than the other native Pacific salmon. The adipose fin separates them from all other native freshwater fish in anadromous streams in coastal southern California (Moyle, 2002).

In streams, steelhead prefer habitat consisting of relatively cool, well-oxygenated water with adequate depth and cover. Temperature tolerances and preferences of steelhead vary among life stages. Eggs tend to experience mortality at temperatures more than 55° F (13.3° C) (McEwan and Jackson, 1996). At temperatures greater than 70° F (21.1° C), steelhead appear to have difficulty obtaining sufficient oxygen from the water (McEwan and Jackson, 1996).

Threats: The extensive decline of steelhead in southern California is due primarily to instream water management facilities that have resulted in inadequate flow, flow fluctuation, water diversion and extraction, blockage of migratory passageways, and desiccation of portions of rivers and streams (NMFS, 1997).

California Tiger Salamander (*Ambystoma californiense*)

Status: The California tiger salamander (*Ambystoma californiense*) is state listed as threatened. The Santa Barbara County Distinct Population Segment (DPS) of the California tiger salamander was federally listed as endangered throughout its entire range in 2000 under the federal ESA.

General Distribution: The DPS is endemic to the northern portion of Santa Barbara County, California, and currently consists of six distinct metapopulations.

Habitat and Habitat Associations: California tiger salamander require vernal pools, ponds (natural or human-made), or semi-permanent calm waters where ponded water is present for a minimum 3 to 4 months for egg development and larval maturation. Adjacent upland areas that contain small mammal burrows or other suitable dry season refuge are essential habitat requirements.

Natural History: Adult California tiger salamander spend most of their lives underground in small mammal burrows, such as those of ground squirrel and pocket gopher. Adults emerge from underground retreats to feed, court, and breed with the onset of seasonal fall and winter rains, when the ground becomes saturated and pools fill. Breeding typically occurs from November through March in the Santa Barbara region, with juveniles dispersing from ponds as they dry in May and June. Eggs hatch in about 10 to 14 days, and the larvae continue to develop in the pools for several weeks until they metamorphose. A minimum of 10 weeks is required for egg development and larval maturation. As the seasonal pools dry, juvenile salamanders seek refuge in surrounding upland habitat, typically in small mammal burrows as described above.

Several studies have recorded migration and dispersal distances from breeding ponds (e.g. Trenham, 2001; Loredo et. Al, 1996; Orloff, 2011). Although none of these studies were conducted in Santa Barbara County, they are considered the best available sources of information on dispersal distance and potential for occurrence in surrounding upland habitats. Maximum dispersal distances of 1.2 miles and 1.4 miles (Orloff, 2011) are most often cited in the literature. The analysis in this EIR considers maximum dispersal distance from breeding ponds to be 1.4 miles based on the Orloff (2011) study and input from a local expert.

Factors including terrain and vegetation type may affect dispersal capability, but it is difficult to precisely determine the degree to which this may occur in a specific context. Man-made features such as roadways, highways, commercial or residential development, and irrigated cropland may inhibit, but not preclude dispersal. Major highways, rivers, or mountain ranges may be considered complete barriers to California tiger salamander migration.

Various studies have gathered data on the use of upland habitats by CTS. This information is essential to determining the potential for impacts to habitat and mortality (i.e., incidental take) due to proposed land use conversions. Range of dispersal from breeding ponds is an important factor in assessing potential for incidental mortality, while patterns of upland habitat use (e.g., concentration of adult California tiger salamander relative to distance from breeding ponds) is most applicable to conservation planning.

The density of CTS occupying upland refugia decreases exponentially with distance from breeding ponds (Searcy and Shaffer 2007). One study showed that approximately 95 percent of migrating CTS remained within 2,034 feet of a breeding pond. More recent studies have suggested that a higher percentage (i.e., >5 percent) might be migrating beyond this distance (Orloff 2011, Searcy and Schaffer 2013).

Threats: The main threat to the species is fragmentation and destruction of habitat by agricultural and urban development.

Lesser slender salamander (*Batrachoseps minor*)

Status: The lesser slender salamander is a California Species of Special Concern. It is not listed federally, or State listed as threatened or endangered**.**

General Distribution: Endemic to a small portion of the southern Santa Lucia Mountains of San Luis Obispo County.

Habitat and Habitat Associations: Inhabits moist locations in forests of mixed oak, tanbark oak, sycamore and laurel above 1,300 ft. elev.

Natural History: The lesser slender salamander is active on rainy or wet nights when temperatures are moderate from the fall into the spring. During the summer months when the soil dries, they go underground or when air temperature drops to near freezing. They commonly **f**ound under rocks, logs, bark, and other debris. They feed on a variety of small invertebrates. Other female Slender Salamanders lay eggs in moist places underground. Young develop completely in the egg and hatch fully formed.

Threats: Threats to the species includes habitat alteration from flash floods, mining, water diversion, and vegetation damage by cattle.

California Red-Legged Frog (*Rana draytonii*)

Status: The California red-legged frog was federally listed as an endangered species by the USFWS on May 23, 1996 and is a California Species of Special Concern. This frog has been extirpated from approximately 70 percent of its historic range. At the time of listing, the red-legged frog (*Rana aurora*) was comprised of two subspecies, the California red-legged frog (*R. aurora draytonii*) and the northern red-legged frog (*R. aurora aurora*) until genetic studies (Shaffer et al., 2004) determined that *R. aurora* is two separate species, northern red-legged frog (*R. aurora*) and California red-legged frog (*R. draytonii*). The ranges of these two species overlap in Mendocino County. Only the California red-legged frog occurs within the project region.

General Distribution: California red-legged frog was formally known as a common native frog in parts of Los Angeles, San Bernardino, Orange, Riverside, and San Diego Counties (Jennings et al., 1992). Numerous records of California red-legged frogs exist from the 1930s along the Mojave River near Victorville (San Bernardino County), as well as along the San Luis Rey River in San Diego County. Red-legged frogs were found in the southern transverse and peninsular ranges. Known historic watersheds include: Calleguas, Santa Monica Bay, Los Angeles, San Gabriel, Antelope-Fremont Valleys (partial), Santa Ana, San Jacinto, Seal Beach, Newport Bay, Aliso-San Onofre, Santa Margarita, San Luis Rey, San Diego, Cottonwood-Tijuana, Whitewater River, San Felipe Creek, and Salton Sea (partial). Red-legged frogs were found in the Mojave River, San Gabriel River, and Santa Clara River. There are historic locations in Los Angeles, Riverside, Santa Barbara, and Ventura Counties in southern California.

Habitat Requirements This species is found in humid forests, woodlands, grasslands, streams, wetlands, ponds, and lakes from sea level to 8,000 ft (2,438 m) above mean sea level (msl) (Stebbins, 2003). Preferred breeding habitat includes deep ponds and slow-moving streams where emergent vegetation is found on the bank edges (Jennings and Hayes, 1994). Although primarily aquatic, it has been recorded in damp terrestrial places up to 302 ft (92 m) from water for up to 50 consecutive days (Tatarian, 2008) and using small mammal burrows and moist leaf litter as refugia during dry periods (Jennings and Hayes, 1994).

Natural History: The California red-legged frog ranges in size from 1.5 to 5.5 inches in length, making it the largest native frog in the western United States. Adult females are significantly longer than males, with an average snout to vent length (svl) of 5.4 inches versus 4.5 inches for adult males. The hind legs and lower abdomen of adult frogs are often characterized by a reddish or salmon pink color, and the back is brown, gray, olive, or reddish brown, marked with small black flecks and larger irregular dark blotches (Stebbins, 2003). Dorsal spots often have light centers, and in some individuals, form a network of black lines (Stebbins, 2003). Dorsolateral folds are prominent. Tadpoles range in length from 14 to 80 mm, and are a dark brown or olive, marked with darker spots (Storer, 1925).

California red-legged frog adults tend to be primarily nocturnal, while juveniles can be active at any time of day. Adults feed on a wide range of prey, having been recorded feeding on at least 42 different taxa in a single study (Hayes and Tennant, 1985), the majority of which were terrestrial invertebrates but also included fish, other amphibians, and small rodents. The diet of red-legged tadpoles has not been studied but is expected to be like other ranid frogs that feed on algae, diatoms, and detritus by grazing the surface of rocks and vegetation.

During the breeding season, typically from November through April, males call to females from the margins of ponds and slow streams (Jennings and Hayes, 1994). Unlike northern red-legged frogs, which lack vocal sacs and call underwater, California red-legged frogs have paired vocal sacs and call above the water surface (Hayes and Krempels, 1986), though vocalizations are relatively weak and difficult to detect. Actual mating most commonly occurs in March but can vary depending on seasonal climatic patterns. The female lays a jellylike mass of 2,000 to 5,000 reddish brown eggs attached to emergent vegetation, twigs, or other structures in still or slow-moving water. The resulting tadpoles typically require about 3 weeks to hatch, and another 11 to 20 weeks to metamorphose into juvenile frogs. Metamorphosis typically occurs from July to September, although some tadpoles have been observed to delay metamorphosis until the following March or April (Fellers et al., 2001). Male red-legged frogs typically reach sexual maturity 2 years from metamorphosis whereas females reach sexual maturity 3 years from metamorphosis (Jennings and Hayes, 1985).

Threats: California red-legged frogs are probably subject to predation by aquatic invertebrates and vertebrates such as fishes, other amphibians, snakes, and occasionally birds and mammals, during all life history stages (Zeiner et al., 1988). Introduced species that prey upon California red-legged frogs, eggs, and larvae include crayfish (*Pacifastacus leniusculus* and *Procambarus clarkii*), bullfrogs (*Lithobates* [*Rana*] *catesbeiana*), green sunfish (*Lepomys cyanellus*), bluegill (*L. macrochirus*), largemouth bass (*Micropterus salmoides*) and smallmouth bass (*M. dolomieu*). This frog has been eliminated from 75 percent of its historic range. Species decline is attributed to habitat loss, introduction of non-native species (predators and competitors), natural predation, and historically, use of frog legs as a food source. Threats to California red-legged frogs on NFS lands include predatory invasive species, crushing due to activities on roads and in campgrounds, disturbance from water play, disease, water diversions, and grazing.

Western spadefoot (*Spea hammondii*)

Status: The western spadefoot toad is a CDFW Species of Special Concern. This species is not federally, or State listed as threatened or endangered.

General Distribution: The western spadefoot toad is endemic to California and northern Baja California. The species ranges from the north end of California's great Central Valley near Redding, south, east of the Sierras and the deserts, into northwest Baja California (Jennings and Hayes, 1994; Stebbins, 2003).

Habitat and Habitat Associations: Although the species primarily occurs in lowlands, it also occupies foothill and mountain habitats. Within its range, the western spadefoot toad occurs from sea level to 1,219 meters (4,000 feet) AMSL, but mostly at elevations below 910 meters (3,000 feet) AMSL (Stebbins, 2003;). Holland and Goodman (1998) report that riparian habitats with suitable water resources may also be used. The species is most common in grasslands with vernal pools or mixed grassland/coastal sage scrub areas (Holland and Goodman, 1998).

Natural History: The western spadefoot toad is almost completely terrestrial, remaining underground eight to 10 months of the year and entering water only to breed (Jennings and Hayes, 1994; Holland and Goodman, 1998). The species aestivates in upland habitats near potential breeding sites in burrows approximately one meter in depth and adults emerge from underground burrows during relatively warm rainfall events to breed. While adults typically emerge from burrows from January through March, they may also emerge in any month between October and April if rain thresholds are met (Jennings and Hayes, 1994; Holland and Goodman, 1998).

Eggs are deposited in irregular small clusters attached to vegetation or debris in shallow temporary pools or sometimes ephemeral stream courses (Stebbins, 1985; Jennings and Hayes, 1994) and are usually hatched within six days. Complete metamorphosis can occur rapidly, within as little as three weeks (Holland and Goodman, 1998; as cited in USACE and CDFW, 2009), but may last up to 11 weeks (Burgess, 1950; Feaver, 1971; Jennings and Hayes, 1994; all as cited in USACE and CDFW, 2009).

Western spadefoot toads likely do not move far from their breeding pool during the year (Zeiner *et al.*, 1988; as cited in USACE and CDFW, 2009), and it is likely that their entire post-metamorphic home range is situated around a few pools. However, opportunistic field observations indicate that they readily move up to at least several hundred meters from breeding sites (NatureServe, 2022).

Threats: Loss of aquatic and adjacent upland habitats supporting the life cycle of the western spadefoot toad is a primary threat to this species, but other factors related to urban development probably are contributing to this species' decline.

Coast Range newt (*Taricha torosa torosa*)

Status: The Coast Range newt is a CDFW Species of Special Concern. This taxon is not federally, or State listed as threatened or endangered.

General Distribution: The Coast Range newt occurs along the coast ranges of California, from Mendocino County south to Los Angeles County and disjunct south to the Cuyumaca Mountains in San Diego County (NatureServe, 2022). This subspecies has also been recorded along the southern Sierra Nevada from Tulare County to Kern County (Kuchta and Tan, 2006).

Habitat and Habitat Associations: This subspecies breeds in ponds, reservoirs, and streams. Terrestrial adults occupy various adjacent upland habitats, including grasslands, woodlands, and forests (NatureServe, 2022).

Natural History: The Coast Range newt belongs to the genus *Taricha*, whose members are readily distinguishable from all other western salamanders by a distinctive tooth pattern, lack of costal grooves, and rough skin (except in breeding males) (Stebbins, 2003). Migration towards suitable breeding grounds usually occurs at night following the first rains in the fall. Upon arriving at breeding sites, adults become aquatic and may remain at these sites for several weeks. Breeding typically occurs between December and May with optimal peaks between February and April (NatureServe, 2022). Adults migrate back to subterranean refuges during the spring and remain at these aestivation sites through the summer. Larvae normally transform in the summer or fall, or when water dries up, of their first year. Metamorphosed individuals feed on earthworms, snails, slugs, sow bugs, and various other invertebrates. Some adults, especially females may consume conspecific eggs. Larvae eat small aquatic organisms and decomposing organic material (Stebbins, 1951).

Threats: This subspecies has suffered marked population declines likely due to the introduction of exotic predators, including green sunfish (*Lepomis cyanellus*), mosquito fish, and crayfish (*Procambarus* sp.) (Stebbins, 2003).

REPTILES

Northern California legless lizard (*Anniella pulchra*)

Status: The silvery legless lizard is a CDFW Species of Special Concern. This taxon is not federally, or State listed as threatened or endangered.

General Distribution: Silvery legless lizard occurs from Contra Costa County, California, south through the Coast, Transverse, and Peninsular Ranges; through parts of the San Joaquin Valley; and, along the western edge of the southern Sierra Nevada and western edge of the Mohave Desert (Jennings and Hayes, 1994). Its reported elevation range extends from sea level to approximately 5,700 feet in the Sierra Nevada foothills, but most historic localities along the central and southern California coast are below 3,500 feet (Jennings and Hayes, 1994). This fossorial species is rarely seen, and it may be more abundant than it appears.

Habitat and Habitat Associations: The silvery legless lizard requires sandy or loose loamy soils under sparse vegetation for burrowing and is strongly associated with soils that contain high moisture content. It has been found in beaches, chaparral, and pine-oak woodland habitat and sycamore, cottonwood, or oak riparian habitat that grows on stream terraces. It is most common in coastal dune, valley-foothill, chaparral, and coastal scrub habitats (Zeiner *et al.*, 1988).

Natural History: The silvery legless lizard is a member of the family Anniellidae, commonly known as North American legless lizards. The silvery, gray, or beige dorsal side of this subspecies is separate from the yellow ventral side by a dark mid-dorsal line (Stebbins, 2003). Little is known about specific habitat requirements for courtship and breeding (CDFW, 2008). Breeding occurs in early spring through July. The gestation period lasts for approximately four months (Jennings and Hayes, 1994). Live young are born in September, October, or occasionally as late as November, with litter size ranging from one to four, but two is most common (Stebbins, 1954). Soil moisture is essential for the subspecies, and they die if they are unable to reach a moist substrate (Stephenson and Calcarone, 1999). Silvery legless lizards have a relatively low thermal preference, allowing for active behavior on cool days, early morning, and even at night during warmer periods (Bury and Balgooyen, 1976). This subspecies typically forages at the base of shrubs or other vegetation either on the surface or just below in leaf litter or sandy soils. The diet consists of insect larvae, small adult insects, and spiders (Stebbins, 1954).

Threats: The subspecies has been extirpated from approximately 20 percent of its known historical range. Potential threats to local populations may include wildfires that destroy the desert shrub with which the subspecies is associated.

Western pond turtle (*Emys marmorata*)

Status: The southwestern pond turtle is a CDFW Species of Special Concern. This taxon is not federally, or State listed as threatened or endangered.

General Distribution: This species occurs from range extends from the Puget Sound region of Washington State south to Baja California.

Habitat and Habitat Associations: Western Pond turtles inhabit permanent or nearly permanent bodies of water in a wide variety of habitat types. Suitable basking sites, such as partially submerged logs, vegetation mats, or open mud banks are a required element for this subspecies.

Natural History: The western pond turtle is a subspecies of western pond turtle (*C. marmorata*) which represent the only abundant native turtles in California. This species is thoroughly aquatic and possesses a low carapace typically olive, brown, or blackish in color (Stebbins, 2003). The subspecies usually lays a clutch of 3 to 14 eggs between April and August as females may move overland up to over 300 feet to find suitable nesting sites. Nests have been observed in many soil types from sandy to very hard and soils must be at least four inches deep for nesting (CDFW, 2008). Most activity is diurnal, but some crepuscular and nocturnal behavior has been observed (CDFW, 2008). Southwestern pond turtles feed on aquatic plants, insects, worms, fish, amphibian eggs and larvae, crayfish, and carrion (Stebbins, 2003).

Threats: Western pond turtles are estimated to be in decline across 75-80 percent of their range (Stebbins, 2003). The primary reason for this decline has been attributed to loss of suitable habitat associated with urbanization, agricultural activities, and flood control and water diversion projects (Jennings *et al.*, 1992).

Coast horned lizard (*Phrynosoma blainvillii*)

Status: The coast horned lizard is a CDFW Species of Special Concern. This taxon is not federally, or State listed as threatened or endangered.

General Distribution: The coast horned lizard's historic range extended from the Transverse Ranges in Kern, Los Angeles, Santa Barbara, and Ventura Counties south through the Peninsular Ranges of southern California and into Baja California, Mexico as far south as San Vicente, however, the current range is much more fragmented (Jennings and Hayes, 1994).

Habitat and Habitat Associations: The coast horned lizard occurs in a wide variety of habitats throughout its range, though is found primarily in chaparral and mixed chaparral-coastal sage scrub, to stands of pure coastal sage scrub. It is also known to occur in riparian habitats, washes, and most desert habitats. They are occasionally locally abundant in conifer-hardwood and conifer forests. This species is most common in open, sandy areas where abundant populations of native ant species (e.g., *Pogonomyrmex* and *Messer* spp.) are present.

Natural History: The coast horned lizard is a flat bodied lizard with a wide, oval-shaped body and scattered enlarged pointed scales on the upper body and tail. Coast horned lizards are oviparous and lay one clutch of 6-17 (average 11-12) eggs per year from May through early July (Jennings and Hayes, 1994). Incubation occurs for two months, and hatchlings first appear in late July and early August. It is surface active primarily from April to July. This species spends a considerable amount of time basking, either with the body buried and head exposed, or with the entire body oriented to maximize exposure to the sun. Although little is known about longevity in the wild, adults are thought to live for at least eight years (Jennings and Hayes, 1994). They primarily eat native harvester ants (*Pogonmyrmex* spp.) and do not appear to eat invasive Argentine ants that have replaced native ants in much of central and southern California. This species is an opportunistic feeder, and while harvester ants can comprise upwards of 90% of their diet, they will feed on other insect species when those species are abundant (Jennings and Hayes, 1994). Defense tactics used by this species include remaining motionless to utilize its cryptic appearance, only running for the nearest cover when disturbed or touched. Captured lizards puff up with air to appear larger, and if roughly handled, will squirt blood from a sinus in each eyelid (Jennings and Hayes, 1994).

Threats: Though once common throughout much of coastal and cismontane southern California, coast horned lizards have disappeared from much of their former range. Their population decline is mainly attributed to habitat loss due to urbanization and agricultural conversion. The introduction of non-native Argentine ants (*Iridomyrmex humilis*), which are inedible to horned lizards and tend to displace native carpenter and harvester ants, is another factor in their decline.

Two-striped garter snake (*Thamnophis hammondii*)

Status: The two-striped garter snake is a CDFW Species of Special Concern. This taxon is not federally, or State listed as threatened or endangered.

General Distribution: This species occurs along a continuous range from northern Monterey County south through the South Coast and Peninsular Ranges to Baja California. Isolated populations also occur through southern Baja California, Catalina Island, and desert regions along the Mojave and Whitewater Rivers in San Bernardino and Riverside Counties, respectively (Jennings and Hayes, 1994). This species typically occurs at elevations ranging between sea level and approximately 8,000 feet (Jennings and Hayes, 1994).

Habitat and Habitat Associations: This species is primarily associated with aquatic habitats that border riparian vegetation and provide nearby basking sites (Jennings and Hayes, 1994). These areas typically include perennial and intermittent streams and ponds in a variety of vegetation communities, including chaparral, oak woodland, and forest habitats (Jennings and Hayes, 1994). During the winter, two-striped garter snakes will seek refuge in upland areas, such as adjacent grassland and coastal sage scrub (Rossman *et al.*, 1996).

Natural History: After several taxonomic revisions, two-striped garter snake has been recognized as a separate species where it had previously been considered a subspecies of the western aquatic garter snake (*T. couchii*) (Rossman and Stewart, 1987). This species is usually morphologically distinguished by the lack of a mid-dorsal stripe. Two-striped garter snakes breed from late March to early April and young are typically born between late July and August; however, some have been observed as late as November (Rossman *et al.*, 1996; Jennings and Hayes, 1994). Two-striped garter snakes hibernate during the winter months; however, they have been observed actively above ground on warm winter days (Jennings and Hayes, 1994). The mainly aquatic diet of this species consists primarily of fish, fish eggs, and tadpoles and metamorphs of toads and frogs; however, they will also consume worms and newt larvae (Jennings and Hayes, 1994).

Threats: The quantity and quality of habitat for two-striped garter snakes is declining throughout much of its range. More than forty percent of this species' historic range has been lost (Jennings and Hayes, 1994). Primary factors for the decline of this species in southern California include habitat conversion and degradation resulting from urbanization, construction of reservoirs, and cement-lining of stream channels.

BIRDS

Cooper's hawk (*Accipter cooperii*)

Status: The Cooper's hawk is a CDFW Watch List Species that was removed from the Species of Special Concern list in 2008. This taxon is not federally, or State listed as threatened or endangered.

General Distribution: The Cooper's hawk is widespread, occurring throughout much of the United States, southern Canada, and northern Mexico. In California this species is a widespread but infrequent breeder but is not considered common at any location.

Habitat and Habitat Associations: The Cooper's hawk breeds in small and large deciduous, conifer, and mixed woodlands. It also nests in pine plantations and suburban and urban environments (Curtis *et al.*, 2006). In California, this species nests predominately in oaks and pines. Cooper's hawks utilize a variety of habitat types with vegetative cover and often hunt on the edges of wooded areas.

Natural History: One of three accipiter species in California, the Cooper's hawk is a medium-sized bird adapted to woodlands. This species shows a high degree of sexual dimorphism, with females generally up to one-third larger than males. Eastern and western individuals also differ in size. The Cooper's hawk generally breeds at two years of age and older and lays 3-6 eggs from early April to late May (Rosenfield and Bielefeldt, 1993). This species feeds primarily on birds (70-80 percent of the diet) (Zeiner *et al.*, 1990a).

Threats: Habitat destruction (including logging and development), pesticide contamination, and shooting have been identified as the primary threats to the Cooper's hawk. However, breeding populations have increased in California and expanded into urban areas and populations are considered stable (Shuford and Gardali, 2008).

Tricolored blackbird (*Agelaius tricolor*)

Status: The tricolored blackbird is a CDFW Species of Special Concern. This taxon is not federally, or State listed as threatened or endangered.

General Distribution: This species is primarily a permanent resident across its range in California and occurs throughout the Central Valley and in coastal districts from Sonoma County south to Baja California.

Habitat and Habitat Associations: The tricolored blackbird breeds near fresh water, preferably in emergent wetland with tall dense cattails (*Typha* spp.) or tules, but also in thickets of willows, blackberry, wild rose, and tall herbs (CDFW, 2022). This species forages primarily in grassland and cropland habitats.

Natural History: The tricolored blackbird is distinguishable from similar species by dark red shoulder patches with broad white tips bordering the distal side. This highly gregarious species is highly colonial and nesting areas must be large enough to support a minimum colony of roughly fifty pairs (Grinnell and Miller, 1944). Tricolored blackbirds are polygynous and during the breeding season, which typically occurs from mid-April into late July, each male may claim several mates nesting in his small territory. Foraging generally occurs in the vicinity of colony sites; however, some breeding individuals have been documented leaving nest sites as far as four miles to feed (Orians, 1961).

Threats: Some of the threats that have been identified for this species include loss of habitat due to draining of freshwater marshes and cowbird parasitism.

Golden eagle (*Aquila chrysaetos*)

Status: The golden eagle is on Golden eagle is federally protected under the Bald and Golden Eagle Protection Act, recognized as sensitive species by the BLM, fully protected species in California, and is USFWS BCC. This taxon is not federally, or State listed as threatened or endangered.

General Distribution: In North America, this species breeds locally from northern Alaska eastward to Labrador and southward to northern Baja California and northern Mexico. The species winters from southern Alaska and southern Canada southward through the breeding range. The golden eagle ranges from sea level up to 11,500 feet AMSL (Grinnell and Miller, 1944).

Habitat and Habitat Associations: The golden eagle requires rolling foothills, mountain terrain, and wide arid plateaus deeply cut by streams and canyons, open mountain slopes and cliffs, and rock outcrops (Zeiner *et al.* 1990a).

Natural History: The golden eagle requires rolling foothills, mountain terrain, and wide arid plateaus deeply cut by streams and canyons, open mountain slopes and cliffs, and rock outcrops (Zeiner *et al.* 1990a). Nest construction in southern California occurs in fall and continues through winter (Dixon. 1937). This species nests on cliffs with canyons and escarpments and in large trees (generally occurring in open habitats) and is primarily restricted to rugged, mountainous country (Garrett and Dunn, 1981; Johnsgard, 1990). It is common for the golden eagle to use alternate nest sites, and old nests are reused. The nests are large platforms composed of sticks, twigs, and greenery that are often three meters (10 feet) across and one meter (three feet) high (Zeiner *et al.* 1990a). They breed from late January through August, mainly during late winter and early spring in the California deserts (Pagel et al. 2010). Golden eagles are wide-ranging predators, especially outside of the nesting season, when they have no need to return daily to tend eggs or young at their nests. Foraging habitat consists of open terrain including grasslands, deserts, savanna, and early successional forest and shrubland habitats. They prey primarily on rabbits and rodents but will also take other mammals, birds, reptiles, and some carrion (Kochert et al. 2002). Golden eagle home ranges in the Mojave Desert range from 1.7 to 1,369 square miles, and averaged 119 square miles (Braham et al., 2015). In any given year, golden eagles may initiate nesting behavior at one nest, without any activity at the other nests. Eagles may complete breeding by laying eggs and raising chicks or may abandon the nest without successfully raising young. In any given year, all or most nests in a territory may be inactive, but eagles may return in future years to nest at previously inactive sites.

Threats: A major threat to this species is human disturbance in the form of habitat loss as well as human development and activity adjacent to golden eagle habitat. Accidental deaths attributed to increased development include collisions with vehicles, power lines, and other structures; electrocution; hunting; and poisoning (Cornell, 2022). Golden eagles avoid developed areas; the golden eagle population in California has undergone a decline within the past century due to a decrease in open habitats (Grinnell and Miller, 1944). If nests are disturbed by humans, abandonment of these nests in early incubation will typically occur (Thelander, 1974), thereby threatening the species' reproductive success.

Long-eared owl (*Asio otus*)

Status: The long-eared owl has been designated by CDFW as a California Species of Special Concern. This taxon is not federally, or State listed as threatened or endangered.

General Distribution: The long-eared owl (*Asio otus*) occurs in North America, Europe, Asia, and northern Africa between elevations from near sea level to over 2,000 meters (6,560 feet) AMSL (Zeiner et al., 1990a). In North America, this species breeds from British Columbia east across Canada and the United States and south to southern California, southern Arizona, and northern Mexico. It also winters in most of its breeding range, except in the northernmost areas. The long-eared owl's wintering range extends from southern Canada and northern New England to the Gulf States and to the Jalisco, Michoacan, Guerrero, and Oaxaca states in Mexico (Cornell, 2022).

Habitat and Habitat Associations: The long-eared owl primarily uses riparian habitat for roosting and nesting but can also use live oak thickets and other dense stands of trees (Zeiner et al., 1990a). It appears to be more associated with forest edge habitat than with open habitat or forest habitat. The long-eared owl usually does not hunt in the woodlands where it nests, but in open space areas such as fields, rangelands, and clearings.). This species typically utilizes nests built by other species, or on occasion nest in cavities in trees and cliffs, and even on the ground (Cornell, 2022).

Natural History: The long-eared owl eats mostly voles and other rodents, though it also occasionally eats birds and other vertebrates (Cornell, 2021). The long-eared owl uses abandoned crow, magpie, hawk, heron, and squirrel nests in a variety of trees with dense canopy (Call, 1978; Cornell, 2022). Breeding season extends from early March to late July (Call, 1978).

Threats: Resident populations of the long-eared owl in California have been declining since the 1940s, especially in southern California (Grinnell and Miller, 1944; Shuford *et al.*, 2008). Habitat destruction, including grasslands used for foraging, fragmentation of riparian nesting habitat and live oak groves, and proximity to urban development are cited as major factors in the decline of populations in California. Other urban-related factors that could affect long-eared owls are nighttime lighting, which may disrupt activity patterns and expose nests to nocturnal predators; use of pesticides, which may cause secondary poisoning and reduction or loss of prey; and predation and harassment by pet, stray, and feral cats, and dogs.

Burrowing owl (*Athene cunicularia*)

Status: The burrowing owl is a CDFW Species of Special Concern. This taxon is not federally, or State listed as threatened or endangered.

General Distribution: The burrowing owl (*Athene cunicularia*) breeds from southern interior British Columbia, southern Alberta, southern Saskatchewan, and southern Manitoba, south through eastern

Washington, central Oregon, and California to Baja California, east to western Minnesota, northwestern Iowa, eastern Nebraska, central Kansas, Oklahoma, eastern Texas, and Louisiana, the southern portion of Florida, and south to central Mexico. The species is also locally distributed throughout suitable habitat in Central and South America to Tierra del Fuego, and in Cuba, Hispaniola, the northern Lesser Antilles, Bahama Islands, and in the Pacific Ocean off the west coast of Mexico. The western subspecies, western burrowing owl, occurs throughout North and Central America west of the eastern edge of the Great Plains south to Panama. The winter range of the western burrowing owl is much the same as the breeding range, except that most individuals apparently vacate the northern areas of the Great Plains and the Great Basin.

Habitat and Habitat Associations: In California, western burrowing owls are yearlong residents of flat, open, dry grassland and desert habitats at lower elevations (Bates, 2006). They typically inhabit annual and perennial grasslands and scrublands characterized by low-growing vegetation and also may occur in areas that include trees and shrubs if the cover is less than 30% (Bates, 2006); however, they prefer treeless grasslands. Although western burrowing owls prefer large, contiguous areas of treeless grasslands, they have also been observed in fallow agriculture fields, golf courses, cemeteries, road allowances, airports, vacant lots in residential areas and university campuses, and fairgrounds when nest burrows are present (Bates 2006). The availability of numerous small mammal burrows, such as those of California ground squirrel (*Spermophilus beecheyi*), is a major factor in determining whether an area with apparently suitable habitat supports western burrowing owls (Coulombe, 1971).

Natural History: Most western burrowing owls that breed in Canada and the northern United States are believed to migrate south during September and October and north during March and April, and into the first week of May. These individuals' winter within the breeding habitat of more southern-located populations. Thus, winter observations may include both the migrant individuals as well as the resident population. Western burrowing owls occurring in Florida are predominantly non-migratory, as are populations in southern California (Thomsen, 1971). Western burrowing owls in northern California are believed to migrate (Coulombe, 1971). In many parts of the United States, the western burrowing owl's breeding range has been reduced and it has been extirpated from certain areas, including western Minnesota, eastern North Dakota, Nebraska, and Oklahoma (Bates 2006).

Western burrowing owls are opportunistic, primarily feeding on arthropods, small mammals, and birds, and often need short grass, mowed pastures, or overgrazed pastures for foraging. Western burrowing owls are primarily crepuscular in their foraging habits, but hunting has been observed throughout the day (Thomsen 1971). Insects are often taken during daylight, whereas small mammals are taken more often after dark.

Threats: Factors related to declines in western burrowing owl populations include the loss of natural habitat due to urban development and agriculture; other habitat destruction; predators, including domestic dogs; collisions with vehicles; and pesticides/poisoning of ground squirrels (Grinnell and Miller 1944). A ranking of the most important threats to the species included loss of habitat, reduced burrow availability due to rodent control, and pesticides (James and Espie 1997).

Northern harrier (*Circus hudsonius*)

Status: The northern harrier is a CDFW Species of Special Concern. This taxon is not federally, or State listed as threatened or endangered.

General Distribution: The northern harrier is found throughout the northern hemisphere. In North America, this species breeds from Alaska and the southern Canadian provinces south to Baja California, New Mexico, Texas, Kansas, and North Carolina (Limas, 2001).

Habitat and Habitat Associations: Northern harriers use a wide variety of open habitats in California, including deserts, coastal sand dunes, pasturelands, croplands, dry plains, grasslands, estuaries, flood plains, and marshes (Macwhirter and Bildstein, 1996; as cited in USACE and CDFG, 2009). The species can also forage over coastal sage scrub or other open scrub communities.

Natural History: The northern harrier's owl-like facial disk and white rump patch, which is prominent in flight, distinguish this species from all other North American falconiformes (Alsop III, 2001). Many California populations, including those in Ventura County, are residents, and many migrating harriers winter in California. The breeding season for this species typically occurs between mid-March to early April. During this period, males, and occasionally females, exhibit uniquely characteristic courtship flights consisting of a series of nose dives (Bent, 1937). The northern harrier is predominately monogamous, but polygyny occurs when prey abundance is high. Nests are built on the ground. Clutch size averages five, and incubation lasts 30-32 days with nestlings fledging at 30-35 days. Hatching occurs from April through June. This bird relies on hearing as well as sight while hunting and primarily feeds on small mammals, but will also take reptiles, amphibians, birds, and invertebrates.

Threats: The primary threat to northern harriers is habitat loss through development and agricultural conversion.

White-tailed kite (*Elanus leucurus*)

Status: The white-tailed kite is a CDFW Fully Protected Species. This taxon is not federally, or State listed as threatened or endangered.

General Distribution: The white-tailed kite is a permanent resident in California, southern Texas, Washington, Oregon, and Florida. It also occurs as a resident from Mexico into parts of South America (Dunk, 1995). In California, this species inhabits coastal and valley lowlands and is typically found in agricultural areas. It has increased population numbers and range in recent decades (Zeiner *et al.*, 1990a).

Habitat and Habitat Associations: The white-tailed kite inhabits savanna, open woodlands, marshes, desert grasslands, partially cleared lands, and cultivated fields (Dunk, 1995). This species roosts in trees with dense canopies as well as saltgrass and Bermuda grass (Zeiner *et al.*, 1990a).

Natural History: The white-tailed kite is a medium-sized, long-winged raptor with red eyes. This monogamous species breeds from February to October, with peak activity occurring between May and August. Incubation is solely performed by the female; however, during incubation and the nestling period, the male feeds the female and provides her with food to feed the young (CDFW, 2022). The white-tailed kite is the only North American kite that hovers while hunting, usually less than thirty meters above the ground before descending vertically upon prey (Alsop III, 2001; Zeiner *et al.*, 1990a). This species primarily feeds on voles and other small mammals but will also take birds, insects, reptiles, and amphibians. Although white-tailed kites are non-migratory, individuals may become nomadic in response to prey availability (Zeiner *et al.*, 1990a).

Threats: While the white-tailed kite is reported to have increased in numbers and range over the past several decades, it is still vulnerable to habitat loss due to development.

American peregrine falcon (*Falco peregrinus anatum*)

Status: The peregrine falcon is a federal Bird of Conservation Concern and a California Fully Protected species.

General Distribution: The peregrine falcon has a worldwide distribution that is more extensive than that of any other bird. In North America, the peregrine falcon breeds from Alaska to Labrador, southward to Baja California and other parts of northern Mexico, and east across central Arizona through Alabama. Its distribution is patchy in North America, and populations in the eastern United States are still chiefly in urban areas (AOU, 1998; White *et al.*, 2002; as cited in USACE and CDFC, 2009).

Habitat and Habitat Associations: Peregrine falcons in general use a large variety of open habitats for foraging, including tundra, marshes, seacoasts, savannahs, grasslands, meadows, open woodlands, and agricultural areas. Sites are often located near rivers or lakes (AOU, 1998; Brown, 1999; Snyder, 1991; all as cited in USACE and CDFC, 2009). Riparian areas, as well as coastal and inland wetlands, are also important habitats year-round for this species. The species breeds mostly in woodland, forest, and coastal habitats (Zeiner et al, 1990a; Brown, 1999; all as cited in USACE and CDFC, 2009).

Natural History: In California, the American peregrine falcon is an uncommon breeder or winter migrant throughout much of the state. It is absent from desert areas (Zeiner *et al.*, 1990a; as cited in USACE and CDFC, 2009). Active nests have been documented along the coast north of Santa Barbara, in the Sierra Nevada, and in other mountains of northern California. As a transient species, the American peregrine falcon may occur almost anywhere that suitable habitat is present (Garrett and Dunn, 1981; as cited in USACE and CDFC, 2009).

The diet of the American peregrine falcon primarily consists of birds that, while most are pigeon-sized, can be as small as hummingbirds or as large as small geese (White *et al.*, 2002; as cited in USACE and CDFC, 2009). Other prey species include jays, flickers, meadowlarks, starlings, woodpeckers, shorebirds, and other readily available birds. The American peregrine falcon may feed on large numbers of rodents when present (Brown, 1999; as cited in USACE and CDFC, 2009).

Breeding requires cliffs or suitable surrogates that are close to preferred foraging areas. Nests are typically located in cliffs between 50 and 200 meters (164 to 656 feet) tall that are prominent in the landscape. American peregrine falcons have also been known to nest in trees and on small outcrops. Tall buildings, bridges, or other tall man-made structures are also suitable for nesting (White *et al.*, 2002; as cited in USACE and CDFC, 2009). The nest site usually provides a panoramic view of open country and often overlooks water. It is always associated with an abundance of avian prey, even in an urban setting. A cliff or building nest site may be used for many years (Brown, 1999; as cited in USACE and CDFC, 2009). The nest site itself usually consists of a rounded depression or scrape with accumulated debris that is occasionally lined with grass (Call, 1978; as cited in USACE and CDFC, 2009). Higher-quality nest sites confer greater protection from the elements and have greater breeding success (Olsen and Olsen, 1989; as cited in USACE and CDFC, 2009).

Threats: There are no persistent threats identified for this species.

California condor (*Gymnogyps californianus*)

Status: The California condor is listed as both state and federally endangered and is a California Fully Protected species.

General Distribution: The southern California population of the California condor is largely confined to the semi-arid, rugged mountain ranges surrounding the southern San Joaquin Valley, including the Coast Ranges from Santa Clara County south to Los Angeles County, the Transverse Ranges, Tehachapi Mountains, and southern Sierra Nevada (Zeiner et al., 1990a; as cited in USACE and CDFG, 2009). The California condor has also historically occurred in northern Baja California, Mexico; northern California; Oregon; Washington; and south British Columbia, Canada in the early nineteenth century (Harris, 1941; Koford, 1953; Wilbur, 1978; Kiff, 2000; Snyder and Snyder, 2000; all as cited in USACE and CDFG, 2009).

Habitat and Habitat Associations: California condors require vast expanses of open savannah, grasslands, and foothill chaparral, with cliffs, large trees, and snags for roosting and nesting (Zeiner et al., 1990a; as cited in USACE and CDFG, 2009).

Natural History: Prior to all California condors being removed from the wild for captive breeding in the late 1980s, nonbreeding California condors often moved north to Kern and Tulare counties in April and returned south in September to winter in the Tehachapi Mountains, Mount Pinos, and Ventura and Santa Barbara counties (Zeiner et al., 1990a; as cited in USACE and CDFG, 2009). Since that time, California condors have been reintroduced into suitable habitat in eastern Ventura County as well as in the Ventana Wilderness area along the coast south of San Francisco.

The California condor requires an adequate food supply, open habitat in which food can readily be found and accessed, and reliable air movements that allow extended soaring flight (Snyder and Schmitt, 2002; as cited in USACE and CDFG, 2010). Most foraging has been documented in grasslands and oak woodlands, where individuals can easily launch into flight from nearly any location by running downhill, and where winds deflected by topographic relief usually provide the uplift necessary for extended flight (Snyder and Schmitt, 2002; as cited in USACE and CDFG, 2009). Most California condors forage within 50 to 70 kilometers (31 to 43 miles) of nesting areas, with core foraging areas ranging around 2,500 to 2,800 square kilometers (1,553 to 1,740 miles). This wide-ranging foraging area appears to be an adaptation to unpredictable food supplies.

The California condor primarily feeds on mammalian carrion, although remains of reptiles and birds have been occasionally found within nests (Collins *et al.*, 2000; as cited in USACE and CDFG, 2009). California condors are scavengers of fresh medium- to large-sized carcasses, such as sheep, cattle, deer, and elk

(Koford, 1953; Snyder and Snyder, 2000; Collins *et al.*, 2000; all as cited in USACE and CDFG, 2009). California condors are not known to feed on vehicle-killed animals, but in recent years, hunter-shot mule deer, shot or poisoned coyotes, and ground squirrels were consumed when available (Snyder and Schmitt, 2002; as cited in USACE and CDFG, 2009).

California condors typically breed annually but frequently breed less often. Observations of new pair formations have been observed in late fall and early winter (Snyder and Schmitt, 2002; as cited in USACE and CDFG, 2009). Once pairs have been formed, the California condors stay together year round for multiple years. California condors lay only one egg; this can occur from the last week of January through the first week of April, with an incubation period averaging 57 days. The hatching of the eggs ranges between the last week of March and the first week of June. The chicks are tended by both parents until the chicks are fledged, which occurs five and a half to six months after hatching. The chicks are fully dependent on their parents for approximately another six months, ending roughly a year after hatching, from early March to mid-May (Snyder and Schmitt, 2002; as cited in USACE and CDFG, 2009).

Threats: Major threats to this species include lead poisoning, collisions, poisoning due to ingestion of antifreeze, drowning and shooting. An increase in power lines and utility poles, which can result in collisions and electrocution; microtrash (e.g., bottle caps, pull tabs, broken glass, cigarette butts, small plastic items, lead bullets, and shell casings, which condors can ingest); long-term habitat degradation; and contaminants other than lead and antifreeze also have the potential to affect individuals.

Bald eagle (*Haliaeetus leucocephalus*)

Status: The bald eagle is designated as fully protect species under the Bald and Golden Eagle Protection Act.

General Distribution: The bald eagle occurs throughout most of North America. Historically, bald eagles bred throughout the mountains of coastal California. Currently, breeding populations exist on the Los Padres and San Bernardino National Forests. The largest wintering population of bald eagles in southern California is at Big Bear Lake in the San Bernardino Mountains. It has been successfully reintroduced as a breeding species on Santa Catalina Island after becoming extirpated from the Channel Islands in the 1950s.

Habitat and Habitat Associations: This species requires large bodies of water, or free flowing rivers with abundant fish, and adjacent snags or other perches (Zeiner et al., 1990a). Perches must be high in large, stoutly limbed trees, on snags or broken-topped trees, or on rocks near water (Zeiner et al., 1990a). Bald eagles are active diurnally and yearlong. Bald eagles are primarily fish eaters; however, they are opportunistic and will utilize avian and mammalian prey and carrion if readily available, especially in the nonbreeding season (Zeiner et al., 1990a). Bald eagles swoop from hunting perches, or soaring flight, to pluck fish from water (Zeiner et al., 1990a). Bald eagles roost communally in winter in dense, sheltered, remote conifer stands (Zeiner et al., 1990a). Eagle nests are characteristically large, typically 5 to 6 feet in diameter and 2 to 4 feet tall (Cornell, 2022). Nests are typically places in trees, but this species will nest on other surfaces when no suitable trees are available (Cornell, 2022) Nests are located 50-200 feet above ground, usually below tree crown (Zeiner et al., 1990a) and nests are usually located near a permanent water source (Zeiner et al., 1990a). In southern California, nesting most often occurs in large trees near water, but occasionally nests are on cliffs or the ground.

Natural History: Bald eagles are common as a winter migrant at a few favored inland waters in Southern California (Zeiner et al., 1990a). Occasionally they will lock talons and somersault downward several hundred feet (Cornell, 2021). Breeding season is February through July but may start as early as November (Zeiner et al., 1990a). Clutch size is 1-3 (Zeiner et al., 1990a) and incubation is usually 34-36 days (Zeiner et al., 1990a) followed by fledging at 10-12 weeks (Cornell, 2022). Semi-altricial young hatch asynchronously (Zeiner et al., 1990a). Bald eagles are monogamous, and breed first at 4-5 years (Zeiner et al., 1990a). Bald eagles are considered long-lived, with the oldest living bald eagle reported near Haines, Alaska at 28 years old (Cornell, 2022).

Threats: Threats to this species include mortality due to impact injuries (usually power line or tower), electrocution, trapping injuries (eagles caught in "sight bait" sets for fur bearers), automobile or train accidents, and poisoning from contaminated coyotes or other carcasses (Cornell, 2022). Territories have been abandoned after disturbance from logging, recreational developments, and other human activities near nests (Zeiner et al., 1990a).

Loggerhead shrike (*Lanius ludovicianus*)

Status: The loggerhead shrike is a CDFW Species of Special Concern and a USFWS Bird of Conservation Concern. This taxon is not federally, or State listed as threatened or endangered.

General Distribution: The breeding range of the loggerhead shrike includes Alberta, Saskatchewan, and Manitoba in Canada; the majority of the United States except the Pacific Northwest; and Mexico (Yosef, 1996). This species is a common resident and winter visitor in lowlands and foothills throughout California.

Habitat and Habitat Associations: The loggerhead shrike prefers open habitats with scattered shrubs, trees, posts, fences, utility lines, or other perches. This species most often occurs in open-canopied valley foothill hardwood forests, valley-foothill hardwood-conifer forests, valley foothill riparian, pinyon-juniper woodlands, desert riparian, and Joshua tree habitats.

Natural History: The loggerhead shrike is a large-headed bird with a hooked beak and whitish underparts. The breeding season for this species generally begins in late January or early February, earlier than those of other sympatric passerine species, and lasts through July (Stephenson and Calcarone, 1999). Nests are typically constructed in well-concealed microsites in densely foliaged trees or shrubs (Bent, 1950). Females typically feed nestlings until fledging occurs at 16 to 20 days; however, males will feed nestlings if females are absent from the nest for extended periods of time (Stephenson and Calcarone, 1999). This species preys primarily on large insects, but will also take small birds, mammals, amphibians, reptiles, fish, carrion, and various invertebrates. Loggerhead shrikes often impale their prey on barbed wire or other sharp objects.

Threats to Species: Breeding Bird Survey data indicate that loggerhead shrike populations are declining in most states (Sauer *et al.*, 1996). Threats include habitat loss and degradation, shooting, and pesticide and other toxic contamination.

Osprey (*Pandion haliaetus*)

Status: The osprey is a CDFW Watch List Species. This taxon is not federally, or State listed as threatened or endangered.

General Distribution: The osprey is one of only two wild bird species with a worldwide distribution (the other is peregrine falcon). In California, this species typically breeds in the northern part of the state from the Cascade Range south to Lake Tahoe and along the coast to Marin County (Stephenson and Calcarone, 1999). Osprey is an uncommon visitor along the coast of southern California (Zeiner *et al.*, 1990a). Although this species is almost entirely migratory across its range, some areas of southern California, including Ventura County, support year-round residents (Ferguson-Lees and Christie, 2001).

Habitat and Habitat Associations: This species most commonly occurs along rivers, lakes, reservoirs, and seacoasts, often crossing land between bodies of water (AOS, 2022). Nests are typically found in tree snags, on cliffs, and among various manmade structures, usually near or above water.

Natural History: The osprey is easily distinguished by its unmarked white belly, wing shape, and flight style. This species typically breeds between late March and early June as the male arrives to breeding sites first followed by the female a few days later (Johnsgard, 1990). Nests consist of a massive accumulation of sticks and other debris and may be added to and used in successive years (Stephenson and Calcarone, 1999). A single brood of three eggs is incubated by both sexes. Ospreys hunt by initially scanning water surfaces from an elevated perch, often followed by a period of hovering, and then diving from heights of roughly 16-23 feet above the water (Stephenson and Calcarone, 1999). Prey consists almost entirely of salt or freshwater surface feeding fish; however, reptiles, sick or injured birds, crustaceans, or small mammals are sometimes taken (Ferguson-Lees and Christie, 2001).

Threats: Threats that have been identified for this species include disturbance from recreation and other activities near nests, development near lakes and rivers, and removal of suitable nesting sites.

California brown pelican (*Pelecanus occidentalis californicus*)

Status: California brown pelican is a California Fully Protected Species. This taxon is not federally, or State listed as threatened or endangered.

General Distribution: Resident to long-distance migrant. The seasonal movements of Brown Pelicans vary across their range. Many Atlantic populations disperse northward in the summer after breeding and return southward in autumn, probably to follow concentrations of fish. Some Atlantic and Gulf coast populations migrate further south along the coast during the coldest months of the year. On the Pacific coast, pelicans leave the Gulf of California after breeding, cross the Baja peninsula, and migrate as far north as British Columbia, returning south to breeding areas by the next winter.

Habitat and Habitat Associations: Brown Pelicans live year-round in estuaries and coastal marine habitats along both the east and west coasts. They breed between Maryland and Venezuela, and between southern California and southern Ecuador; often wandering farther north after breeding as far as British Columbia or New York. On the West Coast they breed on dry, rocky offshore islands. When not feeding or nesting, they rest on sandbars, pilings, jetties, breakwaters, mangrove islets, and offshore rocks (Cornell, 2022).

Natural History: Though they have an awkward gait on land, Brown Pelicans are strong swimmers and masterful fliers. They fly to and from their fishing grounds in V-formations or lines just above the water's surface. They and the closely related Peruvian Pelican are the only pelican species to perform spectacular head-first dives (typically ending in a huge splash visible from far away) to trap fish. Pelicans usually forage during the day but may feed at night during a full moon. Before swallowing their prey, they drain the water from their pouches, while gulls or terns often try to steal fish right out of their beaks. Highly social all year, pelicans breed in colonies of up to several thousand pairs—usually on small islands where they are free from terrestrial predators. The male defends a nest site and nearby perches for up to 3 weeks until he attracts a mate, and the pair is monogamous throughout the breeding season. The parents incubate their eggs with their feet. If disturbed suddenly they fly hastily, sometimes crushing their eggs. Pelicans regurgitate predigested fish onto the nest floor for their nestlings, later switching to whole fish once the young are big enough. The young can fly and fend for themselves after 3 months but take 3–5 years of age to reach sexual maturity (Cornell, 2022).

Brown Pelicans mostly eat small fish that form schools near the surface of the water—including menhaden, mullet, anchovies, herring, and sailfin mollies. A foraging pelican spots a fish from the air and dives head-first from as high as 65 feet over the ocean, tucking and twisting to the left to protect its trachea and esophagus from the impact. As it plunges into the water, its throat pouch expands to trap the fish, filling with up to 2.6 gallons of water. Pelicans usually feed above estuaries and shallow ocean waters within 12 miles of shore, but sometimes venture over the deeper waters past the narrow continental shelf of the Pacific coast. They occasionally feed by sitting on the surface and seizing prey with their bills, like other pelican species, usually when a dense school of fish is close to the surface and the water is too shallow and muddy to plunge. They also steal food from other seabirds, scavenge dead animals, and eat invertebrates such as prawns (Cornell, 2021).

Threats: There are no persistent threats identified for this species.

California least tern (*Sternula antillarum browni*)

Status: The California least tern is federally, and State listed as endangered, and is also fully protected under the California Fish and Game Code.

General Distribution: The least tern is a migratory shorebird that breeds along the California coast from April through August and winters in Mexico and Central and South America.

Habitat and Habitat Associations: Nests are shallow scrapes on open sandy beaches, or other relatively flat areas with little or no vegetation (Cornell, 2022).

Natural History: Elegant Terns nest in dense colonies. Some arrive at the colony already paired, but others associate in "clubs," small flocks that gather on the periphery of the colony and socialize. Clubs probably consist of younger or unpaired birds looking for mates. Elegant Terns are probably monogamous in their mating system. Both parents incubate the egg and feed the chick. As the chicks become mobile just a few days after hatching, the adults gather them into a crèche (a tight group) but can always recognize (and feed) their own chick in these groups. The parents continue to feed their chick well after it fledges, and family groups remain together for 6 months or more after hatching. In the nonbreeding season, Elegant Terns are gregarious and often roost and feed among other seabirds, especially terns and gulls (Cornell, 2022)

Threats: They are vulnerable to disturbance by humans, dogs, cats, rats, and other natural and introduced predators (Cornell, 2022).

Mammals

Pallid bat (*Antrozous pallidus*)

Status: The pallid bat is a CDFW Species of Special Concern. This taxon is not federally, or State listed as threatened or endangered.

General Distribution: Pallid bats have a broad geographic range, extending from southern British Columbia to central Mexico and from California east to the Midwestern United States (Harvey et al., 1999). This species occurs most commonly below elevations of roughly 6,000 feet (Stephenson and Calcarone, 1999). Pallid bats are year-round residents in California (Philpott, 1997).

Habitat and Habitat Associations: Pallid bats occur in a variety of habitats, including grasslands, shrublands, woodlands, scattered desert scrub, agricultural fields, and mixed conifer forests (Barbour and Davis, 1969; Hermanson and O'Shea, 1983; Orr, 1954; Philpott, 1997). This species appears to prefer edges and open areas without trees (SNFPA, 2001). Roosting sites include rock crevices, mines, caves, tree hollows, buildings, bridges, and culverts (Hermanson and O'Shea, 1983).

Natural History: The pallid bat is a large, light-colored bat with prominent ears. This is a social species, communicating through a variety of vocalizations to indicate territorial disputes, direct individuals to roosting sites, and facilitate mother-infant relations (Nagorsen and Brigham, 1993). Pallid bat maternity colonies form in early April and may contain from 12 to 100 individuals (Zeiner et al., 1990b). The diet of pallid bats primarily consist of large arthropods, including scorpions, crickets, moths, and praying mantids which are gleaned from the ground or on the surfaces of vegetation (Hermanson and O'Shea, 1983). Emergence from roosting sites typically begins thirty to sixty minutes after sunset, but can vary seasonally (Hermanson and O'Shea, 1983; Zeiner et al., 1990b). Foraging is usually concentrated into two periods with the first activity peak occurring 90-190 minutes after sunset, and the second occurs just prior to dawn (Hermanson and O'Shea, 1983; Zeiner et al., 1990b). Nagorsen and Brigham (1993) report that pallid bats will travel up to 2.5 miles between day roosts and foraging areas. Between activity periods, pallid bats may remain torpid for up to five hours (O'Shea and Vaughn, 1977). This species is known to hibernate but will periodically arouse to forage for food and water (Philpott, 1997).

Threats: Some of the threats that have been associated to the decline of this species in southern California include the destruction of buildings that provide suitable roosting and maternal colony sites, eradication of roosting colonies due to public health concerns, and urban expansion. As bat species often exhibit high site fidelity to maternity roosts and are highly sensitive to disturbance at these sites, local extirpations may be attributed to roost disturbance (Hermanson and O'Shea, 1983; Orr, 1954; O'Shea and Vaughn, 1977; Philpott, 1997).

Ringtail (*Bassariscus astutus*)

Status: The ringtail is a CDFW Fully Protected Species. This taxon is not federally, or State listed as threatened or endangered.

General Distribution: This species is widely distributed throughout California with the exceptions of the northeastern deserts and the Central Valley.

Habitat and Habitat Associations: Ringtails occur in a variety of habitats, including chaparral, coastal sage scrub, riparian scrub, oak woodlands, and riparian woodlands. This species prefers habitats in proximity to permanent water.

Natural History: Some authors consider ringtails a subfamily of the family Procyonidae, which includes the raccoons and coatis (Burt and Grossenheider, 1954). Ringtails are long, slender animals with large ears and eyes, semi-retractile claws, and distinct black and white bands on a bushy tail. This species nests in rock recesses, hollow trees, logs, snags, abandoned burrows, or woodrat nests and breeding typically occurs between February and May (NatureServe, 2022). Ringtails are opportunistic feeders, but primarily prey on rodents, rabbits, birds, bird eggs, reptiles, and invertebrates (Zeiner *et al.*, 1990b).

Threats: While no persistent threats have been identified for this species, the degradation of preferred riparian habitats has been suggested as a potential threat (Stephenson and Calcarone, 1999).

Townsend's big-eared bat (*Corynorhinus townsendii*)

Status: The Townsend's big-eared bat is designated by CDFW as a California Species of Special Concern and is a U.S. Forest Service Sensitive species. This taxon is not federally, or State listed as threatened or endangered.

General Distribution: The Townsend's big-eared bat (*Corynorhinus townsendii*) (big-eared bat) ranges throughout the western United States, British Columbia, Canada, and Mexico (Kunz and Martin, 1982). In the United States, it occurs in a continuous distribution in all the western states and east into western South Dakota, northwestern Nebraska, southwestern Kansas, western Oklahoma, and western Texas (Kunz and Martin, 1982). It also is known from isolated gypsum caves in northeast Texas, Oklahoma, and Kansas and from limestone areas in Arkansas, Missouri, Oklahoma, Kentucky, Virginia, and West Virginia (Kunz and Martin, 1982). These relict populations are thought to reflect post-Pleistocene climates (Kunz and Martin, 1982). In California, the CNDDB (CDFW, 2022) contains approximately 212 records for this species, of which 52 are from four counties in southern California: San Bernardino (33 records), San Diego (10 records), Riverside (five records) and Imperial (four records). There are no records for Los Angeles, Orange, or Ventura counties.

Habitat and Habitat Associations: The big-eared bat is primarily associated with mesic habitats characterized by coniferous and deciduous forests, although it also occurs in xeric areas (Kunz and Martin, 1982). In California, this species was historically associated with limestone caves and lava tubes located in coastal lowlands, agricultural valleys, and hillsides with mixed vegetation; it occurs in all parts of California, except for alpine and subalpine areas of the Sierra Nevada (Zeiner *et al*. 1990b). The species also occurs in man-made structures and tunnels (Kunz and Martin, 1982), and it has been suggested that the big-eared bat has become more common in the western United States due to the availability of man-made structures (Kunz and Martin, 1982).

Natural History: Big-eared bats are relatively sedentary and are not known to disperse or migrate large distances. Maternity roosts are established in the warm parts of caves, mines, and buildings, with one or more clusters of females numbering up to about 100 individuals. Summer roosts of males are solitary. Young are born from late spring to early summer and are fully weaned by 42 days of age. First flight occurs by about 18 to 21 days. Big-eared bats take a variety of prey on the wing from the edge of forested habitats but also glean prey from vegetation to forage, including small moths, beetles, flies, lacewings, wasps, bees, and ants.

Threats: Big-eared bats are very sensitive to human disturbances and a single disturbance of a maternity roost or hibernation site may cause abandonment (Zeiner *et al*. 1990b). All known limestone cave sites in California, for example, have been abandoned (Zeiner *et al*. 1990b). Other plausible threats to big-eared bats resulting from construction activities include disturbances of day roosts from human activity, noise, and dust, as well as effects of dust on insect prey. Potential long-term impacts from urban development also include human and pet, stray, and feral animals' disturbances of roost sites, roost site and foraging habitat degradation, such as trampling and invasive species, and pesticides that may cause secondary poisoning and affect prey abundance.

Western mastiff bat (*Eumops perotis californicus*)

Status: The western mastiff bat is a CDFW Species of Special Concern. This taxon is not federally, or State listed as threatened or endangered.

General Distribution: The western mastiff bat occurs in two populations; one from the southwestern United States to central Mexico and the other from the northern and central portions of South America (Harvey *et al.*, 1999). The western or California mastiff bat subspecies primarily occurs from low to mid elevations in southern and central California southeast to Texas and south to central Mexico (Best *et al.*, 1996).

Habitat and Habitat Associations: The western mastiff bat utilizes a variety of habitat types including desert scrub, chaparral, mixed conifer forest, giant sequoia forests, and montane meadows (Philpott, 1997). In southern California this bat typically roosts in semiarid areas with low-growing chaparral that does not obstruct cliffs or rock outcrops (Best *et al.*, 1996). Because of its large wingspan, this bat requires roosts that have at least 2 m of free space to drop from to initiate flight. These bats utilize natural crevices in granitic and sandstone cliffs as well as crevices in buildings for roosting (Best *et al.*, 1996; NatureServe, 2022).

Natural History: The western mastiff bat is the largest bat in the United States with a total length of 15.7 to 18.5 cm (NatureServe, 2015). This bat breeds in early spring with most births likely occurring from June through July, and females usually give birth to one offspring (NatureServe, 2022). Colonies typically consist of less than 100 individuals (NatureServe, 2022). Western mastiff bats are primarily insectivorous, and the diet contains a high proportion of moths (Philpott, 1997). Predators include peregrine falcon, American kestrel, red-tailed hawk, and barn owl (Best *et al.*, 1996).

Threats: Threats to the western mastiff bat include loss of habitat to development and the use of insecticides (Williams, 1986). In the southwest, loss of large open ponds used for drinking water threaten this subspecies, and activities that disturb or destroy cliff habitat (such as water impoundments, highway construction, and quarry operations) pose a threat as well (Texas Parks and Wildlife, 2009).

Hoary bat (*Lasiurus cinereus*)

Status: The hoary bat is a CDFW Special Animal and considered a County of Ventura locally important species. This taxon is not federally, or State listed as threatened or endangered.

General Distribution: This species is the most widespread North American bat and occurs throughout California, although distribution is patchy in the southeastern deserts.

Habitat and Habitat Associations: The hoary bat occurs in a wide variety of environments but prefers open habitats or habitat mosaics with access to trees for cover. Open areas or habitat edges are also preferred for foraging.

Natural History: This species is distinguishable by its size and color, exhibiting distinct white markings on hair tips over most of the body (Burt and Grossenheider, 1954). Hoary bats breed in autumn and young are typically born between mid-May and early June (Zeiner *et al.*, 1990b). Females bear young while roosting in trees and may leave the young at the roosting site while foraging (Zeiner *et al.*, 1990b). Typically, a solitary species, hoary bats are known to forage with many other bat species (CDFW, 2022). The primary diet of hoary bats consists of moths that are taken in flight; however, other flying insects are also consumed (Black, 1974, Whitaker *et al.*, 1977, 1981). There is a relatively high incidence of rabies in this species (Shump and Shump, 1982). No important predators are known, but owls likely prey on hoary bats (Zeiner *et al.*, 1990b).

Threats: No persistent threats have been identified for this species.

San Diego desert woodrat (*Neotoma lepida intermedia*)

Status: The San Diego desert woodrat is a CDFW Species of Special Concern. This taxon is not federally, or Sate listed as threatened or endangered.

General Distribution: This subspecies occurs in coastal California from San Luis Obispo south through the Transverse and Peninsular Ranges into Baja California.

Habitat and Habitat Associations: Desert woodrats inhabit Joshua tree woodlands, pinyon-juniper woodlands, mixed chaparral, sagebrush, and desert habitats (Zeiner *et al.*, 1990b). This subspecies preferentially builds nests in areas with large boulders as they presumably provide better protection from predators (Thompson, 1982; Smith 1995). Desert woodrats will actively avoid open areas that lack adequate refuge sites (Thompson, 1982).

Natural History: San Diego desert woodrats construct dens of sticks, yucca leaves, tin cans, and other assorted materials in the crevices between boulders (Thompson, 1982). These dens also provide shelter for a variety of other small vertebrates. Desert woodrats generally breed from late October or November through April, and females can produce up to four litters of two to four young each year (Bleich and Schwartz, 1975). This subspecies forages nocturnally and is primarily herbivorous. Desert woodrats rely on a continuous supply of green vegetation for food and water. They do not drink water but rather depend upon plants such as agave and cactus for their water needs. They can even subsist on creosote year-round. Predators include snakes, owls, coyotes, badgers, skunks, and ringtails (Smith, 1995).

Threats: Loss of habitat, especially coastal sage scrub, is an ongoing threat to this subspecies.

Pocketed free-tailed bat (*Nyctinomops femerosaccus)*

Status: The pocketed free-tailed bat (*Nyctinomops femerosaccus)* is a California Species of Special Concern. This species is not federally, or State listed as threatened or endangered, and is not covered by the CVMSHCP.

General Distribution: This species is found in southern California, central Arizona, southern New Mexico, and western Texas, south into Mexico and Baja California (WBWG, 2017).

Habitat and Habitat Associations: This species is associated with pinyon juniper woodland, desert scrub, palm oasis, desert wash, and desert riparian habitats.

Natural History: This species roosts in rocky areas in high cliffs, usually in large colonies. It is also known to roost in buildings, caves, and under roof tiles. This species will form maternity colonies and female will each bear a single offspring between late June and July. The pocketed free-tailed bat forages primarily on moths, but will consume a variety of insects (WBWG, 2017).

Threats: Loss of roosting habitat and disturbance of roost sites (WBWG, 2017).

Mountain lion (*Puma concolor*)

Status: The mountain lion (Southern California/Central Coast ESU) is a State candidate species. It is not listed as federally threatened, or endangered.

General Distribution: The range of mountain lion extents from southern California along the central coast of California.

Habitat and Habitat Associations: During the evening hours, mountain lions will utilize many habitats within their range to hunt including riparian, scrub, chaparral, grassland, and woodland habitats (Dickson et al. 2005). While hunting, mountain lions prefer to stalk and pursue their prey along canyon bottoms and gentle slopes (Dickson and Beier 2006). Mountain lions will feed on steeper slopes in habitats with dense understory vegetation for cover (Benson et al. 2016). Although they will travel through open or human-disturbed habitat, they prefer expansive, intact, heterogeneous habitat (Dickson and Beier 2002; Dickson et al. 2005).

Natural History: The mountain lion is a large solitary felid that is considered both nocturnal and crepuscular but has been observed during daylight hours (Dickson and Beier 2002; Dickson et al. 2005). Within the State of California, mountain lions can be found in a variety of habitat types between sea level and 10,000 feet in elevation. However, mountain lion habitat, population numbers, and genetic diversity have been declining rapidly, especially within Southern California populations (Yap et al. 2019).

Mountain lions exist at naturally low population densities, but they are very territorial and require large swaths of intact wilderness. In southern California, mountain lions have been found to utilize different habitats within a 24-hour period (Dickson and Beier 2002; Dickson et al. 2005). Mountain lions are mostly active during dusk and dawn, but their peak activity will shift to nocturnal patterns when closer to human developments. During daylight hours, mountain lions were frequently found in riparian habitats, suggesting that they prefer to rest in areas with dense understory vegetation for cover (Dickson and Beier 2002; Dickson et al. 2005). Mountain lion movement patterns tend to follow the distribution and abundance of deer, a common food source of southern California/Central Coast ESU populations (Grigione et al. 2002). Mountain lions are opportunistic hunters and will also feed on other ungulates (such as bighorn sheep, pronghorns, and domestic livestock), bobcats, coyotes, fox, skunks, raccoons, squirrels, rabbits, rodents, and insects (Currier 1983).

Mountain lions are typically active year-round and can reproduce at any time of the year, but the timing of reproduction may be influenced by prey abundance and climate. In North America, kitten births are most common between April and September (Currier 1983; Beier 1995). Mountain lions will form dens in rocky outcrops, caves, and other natural cavities when rearing young (Yap et al. 2019).

Threats: General threats to this species include habitat loss due to urban development, population fragmentation and decreased genetic diversity, vehicle strikes, intraspecific strife (male aggression towards conspecifics and infanticide), and ingestion of rodenticides (Beier 1993; Riley et al. 2014; Vickers et al. 2015). In addition, other threats to this species include depredation kills, poaching, disease, and human-caused wildfires (Beier and Barrett 1993; Vickers et al. 2015).

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Appendix E4

Aquatic Resources Delineation Report

AQUATIC RESOURCES DELINEATION REPORT
Diablo Canyon Power Plant Decommissioning Project

Prepared for:

County of San Luis Obispo Department of Planning and Building
976 Osos Street, Room 200
San Luis Obispo, CA 93408

COUNTY OF SAN LUIS OBISPO
PLANNING & BUILDING

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September 2022

Aquatic Resources Delineation Report

Diablo Canyon Power Plant Decommissioning Project
San Luis Obispo County, California

The undersigned certify that this report is a complete and accurate account of the findings and conclusions of a jurisdictional determination and delineation for the above-referenced project.

Justin M. Wood, M.S.
Senior Biologist
Aspen Environmental Group

September 2022

Contents

Tables

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1.0 Introduction

This report was prepared under contract to the County of San Luis Obispo Department of Planning and Building (County) to describe the findings of an investigation of jurisdictional features conducted by Aspen Environmental Group (Aspen) for the Diablo Canyon Power Plant (DCPP) Decommissioning Project (Project). The DCPP is operated by Pacific Gas and Electric (PG&E). The Project is located in San Luis Obispo County, approximately seven miles northwest of Avila Beach, California (Figure 1, Attachment 1).

The Study Area extends 100 feet from the DCPP and associated facilities as well as the proposed borrow site located to the north of the DCPP (Figure 1, Attachment 1). The Study Area is bordered to the north and east by natural habitats and grazing lands, and the Pacific Ocean to the west and south. Diablo Creek flows west along the northern edge of the DCPP.

The assessment was conducted by Aspen Biologists Justin Wood and Chris Huntley on July 11-12, 2022. This assessment was conducted to determine the extent of resources under the jurisdiction of the U.S. Army Corps of Engineers (USACE), the Central Coast Regional Water Quality Control Board (CCRWQCB), California Coastal Commission (CCC) and the California Department of Fish and Wildlife (CDFW) that occur within the Study Area.

1.1 Lead Agency Name and Address

County of San Luis Obispo
Department of Planning and Building
976 Osos Street, Room 200
San Luis Obispo, CA 93408

1.2 Contact Person and Phone Number

Susan Strachan
Nuclear Power Plant Decommissioning Manager
Phone: (805) 788-2129
Email: sstrachan@co.slo.ca.us

1.3 Site Access

Driving directions to the Survey Area are provided below in Table 1.

Table 1. Driving Directions to the Survey Area
From the City of San Luis Obispo:
Take Interstate 101 south towards Los Angeles. Exit San Luis Bay Dr. and turn right. Turn right on Avila Beach Dr. Turn right on Diablo Canyon Rd. Reach gate with security guard. Continue approximately 7 miles north to the Survey Area.

2.0 Project and Property Description

2.1 Project Description

PG&E proposes to decommission the DCPP, which involves the decommissioning and dismantlement (referred to as D&D) of the existing power plant. The DCPP is a two-unit (i.e., two reactor units) nuclear-powered electrical generating station that began commercial operation in 1985 for Unit 1 and 1986 for Unit 2 and is the last nuclear power plant still operating in California. The Nuclear Regulatory Committee (NRC) licensed the two reactors to operate until November 2, 2024 (Unit 1) and August 26, 2025 (Unit 2). Upon final shutdown of the reactor units and assuming all permit conditions are acceptable, PG&E intends to transition DCPP immediately from an operating status into a decommissioning status, meaning the facility would be shut down and the process of dismantling, decontaminating, and removing it would begin. Table 2 provides a summary of the Project activities by phase.

Table 2. Decommissioning Project Activities Summary

Phase 1: Pre-Planning and Decommissioning Project Activities (2024-2031)

- **Cold and Dark Modifications.** Install electrical infrastructure to supply power for decommissioning
- **Site Security Modifications.** Change security infrastructure to support decommissioning
- **Site Infrastructure Modifications.** Change site facilities, civil features, utilities, and equipment
- **Railyard Modifications.** Modify (under separate permits) and use railyard(s) for waste shipments (Pismo Beach – contingency site, Santa Maria or Santa Barbara County)
- **System and Area Closure.** Remove select systems, structures, and components from structures
- **Intake Structure Modification.** Modify Intake Structure to load barges for bulk waste transport
- **Auxiliary Saltwater System Cooling of Spent Fuel Pool (SFP).** Cool SFP via the auxiliary saltwater system (current method)
- **Site Characterization Study.** Identify radioactive and non-radioactive contamination at DCPP
- **Decontamination.** Remove, remediate, and/or abate hazardous materials in structures
- **Building Demolition.** Remove on-site structures
- **Stormwater Management.** Implement compliance measures for stormwater control
- **Waste Transportation.** Transport radiological and non-radiological waste materials off site
- **Reactor Pressure Vessel and Internals Removal and Disposal.** Remove reactor pressure vessels and internal components and transport off site for disposal
- **Large Component Removal.** Remove large components prior to building demolition
- **Utilities, Remaining Structures, Roads, and Parking Area Demolition.** Remove facilities not needed to support decommissioning or final site use
- **Remove Power Plant 230 kilovolt (kV) and 500 kV Infrastructure.** Remove 230 kV and 500 kV lines, poles, and towers from the power block to the switchyards (switchyards are to be retained)
- **Discharge Structure Removal and Restoration.** Remove discharge concrete structure and restore area to natural conditions
- **Construct Waste Storage Facilities**
  - Construct a GTCC Waste Storage Facility for storing radioactive materials regulated by Title 10 of the Code of Federal Regulations (10 CFR) Part 72 (Part 72)1
  - Construct a Non-Radioactive Waste Storage Facility for storing general demolition debris including hazardous, non-hazardous, and universal wastes (i.e., hazardous wastes more widely produced such as batteries, mercury-containing equipment, lamps, aerosol cans, and pesticides)
- **SNF and GTCC Waste Transfer to ISFSI.** After a cooling and decay period (i.e., time to reduce radioactivity), SNF and GTCC waste would be moved to the ISFSI and new GTCC Waste Storage Facility, respectively, for storage (SNF will be transferred to dry cask storage within approximately 4 years after each reactor shutdown)
- **Water Management.** Produce fresh water and cooling water, and manage wastewater

Table 2. Decommissioning Project Activities Summary

Phase 1: Pre-Planning and Decommissioning Project Activities (2024-2031)

- **Soil Remediation.** Remediate (i.e., clean up and restore from environmental damage) radiological and non-radiological impacted (i.e., contaminated) soils
- **Final Status Surveys.** Complete surveys to ensure the DCPP site meets the radioactivity release criteria specified in the NRC-required License Termination Plan (LTP)
- **Initial Site Restoration.** Backfill, grade, and landscape to restore excavated and disturbed features at DCPP to natural conditions
- **LTP.** Prepare and submit an LTP to the NRC
- **Firing Range.** Remove the existing Firing Range and construct a new indoor Firing Range
- **Retain Breakwaters.** Release Breakwaters from Part 50 facility operating license for reuse by others
- **Retain Intake Structure.** Release Intake Structure from Part 50 facility operating license for reuse by others

Phase 2 – Completion of Soil Remediation, Final Status Surveys, and Final Site Restoration (2032-2039)

- **Complete Waste Transportation.** Complete transport of remaining radiological and non-radiological waste materials off site
- **Complete Soil Remediation.** Complete remediation of radiological and non-radiological-impacted soils
- **Complete Final Status Surveys.** Complete surveys to ensure the site meets the release criteria
- **Intake Structure Closure.** Seal openings of Intake Structure with concrete bulkheads and clear deck to support reuse by third-party
- **NRC Part 50 License Termination.** Terminate DCPP's NRC Part 50 facility operating licenses
- **Utilities, Remaining Structures, Roads, and Parking Area Demolition.** Remove facilities not needed to support the retained DCPP facilities
- **Final Site Restoration (FSR).** Continue to backfill, grade, and landscape to restore excavated and disturbed features, including the former Firing Range, at DCPP to natural conditions
- **Long-Term Stormwater Management.** Install post-construction stormwater controls
- **Post-Final Site Restoration Monitoring.** Monitor (up to 5 years) efforts to restore the DCPP site and ensure restoration criteria are met
- **Construct Bluff-Top Road.** Construct new blufftop road segment to connect Diablo Canyon Road with North Ranch Road/Pecho Valley Road
- **Release of Marina and Retention for Reuse by Third-Party.** Improve Marina area, including new parking areas, bathroom2, and boat hoist; Reuse of Marina by third-party (to continue past 2039) Complete Waste Transportation. Complete transport of remaining radiological and non-radiological waste materials off site

Source: PG&E, 2021a – Table 2.1-1.

Acronyms: CFR = Code of Federal Regulations, DCPP = Diablo Canyon Power Plant, FSR = Final Site Restoration, GTCC = Greater Than Class C, ISFSI = Independent Spent Fuel Storage Installation, kV = kilovolt, LTP = License Termination Plan, NRC = Nuclear Regulatory Commission, SFP = Spent Fuel Pool, SNF = Spent Nuclear Fuel

Notes:

[1] GTCC wastes are defined as those wastes with concentrations of radionuclides which exceed the limits established for Class C Low-Level Radioactive Waste. For the Project, the GTCC waste inventory includes GTCC waste that has been generated throughout normal operations of the DCPP units and the GTCC waste that would be generated during RPV internals segmentation.

[2] While the entire Marina area was evaluated in this EIR, the final design and location of the bathroom facilities would be completed by the third party after release of the Marina from the Part 50 license (end of 2034). The third-party user would apply for separate land use and building permits for the bathroom facilities (septic or other system) and other Marina improvements.

Facilities remaining following completion of Phases 1 and 2 include:

- primary and secondary access roads, internal roads (including existing road over Diablo Creek)
- 230 and 500 kV switchyards
- Independent Spent Fuel Storage Installation (ISFSI)
- Water Reservoirs
- New Security Building, Firing Range, and GTCC Waste Storage Facility (built in Phase 1).

In addition, PG&E proposes to retain the existing East and West Breakwaters and Intake Structure for potential future use by others.

2.2 Project Location

The Project is located within the Port San Luis United States Geological Survey (USGS) 7.5-minute topographic quadrangle, approximately seven miles northwest of Avila Beach, San Luis Obispo County (Figure 1, Attachment 1).

3.0 Existing Conditions

3.1 Topography and Surrounding Land Uses

The Study Area is in the southwestern portion of San Luis Obispo County, California and the middle portion of the Port San Luis United States Geological Survey (USGS) 7.5' Quadrangle (USGS, 2018). Site elevations range from 0 to 750 feet above mean sea level (MSL). The coastal border of the Study Area is defined by rocky bluffs with gently to moderately sloping terraces. Structures comprising the DCPP complex are located several hundred feet from the shoreline on a flat terrace. The reactors and associated primary systems equipment for Units 1 and 2 are housed in separate, but adjacent, containment structures on the main terrace at 85 feet above MSL. Topography of the borrow site and associated access route consists of steep west-facing slopes ranging in elevation from 300 to 750 feet above MSL. Within the Study Area, small drainages may convey water into Diablo Creek.

Land uses adjacent to the survey area varies, ranging from open space to industrial. Montaña de Oro State Park is located adjacent to the North Ranch (land north of the DCPP site) of the PG&E property. The North Ranch contains the Point Buchon Trail. Montaña de Oro State Park includes campsites and various hiking trails and other recreational opportunities. The nearest residential communities are in Avila Beach and Los Osos. Avila Beach is located near the main DCPP Access Gate, which is approximately seven miles southeast of the DCPP site. Los Osos is situated adjacent to Montaña de Oro State Park and is located eight miles north of the DCPP site. Other cities and unincorporated residential areas exist along the coast and inland at distances of more than eight miles from the DCPP site. The closest public facilities to the DCPP site are the Port San Luis Harbor District facilities, which are located west of Avila Beach.

The Irish Hills are considered an important ecological resource in the region and provides habitat for resident and migratory wildlife species. Diablo Creek supports populations of the federally listed south-central California coast steelhead (*Oncorhynchus mykiss irideus*) and California red-legged frogs (*Rana aurora draytonii*).

3.2 Vegetation

Vegetation in the Study Area consists of a mosaic of upland scrub and woodland communities with riparian thickets in some areas. Riparian communities are located along Diablo Creek and are dominated by stands of arroyo willows (*Salix lasiolepis*) and coast live oak (*Quercus agrifolia*) (Figure 3, Attachment 1). Upland scrub and grassland communities are present throughout the Study Area and are dominated by California sagebrush (*Artemisia californica*), bush monkeyflower (*Diplacus aurantiacus*), toyon (*Heteromeles arbutifolia*), coyote brush (*Baccharis pilularis*), and poison oak (*Toxicodendron diversilobum*).

Non-native vegetation is located throughout the Study Area and consists primarily of wild oat (*Avena fatua*), slender wild oat (*Avena barbata*), ripgut grass (*Bromus diandrus*), sweet fennel (*Foeniculum* *vulgare*), and Russian thistle (*Salsola tragus*). Non-natives are found both in large stands adjacent to developed areas and interspersed within native communities within the Study Area.

Vegetation within the Study Area was mapped by Terra Verde as part of the Terrestrial Biological Resources Assessment in 2020 and were verified by Aspen during the wetland delineation in 2022 (PG&E, 2020). The vegetation was mapped in detail following descriptions identified by *A Manual of California Vegetation* (Sawyer et al., 2009). Vegetation communities have been designated as sensitive when they have a California State Rarity Ranking of one, two, or three (S1, S2, S3). These communities have been determined to be rare or threatened in California. A ranking of S1 has fewer than six viable occurrences statewide and/or up to 518 hectares; a ranking of S2 has between 6-20 viable occurrences statewide and/or up to between 518-2,590 hectares; and a ranking of S3 has between 21-100 viable occurrences statewide and/or up to between 2,590-12,950 hectares. Rankings of S4 and S5 are secure in the state.

Riparian vegetation types mapped within the Study Area include arroyo willow thickets and coast live oak woodland (see Table 3). The native riparian vegetation types tend to integrate making it difficult to define the exact limits of each vegetation type.

Upland vegetation types were mapped within the Study Area (see Table 3). Communities and monotype patches of non-native species include buck brush chaparral, California sagebrush scrub, Coast live oak woodland and forest, coyote brush scrub, wild oats and annual brome grasslands, needle grass – melic grass grassland, bush monkeyflower scrub, toyon chaparral. Upland vegetation types tend to intergrade blurring the limits of each vegetation type in some areas.

Table 3. Vegetation and Other Cover Types within the Survey Area (acres)

Vegetation Type	Limits of Disturbance (Acres)	Survey Buffer (Acres)	Total Survey Area (Acres)
Arroyo Willow Thickets	0.02	1.21	1.23
Bush Monkeyflower Scrub	2.39	1.88	4.27
California Coffee Berry Scrub	0.14	0.46	0.59
California Sagebrush Scrub	3.84	20.23	24.07
Coast Live Oak Woodland	0.19	5.58	5.77
Coastal Bluff Scrub	0.14	1.51	1.65
Coyote Brush Scrub	2.41	4.76	7.17
Needle Grass - Melic Grass Grassland	0.83	0.23	1.06
Toyon Chaparral	0.08	0.19	0.27
Wild Oats and Annual Brome Grassland	7.83	39.12	46.95
Other Cover Types			
Developed	81.45	14.36	95.81
Ruderal / Anthropogenic	2.04	1.17	3.22
Total	**101.37**	**90.70**	**192.07**

Coastal, Riparian and Wetland Vegetation Communities

Arroyo Willow Thickets (*Salix lasiolepis* Shrubland Alliance)
Arroyo willow thickets occurs on stream banks and benches, slope seeps, and along drainages at elevations below 7,120 feet above MSL. This vegetation community is present in the lower reaches of Diablo Creek. The overstory is dominated by arroyo willow forming an intermittent to continuous canopy. A multi-layered understory is dominated by blue elderberry (*Sambucus nigra* ssp. *caerulea*), American dogwood (*Cornus sericea* ssp. *sericea*), and California blackberry (*Rubus ursinus*). Emergent herbaceous vegetation on the slopes and within the channel bottom is dominated by western water hemlock (*Cicuta douglasii*), giant horsetail (*Equisetum telmateia* ssp. *braunii*), cattail (*Typha* sp.), low bulrush (*Isolepis cernua*), and cutleaf water parsnip (*Berula erecta*). This community is dominated by hydrophytic species and is considered a coastal wetland and meets the definition of Environmentally Sensitive Habitat Areas (ESHA) wherever it occurs within the Coastal Zone. Arroyo willow thickets are not designated as a CDFW sensitive community (CDFW, 2022).

Coast Live Oak Woodland and Forest (*Quercus agrifolia* Forest and Woodland Alliance)
Coast live oak woodland and forest occurs on Canyon bottoms, slopes, and flats. Soils are deep; sandy or loamy with high organic matter at elevations below 4,000 feet above MSL. This community is present in the upper reaches of Diablo Creek. Upper Diablo Creek above the 500kV yard supports a wide riparian woodland dominated by coast live oak, with California bay (*Umbellularia californica*), and big-leaf maple (*Acer macrophyllum*) in the overstory. The understory is open to intermittent and is dominated by poison oak and California coffeeberry (*Frangula californica*). Herbaceous vegetation along the edge of and emergent in the creek bottom is dominated by western water hemlock, giant horsetail, and hoary nettle (*Urtica dioica* ssp. *holosericea*). Coast live oak woodland and forest are not designated as a CDFW sensitive community (CDFW, 2022) however, CDFW is likely to exert jurisdiction over coast live oak woodlands that are growing in and adjacent to Diablo Creek.

Upland Vegetation Types

Buck Brush Chaparral (*Ceanothus cuneatus* Shrubland Alliance)
Buck brush chaparral occurs in shallow, rocky, and well drained soils on ridges and upper slopes below 5,900 feet above MSL. This community is present on the steep slopes and ridgelines along the northern boundary of the Study Area. It is dominated by buck brush (*Ceanothus cuneatus*) with black sage (*Salvia mellifera*) as a co-dominant, which form a continuous shrub canopy. Other species including California sagebrush and redberry (*Rhamnus crocea*) are also present. Buck brush chaparral is not designated as a CDFW sensitive community (CDFW, 2022).

California Sagebrush Scrub (*Artemisia californica* Shrubland Alliance)
California sagebrush scrub occurs on steep slopes and low-gradient deposits along streams at elevations below 4,000 feet above MSL. This community occurs along the coastal terrace and on slopes and canyons within the Study Area. California sagebrush is dominant with coyote brush, black sage, poison oak, and bush monkeyflower present within the community at low densities. The shrub canopy is continuous to intermittent. Coastal goldenbush and big saltbush (*Atriplex lentiformis*) are present at low cover in stands along the coastal terrace. Giant wild rye (*Elymus condensatus*), deerweed (*Acmispon glaber*), spiny redberry (*Rhamnus crocea*), and western bracken fern (*Pteridium aquilinum* var. *pubescens*) are common components of more inland stands within the Study Area. The understory is variable, from sparse cover of annual grasses to continuous cover of annual and perennial grasses and forbs. California sagebrush scrub is not designated as a CDFW sensitive community (CDFW, 2022).

Coyote Brush Scrub (*Baccharis pilularis* Shrubland Alliance)
Coyote Brush Scrub occurs in variety of habitats including coastal bluffs, terraces, stream sides, open exposed slopes, ridges, and gaps in forest stands at elevations below 5,000 feet above MSL. Within the Study Area this community occurs along the margins of roads and developed portions of the site, where weed abatement and vegetation management activities regularly occur. Coyote brush is dominant with California sagebrush, California coffeeberry, and black sage occurring in lower densities. Herbaceous species within these areas include sweet fennel, tocalote (*Centaurea melitensis*), and jubata grass (*Cortaderia jubata*). Coyote bush scrub is not designated as a CDFW sensitive community (CDFW, 2022).

Wild Oats and Annual Brome Grasslands (*Avena spp. – Bromus spp.* Herbaceous Semi-Natural Alliance)
This community is widespread and may occur in any topographic setting in foothills, waste places, rangelands, and openings in woodlands at elevations below 7,200 feet above MSL. Annual brome grassland is present in the borrow site and developed areas within the Study Area. The dominant plant in these areas is wild oat, slender wild oat, ripgut grass, false brome (*Brachypodium distachyon*), and rye grass (*Festuca perennis*) growing with other weedy species such as Italian thistle (*Carduus pycnocephalus*), and black mustard (*Brassica nigra*). Annual brome grassland is not designated as a CDFW sensitive community (CDFW, 2022).

Needle Grass – Melic Grass Grassland (*Nassella* (=*Stipa*) spp. – *Melica* spp. Herbaceous Alliance)
Needle grass – melic grass grassland occurs in open areas with soil that have a high clay content, loamy, sandy, or silty derived from mudstone, sandstone, or serpentine substrates at elevations below 5,600 feet above MSL. Fragmented patches of needle grass grassland occur within openings of bush monkey flower scrub and annual brome grasslands within the Study Area. This community is characterized by purple needle grass (*Stipa pulchra*) occurring at 20 to 60 percent cover in the herbaceous layer. Little California melic (*Melica imperfecta*) is present, with non-native annual grasses often comprising most of the herbaceous cover. Needle grass - melic grass grassland is a CDFW sensitive natural community (CDFW, 2022).

Bush Monkeyflower Scrub (*Diplacus aurantiacus* Shrubland Alliance)
Bush monkeyflower scrub occurs on gentle to steep northerly slopes at elevations between 100 and 2,000 feet above MSL. This community occurs on the north-facing slope above upper Diablo Creek within the borrow site. This community is an early successional habitat on site, regenerating from past vegetation clearing on this slope. Patches with distinct stages of regeneration are present within the Study Area, based on a variable disturbance history. Younger patches form an intermittent shrub canopy dominated entirely by bush monkeyflower, with annual grasses and forbs. The understory is irregular, occasionally with co-dominant poison oak, southern hedge nettle (*Stachys bullata*), California man-root (*Marah fabacea*), purple needle grass, and California melic (*Melica californica*). Bush monkeyflower scrub is not designated as a CDFW sensitive community (CDFW, 2022).

Toyon Chaparral (*Heteromeles arbutifolia* Shrubland Association)
Toyon chaparral usually occurs on steep, north-facing slopes at elevations between 100 and 4,300 feet above MSL. Within the Study Area the community occurs along the north-facing slope above upper Diablo Creek. It has a continuous shrub canopy dominated by toyon (*Heteromeles arbutifolia*) and an understory dominated by poison oak. This habitat forms transitional areas with other shrublands and coast live oak woodland communities, often forming a variable and mixed shrub canopy that includes California coffeeberry, coyote brush, and California sagebrush. Emergent trees are present and include California bay and coast live oak. Toyon chaparral is not designated as a CDFW sensitive community (CDFW, 2022).

Other Land Cover Types

Developed. Developed areas in the Study Area include flood control facilities, roads/parking lots, DCPP, 230 kV and 500 kV lines, poles, and switchyards, and associated support structures. Vegetation types within these areas consists of non-native, ruderal vegetation.

Ruderal / Anthropogenic. This cover type is used to map the fragmented areas of vegetation bordering the developed portions of the Study Area. These areas are characterized by regular disturbance in the form of weed abatement (e.g., mowing, herbicide application) and vegetation suppression and contain a low cover of native or non-native plants. Species common to ruderal areas of the Study Area include sweet fennel, tocalote, red brome (*Bromus rubens*), and Russian thistle. Areas of ruderal vegetation do not correspond to a natural vegetation community.

3.3 Climate

The climate along the Central Coast is typically characterized as Mediterranean with mild year-round temperatures averaging 80 degrees in the dry summer months and 60 degrees in the moist winter months. The coastal influence of the Pacific Ocean moderates temperatures in the summer and winter and provides moisture in the form of coastal fog. The Study Area falls within the low-lying coastal zone which has smaller variations in temperatures on a daily and seasonal basis and is subject to an inversion layer that can trap cool moist air resulting in fog and low clouds in the early mornings and evenings. Rainfall is highly seasonal, with 80 percent of the average annual 17 inches of precipitation falling between December and April (San Luis Obispo, 2022).

3.4 Hydrology and Geomorphology

The Study Area is located within the Irish Hills Coastal Watershed (SLO Watershed Project, 2021). The Irish Hills Coastal Watershed drains 27,922 acres or approximately 44 square miles. The Irish Hills Coastal Watershed is in the San Luis Range, along the remote San Luis Obispo County coastline between the communities of Los Osos and Avila Beach. The drainages rise to a maximum elevation of 1,819 feet above MSL at Saddle Peak. The watershed is dominated by grazing lands, some of which are in conservation or agricultural easements, and public lands. The Central Coast Regional Water Quality Control Board (CCRWQCB) uses a watershed classification system that divides surface waters into hydrologic units (HUs). The Study Area is in the Estero Bay HU 10.

Diablo Creek is a single channel creek characterized by a narrow low-flow channel varying in depth from one to three feet, boarded by low a low terraces and deeply incised banks. Substrate in the channel varies from fine sized sediments (silt and clay) to coarse cobble and boulders (PG&E, 2020). Diablo Canyon Creek flows west out of the Irish Hills and passes through the DCPP site along the northern edge of the developed industrial areas. Above the switchyards, Diablo Creek enters an underground culvert (for approximately 2,714 linear feet) and flows beneath the 230 kilovolts (kV) and 500 kV switchyards northeast of Units 1 and 2 and drains directly into the Pacific Ocean and forms the western boundary of the DCPP (PG&E, 2021). Stormwater runoff flows to Diablo Creek or directly to the Pacific Ocean.

3.5 Soils and Geology

The DCPP site is in the Irish Hills in the southern part of the Coast Ranges Geomorphic Province of Central California. The Irish Hills lie west of the Santa Lucia Mountain range, a major topographic feature of the province. The Santa Lucia Mountains is approximately 140 miles long, extending from Monterey to Cuyama River, and approximately 20 to 25 miles wide and consists of Franciscan bedrock and Salinian granitic basement rocks overlain by Cretaceous sedimentary sequences, Cenozoic sedimentary and volcanic rocks, and Quaternary sediments and volcanic deposits.

The Central Coast Ranges are a product of tectonic forces that continue to influence the geological and topographic development of the region, which has included folding, faulting, and uplift, which in turn has resulted in erosion and deposition of sediments in the Survey Area. The Survey Area is in a geologically complex and seismically active region which includes both the north-south trending Coast Ranges and the east-west Transverse Ranges. The seismicity of the Survey Area is dominated by the intersection of the north-northwest trending San Andreas and Coast Ranges faults and the east-west trending Transverse Ranges fault system. These systems are all responding to strain produced by the relative motions of the Pacific and North American Tectonic Plates. This strain is relieved by right-lateral strike-slip faulting on the San Andreas and related faults in the Coast Ranges and offshore, and by vertical, reverse-slip or left-lateral strike-slip displacement on faults in the Coast and Transverse Ranges. The effects of this strain and deformation includes mountain building, basin development, deformation of Quaternary marine terraces, widespread regional uplift, and generation of earthquakes. Both the Transverse Ranges and Coast Ranges areas are characterized by numerous geologically young faults (CGS, 2018).

Soils in the Study Area were dominated by a silty clay loam substrate resulting from the weathering of bedrock (see Table 4). Historic soil data (from 1984 to the present) from the Natural Resources Conservation Service (NRCS) were used to determine potential soil types, including where hydric soils have historically occurred in the Study Area (NRCS, 2022a). Figure 2 (Attachment 1) provides a graphical depiction of the location of historic soil types identified in the Study Area.

Table 4. Soil Units Occurring within the Survey Area (acres)

Map Unit Symbol	Map Unit Name	Description	Limits of Disturbance (Acres)	Survey Buffer (Acres)	Total Survey Area (Acres)
177	Nacimiento silty clay loam, 15 to 30 percent slopes	A well-drained soil that typically occurs along mountains and hills around 400 to 2,000 feet in elevation; parent material consists of residuum weathered from calcareous shale and/or sandstone; depth to water table > 80"; not prone to flooding or ponding; silty clay loam (0-39"), weathered bedrock (39-59").	2.40	2.35	4.74
178	Nacimiento silty clay loam, 30 to 50 percent slopes	A well-drained soil that typically occurs along mountain slopes and hillslope around 0 to 2,860 feet in elevation; parent material consists of residuum weathered from calcareous shale; depth to water table > 80"; not prone to flooding or ponding; silty clay loam (0-31"), bedrock (31-41").	23.20	26.77	49.97
179	Nacimiento silty clay loam, 15 to 75 percent slopes	A well-drained soil that typically occurs along mountain slopes and hillslope around 90 to 1,930 feet in elevation; parent material consists of fine-loamy residuum weathered from calcareous shale; depth to water table > 80"; not prone to flooding or ponding; silty clay loam (0-31"), bedrock (31-41").	1.61	3.71	5.32
182	Nacimiento-Calodo complex, 50 to 75 percent slopes	A well-drained soil that typically occurs along mountains and hills around 500 to 2,500 feet in elevation; parent material consists of residuum weathered from limestone; depth to water table > 80"; not prone to flooding or ponding; loam (0-16"), weathered bedrock (16-59").	2.36	4.23	6.59

Table 4. Soil Units Occurring within the Survey Area (acres)

Map Unit Symbol	Map Unit Name	Description	Limits of Disturbance (Acres)	Survey Buffer (Acres)	Total Survey Area (Acres)
203	Santa Lucia channery clay loam, 30 to 50 percent slopes	A well-drained soil that typically occurs along mountain slopes and hillslopes around 20 to 3,010 feet in elevation; parent material consists of shaly clayey residuum weathered from shale; depth to water table > 80"; not prone to flooding or ponding; channery clay loam (0-12"), very channery clay loam (12-24"), bedrock (24-34").	4.25	12.43	16.69
221	Xererts-Xerolls-Urban land complex, 0 to 15 percent slopes	A well-drained soil that typically occurs along mountains and hills around 0 to 2,500 feet in elevation; parent material consists of residuum weathered from mudstone, sandstone and/or shale; depth to water table > 80"; not prone to flooding or ponding; variable (0-60"), weathered bedrock (60-64").	68.02	41.02	109.03
		Total	**101.84**	**90.50**	**192.34**

4.0 Regulatory Background

Jurisdictional waters, including some wetlands and riparian habitats, are regulated by the USACE, the Regional Water Quality Control Board (RWQCB), and CDFW. The USACE Regulatory Program regulates activities pursuant to Section 404 of the federal Clean Water Act (33 U.S.C. 1344; CWA); the CDFW regulates activities under the Fish and Game Code Section 1600-1607; and the RWQCB regulates activities under Section 401 of the CWA and the California Porter-Cologne Water Quality Control Act.

4.1 Section 404 of the Clean Water Act

Section 404 of the CWA regulates the discharge of dredged material, placement of fill material, or certain types of excavation within "waters of the U.S." (resulting in more than incidental fallback of material) and authorizes the Secretary of the Army, through the Chief of Engineers, to issue permits for such actions. Permits can be issued for individual projects (individual permits) or for general categories of projects (general permits). "Waters of the U.S." are defined by the CWA as "rivers, creeks, streams, and lakes extending to their headwaters and any associated wetlands." Wetlands are defined by the CWA as "areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for life in saturated soil conditions." USACE has adopted several revisions to their regulations in order to more clearly define "waters of the U.S." Until the beginning of 2001, "waters of the U.S." included, among other things, isolated wetlands and lakes, intermittent streams, prairie potholes, and other waters that are not part of a tributary system to interstate waters or to navigable "waters of the U.S."

The jurisdictional extent of USACE regulation changed with the 2001 SWANCC (Solid Waste Agency of Northern Cook County) ruling. The U.S. Supreme Court held that the USACE could not apply Section 404 of the CWA to extend their jurisdiction over an isolated quarry pit. The Court ruled that the CWA does not extend Federal regulatory jurisdiction over non-navigable, isolated, intra-state waters. However, the Court made it clear that non-navigable wetlands adjacent to navigable waters are still subject to USACE jurisdiction.

In 2020, the U.S. Environmental Protection Agency (EPA) updated the CWA and their definition of navigable waters (USACE and EPA, 2020). The Navigable Waters Protection Rule regulates the nation's navigable waters and the core tributary systems that provide perennial or intermittent flows into these systems. As such, "Waters of the U.S." encompass traditional navigable waters; perennial and intermittent tributaries that contribute surface waters flow to such waters; certain lakes, ponds, and impoundments of jurisdictional waters; and wetlands adjacent to other jurisdictional waters. Based on this ruling, ephemeral waters were not mapped as "Waters of the U.S." In 2021, the EPA and USACE were directed by the Biden Administration and the U.S. District Court to vacate the 2020 Navigable Waters Protection Rule and revert to the pre-2020 rule. This revision of the Waters of the U.S. rule meant that ephemeral drainages were once again being treated as Waters of the U.S.

On April 6, 2022, the U.S. Supreme Court issued a stay of the 2021 order by the U.S. District Court for the Northern District of California that vacated the EPA's 2020 Clean Water Act Section 401 Certification Rule. Therefore, the CWA section 401 certification process is once again governed by the CWA section 401 certification regulations promulgated by EPA in 2020 (40 CFR 121). On June 1, 2022, the EPA Administrator signed a proposed rule to improve the CWA section 401 certification process. The proposed rule would replace and update the existing regulations at 40 CFR 121, to be more consistent with the statutory text of the 1972 CWA and clarify elements of section 401 certification practice that has evolved over the 50 years since the 1971 regulation was promulgated. On June 9, 2022, the proposed rule was published in the Federal Register (EPA, 2022). Based on a high degree of uncertainly and on-going changes in policy, ephemeral drainages are treated as jurisdictional Waters of the U.S. in this report.

4.2 Porter Cologne Water Quality Control Act and Section 401 of the Clean Water Act

The RWQCBs regulate activities affecting 'waters of the State' according to the Porter-Cologne Water Quality Control Act and Section 401 of the federal CWA. The Porter-Cologne Act defines waters of the State as all surface and subsurface waters. The RWQCBs may issue permits (called Waste Discharge Requirements or WDRs) or may issue a waiver for a given application. In addition, the RWQCB recently started to implement a new regulatory program for all waters of the State. For non-wetland waters of the State, RWQCB procedures and guidelines recognize the ordinary high-water mark (OHWM) as defined by federal guidelines (SWRCB, 2022; see also USACE, 2008) as the limits of jurisdiction. However, waters of the State include isolated waters and need not have downstream surface connection to federally jurisdictional waters. The new program uses the soils, hydrology, and vegetation criteria to identify wetlands, but may define certain unvegetated sites (e.g., mud flats or playas) as wetlands based on only the soils and hydrology criteria. The Survey Area is within the jurisdictional boundaries of the Central Coast RWQCB.

Section 401 of the CWA requires that:

> *…any applicant for a Federal permit for activities that involve a discharge to "waters of the State," shall provide the Federal permitting agency a certification from the State in which the discharge is proposed that states that the discharge will comply with the applicable provisions under the Federal Clean Water Act.*

Therefore, before the USACE may issue a Section 404 permit, a permittee must apply for and receive a Section 401 Water Quality Certification from the RQWCB, Central Coast Region. The RWQCB may add conditions to their certification to remove or mitigate potential impacts to water quality standards.

On April 2, 2019, the State Water Resources Control Board (State Water Board) adopted a State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State. The adopted definitions and procedure allow for the presence of hydric substrates as a criterion for wetland identification (not just wetland soils) and wetland hydrology for an area devoid of vegetation (less than 5% cover) to be considered a wetland. Waters of the State were delineated based on the OHWM in the field.

4.3 Coastal Commission Wetlands

As discussed above, the USACE generally uses a three-parameter definition for delineating wetland Waters of the U.S. as discussed in the USACE Wetland Delineation Manual (USACE, 1987). These three parameters include a positive indicator of hydrophytic vegetation, hydric soils, and wetland hydrology. In contrast, the CCC utilizes a one parameter definition of wetlands that only requires evidence of a single parameter to establish wetland conditions (California Code of Regulations Title 14 (14 CCR)).

4.4 Section 1602 of the California Fish and Game Code

Section 1602 of the California Fish and Game Code requires any person, State or local governmental agency, or public utility which proposes a project that will substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake, or use materials from a streambed, or result in the disposal or deposition of debris, waste, or other material containing crumbled, flaked, or ground pavement where it can pass into any river, stream, or lake, to first notify the CDFW of the proposed project. Notification is generally required for any project that will take place in a river, stream, lake, or their tributaries. This includes rivers or streams that flow at least periodically or permanently through a bed or channel with banks that support fish or other aquatic life and watercourses having a surface or subsurface flow that support or have supported riparian vegetation. CDFW may also exert jurisdiction over storm drains or concrete channels that convey flows from one jurisdictional feature to another. Based on the notification materials submitted, the CDFW will determine if the proposed project may impact fish or wildlife resources.

If the CDFW determines that a proposed project may substantially adversely affect existing fish or wildlife resources, a Lake or Streambed Alteration Agreement (SAA) will be required. A completed CEQA document must be submitted to CDFW before a SAA will be issued.

5.0 Waters and Wetlands Delineation Methodology

This section describes the methods employed to determine the extent of potentially jurisdictional wetlands and/or waters that occur in the Study Area. Prior to conducting the field assessment, Aspen reviewed current and historic aerial photographs; detailed topographic maps (1-foot intervals); the Soil survey of San Luis Obispo County, California, coastal part Soil Survey; and the local and State hydric soil list to evaluate the potential active channels and wetland features that occur in the Study Area (NRCS 2022a, 2022b). During the field assessment, vegetation, hydrology, and locations of soil test pits were mapped using an Apple iPad paired with an Arrow GPS unit and identified on aerial photographs (Figure 4, Attachment 1). Field maps were digitized using Global Information Technology (GIS) and total jurisdictional area for each jurisdiction was calculated. All drainages were assigned a number to identify the feature and (b) was assigned to those drainages within the Survey Area buffer while (a) was assigned to drainage segment within the limits of disturbance.

5.1 Wetland Waters of the U.S.

Jurisdictional wetlands were delineated using a routine determination according to the methods outlined in the USACE Wetland Delineation Manual (USACE, 1987) and the Arid West Supplement (USACE, 2008) based on three wetland parameters: dominant hydrophytic vegetation, wetland hydrology, and hydric soils. In addition, areas that fell outside the established transects but that had standing water and wetland hydrology and were dominated by obligate plants were mapped as wetlands without soils being sampled.

5.1.1 Wetland Vegetation

Percent cover of vegetation was visually estimated at each soil test pit. Plant species in each stratum (tree, sapling/shrub, herb, and woody vine) were ranked according to their canopy dominance (USACE, 2008). Species that contributed to a cumulative coverage total of at least 50 percent and any species that comprised at least 20 percent of the total coverage for each stratum were recorded on the Field Data Sheets (50/20 Rule). Wetland indicator status was assigned to each dominant species using the Arid West 2016 Regional Wetland Plant List (USACE, 2016) and Wetland Plants of Specialized Habitats in the Arid West (USACE, 2007). If greater than 50 percent of the dominant species from all strata were Obligate, Facultative-wetland, or Facultative species, the criterion for wetland vegetation was met (refer to Table 3, Attachment 3).

5.1.2 Wetland Hydrology

The presence of wetland hydrology was evaluated by recording the extent of observed primary and secondary indicators, as listed in Tables 4 and 5 of Attachment 3 (USACE, 2008). The Arid West Supplement includes two additional indicator groups that can be utilized during dry conditions or in areas where surface water/saturated soils are not present; these are Group B (evidence of recent inundation) and Group C (evidence of recent soil saturation) (USACE, 2008). The indicators are divided into two categories (primary and secondary indicators) and presence of one primary indicator from any of the groups is considered evidence of wetland hydrology. If only secondary indicators are present, two or more must be observed to conclude presence of wetland hydrology. Indicators are intended to be one-time observations of site conditions representing evidence of wetland hydrology when hydrophytic vegetation and hydric soils are present (USACE, 2008).

5.1.3 Wetland Soils

A single soil pit was excavated in the portion of the Survey Area with evidence of hydrology and hydrophytic vegetation. A soil pit was dug to a depth of 20 inches where possible (USACE, 2008). At the soil pit, the soil texture and color were recorded by comparison with standard plates within a Munsell soil color chart (Munsell Color, 2009). Any other indicators of hydric soils, such as redoximorphic features, buried organic matter, organic streaking, reduced soil conditions, gleyed or low-chroma soils were also recorded (refer to Tables 6 – 7, Attachment 3).

5.2 Non-wetland Waters of the U.S.

Jurisdictional non-wetland "waters of the U.S." were delineated based on the limits of the ordinary high-water mark (OHWM) as determined by changes in physical and biological features, such as bank erosion, deposited vegetation or debris, and vegetative characteristics. Outside of the riparian and estuarine system on the coast, the OHWM was a determined at the average high tide line. Tables 1 – 2 in Attachment

3 (Potential Geomorphic and Vegetative Indicators of Ordinary High-Water Marks for the Arid West) list key physical features for determining the OHWM identified by the Arid West Supplement.

Pursuant to the USACE Wetland Delineation Manual (USACE, 1987) and the Arid West Supplement (USACE, 2008), wetland areas within the Study Area may be considered a problematic, due to the changes in topography and the altering of run-off from the Study Area and adjacent upland areas. This may result in limited or no access to hydric indicators within the soils during the delineation throughout the Study Area. Although these conditions could complicate the delineation, the 2008 Arid West Supplement (USACE, 2008) provides guidance for atypical and problematic conditions. Aspen also reviewed the (NRCS, 2022a) to identify historic soil types for the Study Area. Data on vegetation, hydrology, and soils were collected using the methods described in Sections 4.1.1 through 4.1.3 and recorded on Wetland Determination Data Forms (Attachment 4).

5.3 RWQCB Wetlands and Waters of the State

RWQCB waters of the state generally match the limits of the waters of the U.S. described above. The RWQCB waters of the state are generally delineated based on the limits of the OHWM as determined by changes in physical and biological features, such as bank erosion, deposited vegetation or debris, and vegetative characteristics. In some locations where waters of the U.S. are absent, the limits of RWQCB jurisdiction match the top of bank, as described below for CDFW jurisdiction. The CCRWQCB is the state agency responsible throughout the Survey Area.

RWQCB wetlands of the State are generally mapped based on the presence of three wetland parameters: dominant hydrophytic vegetation, wetland hydrology, and hydric soils. The methods used match those described above for Wetland Waters of the U.S.

5.4 California Coastal Commission Wetlands

CCC jurisdiction occurs in coastal areas approximately 1,000 yards inland and three miles seaward. CCC delineates wetlands using a one parameter definition of wetlands. Three parameters (hydrophytic vegetation, wetland hydrology, and hydric soils) were evaluated within the wetlands in the Survey Area using the methods outlined in the USACE Wetland Delineation Manual (USACE, 1987) and the Arid West Supplement (USACE, 2008) as described above in Section 4.1. For any drainage within the Survey Area that contained at least one of these wetland parameters, CCC jurisdictional wetlands were identified.

5.5 CDFW Jurisdictional Waters

CDFW jurisdiction was delineated to the top of the banks of the channel and/or to the edge of the riparian canopy/riparian habitat where the trees and vegetation are rooted within the bank. Coastal bluffs were mapped to the top of the unvegetated bluff, which was representative of the top of bank. Other marine areas were mapped at the clearest transition between the marine environment and the adjacent upland or developed area. For portions of the Study Area, the CDFW jurisdictional boundary is concurrent with the OHWM. In some areas, the riparian canopy/riparian habitat extends beyond the OHWM. Therefore, the total acreage of CDFW jurisdictional waters is greater than the combined acreage of federal jurisdictional waters/wetlands.

6.0 Results

Four categories of jurisdictional features were documented within the Survey Area: USACE Waters of the U.S., CCRWQCB Waters of the State, CCC Wetlands, and CDFW jurisdictional streambeds and vegetation (refer to Tables 5 and 6 below; Figure 4, Attachment 1). Table 4-1 and Figure 4 (Attachment 1) show locations and acreages of jurisdictional features in the Study Area. Attachment 4 contains the Wetland Determination Data Forms completed during the assessment. According to the NRCS Hydric Soils List (NRCS 2022a, 2022b), Xererts-Xerolls-Urban land complex, 0 to 15 percent slopes is considered a hydric soil. There are no additional mapped hydric soils in the Study Area.

Table 5. Summary of Jurisdictional Resources Within the Survey Area

	USACE Waters and Wetlands (Acres)[1]		CCRQWCB Waters and Wetlands (Acres)[1]		CCC Wetland (Acres)	CDFW Streambeds (Acres)
	Non-wetland Waters of U.S.	Wetlands	Non-wetland Waters of State	Wetlands		
Limits of Disturbance (Temporary Impact Area)	0.79	--	1.07	--	--	1.17
Survey Buffer (Indirect Impact Area)	1.99	--	2.29	--	0.01	4.52
Total Survey Area	2.78	--	3.36	--	0.01	5.69

[1] Non-wetland Waters of the United States and Non-wetland Waters of the State overlap; as such, jurisdictional acreages are not additive.

- **Drainages 1-4, 7-12, 14-16, 25** – These drainages are primarily upland ephemeral swales, earthen roadside ditches, and other erosional features. These drainages are likely to fall under the jurisdiction of the CCRWQCB and CDFW. They all convey flows downstream or downslope but lack any evidence of an OHWM and are therefore not anticipated to be USACE Waters of the U.S. These features are primarily located in developed areas and in upland vegetation such as coast live oak woodland and wild oats and annual brome grassland. These drainages are not mapped in the National Wetland Inventory (USFWS, 2022).

- **Drainages 11, 13, and 19** – These drainages make up portion of Diablo Creek that flow westward through the Survey Area. Diablo Creek is a perennial stream with downstream connectivity to the Pacific Ocean. It is occupied by steelhead and potentially other fish species and supports a broad riparian corridor dominated by coast live oak, arroyo willow, and big-leaf maple. Wetland hydrology, hydric soils, and hydrophytic vegetation are expected to be present but are entirely within the OHWM and therefore not mapped as wetlands. These drainages are mapped as freshwater forested/shrub wetland (PFO/SSC) and riverine (R3UBH) in the National Wetland Inventory (USFWS, 2022).

- **Drainages 5 and 6** – These two features form a single upland ephemeral drainage that crosses an existing access road near the proposed borrow site. The vegetation along these drainages is dominated by coast live oak and coyote brush. These drainages lack a clearly defined OHWM and do not have connectivity to downstream jurisdictional features or the Pacific Ocean. For this reason, they are likely to fall under the jurisdiction of the CCRWQCB and CDFW but are not expected to fall under the jurisdiction of the USACE. These drainages are not mapped in the National Wetland Inventory (USFWS, 2022).

Table 6. Acreage of Jurisdictional Wetlands, Waters, and Streambeds

		Limits of Disturbance (Temporary Impacts)						Survey Buffer (Indirect Impacts)						
		CCRWQCB Waters of the State/CDFW Streambeds		CDFW Streambeds		USACE Waters of the U.S.		CCRWQCB Waters of the State/CDFW Streambeds		CDFW Streambeds		USACE Waters of the U.S.		CCC Wetlands
Drainage ID[1]	Dominate Vegetation Type[2]	Length (ft)	Area (sqft)	Length (ft)	Area (sqft)	Length (ft)	Area (sqft)	Length (ft)	Area (sqft)	Length (ft)	Area (sqft)	Length (ft)	Area (sqft)	Area (sqft)
1a	WOABG	128	127.62											
1b	WOABG							31	31.28					
2a	DEV	154	153.62											
2b	WOABG							34	33.88					
3a	DEV	114	113.71											
4a	DEV	309	308.36											
5a	DEV	50	56.96											
5b	CSS							225	346.36					
6a	WOABG	7	6.45											
6b	WOABG							35	35.42					
7a	DEV	29	29.32											
7b	CSS							19	19.21					
8a	CLOW	11	11.10											
8b	CLOW							265	264.32					
9b	CLOW							172	171.77					
10b	CLOW							87	514.15					
11a	DEV	25	48.46											
11b	CLOW							165	327.72					
12b	CLOW							13	13.18					
13b	CLOW							168	3871.49					
14b	CLOW							99	98.45					
15a	WOABG	230	229.08											
16a	WOABG	380	378.43											
17b	CSS									136	1200.78	37	480.70	
18b	RUD							138	135.08					
19a	DEV			20	213.57	2	71.73							
19b	AWT									1025	54458.55	276	11641.71	
20a	OW			125	38350.34	38	34354.30							

Table 6. Acreage of Jurisdictional Wetlands, Waters, and Streambeds

		Limits of Disturbance (Temporary Impacts)						Survey Buffer (Indirect Impacts)						
		CCRWQCB Waters of the State/CDFW Streambeds		CDFW Streambeds		USACE Waters of the U.S.		CCRWQCB Waters of the State/CDFW Streambeds		CDFW Streambeds		USACE Waters of the U.S.		CCC Wetlands
Drainage ID[1]	Dominate Vegetation Type[2]	Length (ft)	Area (sqft)	Length (ft)	Area (sqft)	Length (ft)	Area (sqft)	Length (ft)	Area (sqft)	Length (ft)	Area (sqft)	Length (ft)	Area (sqft)	Area (sqft)
20b	CBS									1216	90726.57	203	59089.89	
21b	CBS									202	3873.20			
22b	DEV									264	11487.83	79	9021.26	
23b	CSS									10	623.39	3	46.48	
24b	CSS									43	87.35	13	43.22	
25b	CSS									109	1496.93	12	669.29	397.89
26b	CSS									759	18398.60	94	5543.69	
27b	CSS							63	1743.02					
28a	DEV	947	4619.12											
28b	CSS							655	5206.67					
29a	DEV	1053	6335.83	5	53.20	2	5.33							
29b	WOABG									190	1899.01	58	190.01	
Project Totals:		**3437**	**12418.06**	**151**	**38617.10**	**42**	**34431.35**	**2171**	**12812.01**	**3955**	**184252.21**	**775**	**86726.26**	**397.89**

Notes:
1 The letter “a” indicated temporary impacts and the letter “b” indicated indirect impacts.
2 AWT=Arroyo willow thicket, CBS = Coastal bluff scrub, CSS = California sagebrush scrub, CLOW=Coast live oak woodland, DEV=Developed, OW=Open water, RUD=Ruderal, WOABG=Wild Oats and Annual Brome Grassland.

- **Drainage 20-22, 26, 27** – These drainages include the Pacific Ocean, intertidal areas, and a portion of the marina. These drainages are all expected to fall under the jurisdiction of the USACE, CCRWQCB, CCC, and CDFW. They are all subject to tidal shifts and have clearly defined OHWM. The majority of these features are within the Survey Area but are not expected to be impacted. These drainages are mapped as estuarine and marine deepwater (M1UBL) and estuarine and marine wetland (M2RSN) in the National Wetland Inventory (USFWS, 2022).
- **Drainage 25** – This drainage is a recently formed wetland, adjacent to the marina. The wetland is dominated by tall cyperus (*Cyperus eragrostis*). The wetland does not have hydric soils present, likely because it was recently formed by a nearby leaking pipe. This wetland is likely to fall under the jurisdiction of the CCRWQCB, CCC, and CDFW. Three parameter wetlands are not present, and the wetlands therefore do not fall under the jurisdiction of the USACE. However, this drainage does have a clearly defined OHWM that is well above the limits of the wetland vegetation. Flows from this drainage must accumulate to a depth of approximately 2 feet before flows spill into a drainage pipe that leads to the Pacific Ocean. These drainages are not mapped in the National Wetland Inventory (USFWS, 2022).
- **Drainage 24** – Is a small ephemeral drainage that flows into drainage 25, described above. Until recently, this drainage only flowed during rainfall events. More recently, a broken or leaking pipe in the drainage has begun to release perennial water into the drainage which is feeding the downstream wetland. It is unclear if repairs to this pipe are planned. Vegetation surrounding the drainage is primarily coastal sage scrub, but some wetland species are beginning to show up along the flow path of the water. These drainages are not mapped in the National Wetland Inventory (USFWS, 2022).
- **Drainage 28** – This drainage is an ephemeral channel that flows west through an old leach field, enters the existing storm drain system, and eventually reaches the Pacific Ocean. It is located entirely within wild oats and annual brome grassland. This drainage is likely to fall under the jurisdiction of the CCRWQCB and CDFW but not the USACE because it lacks an OHWM. This drainage is not mapped in the National Wetland Inventory (USFWS, 2022).
- **Drainage 29** – This drainage is an ephemeral channel that is located in the southern portion of the Survey Area. It originates in the hills to the east of the Survey Area and enters a storm drain near the edge of the limits of disturbance. The drainage has evidence of an OHWM which has been largely tramped by cattle. The drainage is likely to fall under the jurisdiction of the USACE, CCRWQCB, and CDFW. This drainage is not mapped in the National Wetland Inventory (USFWS, 2022).

6.1 Wetland Waters of the U.S.

Based on the field assessment, including the wetland sample locations, no federal wetlands were determined to be present within the Survey Area (see Figure 4, Attachment 1). Wetland hydrology and hydrophytic vegetation are present in drainage 25 however hydric soils were not present. Regardless, the wetlands in drainage 25 are within the OHWM and would therefore not be considered wetland Waters of the U.S., even if soils were present. The Wetland Determination Data Form is included in Attachment 4.

6.2 Non-wetland Waters of the U.S.

Approximately 2.78 acres of the Survey Area meet the definition of “waters of the United States” as outlined in 33 CFR Part 328 (Figure 4, Attachment 1). Of these, approximately 0.79 acres are within the limits of disturbance and may be temporary impacted. The remaining 1.99 acres are within the Survey Area buffer and are not expected to be directly impacted. This assessment is based on Aspen's professional opinion following an assessment of hydrology and the limits of the OHWM as determined by changes in physical and biological features, such as bank erosion, deposited vegetation or debris, and vegetation and soils characteristics noted during the field surveys. Some of the key hydrology indicators (see Tables 1 – 2 in Attachment 3 for additional information) that were noted during the delineation included:

- A11 – Scour holes downstream of obstructions
- A16 – Desiccation/med cracks
- B3 – Benches
- B6 – Break in bank slope
- B8 – Change in particle size distribution
- B10 – Exposed root hairs below intact soil layer
- B11 – Silt deposits
- B12 – Litter (organic debris, small twigs and leaves)
- B13 – Drift (organic debris, larger than twigs)
- C8 – Soil development

6.3 RWQCB Waters of the State

Based on this assessment of OHWMs and Aspen's professional opinion, 3.36 acres of the Survey Area meet the definition of non-wetland Waters of the State (Tables 5 and 6 and Figure 4 of Attachment 1). Of these, approximately 1.07 acres are within the limits of disturbance and may be temporary impacted. The remaining 2.29 acres are within the Survey Area buffer and are not expected to be directly impacted. Most of these drainages within the Survey Area are not Waters of the U.S. and fall under the jurisdiction of the CCRWQCB via the Porter Cologne Water Quality Control Act.

6.4 RWQCB Wetlands of the State

Based on this assessment and Aspen's professional opinion, no Wetlands of the State were determined to be present within the Survey Area (see Figure 4, Attachment 1). Wetland hydrology and hydrophytic vegetation are present in drainage 25 however hydric soils were not present. Regardless, the wetlands in drainage 25 are within the OHWM and would therefore not be considered Wetland Waters of the U.S. or Wetlands of the State, even if soils were present. The Wetland Determination Data Form is included in Attachment 4.

6.5 Coastal Commission Wetlands

Based on the assessment of hydrology, vegetation, and soils, and Aspen's professional opinion, approximately 0.01 acres of the Survey Area satisfy the CCC criteria as wetlands. None of the CCC jurisdictional wetlands are within the limits of disturbance. Additional information can be found above in Section 6.1 and on the field data sheet (Attachment 4).

6.6 CDFW Jurisdictional Waters

Based on Aspen's professional opinion following an assessment of hydrology, presence of bed and bank, and extent of riparian vegetation, approximately 5.69 acres of the Survey Area meet the definition of CDFW jurisdictional streambeds as outlined in Sections 1600-1616 of the CDFW Code (Figure 4, Attachment 1). This also includes two concrete-lined channels that convey flows from drainages 28 and 29, offsite to the Pacific Ocean. Of these, approximately 1.17 acres are within the limits of disturbance and may be temporary impacted. The remaining 4.52 acres are within the Survey Area buffer and are not expected to be directly impacted. CDFW jurisdiction encompassed all areas of open water, wetlands, streambeds, channels, erosional features, and immediately adjacent riparian vegetation.

7.0 Summary and Conclusions

The Survey Area includes USACE Waters of the U.S., CCRWQCB Waters of the State, CCC Wetlands, and CDFW jurisdictional waters and vegetation. Acreages of each jurisdiction are listed below and discussed above:

- 2.78 acres of jurisdictional non-wetland Waters of the U.S. were mapped in portions of the Survey Area that a discernible OHWM. Of these, approximately 0.79 acres are expected to be impacted as a result of the Project.
- 3.36 acres of non-wetland Waters of the State were mapped within the Survey Area. Of these, 1.07 acres are expected to be impacted as a result of the Project.
- 0.01 acres of CCC wetland were mapped within the Survey Area. These wetlands are not expected to be impacted as a result of the Project.
- 5.69 acres of CDFW jurisdictional streambeds and vegetation were mapped based on the presence of clearly defined bed and banks and other field observations. Of these, approximately 1.17 acres are expected to be impacted as a result of the Project.

The conclusions presented above represent Aspen's professional opinion based on our knowledge and experience with the USACE, CCRWQCB, and CDFW, including the applicable regulatory guidance documents and manuals. However, the USACE, CCRWQCB, and CDFW have final authority in determining the status and presence of jurisdictional wetlands and waters and the extent of their boundaries.

8.0. Literature Cited

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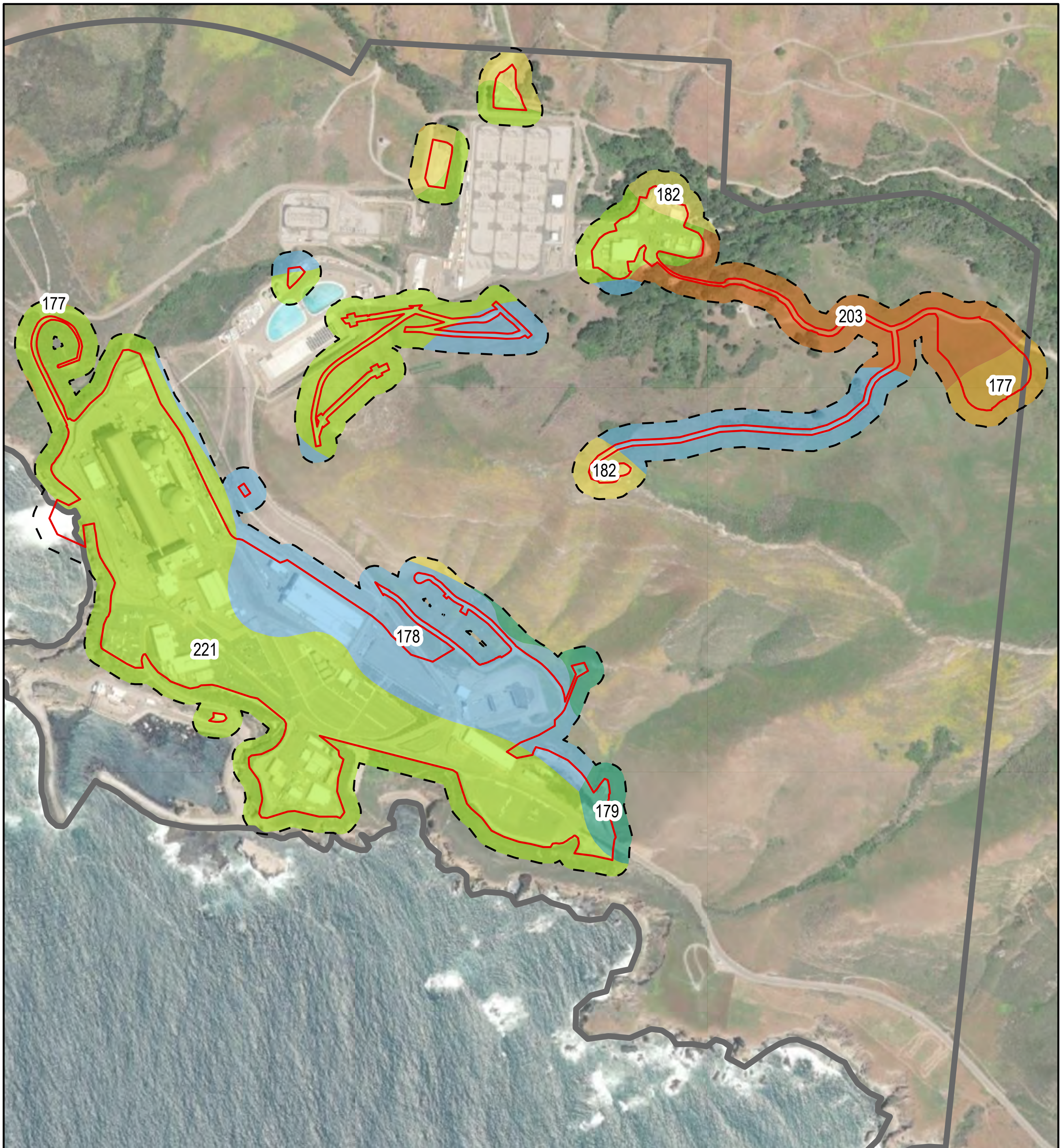
Attachment 1 – Figures

Figure 1

Project Overview

Sources: Aspen, 2022; Esri, 2022; PG&E, 2022.



Diablo Canyon Power Plant (DCPP)
Limits of Disturbance (LOD)
Survey Buffer
177: Nacimiento silty clay loam, 15 to 30 percent slopes
179: Nacimiento silty clay loam, 15 to 75 percent slopes, MLRA 15
178: Nacimiento silty clay loam, 30 to 50 percent slopes, MLRA 15
182: Nacimiento-Calodo complex, 50 to 75 percent slopes
203: Santa Lucia channery clay loam, 30 to 50 percent slopes, MLRA 15
221: Xererts-Xwerlls-Urban land complex, 0 to 15 percent slopes

Figure 2

Soils

0 1,000 2,000 Feet

Sources: Aspen, 2022; Esri, 2022; PG&E, 2022; USGS, 2022.

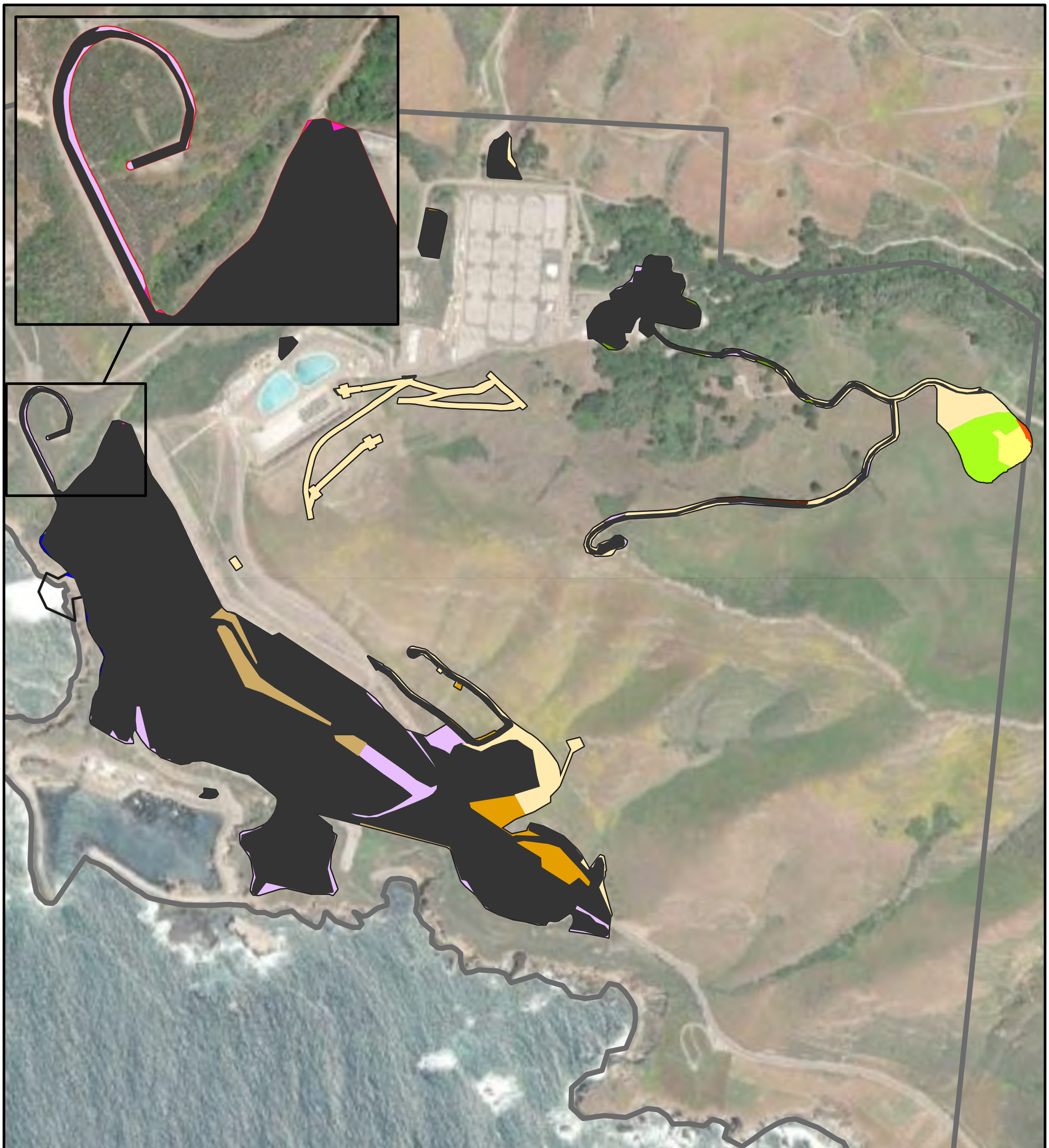


Figure 3

Vegetation and Land Cover

Sources: Aspen, 2022; PG&E, 2022.

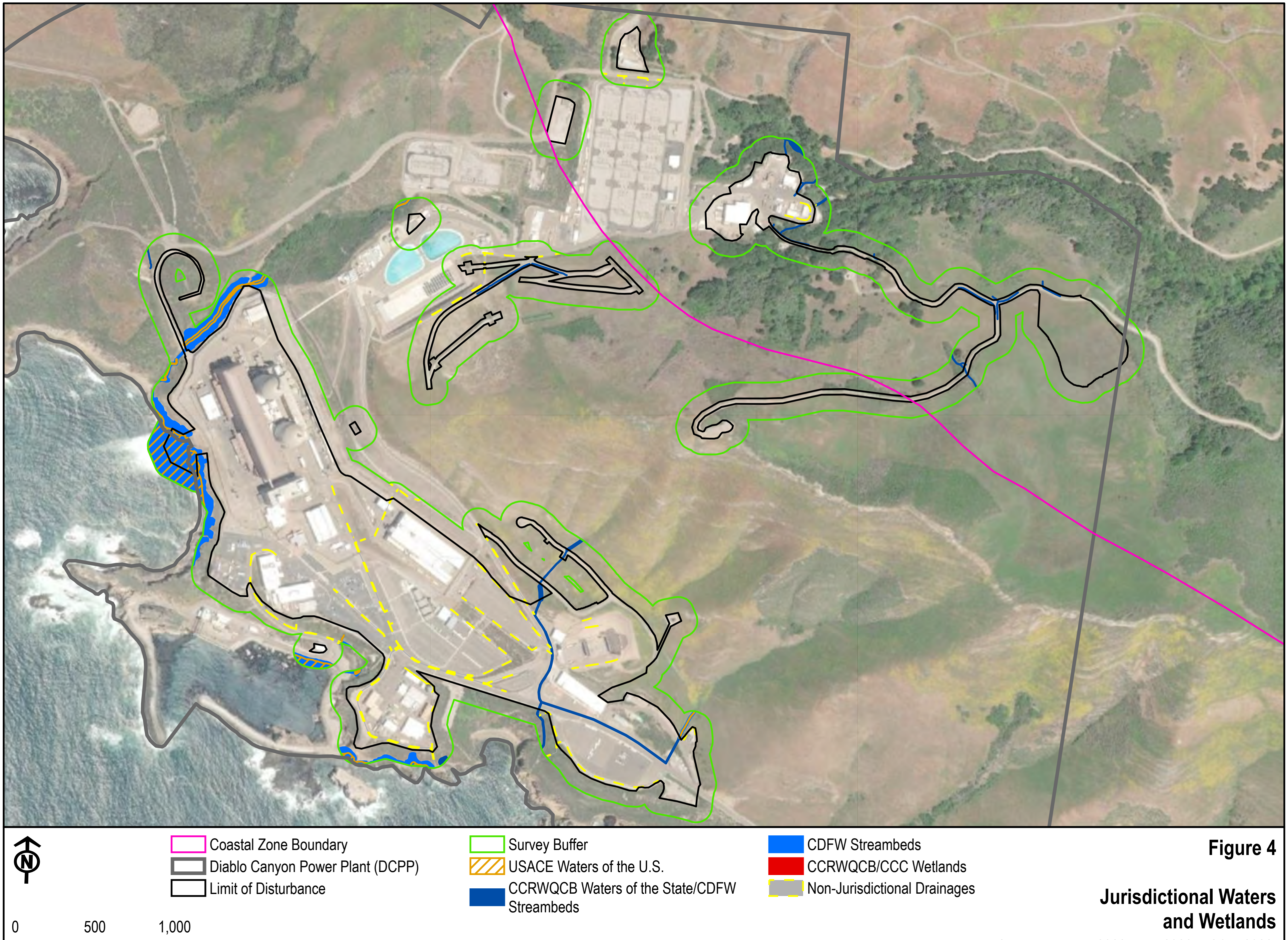
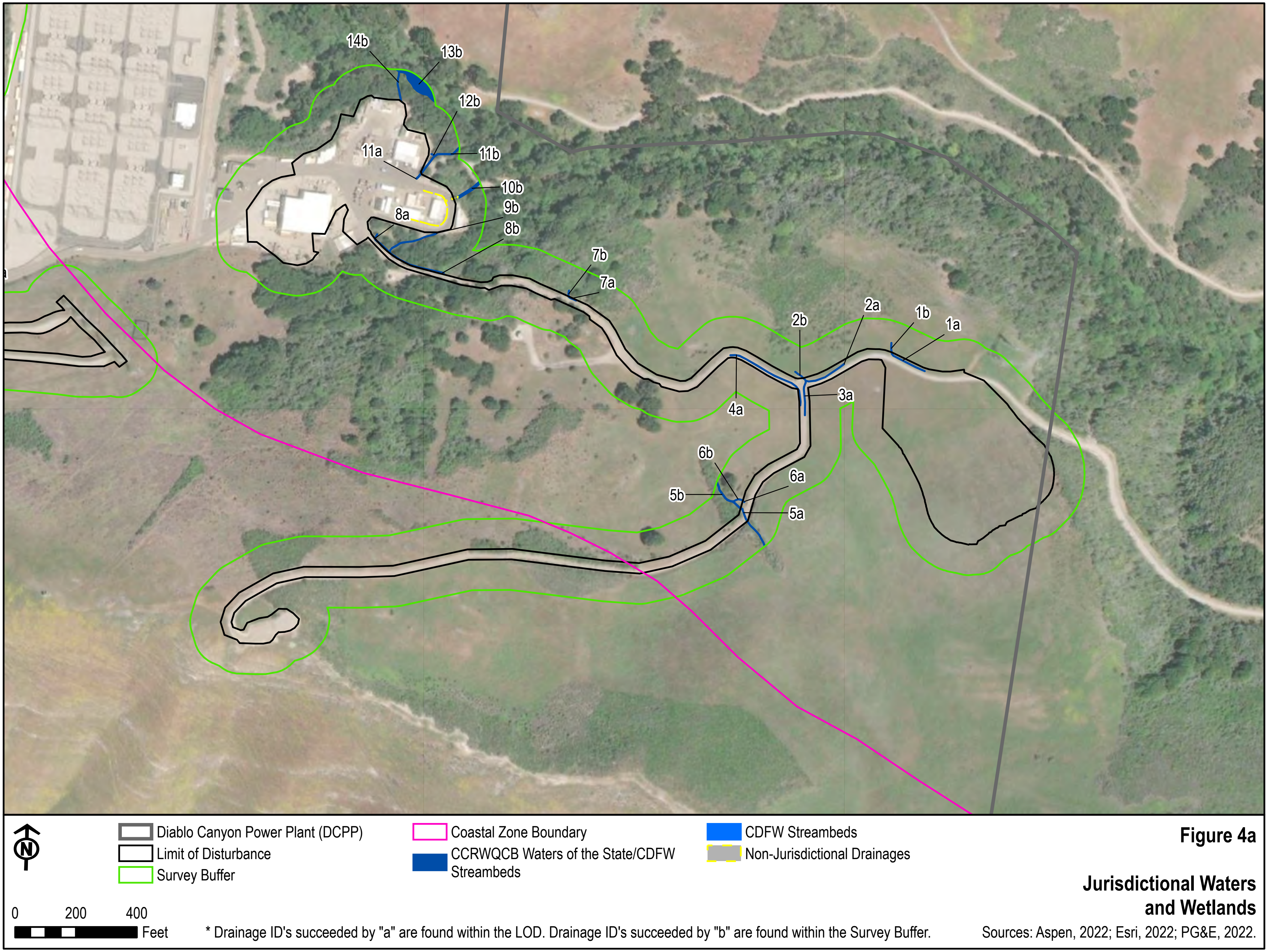


Figure 4

Jurisdictional Waters and Wetlands

Sources: Aspen, 2022; Esri, 2022; PG&E, 2022.

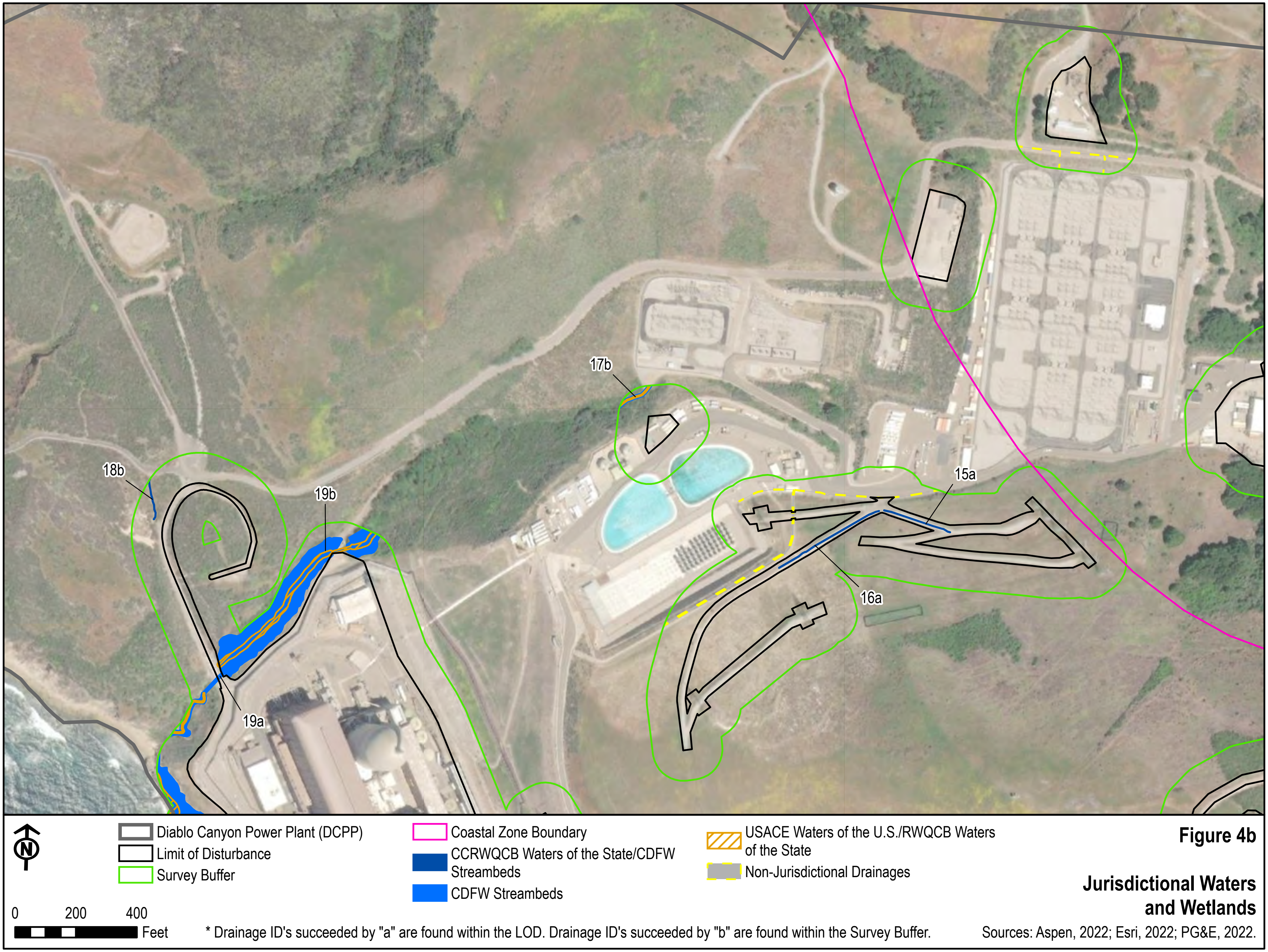


* Drainage ID's succeeded by "a" are found within the LOD. Drainage ID's succeeded by "b" are found within the Survey Buffer.

Figure 4a

Jurisdictional Waters and Wetlands

Sources: Aspen, 2022; Esri, 2022; PG&E, 2022.



* Drainage ID's succeeded by "a" are found within the LOD. Drainage ID's succeeded by "b" are found within the Survey Buffer.

Figure 4b

Jurisdictional Waters and Wetlands

Sources: Aspen, 2022; Esri, 2022; PG&E, 2022.

Diablo Canyon Power Plant (DCPP)
Limit of Disturbance
Survey Buffer
Coastal Zone Boundary
CCRWQCB Waters of the State/CDFW Streambeds
CDFW Streambeds
CCC Wetlands
USACE Waters of the U.S./RWQCB Waters of the State
Non-Jurisdictional Drainages

0 200 400 Feet

* Drainage ID's succeeded by "a" are found within the LOD. Drainage ID's succeeded by "b" are found within the Survey Buffer.

Figure 4c

Jurisdictional Waters and Wetlands

Sources: Aspen, 2022; Esri, 2022; PG&E, 2022.

Coastal Zone Boundary
Limit of Disturbance
Survey Buffer
CDFW Streambeds
CCC Wetlands
USACE Waters of the U.S./RWQCB Waters of the State
Non-Jurisdictional Drainages

0 50 100 Feet

Figure 4d

Jurisdictional Waters and Wetlands

Sources: Aspen, 2022; Esri, 2022; PG&E, 2022.

Attachment 2 – Photo Exhibit

Photo 1: Northwest-facing overview of the coastal bluffs and cliffs within the survey area.

Photo 2: West-facing view of the marina, showing jurisdictional resources within the survey area.

Photo 3: Downstream view of Diablo Creek (drainages 13b and 19b), within the survey area.

Photo 4: Upstream view of Diablo Creek (drainages 13b and 19b), within the survey area.

Photo 5: Close-up photo of Diablo Creek (drainages 13b and 19b), near the inlet beneath the substation, within the survey area.

Photo 6: North-facing view of the Project site, note drainage 29a in the lower left corner of the photo.

Photo 7: Close-up view of CCC wetlands (drainage 25b) within the survey area.

Photo 8: North-facing view of CCC wetlands (drainage 25b) within the survey area.

Photo 9: Close-up view of the drainage structure at the south end of the CCC wetlands within the survey area.

Photo 10: Overview of drainage 5b within the survey area.

Photo 11: North-facing view of a non-jurisdictional concrete-lined ditch within the survey area.

Photo 12: South-facing view of concrete-lined ditch (drainage 28a) within the survey area.

Attachment 3 – Federal Non-wetland and Wetland Water Indicator Information

Table 1. Potential Geomorphic Indicators of Ordinary High-Water Marks for the Arid West		
(A) Below OHW	**(B) At OHW**	**(C) Above OHW**
1. In-stream dunes	1. Valley flat	1. Desert pavement
2. Crested ripples	2. Active floodplain	2. Rock varnish
3. Flaser bedding	3. Benches: low, mid, most prominent	3. Clast weathering
4. Harrow marks	4. Highest surface of channel bars	4. Salt splitting
5. Gravel sheets to rippled sands	5. Top of point bars	5. Carbonate etching
6. Meander bars	6. Break in bank slope	6. Depositional topography
7. Sand tongues	7. Upper limit of sand-sized particles	7. Caliche rubble
8. Muddy point bars	8. Change in particle size distribution	8. Soil development
9. Long gravel bars	9. Staining of rocks	9. Surface color/tone
10. Cobble bars behind obstructions	10. Exposed root hairs below intact soil layer	10. Drainage development
11. Scour holes downstream of obstructions	11. Silt deposits	11. Surface relief
12. Obstacle marks	12. Litter (organic debris, small twigs and leaves)	12. Surface rounding
13. Stepped-bed morphology in gravel	13. Drift (organic debris, larger than twigs)	
14. Narrow berms and levees		
15. Streaming lineations		
16. Desiccation/mud cracks		
17. Armored mud balls		
18. Knick Points		

Table 2. Potential Vegetation Indicators of Ordinary High-Water Marks for the Arid West			
	(D) Below OHW	**(E) At OHW**	**(F) Above OHW**
Hydroriparian indicators	1. Herbaceous marsh species 2. Pioneer tree seedlings 3. Sparse, low vegetation 4. Annual herbs, hydromesic ruderals 5. Perennial herbs, hydromesic clonals	1. Annual herbs, hydromesic ruderals 2. Perennial herbs, hydromesic clonals 3. Pioneer tree seedlings 4. Pioneer tree saplings	1. Annual herbs, xeric ruderals 2. Perennial herbs, non-clonal 3. Perennial herbs, clonal and non-clonal co-dominant 4. Mature pioneer trees, no young trees 5. Mature pioneer trees w/upland species 6. Late-successional species
Mesoriparian Indicators	6. Pioneer tree seedlings 7. Sparse, low vegetation 8. Pioneer tree saplings 9. Xeroriparian species	5. Sparse, low vegetation annual herbs, hydromesic 6. ruderals 7. Perennial herbs, hydromesic clonals 8. Pioneer tree seedlings 9. Pioneer tree saplings 10. Xeroriparian species 11. Annual herbs, xeric ruderals	7. Xeroriparian species 8. Annual herbs, xeric ruderals 9. Perennial herbs, non-clonal 10. Perennial herbs, clonal and non-clonal codominant 11. Mature pioneer trees, no young trees 12. Mature pioneer trees, xeric understory 13. Mature pioneer trees w/upland species 14. Late-successional species 15. Upland species
Xeroriparian indicators	10. Sparse, low vegetation 11. Xeroriparian species 12. Annual herbs, xeric ruderals	12. Sparse, low vegetation 13. Xeroriparian species 14. Annual herbs, xeric ruderals	16. Annual herbs, xeric ruderals 17. Mature pioneer trees w/upland species 18. Upland species

Table 3. Summary of Wetland Indicator Status

Category		Probability
Obligate Wetland	OBL	Almost always occur in wetlands (estimated probability >99%)
Facultative Wetland	FACW	Usually occur in wetlands (estimated probability of 67–99%)
Facultative	FAC	Equally likely to occur in wetlands/non-wetlands (estimated probability of 34–66%)
Facultative Upland	FACU	Usually occur in non-wetlands (estimated probability 67–99%)
Obligate Upland	UPL	Almost always occur in non-wetlands (estimated probability >99%)
Non-Indicator	NI	No indicator status has been assigned

Source: Reed, 1988

Table 4. Wetland Hydrology Indicators*

Primary Indicators	Secondary Indicators
Watermarks	Oxidized Rhizospheres Associated with Living Roots
Water-Borne Sediment Deposits	FAC-Neutral Test
Drift Lines	Water-Stained Leaves
Drainage Patterns Within Wetlands	Local Soil Survey Data

*Table adapted from 1987 USACE Manual and Related Guidance Documents.

Table 5. Wetland Hydrology Indicators for the Arid West*

	Primary Indicator (any one indicator is sufficient to determine that wetland hydrology is present)	Secondary Indicator (two or more indicators are required to determine that wetland hydrology is present)
Group A – Observation of Surface Water or Saturated Soils		
A1 – Surface Water	X	
A2 – High Water Table	X	
A3 – Saturation	X	
Group B – Evidence of Recent Inundation		
B1 – Water Marks	**X** (Non-riverine)	**X** (Riverine)
B2 – Sediment Deposits	**X** (Non-riverine)	**X** (Riverine)
B3 – Drift Deposits	**X** (Non-riverine)	**X** (Riverine)
B6 – Surface Soil Cracks	X	
B7 – Inundation Visible on Aerial Imagery	X	
B9 –Water-Stained Leaves	X	
B10 – Drainage	X	X
B11 – Salt Crust	X	
B12 – Biotic Crust	X	
B13 – Aquatic Invertebrates	X	
Group C – Evidence of Current or Recent Soil Saturation		
C1 – Hydrogen Sulfide Odor	X	
C2 – Dry-Season Water Table		X
C3 – Oxidized Rhizospheres along Living Roots	X	
C4 – Presence of Reduced Iron	X	
C6 – Recent Iron Reduction in Tilled Soils	X	

Table 5. Wetland Hydrology Indicators for the Arid West*		
	Primary Indicator (any one indicator is sufficient to determine that wetland hydrology is present)	**Secondary Indicator (two or more indicators are required to determine that wetland hydrology is present)**
C7 – Thin Muck Surface	X	
C8 – Crayfish Burrows		X
C9 – Saturation Visible on Aerial Imagery		X
Group D – Evidence from other Site Conditions or Data		
D3 – Shallow Aquitard		X
D5 – FAC-Neutral Test		X

*Table adapted from Regional Supplement to the USACE of Engineers Wetland Delineation Manual: Arid West Region, Version 2.0.

Table 6. Field Indicators of Hydric Soil Conditions*	
1. Indicators of Historical Hydric Soil Conditions	**2. Indicators of Current Hydric Soil Conditions**
a. Histosols b. Histic epipedons; c. Soil colors (e.g., gleyed or low-chroma colors, soils with bright mottles (Redoximorphic features) and/or depleted soil matrix d. High organic content in surface of sandy soils e. Organic streaking in sandy soils f. Iron and manganese concretions g. Soil listed on county hydric soils list	a. Aquic or peraquic moisture regime (inundation and/or soil saturation for *7 continuous days) b. Reducing soil conditions (inundation and/or soil saturation for *7 continuous days) c. Sulfidic material (rotten egg smell)

*Table adapted from 1987 USACE Manual and Related Guidance Documents.

Table 7. Hydric Soil Indicators for the Arid West*			
Hydric Soil Indicators			**Hydric Soil Indicators for Problem Soils****
All Soils	**Sandy Soils**	**Loamy and Clay Soils**	
A1 – Histosol	S1 – Sandy Mucky Mineral	F1 – Loamy Mucky Mineral	A9 – 1 cm Muck
A2 – Histic Epipedon	S4 – Sandy Gleyed Matrix	F2 – Loamy Gleyed Matrix	A10 – 2 cm Muck
A3 – Black Histic	S5 – Sandy Redox	F3 – Depleted Matrix	F18 – Reduced Verti
A4 – Hydrogen Sulfide	S6 – Stripped Matrix	F6 – Redox Dark Surface	TF2 – Red Parent Material
A5 – Stratified Layers	—	F7 – Depleted Dark Surface	Other (See Section 5 of Regional Supplement, Version 2.0)
A9 – 1 cm Muck	—	F8 – Redox Depressions	—
A11 – Depleted Below Dark Surface	—	F9 – Vernal Pools	—
A12 – Thick Dark Surface	—	—	—

* Table adapted from Regional Supplement to the USACE of Engineers Wetland Delineation Manual: Arid West Region, Version 2.0.

** Indicators of hydrophytic vegetation and wetland hydrology must be present

Attachment 4 – Arid West Wetland Determination Data Sheet

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Diablo Canyon Nuclear Power Plant Decommissic City/County: San Luis Obispo/San Luis Obisp Sampling Date: 7/11/2022

Applicant/Owner: San Luis Obispo County State: CA Sampling Point: 1

Investigator(s): Justin Wood, Chris Huntley Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Basin Floor Local relief (concave, convex, none): Concave Slope (%): 0

Subregion (LRR): California Lat: 35.207249 Long: -120.852811 Datum: NAD83

Soil Map Unit Name: Xererts-Xwerlls-Urban land complex, 0to 15 percent slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔	No ___	**Is the Sampled Area within a Wetland?** **Yes** ___ **No** ✔
Hydric Soil Present?	Yes ___	No ✔	
Wetland Hydrology Present?	Yes ✔	No ___	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: 1m x 1m)			
1. Cyperus eragrostis	60	Yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
= Total Cover	60		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 40 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species	60	x 2 = 120
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = 2

Hydrophytic Vegetation Indicators:

✔ Dominance Test is >50%

✔ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ✔ **No** ___

Remarks:

SOIL

Sampling Point: 1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-12	7.5YR 3/1	100					Silty loam	No odor

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5) (**LRR C**)
___ 1 cm Muck (A9) (**LRR D**)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

___ 1 cm Muck (A9) (**LRR C**)
___ 2 cm Muck (A10) (**LRR B**)
___ Reduced Vertic (F18)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? Yes ___ No ✔

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

✔ Surface Water (A1)
✔ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1) (**Nonriverine**)
___ Sediment Deposits (B2) (**Nonriverine**)
___ Drift Deposits (B3) (**Nonriverine**)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Salt Crust (B11)
___ Biotic Crust (B12)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water Marks (B1) (**Riverine**)
___ Sediment Deposits (B2) (**Riverine**)
___ Drift Deposits (B3) (**Riverine**)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ✔ No ___ Depth (inches): ___
Water Table Present? Yes ✔ No ___ Depth (inches): 4
Saturation Present? (includes capillary fringe) Yes ___ No ___ Depth (inches): ___

Wetland Hydrology Present? Yes ✔ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Recently formed wetland, hydric soils may develope with time. Source of water is unknown but may be from broken pipe.

Attachment 5 – Aquatic Resource Table

Waters_Name	State	Cowardin_Code	HGM_Code	Meas_Type	Amount	Units	Waters_Type	Latitude[1]	Longitude[1]	Local_Waterway
DRAINAGE_19a	CA	R2SB	RIVERINE	AREA	71.73	SQ_FT	RPW	695089.20	3898750.93	DIABLO_CREEK
DRAINAGE_20a	CA	M2RS	TIDAL_FRINGE	AREA	34,354.30	SQ_FT	RPW	695121.38	3898495.80	PACFIC_OCEAN
DRAINAGE_29a	CA	R4SB	RIVERINE	AREA	190.01	SQ_FT	NRPW	696081.04	3898050.68	UNNAMED

Notes:

(1) Latitude and Longitude are reported in NAD83 and UTM Zone 10 S.

Appendix F

Historic Built Environment Evaluation

PAGE & TURNBULL

DIABLO CANYON POWER PLANT DECOMMISSIONING PROJECT HISTORIC BUILT ENVIRONMENT EVALUATION REPORT

SAN LUIS OBISPO COUNTY, CALIFORNIA
[P21214]

PREPARED FOR ASPEN ENVIRONMENTAL GROUP
April 14, 2022
REVISED

TABLE OF CONTENTS

1. INTRODUCTION

This Historic Built Environment Evaluation Report has been prepared for Aspen Environmental Group as part of the Diablo Canyon Power Plant (DCPP) Decommissioning Project proposed by Pacific Gas & Electric (PG&E), which operates the plant. The report evaluates the early buildings and structures at the DCPP site individually and collectively to determine if any meet the qualifications for listing as a historical resource for the purpose of the California Environmental Quality Act (CEQA). This report provides a summary of the regulatory setting for built historic resources, a physical description of the DCPP site, and historic context for the power plant, followed by its site history and evaluation for listing in the National Register of Historic Places and the California Register of Historical Resources.

Figure 1. General Site Vicinity map for Diablo Canyon Power Plant Decommissioning Project. No scale. Source: Google Maps, 2022. Edited by Page & Turnbull.

DCPP is located along the coast of the Pacific Ocean, approximately seven miles to the northwest of the unincorporated community of Avila Beach in San Luis Obispo County, California **(Figure 1)**. The site consists of a 750-acre high security zone, surrounded by approximately 12,000-acre area of owner-controlled land (jointly owned by PG&E and its subsidiary, Eureka Energy Company) that extends from Montaña de Oro State Park to the north to Port San Luis to the south. The built resources associated with DCPP are primarily on a flat terrace several hundred feet from the shoreline and at a leveled plateau (upper terrace) created on the hillside above the flat terrace, all within the 750-acre area that is the existing power plant boundaries.

Construction of the two-unit nuclear power plant began in 1968. Although most of the buildings and structures necessary for the plant's operation were essentially completed by 1973, operating licenses for DCPP Units 1 and 2 were not granted until 1984 and 1985, respectively, with both units going into commercial operation the following year. DCPP is the last nuclear power plant in operation in California and is scheduled to be decommissioned after its operating licenses under the U.S. Nuclear Regulatory Commission (NRC) expire in 2024 (Unit 1) and 2025 (Unit 2).

Methodology

Page & Turnbull prepared this report using books, journal articles, and other pieces of scholarly literature about the history of the plant, nuclear power, and the environmental movement, as well as various online sources including Newspapers.com and the websites of the NRC and World Nuclear Association. Key primary sources consulted and cited in this report include historic photographs from the PG&E archives, historic aerial photographs, and historical newspapers. Inquiries were made the University of California, Berkeley's Environmental Design Archives and to the Oregon Historical Society Research Library for information regarding Wurster, Bernardi, and Emmons and Pietro Belluschi, respectively, and their involvement as architects in the original plant design. Page & Turnbull staff conducted a site visit to DCPP on September 23 and 24, 2021. All photographs within this report were taken at that time, unless otherwise noted.

Names and numbers of the individual buildings and structures at DCPP, along with their dates of construction and the decommissioning zones in which they are located, are based on the Facilities Database spreadsheet provided by PG&E to Aspen Environmental Group, and shared with Page & Turnbull, along with a Revised Facilities Data site plan (SK-002-R1, dated October 10, 2018) denoting the various decommissioning zones. The dates of construction listed in the Facility Database spreadsheet are approximate substantial completion dates, as buildings and structures continued to be modified and PG&E records did not include consistent completion dates. During the September 2021 site visit, PG&E architect Al Clark provided Page & Turnbull with a separate spreadsheet dated August 27, 2009 with building information that he had compiled over the years of working at the plant. According to Mr. Clark, dates of construction in this 2009 spreadsheet were based on dates on original architectural drawings, though the construction completion dates were not recorded. As such, Page & Turnbull used the dates from Mr. Clark's spreadsheet as the secondary source for confirming the date of construction for individual buildings and structures at DCPP. In cases where the date of construction differed between these two sources, the dates were cross-referenced and confirmed where possible. This included reviewing historic photographs of the site, such as a historic aerial photograph taken in 1981, and other construction timelines provided by PG&E. In addition, PG&E confirmed date of construction and associated architect or engineer for six buildings through their response to Data Request Set 2. Page & Turnbull also referenced building permit records available online from the County of San Luis Obispo. However, because individual permit records could not always be definitively associated with a specific building or structure, the permits were only used to identify dates of construction in very limited instances.

For the purposes of evaluation, 1985 was selected as the end point for the site's potential period of significance, as DCPP's Unit 2 reactor was licensed for full commercial operation by the Nuclear Regulatory Commission that year and the plant was considered functionally complete. While this is less than 50 years ago, sufficient resources are available to understand DCPP within the context of nuclear power in California and the nation. The buildings and structures listed in the Facilities Database with a date of construction of 1985 or earlier, and confirmed by PG&E, were reviewed as part of the evaluation; they are described on California Department of Parks and Recreation Primary Record (DPR 523A) forms appended to this report. DPR 523A forms were not prepared for buildings and structures with construction dates after 1985, such as the Administration Building that PG&E confirmed had a 1986 date of construction.

It should be noted that some archival materials, including historical aerials from the University of California, Santa Barbara Library Geospatial Collection, were not available as a result of limited access due to the COVID-19 pandemic.

Summary of Findings

Upon evaluation, Page & Turnbull finds that the Diablo Canyon Power Plant is not eligible for listing on the National Register of Historic Places or the California Register of Historical Resources under any criteria. DCPP is not strongly associated with any significant events, patterns, or trends in nuclear power history under Criterion A/1. Construction on DCPP began in the late 1960s after an initial wave of nuclear power plants had already been completed in the country and in California in the late 1950s and early 1960s. After years of delays and setbacks, the plant went into full commercial operation in the mid-1980s, becoming one of the last nuclear power plants to begin operation in California. As such, it did not strongly influence the design or development of nuclear power plants in the state.

Although DCPP attracted significant and sustained opposition throughout its development, it does not appear to have directly contributed to the decline of the nuclear power industry nationally or at the state level; been the primary cause for any major actions, pieces of legislation, or policy changes;

or have had a historically significant impact on the development of the environmental movement. Rather, DCPP was one of many complicated and overlapping factors that contributed to a widespread atmosphere of growing concern and distrust toward nuclear power that emerged across the United States from the 1960s to the 1980s.

Furthermore, research did not indicate that DCPP is associated with any historically significant individuals under Criterion B/2 (Persons). Lastly, it does not appear that the site, nor any building or structure, is historically significant for its architectural design or construction under Criterion C/3 (Architecture). DCPP was built around two pressurized water reactors, the most common type of nuclear reactor in the United States. The design of these reactors and that of the support buildings and structures that comprise DCPP do not appear to be particularly unique or innovative within the history of nuclear power plants in California or the United States. Research did not uncover significant architectural designs or engineering achievements associated with DCPP. PG&E staff appear to be responsible for the design of many built resources, including larger-scale buildings such as the Training Building (Building 109) from 1984 and the 1986 Administration Building (Building 104). Master architects Wurster, Bernardi, and Emmons (WBE) and Pietro Belluschi were consultants to PG&E on the initial group of buildings around the nuclear reactors, though existing scholarship has not identified DCPP as an important work for WBE or Belluschi. Additional research was unable to confirm the extent of their contributions to attribute the design of any specific building or structure to either the firm or the architect. Where other outside architects, engineers, or designers had involvement with DCPP on specific buildings or structures, their work has not been recognized as of particular importance to meet Criterion C/3. As such, the plant's buildings and structures are not currently considered the work of a master architect or builder.

In addition, none of the individual buildings or structures rose to the level of significance to meet any of the criteria for listing on the National Register or California Register. Because no resource was found to meet any significance criteria, those that are less than 50 years of age also did not meet the threshold for exceptional significance under Criterion Consideration G.

Overall, no individual building or structure, or the Diablo Canyon Power Plant as a grouping or potential historic district, appear to qualify as a historic resource for the purposes of review under the California Environmental Quality Act (CEQA).

2. REGULATORY SETTING

California Environmental Quality Act

The California Environmental Quality Act (CEQA) is state legislation (Pub. Res. Code §21000 et seq.), which provides for the development and maintenance of a high-quality environment for the present-day and future through the identification of significant environmental effects.[1] CEQA applies to "projects" proposed to be undertaken or requiring approval from state or local government agencies. In accordance with CEQA Guidelines Section 15378, a "Project" is defined as "…the whole of an action, which has the potential for resulting in either a direct change in the environment, or a reasonably foreseeable indirect physical change in the environment" and which involves an activity directly undertaken by a public agency, an activity that requires public agency assistance or entitlement, or an activity that requires discretionary approval by a public agency.[2] Historic and cultural resources are considered to be part of the environment. In general, the lead agency must complete the environmental review process as required by CEQA.

A building may qualify as a historic resource if it falls within at least one of four categories listed in CEQA Guidelines Section 15064.5(a), which are defined as:

1. A resource listed in, or determined to be eligible by the State Historical Resources Commission, for listing in the California Register of Historical Resources (California Register) (Pub. Res. Code SS5024.1, Title 14 CCR, Section 4850 et seq.).

2. A resource included in a local register of historical resources, as defined in Section 5020.1(k) of the Public Resources Code or identified as significant in an historical resource survey meeting the requirements of section 5024.1 (g) of the Public Resources Code, shall be presumed to be historically or culturally significant. Public agencies must treat any such resource as significant unless the preponderance of evidence demonstrates that it is not historically or culturally significant.

3. Any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of

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[1] California Enviornmental Quality Act (CEQA), Public Resources Code (PRC), §21000 et seq., accessed online, November 9, 2021, https://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?lawCode=PRC&sectionNum=21000. .

[2] Guidelines for Implementation of the California Enviornmental Quality Act, California Code of Regulations (CCR), Title 14 § 15000 et seq., Thomson Reuters Westlaw, accessed online November 9, 2021, https://govt.westlaw.com/calregs/Browse/Home/California/CaliforniaCodeofRegulations?guid=IEB5FF9F0D48811DEBC02831C6D6C108E&originationContext=documenttoc&transitionType=Default&contextData=(sc.Default)

California may be considered to be an historical resource, provided the lead agency's determination is supported by substantial evidence in light of the whole record. Generally, a resource shall be considered by the lead agency to be "historically significant" if the resource meets the criteria for listing on the California Register of Historical Resources (Pub. Res. Code SS5024.1, Title 14 CCR, Section 4852).

4. The fact that a resource is not listed in, or determined to be eligible for listing in the California Register of Historical Resources, not included in a local register of historical resources (pursuant to section 5020.1(k) of the Pub. Resources Code), or identified in an historical resources survey (meeting the criteria in section 5024.1(g) of the Pub. Resources Code) does not preclude a lead agency from determining that the resource may be an historical resource as defined in Pub. Ressources Code sections 5020.1(j) or 5024.1.[3]

Properties listed or formally determined eligible for listing in the National Register are listed automatically in the California Register. [4] As such, they are considered historic resources under CEQA.

Historic Registers

NATIONAL REGISTER OF HISTORIC PLACES

The National Register of Historic Places (National Register) is the nation's most comprehensive inventory of historic resources. The National Register is administered by the National Park Service and includes districts, sites, buildings, structures and objects significant in American history, architecture, archeology, engineering, and culture. These resources contribute to an understanding of the historical and cultural foundations of the Nation at the national, state, or local level. Typically, properties over fifty years of age may be eligible for listing in the National Register if they meet any one of the four significance criteria and if they retain sufficient historic integrity to convey that significance. However, properties under fifty years of age may be determined eligible if it can be demonstrated that they are of "exceptional importance." Other criteria considerations apply to cemeteries, birthplaces, graves of historical figures, properties owned by religious institutions or used for religious purposes, structures that have been moved from their original locations, reconstructed buildings, and properties primarily commemorative in nature. National Register criteria are defined in depth in *National Register Bulletin Number 15: How to Apply the National Register Criteria for Evaluation.*

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[3] Pub. Res. Code SS5024.1, Title 14 CCR, Section 4850 et seq.
[4] California Office of Historic Preservation, *Technical Assistant Series No. 7, How to Nominate a Resource to the California Register of Historic Resources* (Sacramento: California Office of State Publishing, 2001),11.

Historic Significance

The National Register has four basic criteria under which a property may be considered eligible for listing. It can be found significant under one or more of the following criteria:

- Criterion A (Events): Properties associated with events that have made a significant contribution to the broad patterns of our history;
- Criterion B (Person): Properties associated with the lives of persons significant in our past;
- Criterion C (Architecture): Properties that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant distinguishable entity whose components lack individual distinction; and
- Criterion D (Information Potential): Properties that have yielded, or may be likely to yield, information important in prehistory or history.

A property may be considered significant on a national, state, or local level to American history, architecture, archaeology, engineering, and culture.

Criteria Consideration G

Properties that have achieved significance within the past 50 years shall not be considered eligible for the National Register unless it can be demonstrated that they are of exceptional importance. According to National Register Bulletin 15, the phrase exceptional importance "may be applied to the extraordinary importance of an event or to an entire category of resources so fragile that survivors of any age are unusual."[5] In order for a property to be evaluated under Criteria Consideration G, there must be sufficient historical perspective to determine that the property is exceptionally important. In addition, the property must be compared with other related properties to determine if the property qualifies as exceptionally important. Properties which have achieved significance within the past 50 years can also be eligible for the National Register if they are an integral part of a district which qualifies for the National Register listing.

[5] National Park Service, "National Register Bulletin Number 15: How to Apply the National Register Criteria for Evaluation" (Washington, D.C.: National Park Service, 1995), 42.

Integrity

In addition to qualifying for listing under at least one of the National Register criteria, a property must be shown to have sufficient historic integrity in order to be considered eligible for listing in the National Register. The concept of integrity is essential to identifying the important physical characteristics of historic resources and hence, in evaluating adverse changes to them. Integrity is defined as "the authenticity of an historical resource's physical identity evidenced by the survival of characteristics that existed during the resource's period of significance."[6]

According to the *National Register Bulletin Number 15: How to Apply the National Register Criteria for Evaluation*, integrity is determined through seven aspects: location, design, setting, materials, workmanship, feeling, and association.

Integrity is a "yes" or "no" determination. A historic property either has adequate integrity, or it does not. To retain historic integrity, a property will often possess several, if not all, of the aforementioned aspects. Specific aspects of integrity may also be more important, depending on the criteria for which it is significant.

CALIFORNIA REGISTER OF HISTORICAL RESOURCES

The California Register of Historical Resources (California Register) is an inventory of significant architectural, archaeological, and historical resources in the State of California. Resources can be listed in the California Register through a number of methods. State Historical Landmarks and National Register-listed properties are automatically listed in the California Register. Properties can also be nominated to the California Register by local governments, private organizations, or citizens.

In order for a property to be eligible for listing in the California Register, it must be found significant under one or more of the following criteria.

- **Criterion 1 (Events):** Resources that are associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States.

- **Criterion 2 (Persons):** Resources that are associated with the lives of persons important to local, California, or national history.

[6] National Park Service, "National Register Bulletin Number 15", 46.

- **Criterion 3 (Architecture):** Resources that embody the distinctive characteristics of a type, period, region, or method of construction, or represent the work of a master, or possess high artistic values.

- **Criterion 4 (Information Potential):** Resources or sites that have yielded or have the potential to yield information important to the prehistory or history of the local area, California, or the nation.

These criteria are based upon National Register of Historic Places criteria; however, the California Register does not impose as specific of requirements for integrity and age as the National Register. Properties eligible for listing in the California Register must retain enough of their historic character or appearance to be recognizable as historic resources and to convey the reasons for their significance. While the National Register guidelines for integrity can be applied for California Register eligibility, it is possible that resources that may not retain sufficient integrity for listing in the National Register may still be eligible for the California Register. Moved or reconstructed buildings, structures, or objects may also be considered for listing in the California Register under specific circumstances. In addition, properties that were constructed less than 50 years ago or which achieved significance less than 50 years ago may be eligible for inclusion in the California Register provided that sufficient time has passed to understand their significance within a historic context. With the exception of some properties with additional criteria consideration (50 years or less, moved buildings, etc.), properties that meet the National Register criteria typically also meet the California Register criteria and vice versa and are often evaluated together.

SAN LUIS OBISPO COUNTY

The County of San Luis Obispo, in which the subject property is located, currently does not have a historic preservation ordinance nor registration system for historic resources.

Historic Surveys and Evaluations

CEQA also recognizes a property that has been surveyed or evaluated and meets the criteria for listing in the California Register as a historic resource, unless a preponderance of evidence demonstrates that it is not historically or culturally significant. Below are relevant surveys and evaluations.

CALIFORNIA HISTORICAL RESOURCE STATUS CODES

Properties listed or under review by the State of California Office of Historic Preservation are listed within the Built Environment Resource Directory (BERD) and are assigned a California Historical Resource Status Code (Status Code) of "1" to "7" to establish their historical significance in relation to the National Register of Historic Places (National Register) or California Register of Historical Resources (California Register).[7] Properties with a Status Code of "1" or "2" are either eligible for listing in the California Register or the National Register, or are already listed in one or both of the registers. Properties assigned Status Codes of "3" or "4" appear to be eligible for listing in either register, but normally require more research to support this rating. Properties assigned a Status Code of "5" have typically been determined to be locally significant or to have contextual importance. Properties with a Status Code of "6" are not eligible for listing in either register. Finally, a Status Code of "7" means that the resource has not been evaluated for the National Register or the California Register, or needs reevaluation.

Historic Status of the Diablo Canyon Power Plant

The Diablo Canyon Power Plant is not currently listed in the National Register or California Register. It is also not listed in the BERD database for San Luis Obispo County, as of the March 2020 update. This means no previous evaluations or surveys of the property have been submitted to Office of Historic Preservation.

[7] California State Office of Historic Preservation, Built Environment Resource Directory (BERD), Los Angeles County, updated March 2020.

3. PHYSICAL DESCRIPTION

The Diablo Canyon Power Plant occupies a 750-acre site within a larger approximately 12,000-acre existing owner-controlled area on the California coast in central San Luis Obispo County. The 750-acre site where most of the built resources were constructed is located within the Irish Hills approximately seven miles northwest of Avila Beach, 12 miles southwest of the City of San Luis Obispo, and directly southeast of Montaña de Oro State Park.

The primary access to Diablo Canyon Power Plant is Diablo Canyon Road, which starts at its intersection with Avila Beach Drive close to Port San Luis near Avila Beach. A guard station controls entrance to the road and property at this Ávila Gate. Diablo Canyon Road is a paved, seven-mile, two-lane road that winds its way along the coast to the area where the power plant's built resources are located.

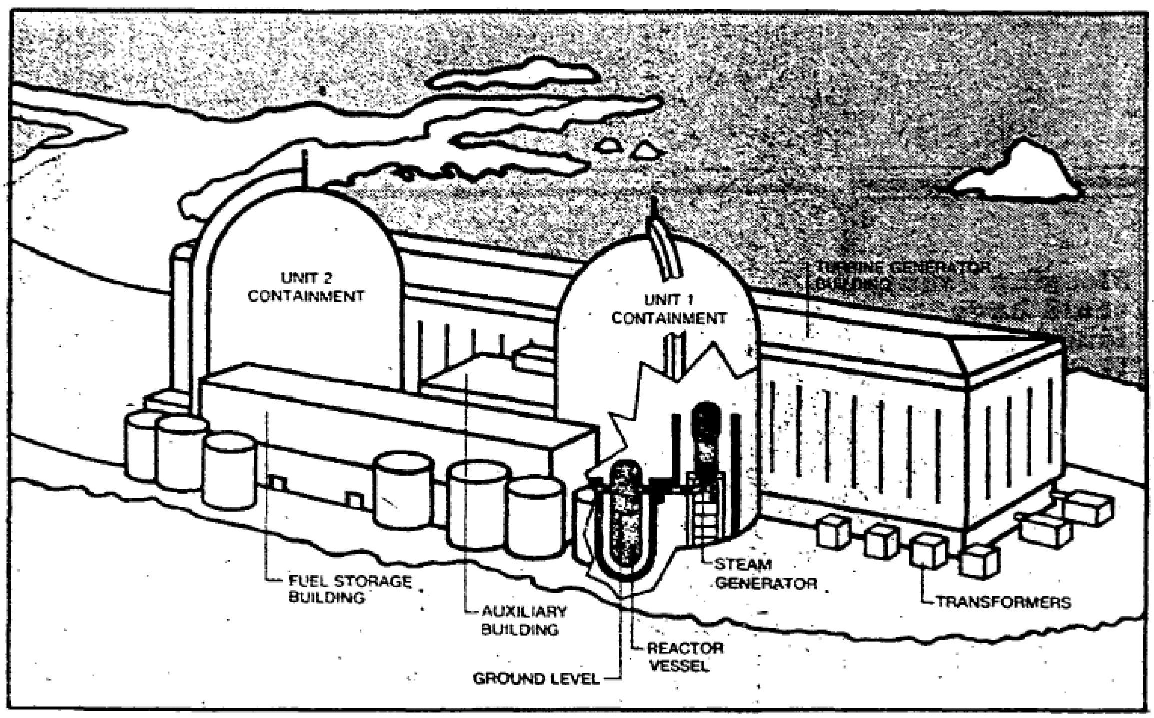


Figure 2. Diagram of the buildings and structures within the power block.
Source: "A Rare Glimpse of the Plant," *San Francisco Chronicle*, 12 November 1978: 1.

According to the site plan provided (Appendix A), upon reaching the plant site, the road forks into Shore Cliff Road and Reservoir Road. Shore Cliff Road leads to a large flat terrace along the rocky coastline of the Pacific Ocean that contains a majority of the plant's buildings and structures, including the main power generating facilities in the power block (**Figure 2**). Reservoir Road ascends along the hillsides to the northwest of this terrace to a second higher terrace, containing additional support buildings, structures, and site features. The buildings on this upper terrace roughly align with the path of Diablo Canyon Creek, which runs through the plant site along the base of a ravine and through underground tunnels before emptying into Diablo Cove. Diablo Cove and a separate manmade cove, known as the Intake Cove, supply water for the plant's water systems.

Buildings by Decommissioning Zones

The following section contains a brief summary of the various areas that comprise main plant site, organized according to decommissioning zones established by PG&E **(Figure 3)**. Detailed views of each zone from the Revised Facilities Data site plan (SK-002-R1) are provided for reference. Dates of construction are based on the Facility Database provided by PG&E to Aspen Environmental Group, unless otherwise noted. Individual buildings and structures that were built in 1985 or earlier are highlighted on the zone site plans and DPR 523A forms with their physical descriptions are included in Appendix A.

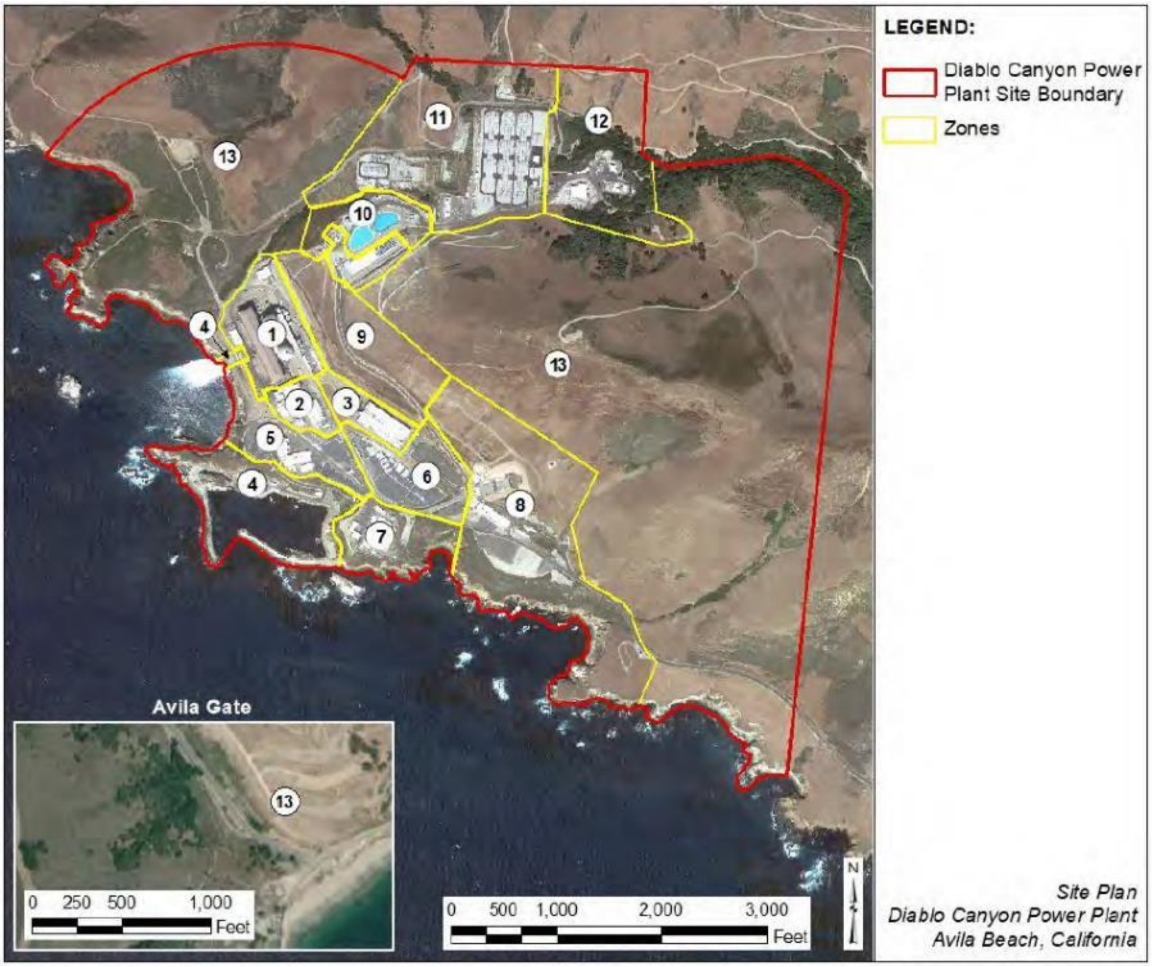
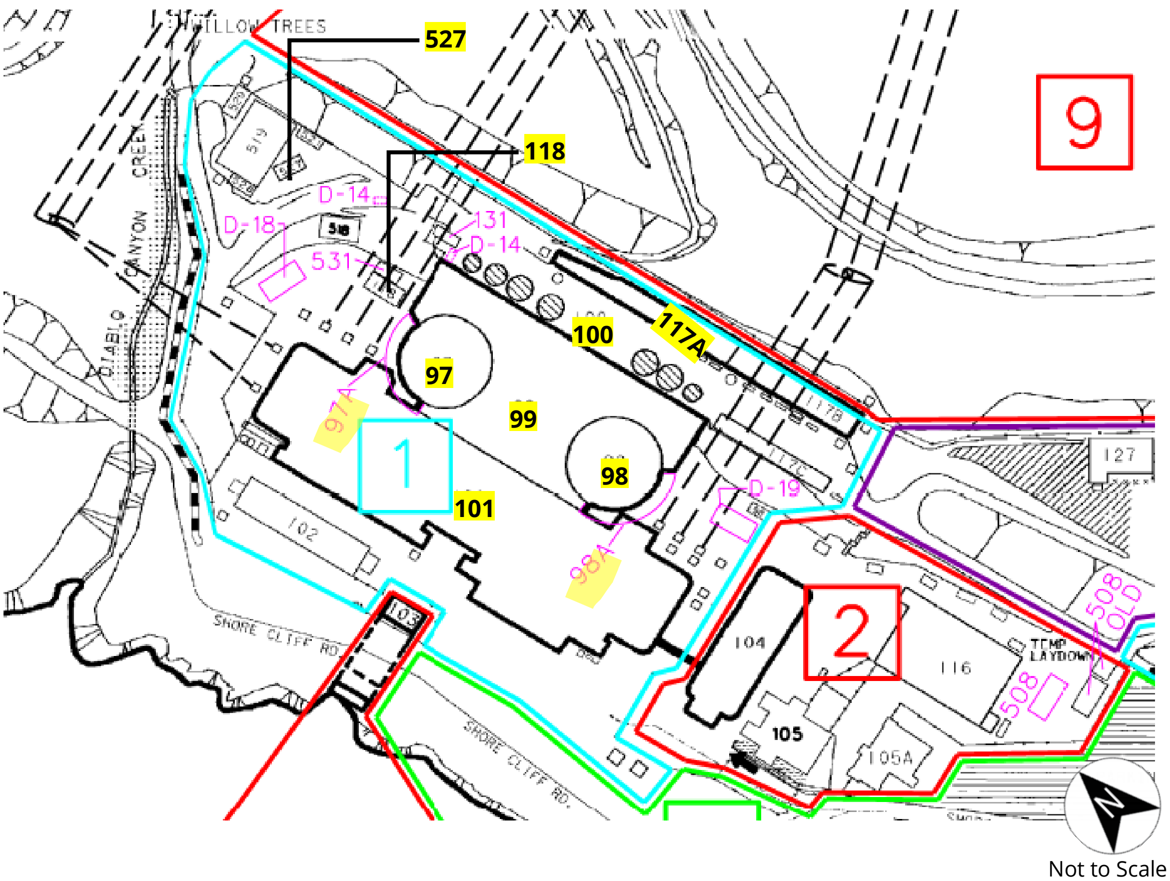


Figure 3. Boundaries for the 750-acre area that comprise the project site, with the 13 decommissioning zones shown. Source: Pacific Gas and Electric Company, 2021. County of San Luis Obispo Development Plan / Coastal Development Permit and Conditional Use Permit Application Package for the Diablo Canyon Power Plant Decommissioning Project (Amended Submittal). June 30. File: Project Description, Environmental & Alternatives Analyses (Revised).

ZONE 1

Zone 1 is located on the main terrace directly to the northwest of Diablo Cove. The zone contains the plant's primary power generating buildings and structures, also known as the power block. Two pressurized water nuclear reactors (Unit 1 and Unit 2) and their associated steam generators, feedwater systems, and cooling water systems are housed inside separate, but adjacent, containment domed structures (Buildings 097 and 098). The containment structures are behind a long Turbine Building (Building 101) that contains turbines and generators that convert steam produced in the containment domes into electricity. An Auxiliary Building (Building 099) – containing the plant's control room, emergency safety systems, and other support systems – connects to the Turbine Building and surrounds the two containment structures. A fuel handling building, radioactive waste storage building, medical facility, outdoor water storage tanks, maintenance warehouses, storage facilities, and other support buildings and structures surround the main power block buildings.



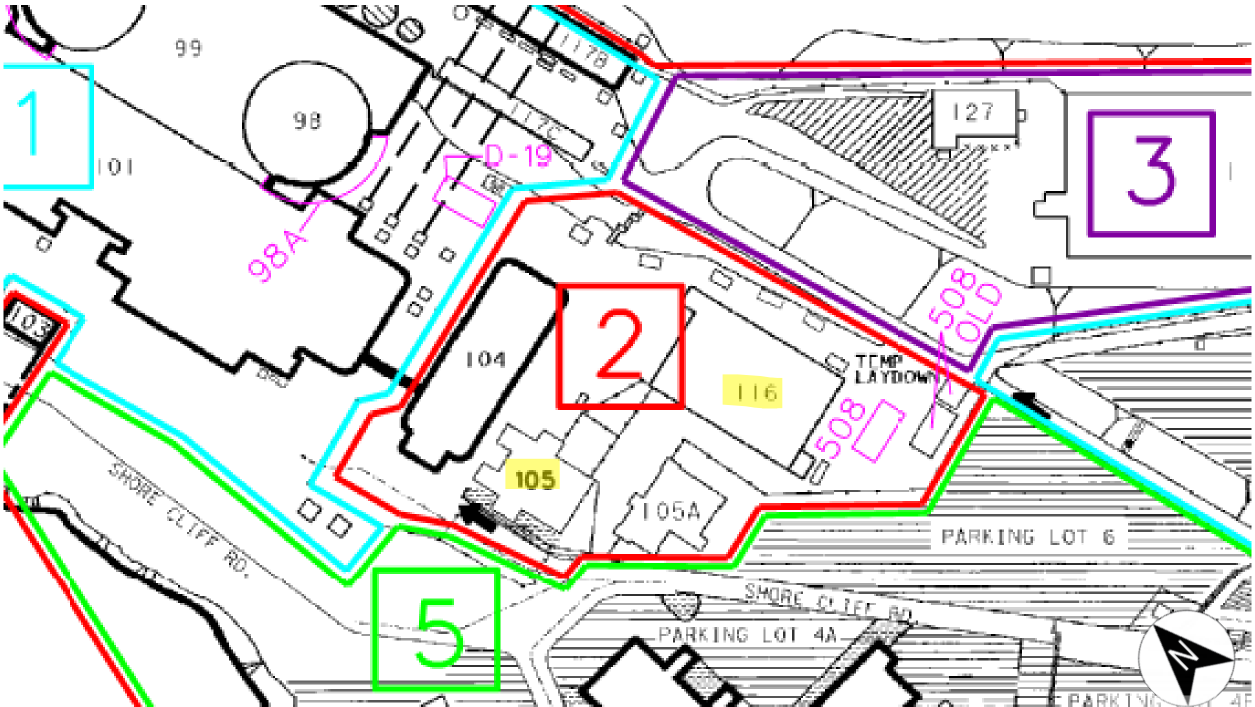
Zone 1			
Building #	**Building Name**	**Year Built**	**DPR 523A Form**
090	Service Air Building	1996	No
097	Unit 1 Containment	1972	Yes
097A	Unit 1 Pipe Rack Area	1972	Yes
098	Unit 2 Containment	1973	Yes
098A	Unit 2 Pipe Rack Area	1973	Yes
099	Auxiliary Building	1972-1973	Yes
100	Outdoor Water Storage Tanks	1973	Yes
101	Turbine Building	1972-1973	Yes
102	I&C/Medical Facility	1988	No
117A	RCA Laundry Facility	1975	Yes
117B	RCA Radwaste Storage	1990	No
117C	RCA Storage Building	2003	No
118	Aux Boiler Enclosure	1980	Yes
131	RCA Calibration Facility	2007	No
518	Craft Facility - Storage (Assembly Building)	1980*	No
519	Warehouse A	Not dated	No
527	Start-up – Instrumentation & Control Craft Shop	By 1981**	Yes
528	Toilet trailer	Not dated	No
531	Scaffold Storage Area (Hazardous Waste Handling Area)	Not dated	No
D-14	Abandoned Diesel Storage Tanks	Not dated	No
D-18	Unit 1 Transformer Yard Oil Retention Basin	Not dated	No
D-19	Unit 2 Transformer Yard Oil Retention Basin	Not dated	No

* According to PG&E Architect Al Clark's August 27, 2009 list of plant buildings.

** Confirmed by appearance in 1981 aerial photograph of the plant site.

ZONE 2

Zone 2 is located directly to the southeast of Zone 1 and contains several large buildings that primarily support the administration, security, and maintenance of the plant. Principal buildings include a six-story Administrative Building (Building 104), two security buildings used to screen workers and visitors to the power block (Buildings 105 and 105A), and a large maintenance warehouse (Building 116).



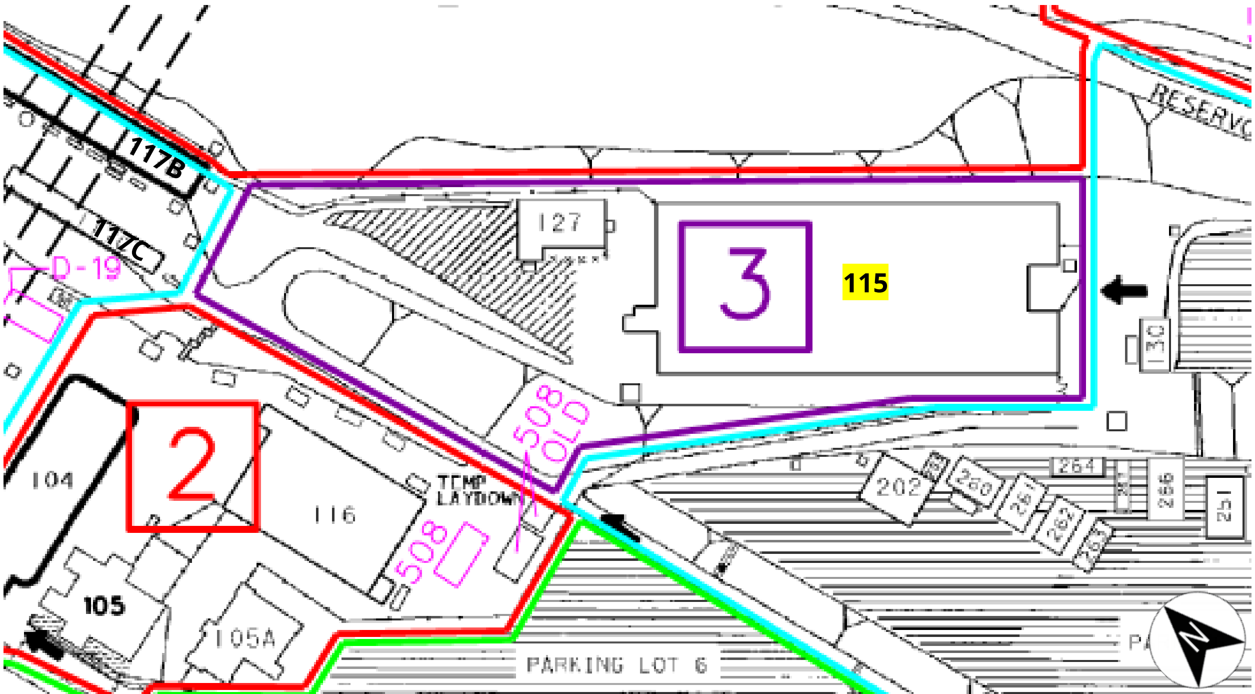
Not to Scale

Zone 2			
Building #	**Building Name**	**Year Built**	**DPR 523A Form**
104	Administration Building	1986*	No
105A	Protected Area Access Facility	2012	No
105	Security Office Building	1977, expanded 1988 and unknown date	Yes
116	Unit 2 Cold Machine Shop	1984	Yes
508	Office	Not dated	No
508 old	Office – condemned	Not dated	No

* PG&E confirmed date through Data Request Set 2.

ZONE 3

Located immediately to the northeast of Zones 1 and 2, Zone 3 provides additional maintenance and storage support for the plant. The zone's main building consists of the Main Warehouse (Building 115), a combined maintenance warehouse and office building that is nestled into the excavated hillsides of the Irish Hills.



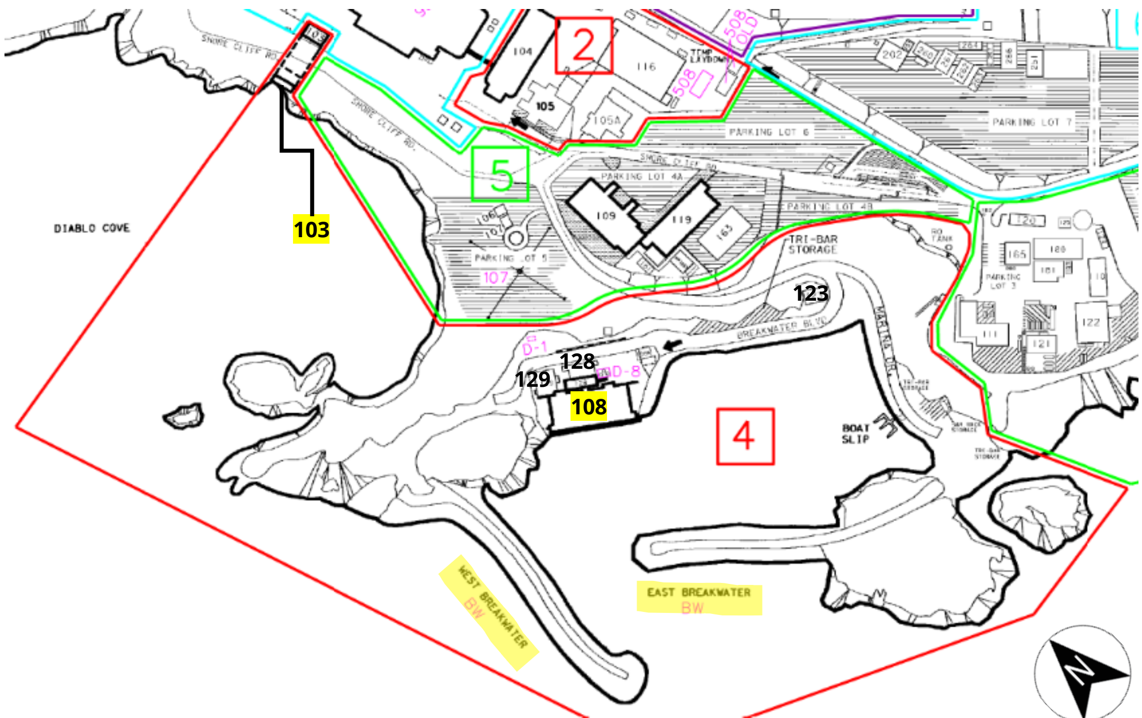
Not to Scale

Zone 3			
Building #	**Building Name**	**Year Built**	**DPR 523A Form**
115	Main Warehouse	1985	Yes
127	Liquids Storage	1988* or 1991	No

* According to PG&E Architect Al Clark's August 27, 2009 list of plant buildings.

ZONE 4

Zone 4 consists primarily of the plant's Discharge Structure (Building 103) and Intake Structure (Building 108) that draw seawater from the Pacific Ocean into the plant's tertiary cooling system and returns it into the ocean. It includes the manmade Intake Cove formed by two long breakwaters that shelters the Intake Structure and its adjacent support facilities, also in the zone, from the ocean. A small boat dock is within the Intake Cove. The Intake Cove area is accessed by a curving, paved road that descends from the main terrace to the shoreline and splits into one named Breakwater Boulevard and another named Marina Drive.



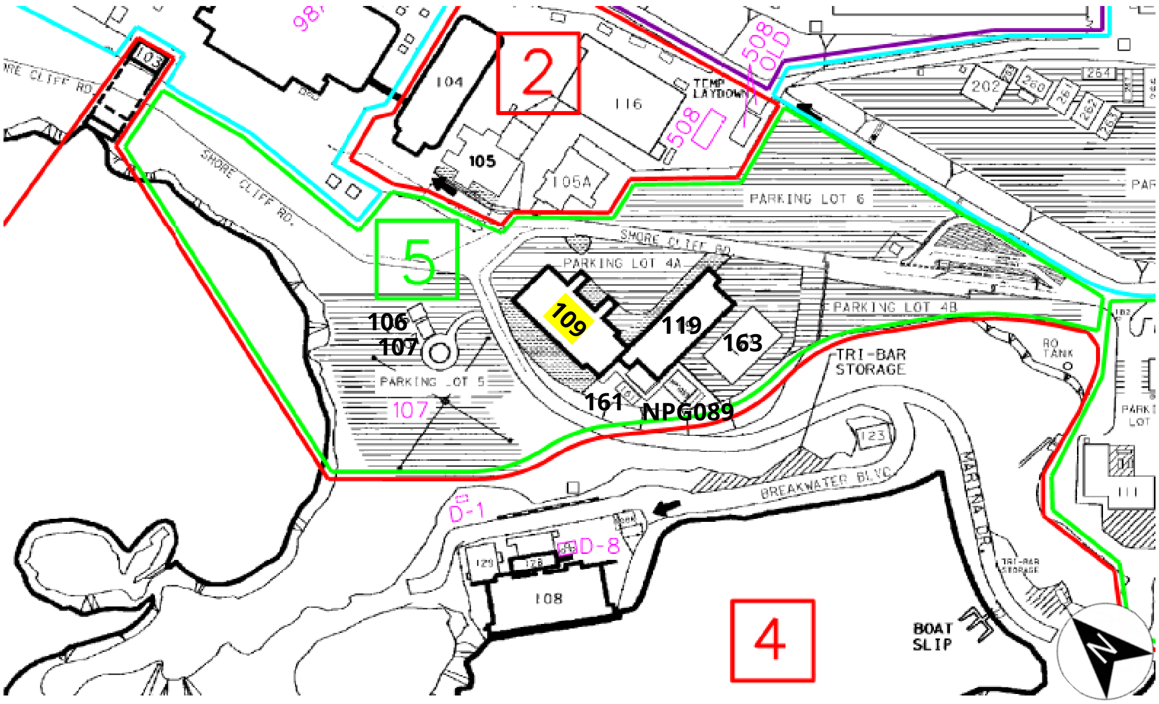
Not to Scale

Zone 4			
Building #	**Building Name**	**Year Built**	**DPR 523A Form**
103	Discharge Structure	1972	Yes
108	Intake Structure	1972	Yes
108A	Intake Access Facility	2012	No
123	TES Shower/Lab Facility	Not dated	No
128	Intake Control Building	1989	No
129	Intake Maintenance Shop	1989 / 1991*	No
BW	East and West Breakwater	1972	Yes
D-1	Underground Sewage Holding Tank/Lift	Not dated	No
D-8	Chemical Storage Tanks and Pad	Not dated	No

* According to PG&E Architect Al Clark's August 27, 2009 list of plant buildings.

ZONE 5

Zone 5 is located between Zones 2, 4, and 6. The zone contains personnel training facilities and several smaller support buildings concentrated on the south side of Shore Cliff Road, which bisects the zone. This cluster of buildings is surrounded by several large, paved parking lots, which previously had building around the plant's original construction that have since been demolished.



Not to Scale

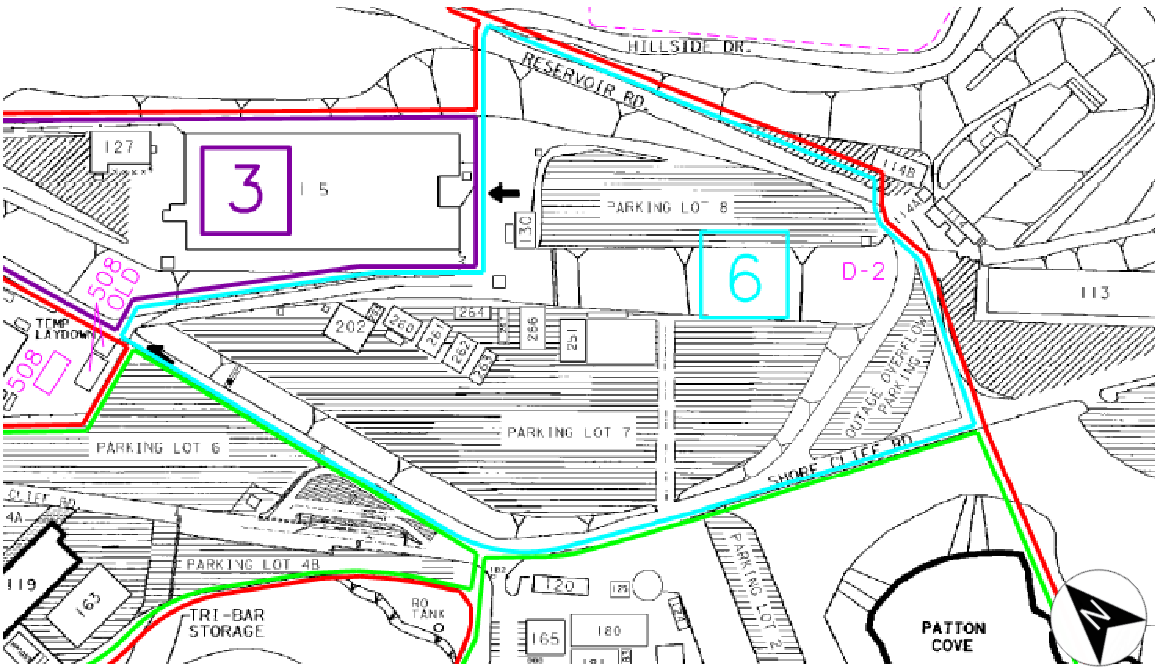
Zone 5			
Building #	**Building Name**	**Year Built**	**DPR 523A Form**
106	Telephone Terminal Building	1984*	No
107	Meteorological Tower No. 1 & Building	1981* / 1995	No
109	Training Building	1984**	Yes
119	Maintenance Shop Building	1986	No
161	Maintenance Shop Annex Building	1989	No
163	FFD/Access Building	2007	No
NPG089	Steam Generator Mock-up	Not dated	No

* According to PG&E Architect Al Clark's August 27, 2009 list of plant buildings.

** PG&E confirmed date through Data Request Set 2.

ZONE 6

Zone 6 is located to the northeast of Zone 5, where Diablo Canyon Road forks into Reservoir Road and Shore Cliff Road. It contains a group of one- and two-story modulars that are used as offices, storage facilities, and restrooms. The buildings are set inside a large, paved parking lot (Parking Lot 7). A second parking lot (Parking Lot 8) is to the south of Reservoir Road.



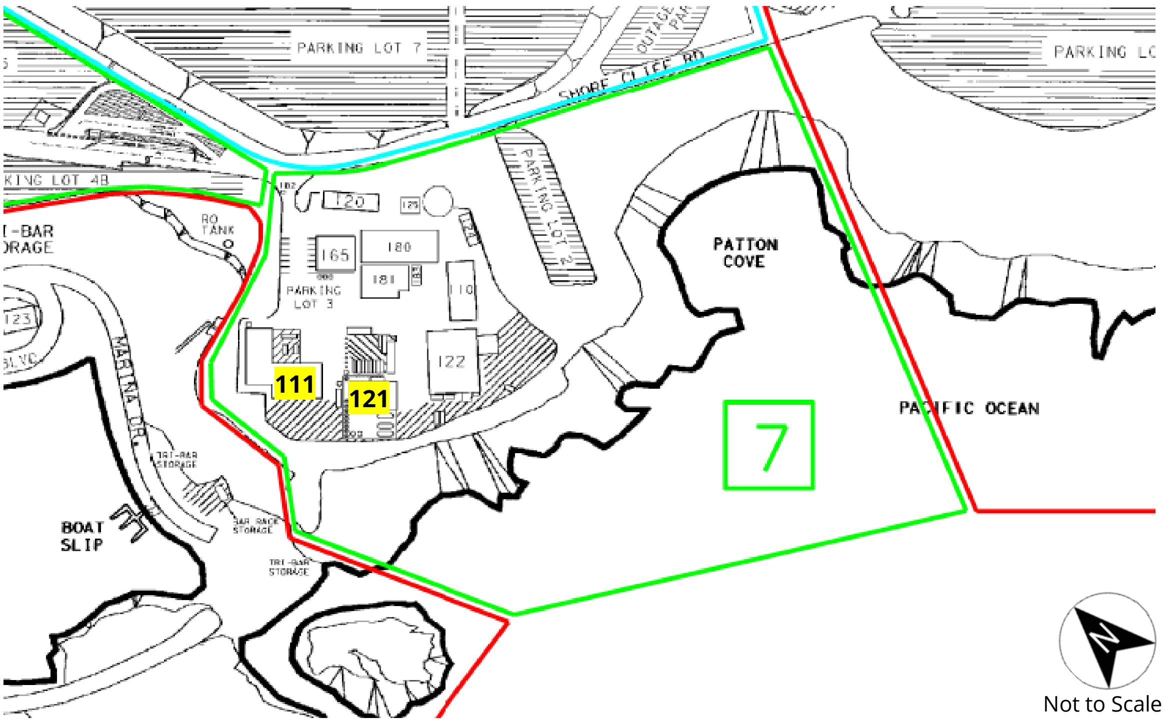
Not to Scale

Zone 6			
Building #	**Building Name**	**Year Built**	**DPR 523A Form**
130	Gas Cylinder Enclosure	1991	No
203	Telecommunications / SGI Vault Building	Not dated	No
251	Industrial Fire Operations Garage	approx. 2000	No
260	Steam Generator Maintenance	1986	No
261	Day-Zimmerman/Construction Field Engineering	1986	No
262	Facility Maintenance/Conference room/In-processing	1986	No
263	Fire Department	1986	No
264	Conference room/TCOM/Storage	1986	No
266	Offices	1986	No
267	Toilets	Not dated	No
D-2	Small Storage Building & Tank	Not dated	No

Note, Building 202 shown in the map had been demolished by the time of the site visit.

ZONE 7

Zone 7 consists of the area to the east of the Intake Cove. It contains various buildings and structures that comprise the plant’s water desalination plant (Building 121), other water treatment facilities, and maintenance and support buildings.

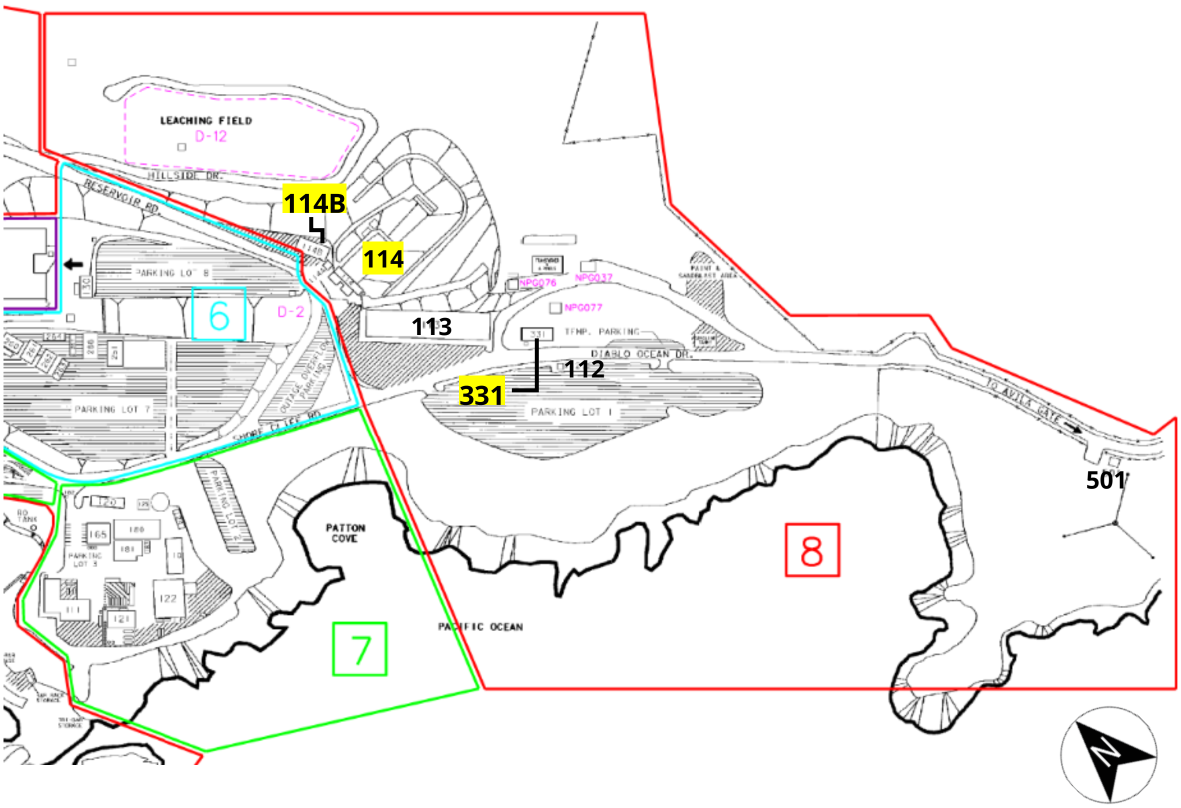


Zone 7			
Building #	**Building Name**	**Year Built**	**DPR 523A Form**
110	Sandblasting and Spray Paint Facility	1989	No
111	Turbine Generator and Rotor Equipment Warehouse	1982	Yes
121	Seawater Reverse Osmosis Facility	1985	Yes
120	Hazardous Waste Facility	1986	No
122	Fabrication Shop	1986	No
124	Sewage Treatment Plant	1987	No
125	Fire Water Tank and Pumphouse	1986	No
180	Modular Building	approx. 2015	No
181	Modular Building	approx. 2015	No
182	TCOM Building	approx. 2015	No
183	Modular Building	approx. 2015	No
165	Used Fuel Storage Project	Not dated	No

ZONE 8

Zone 8 is at the far east end of the Diablo Canyon Power Plant's main site, flanking Diablo Canyon Road where it approaches the main terrace. The zone contains a variety of buildings and structures on the north side of Diablo Canyon Road that serve different purposes. The first set of buildings as one enters the plant on Diablo Canyon Road consists of the remaining buildings and structures of the plant's concrete batch plant, such as the Soils Lab – Concrete Testing Lab (Building 331).

To the west of these buildings is a large former warehouse (Building 113) that now serves as a visitor screening facility, offices, and FLEX program storage. To the northwest of this building are a series of buildings and structures used to train the plant's security staff, including a large outdoor shooting range (Building 114) that is carved into the hillside to the north.



Not to Scale

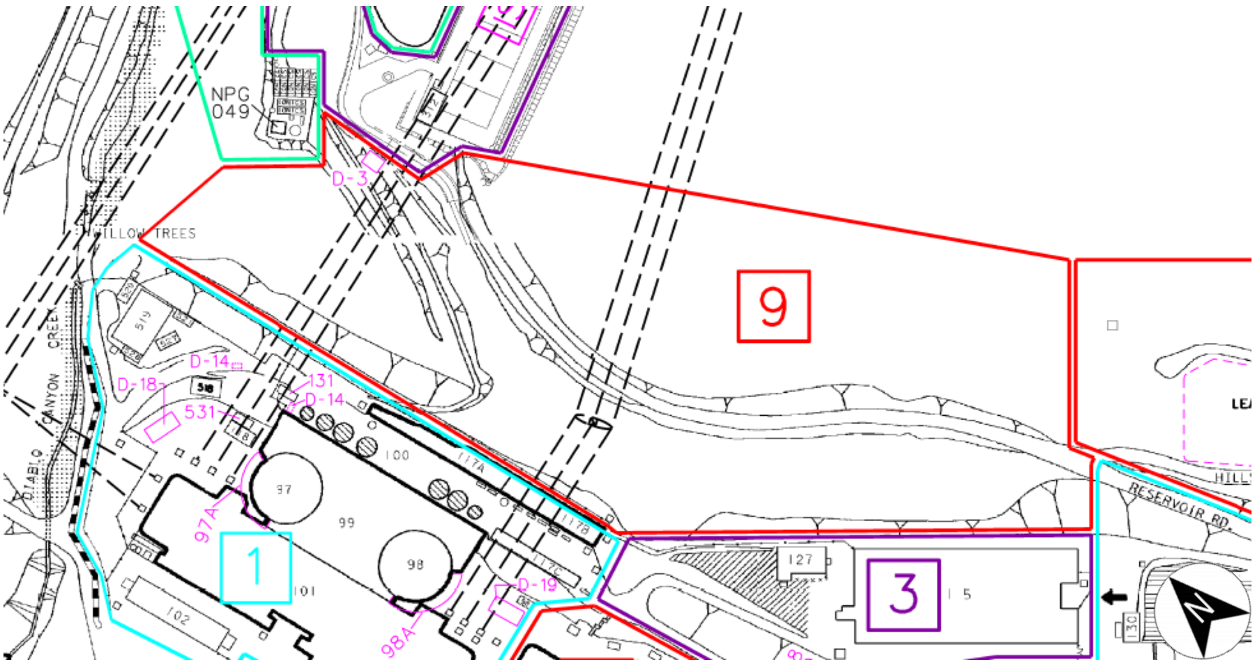
Zone 8			
Building #	**Building Name**	**Year Built**	**DPR 523A Form**
112	Equipment Shelter - Back-up Met Tower	1984*	No
113	Warehouse "B" Fukushima FLEX Equipment Storage	By 1981 / altered 2013**	No
114	Firing Range	1978	Yes
114A	Security Training Tower	2012	No
114B	Security Training Building	2004	No
331	Soils lab - Concrete Testing Lab	1970	Yes
501	Secondary Met Tower and Control Building	Not dated	No
D-12	Leach Field East of Lot 8, abandoned	Not dated	No
NPG037	Office/Paint Storage	Not dated	No
NPG076	Storage - Facilities Maintenance	Not dated	No
NPG077	Storage - Facilities Maintenance	Not dated	No

* According to PG&E Architect Al Clark's August 27, 2009 list of plant buildings.

** Building 113 appears in the 1981 aerial photograph of the plant site, but was significantly altered in 2013.

ZONE 9

Zone 9 is located to the north of the main power block buildings in Zone 1 and consists of a stretch of Reservoir Road as it heads uphill toward the upper terrace. The only buildings or structure inside this zone is an observation station overlooking the power block buildings in Zone 1 below.

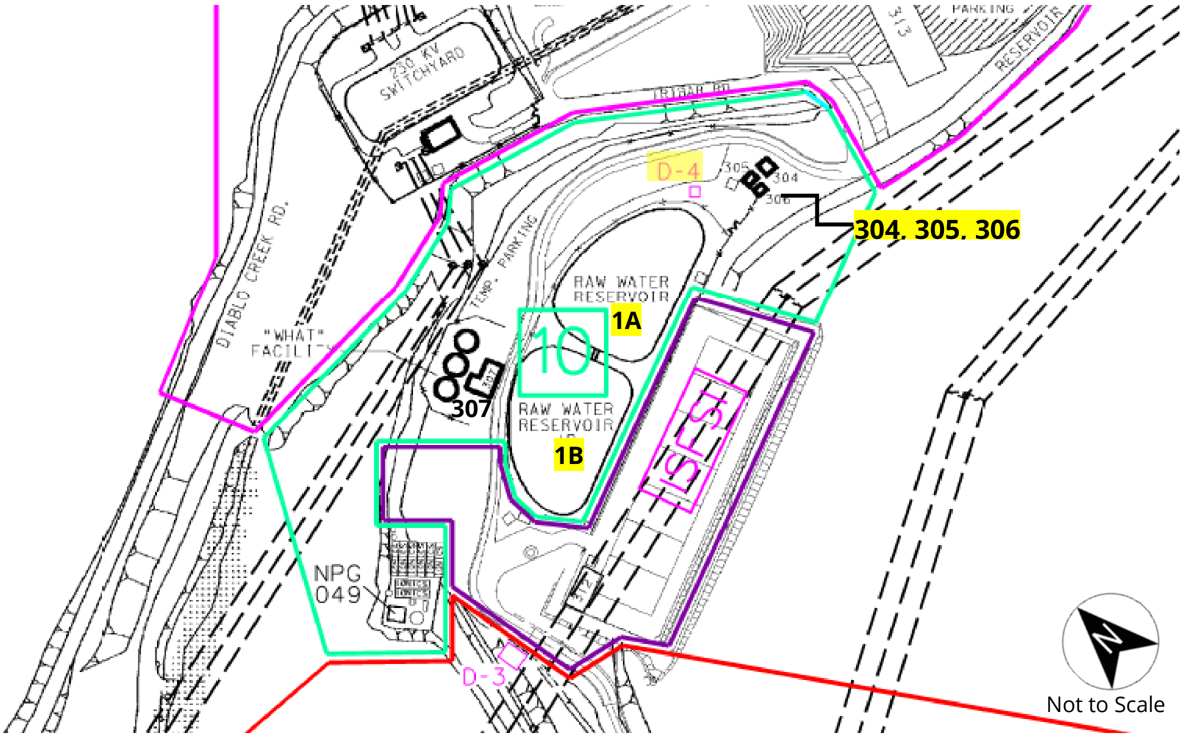


Not to Scale

Zone 9			
Building #	**Building Name**	**Year Built**	**DPR 523A Form**
D-3	Site Overlook Facility	1989	No

ZONE 10

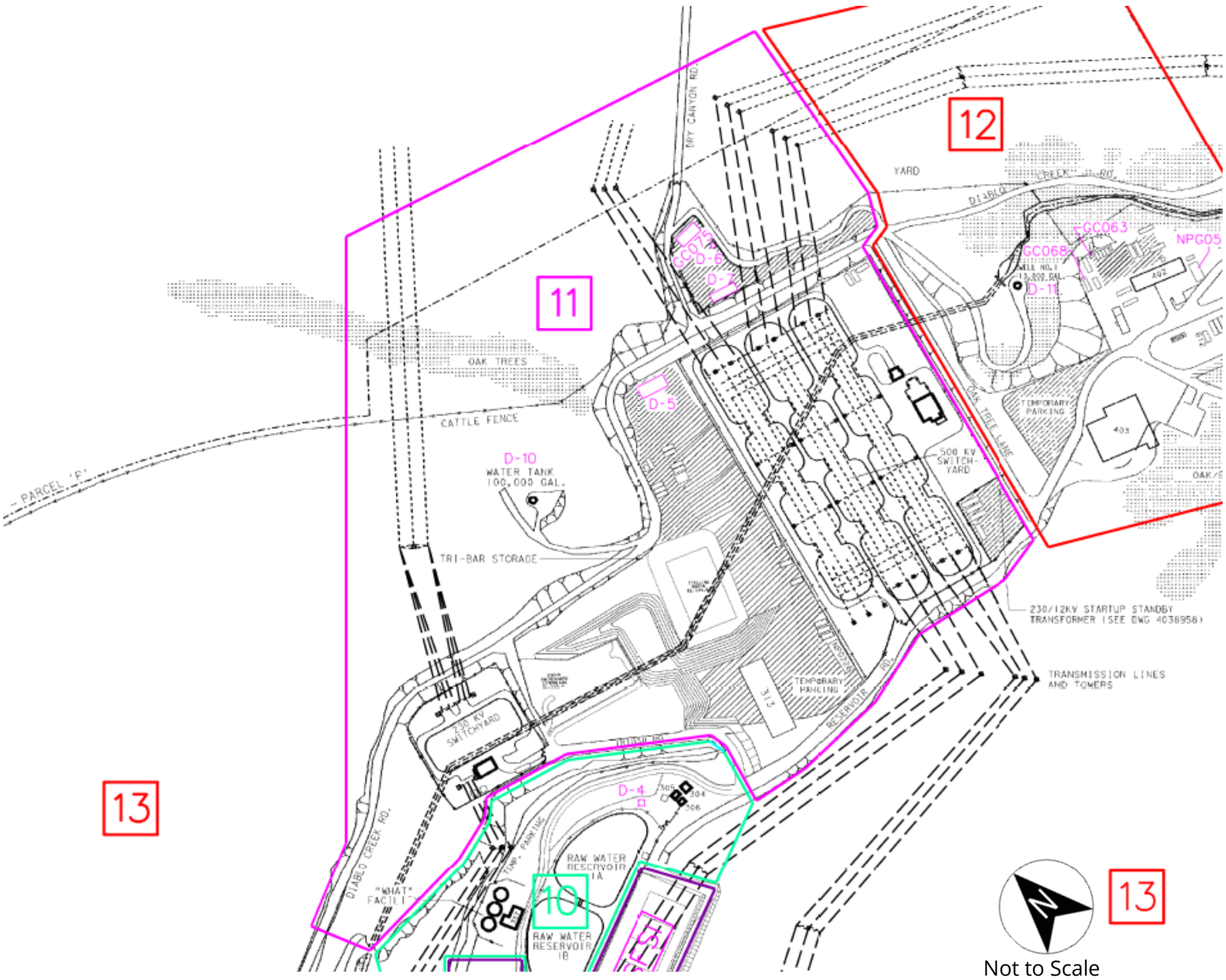
Zone 10 is located along Reservoir Road on the large, elevated terrace overlooking the power block in Zone 1. The zone contains two raw water reservoir ponds and several other water treatment structures and facilities.



Zone 10			
Building #	**Building Name**	**Year Built**	**DPR 523A Form**
1A	Raw Water Reservoir Pond - East	1972	Yes
1B	Raw Water Reservoir Pond - West	1972	Yes
304	Chlorination and Domestic Water	1985	Yes
305	Clarifier & Make-up Pre-Treatment Building	1985	Yes
306	Chemical Storage	1985	Yes
307	Wastewater Holding and Treatment Equipment Enclosure (WHAT)	1986	No
D-4	Long Term Cooling Water Pump Storage	1979	Yes
NPG049	Make-up Water Office	Not dated	No

ZONE 11

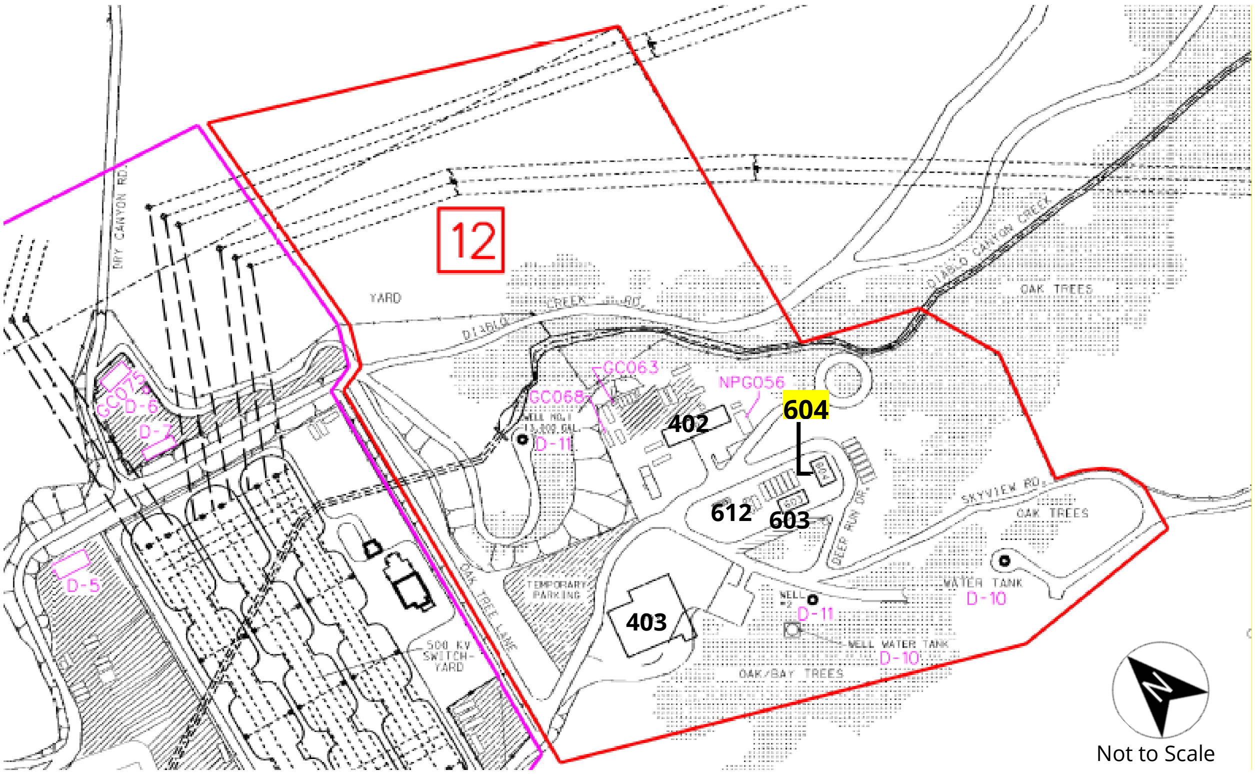
Zone is situated on the northwest side of Reservoir Road at the upper terrace and contains the electrical switchyards that provide power to the plant from the electrical grid and also transmit the power generated by the plant back into the grid.



Zone 11			
Building #	**Building Name**	**Year Built**	**DPR 523A Form**
313	Secondary FLEX Equipment Storage Facility	2015	No
D-5	Scaffold Storage Yard	Not dated	No
D-6	B-Gate Office	Not dated	No
D-7	B-Gate Shade Structure	Not dated	No
GC075	Intake Crew Storage - B-Gate	Not dated	No
NPG226	ISFSI office Trailer	Not dated	No

ZONE 12

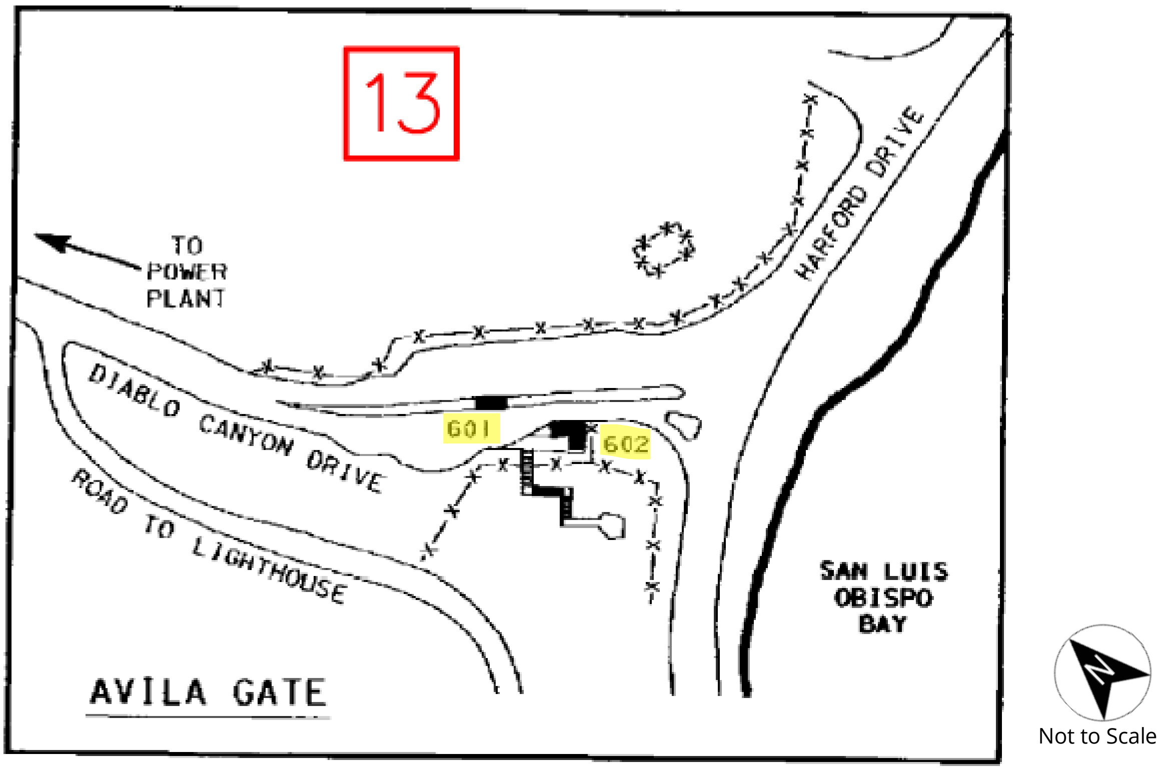
Zone 12 is at the far north end of the main plant site at the termination of Reservoir Road at the upper terrace. It contains several modular buildings and other small buildings and structures that are used for storage and plant maintenance, as well as remnants of the worker camp that was located in the area during the plant's original construction. A large new concrete building used to store the original, radioactive steam generators and reactor equipment from the containment units (since replaced) is located on the south side of Reservoir Road.



Zone 12			
Building #	**Building Name**	**Year Built**	**DPR 523A Form**
402	Vehicle Maintenance Shop	1986	No
403	Old Steam Generator Storage Facility (OSGSF)	2007	No
603	Document Storage Facility	1990	No
604	Warehouse Storage	1985	Yes
612	Toilet Trailer	Not dated	No
GC063	LB Break Room	Not dated	No
GC068	LB Break Room	Not dated	No
NPG056	Vehicle Maintenance Office	Not dated	No
NPG091	Fleet Services Break Trailer	Not dated	No

ZONE 13

Zone 13 comprises all of the areas outside of the plant's core area, including the entry structures at the plant's main entrance (Ávila Gate) and the access road (Diablo Canyon Road) that leads to the power plant site.



Zone 13			
Building #	**Building Name**	**Year Built**	**DPR 523A Form**
601	Avila Gate Guard House	1970	Yes
602	Avila Gate Storage Building	1970	Yes
D-9	Underground Septic Tanks and Pump Stations	Not dated	No
D-10	Above ground Water Tanks	Not dated	No
D-11	Water Wells	Not dated	No
D-15	Security Structures - BBRE's and Crash Gates, VIS, VBS, etc.	Not dated	No
D-17	Circulating Water Tunnels, Units 1 & 2	Not dated	No

4. HISTORIC CONTEXT

San Luis Obispo County

PRE-CONTACT AND NATIVE PEOPLES

Prior to Father Junipero Serra founding Mission San Luis Obispo in 1772, the San Luis Obispo region was inhabited by the Chumash Indians. Archeological evidence indicates that the Chumash and their ancestors thrived along the California Coast for more than eleven thousand years. Chumash coastal life was highly connected to both marine and terrestrial habitats where the natural diversity and productivity of the land allowed for complex sociopolitical and technological culture. The Chumash suffered unprecedented changes to their lifestyle when Europeans began settling Alta California through the Mission system in 1769.[8] Through disease, depletion of Chumash land caused by Spanish cattle grazing, and colonial degradation, the Chumash people died by the thousands. Survivors often converted to Catholicism and worked at the mission and in the surrounding lands.

SPANISH AND MEXICAN PERIOD

Spanish explorers arrived in Mexico in the sixteenth century. In order to establish control over this new territory, they began using a system of missions and presidios to settle New Spain (present-day Mexico and Baja California). In 1768, King Carlos III decided to expand the mission program into Alta California (present-day California). Father Junipero Serra, a Catholic Priest, was sent to Alta California to build missions between 1769 and 1823. He began building missions in San Diego, working his way up the coast.[9] In 1772, he founded Mission San Luis Obispo de Tolosa in San Luis Obispo. Twenty-one Missions were ultimately established along California's coast.[10]

After Mexico achieved independence from Spain in 1822, Alta California became part of the Mexican Republic. The Mexican government began issuing land grants and created a system of large agricultural estates or ranchos. In 1834, Mexican authorities instated laws asserting governmental authority over mission lands. Through secularization, the Mexican government took land from the missions and began redistributing it through private land grants.[11]

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[8] Deanna Dartt-Newton and Jon M Erlandson, "Little Choice for the Chumash: Colonialism, Cattle, and Coercion in the Mission Period California," *American Indian Quarterly* 30 (2006): 416.
[9] "Spanish Viceroyalty [AD 1542/ 1769-1821]," Digital Commons, California State University Monterey Bay, accessed February 25, 2022, https://digitalcommons.csumb.edu/hornbeck_span/.
[10] "The California Missions Trail," California State Parks, accessed February 25, 2022, https://www.parks.ca.gov/?page_id=22722.
[11] Louise Pubols, *A Companion to Los Angeles*, ed. William Deverell and Greg Hise (Los Angeles: Blackwell Publishing Ltd, 2010), 20.

During the Mexican period, approximately thirty ranchos existed within San Luis Obispo County. Rancho San Miguelito encompassed the present site of the Diablo Canyon Power Plant and was granted to Miguel Ávila in 1842.[12]

GOLD RUSH AND EARLY AMERICAN SETTLEMENT

The discovery of gold in the foothills of the Sierra Nevada in 1848 brought miners and entrepreneurs to California from all over the world. This mass migration created demand for goods and services, especially cattle, thus boosting economic development for California ranchos. In 1848, the United States and Mexico signed the Treaty of Hidalgo, ending the Mexican American War. The treaty transferred Mexican land rights in Texas, California, and New Mexico to the United States. This change in nationality caused property rights problems for Mexican land grant holders in California, as the United States did not necessarily recognize agreements made between rancheros and the Mexican government.[13] In 1850, California became a state, and San Luis Obispo County was created as one of the state's original 27 counties. In 1851, Congress created the U.S. Land Commission to review the land ownership of all the 813 Mexican land grant recipients. As part of this process, much of the lands owned by Mission San Luis Obispo were divided into ranchos and redistributed to private owners. The City of San Luis Obispo, also serving as the county seat, was created from former mission land that was platted out into a town grid in 1874.[14]

The economy of San Luis Obispo County in the late nineteenth century centered around ranching, farming, and vineyards, much of which took place on the ranchos. Wheat and barley were the most important agricultural crops in the region, while wool, flour, and dairy products were also important income producers. From 1862 to 1864, a severe drought struck San Luis Obispo County. As a result, many of the area's cattle ranches were sold, and the local agricultural industry began to shift toward dairy farming.[15]

Until the late nineteenth century, San Luis Obispo County remained relatively isolated due to surrounding mountains that limited transportation to horseback, stagecoach and wagon. Wharves constructed in San Luis Bay at Avila Beach in the 1850s and 1860s enabled goods to be transported via steamship. Further transportation improvements in the late 19th century led to increased development. In 1873, businessman John Harford established the San Luis Obispo Railroad

[12] Historic Resources Group, "City of San Luis Obispo Citywide Historic Context Statement," 2013, 32.
[13] Tensions between the US Government and rancho owners brewed even before 1848. The renowned John C. Fremont clashed with several Arroyo Grande area ranchers during his 1846 march through California. In 1846, Freemont demanded hospitality from John. M Price of Pismo Rancho after surrounding the Price Adobe with his battalion. Fremont also tried to arrest several of the Chumash Indians that worked for Price. Madge Ditmas, *According to Madge* (Arroyo Grande: South County Historical Society, 1983), 67.
[14] Historic Resources Group, "City of San Luis Obispo Citywide Historic Context Statement," 35-36.
[15] Historic Resources Group, "City of San Luis Obispo Citywide Historic Context Statement," 37, 60.

Company and built a new wharf, Point Harford, at Point San Luis that was connected by a horse-drawn, narrow gauge railroad to San Luis Obispo Creek. The railroad allowed the region's farmers to more easily ship their goods from the port.[16] By 1876, passenger and freight service was also offered by the Pacific Coast Steamship Company, which operated at approximately 20 California ports.[17]

The expansion of rail service from northern and southern California through San Luis Obispo County enabled further growth. The Pacific Coast Railway was completed from Los Olivos in Santa Barbara County to San Luis Obispo in 1881. This was followed by the completion of the Southern Pacific Railway between San Francisco and Santa Margarita in San Luis Obispo County, just north of the City of San Luis Obispo, in 1886.[18] The coming of the railroads spurred a period of speculative development in the late 1880s and attracted workers from diverse background – including Japanese, Italian, and Swiss men and women – to the area.[19] With the arrival of the railroads, San Luis Obispo County and its principal towns and villages (San Luis Obispo, San Simeon, Cambria, Cayucos, Morro, Arroyo Grande, Los Berros, and Nipomo) were advertised as the perfect landscape for agriculture, minerals, dairy, climate, and health, attracting more residents to the area.[20]

EARLY 20TH CENTURY DEVELOPMENT AND THE GREAT DEPRESSION

Numerous factors influenced the development of San Luis Obispo County in the first half of the 20th century, including the founding of the California Polytechnic School (now California Polytechnic State University, aka Cal Poly San Luis Obispo), arrival of the automobile, introduction of oil drilling, establishment of military camps, and the Great Depression. The California Polytechnic School opened in 1903 as a school for agricultural and vocational training. Located at the northern outskirts of the City of San Luis Obispo, the school became an important driver in the city's growth as its population swelled with students, particularly following World War I.[21]

The primacy of the railroads began to wane in the early 20th century as the popularity of the automobile increased. In 1915, the Pacific Coast Highway (State Route 1), the first state highway in California, was completed through San Luis Obispo County, bringing automobile tourism to the region. Intended as a convenient stopover between Los Angeles and San Francisco, the first motel in California, the Milestone Mo-tel was completed along the route of the highway at the northern outskirts of San Luis Obispo in 1925.[22]

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[16] Historic Resources Group, "City of San Luis Obispo Citywide Historic Context Statement," 63-64
[17] Page & Turnbull, "Historic Context Statement and Survey Report, City of Arroyo Grande, California," 2013, 30.
[18] Historic Resources Group, "City of San Luis Obispo Citywide Historic Context Statement," 64-65.
[19] Historic Resources Group, "City of San Luis Obispo Citywide Historic Context Statement," 63-66.
[20] Page & Turnbull, "Historic Context Statement, City of Arroyo Grande," 30-31
[21] Historic Resources Group, "City of San Luis Obispo Citywide Historic Context Statement," 74-75.
[22] Historic Resources Group, "City of San Luis Obispo Citywide Historic Context Statement," 76-77.

Much of the county's economy continued to revolve around ranching and agriculture. Primary agricultural crops during this period included flower seeds, winter peas, bush beans, pole beans, and celery. Many of these crops were grown by Japanese farmers, who established enclaves throughout the county. In spite of discrimination against them, by the 1930s, Japanese farmers had established themselves as a vital part of the county's agricultural industry.[23]

Oil drilling also became an important part of the economy of San Luis Obispo County during this period. Oil was transported from local oil wells, many of which were located to the south of the City of San Luis Obispo, to Port San Luis in San Luis Bay near Avila Beach. Port San Luis subsequently developed into the largest oil shipping port in the world and employed hundreds of workers from the surrounding area.[24]

The establishment of Camp San Luis Obispo also helped diversity the region's economy. The camp, founded in 1927 on the 2,000-acre Jack Ranch along State Route 1, was the first formal training camp for the California National Guard. The camp was renamed Camp Merriam in 1932. Many of the soldiers who trained at the camp settled in the area after they had completed their military service.

Thanks to its agricultural and economic diversity, San Luis Obispo County was spared from the worst effects of the Great Depression in the 1930s. Nevertheless, residential and commercial development was limited during this period. New Deal programs such as the Public Works Administration and Works Progress Administration funneled money to the construction of a new County courthouse, as well as local flood control and highway improvement projects, including the completion of State Route 1 between Morro Bay and Carmel.[25]

The completion of more reliable highways and roads not only improved transportation for commuters and tourists but also benefited the local agricultural industry. Refrigerated trucks increasingly replaced railcars as the primary means of transporting fresh produce to markets, enhancing the vitality of the local produce industry and contributing to the decline of the railroads. Reflecting the increasing shift toward automobile transportation, the Pacific Coast Railway closed in 1936.[26]

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[23] Historic Resources Group, "City of San Luis Obispo Citywide Historic Context Statement," 92, 96; Page & Turnbull, "Historic Context Statement, City of Arroyo Grande," 48.
[24] Historic Resources Group, "City of San Luis Obispo Citywide Historic Context Statement," 92-93.
[25] Historic Resources Group, "City of San Luis Obispo Citywide Historic Context Statement," 98.
[26] Page & Turnbull, "Historic Context Statement, City of Arroyo Grande," 30.

WORLD WAR II AND MID-20TH CENTURY GROWTH

The entry of the United States into World War II brought San Luis Obispo County out of the Great Depression and boosted the region's economy. In the immediate lead up to the war, Camp Merriam was renamed back to Camp San Luis Obispo, and a county regional airport opened in 1939. Both were utilized by the federal government as part of the war effort. Camp San Luis Obispo was rapidly expanded to serve as the training base for multiple combat divisions deployed to Europe and the Pacific regions. At its peak during the war, Camp San Luis Obispo housed approximately 20,000 soldiers. A second base, the Baywood Park Training Camp, was established roughly 13 miles northwest of San Luis Obispo.[27] Additional military facilities developed during the war included a rest camp for ill and wounded soldiers between Grover Beach and Pismo Beach.[28] Employment opportunities at these military facilities attracted many former agricultural workers from the San Joaquin Valley and other farming areas to San Luis Obispo County.[29]

The war, however, had a devastating impact on the county's Japanese American community. With the signing of Executive Order 9066 in 1942, Japanese Americans living across the West Coast, including those living in San Luis Obispo County, were relocated into internment camps. While some Japanese American families and individuals returned to their properties after the war, many did not.[30]

After the war, the population of San Luis Obispo County expanded at a rapid pace, as returning veterans, many of whom had been stationed at one of the county's military bases decided to permanently settle in the area. Educational opportunities at Cal Poly San Luis Obispo also attracted veterans and their families to the area and contributed to the county's growth during the postwar period. As in many cities and counties across California, the postwar population boom resulted in a housing shortage. To meet the demand for new housing, large areas of farmland outside of existing cities and towns were developed into sprawling new subdivisions full of tract housing.[31]

Camp San Luis Obispo was returned to State control after the war in 1946, but was reactivated as a Signal Corps training center during the Korean War in the 1950s. In 1965, the camp was again returned to the California National Guard and subsequently developed into an academic complex for the California Military Academy. A portion of the camp was later deeded to San Luis Obispo County in 1972 as part of President Richard Nixon's "Legacy of Parks" program and developed into El

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[27] Historic Resources Group, "City of San Luis Obispo Citywide Historic Context Statement," 100-101.
[28] Page & Turnbull, "Historic Context Statement, City of Arroyo Grande," 57.
[29] Historic Resources Group, "City of San Luis Obispo Citywide Historic Context Statement," 101.
[30] Page & Turnbull, "Historic Context Statement, City of Arroyo Grande," 58.
[31] Page & Turnbull, "Historic Context Statement, City of Arroyo Grande," 66.

Chorro Regional Park.[32] An additional recreation area for the south portion of the county was created in 1968 with the completion of the Lopez Dam and Recreation Project. In order to create a new water reservoir for the residents of the Arroyo Grande Valley, a portion of the Arroyo Grande Creek to the northwest of Arroyo Grande was dammed. The reservoir, known as Lake Lopez, was also developed to include a public outdoor recreation area.[33]

An increasing reliance on the automobile and the completion of major new highways and roadways also impacted the county's development in the mid-20th century. In 1958, U.S. Route 101 was completed along the California coast. The highway became one of the state's main north-south thoroughfares, linking cities and towns down the entire length of the state. The completion of U.S. Route 101 boosted San Luis Obispo County's status as a popular tourist destination, thanks to its convenient location roughly halfway between Los Angeles and San Francisco. Motels and hotels sprang up along the highway in the 1950s and 1960s to cater to motor tourists. The most prominent of these was the Madonna Inn, which was built in 1961, roughly one-half mile outside downtown San Luis Obispo.[34] The construction of new commercial developments followed a similar trend. Across the county, new shopping centers, restaurants, and auto-oriented businesses were completed along the routes of highways and major new thoroughfares constructed in the new subdivisions at the outskirts of traditional urban centers.[35]

[32] Historic Resources Group, "City of San Luis Obispo Citywide Historic Context Statement," 115.
[33] Page & Turnbull, "Historic Context Statement, City of Arroyo Grande," 67.
[34] Historic Resources Group, "City of San Luis Obispo Citywide Historic Context Statement," 125.
[35] Page & Turnbull, "Historic Context Statement, City of Arroyo Grande," 61.

Nuclear Energy and Commercial Nuclear Power in the U.S.

The discovery of radioactive matter by pioneers like Henri Becquerel and Marie Curie in the late 19th century spurred the study of the nucleus of atoms and the start of nuclear science. In 1934, Italian physicist Enrico Fermi observed that firing neutrons at an atom could split it into two smaller, lighter atoms of a different element. German scientists Otto Hahn and Fritz Strassman, in cooperation with Austrian physicist Lise Meitner, confirmed this process, known as nuclear fission, in 1938. Hahn, Strassman, and Meitner discovered that splitting an atom produced large amounts of energy in the form of heat. This discovery led to discussions about the possibility and potential of using nuclear fission to create self-sustaining chain reactions as a perpetual source of energy.[36]

Shortly thereafter, a group of scientists at the University of Chicago, led by Fermi, began developing the world's first nuclear reactor. Known as the Chicago Pile-1 (CP-1), the reactor was constructed on a squash court beneath the university's athletic stadium. It consisted of uranium, an element that fissions easily, placed in a cube-like lattice of graphite and rods of cadmium that could be added or withdrawn from within the reactor to control the speed of the chain reaction. The first successful self-sustaining nuclear reaction took place at Chicago Pile-1 in December 1942, announcing the start of the Atomic Age.[37]

Much of this early nuclear research took place during and in the build up to World War II. As a result, nuclear research projects, such as the Manhattan Project in New Mexico, initially focused on developing weapons of war.[38] The use of atomic bombs on Hiroshima and Nagasaki, Japan at the end of World War II revealed both the catastrophic horrors and tantalizing potential of nuclear energy. Debates about whether nuclear materials should remain in military or civilian hands ensued. Peace initially prevailed and, in 1946, Congress passed the Atomic Energy Act, which formed the United States Atomic Energy Commission (AEC) to facilitate the transition of government research to the public sector and to "control the peacetime development of atomic science and technology."[39]

In the late 1940s and 1950s, the AEC directed part of its efforts to developing nuclear energy to produce electricity for commercial use. The Experimental Breeder Reactor I, developed by the AEC at the National Reactor Testing Station in Idaho, became the first reactor to generate electricity from nuclear energy when it began operation in December 1951. A second early experimental reactor was completed at the Oak Ridge National Laboratory in Tennessee in the early 1950s.

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[36] U.S. Department of Energy Office of Nuclear Energy, Science, and Technology, *The History of Nuclear Energy* (Washington, DC: U.S. Department of Energy), ii-5.
[37] U.S. Department of Energy Office of Nuclear Energy, Science, and Technology, *The History of Nuclear Energy*, 7-8.
[38] U.S. Department of Energy Office of Nuclear Energy, Science, and Technology, *The History of Nuclear Energy*, ii-8.
[39] Alice Buck, *The Atomic Energy Commission*, (Washington, DC: U.S. Department of Energy, July 1983) 1.

Until this point, nuclear research and development had been conducted exclusively and under strict secrecy by the U.S. federal government. The shift to private nuclear development began in 1953 with President Dwight D. Eisenhower's "Atoms for Peace" speech, during which he announced his desire that nuclear power should be turned toward the benefit of mankind, rather than toward its destruction. Eisenhower's proposal was formalized with the passage of an updated Atomic Energy Act in 1954. The law allowed for nuclear reactors to be privately owned and operated for the first time. The same year, the AEC announced a Five-Year Plan to test the design of different types of nuclear reactors by producing five experimental reactors within five years. The AEC subsequently began providing nuclear fuel and research to private industries, typically utilities consortiums, to help them develop reactors capable of producing commercial levels of electricity. One of these experimental reactors under the Five-Year Plan, a pressurized water reactor at Shippingport, Pennsylvania, became the first privately owned nuclear reactor to produce electricity for commercial use when it began operation in 1957.

In 1955, the AEC announced the Power Demonstration Reactor Program in order to encourage private companies to develop nuclear power plants, using nuclear fuel leased from the federal government. As a result of the Five-Year Plan and the demonstration program, by the end of 1957, seven experimental reactors were in operation in the United States, with several others under development. These early experimental reactors were spread out across all regions of the United States. Two of these early reactors were located in California at the Santa Susana Sodium Reactor Experiment in Ventura County and Vallecitos Nuclear Power Plant near Pleasanton, California.[40]

In spite of these early advancements, private development of nuclear power plants initially remained limited due to the high start-up cost and unproven nature of early reactors. Those that were commissioned by private companies during the 1950s and early 1960s were completed with the help of lucrative government subsidies and exemptions from antitrust review. By the mid-1960s, however, large private utilities companies with the resources to overcome the initial high capital costs began to see the economic viability of nuclear power plants as a way of scaling up their operations to meet increasing energy demands.[41]

Additional legislation in the mid-1960s cleared the way for the establishment of a fully fledged private nuclear power industry. In 1964, President Lydon B. Johnson signed the Private Ownership of Special Nuclear Materials Act, allowing private companies to own nuclear materials, such as

[40] Buck, *The Atomic Energy Commission*, 6-7.
[41] Thomas Raymond Wellock, *Critical Mass: Opposition to Nuclear Power in California, 1958-1978* (Madison, WI: University of Wisconsin Press, 1998), 29.

enriched uranium fuel, for the first time. The following year, most of the AEC's literature on reactor technology was declassified and made available to the public.[42]

PEAK AND DECLINE OF COMMERCIAL NUCLEAR POWER PLANTS

The construction of privately owned commercial nuclear power plants grew in the 1960s with the first round of orders for commercial nuclear reactors. A second, larger wave followed in the early 1970s.[43] However, the construction of nuclear power plants in the United States began to decline around 1972, and orders for new nuclear plants virtually stopped by 1978. While 231 new nuclear power plants were ordered through 1974, only 15 were ordered the following year, and none were ordered after 1978.[44]

Many different factors led to the decline of the U.S. nuclear power industry. Following the initial period of optimism and excitement surrounding nuclear power in the 1950s and 1960s, public and media scrutiny over the environmental impact and safety of nuclear power plants increased in the 1970s and 1980s. Concerns about radioactive fallout and, particularly in California, the safety of nuclear plants in case of an earthquake, increasingly called into question their construction and helped turn public sentiment against nuclear power. These concerns led to progressively stricter policies aimed at regulating the design, construction, siting, licensing process, and operation of new nuclear power plants.[45] Reflecting the desire for greater regulation, in 1974 President Gerald Ford signed the Energy Reorganization Act, which split the responsibilities of the Atomic Energy Commission into two new agencies: the Energy Research and Development Administration (later the Department of Energy) and the Nuclear Regulatory Commission (NRC).[46] The NRC took over the licensing and regulatory powers of the AEC.

This environment of increased public scrutiny and regulation was accompanied by an energy crisis in the 1970s. In 1973, the Organization of Petroleum Exporting Countries (OPEC) halted the export of crude oil to the United States and its allies in response to the United States giving military support to Israel during the Yom Kippur War. The embargo provoked a worldwide energy crisis and economic recession. In the United States, the price of oil quadrupled and the economy contracted, sending millions of Americans into unemployment. The 1970s recession and energy crisis forced Americans and elected officials to shift their focus toward energy conservation and renewable energy sources,

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[42] Buck, *The Atomic Energy Commission*, 11.
[43] Marco Giugni, *Social Protest and Policy Change: Ecology, Antinuclear, and Peace Movements in Comparative Perspective* (Lanham, MD: Rowman & Littlefield Publishers, Inc., 2004), 83.
[44] Giugni, *Social Protest and Policy Change,* 85.
[45] Giugni, *Social Protest and Policy Change,* 86.
[46] Buck, *The Atomic Energy Commission*, 17.

such as wind and solar power.[47] The effects of the economic recession and conservation efforts led to a decline in electricity demands by the 1980s, lessening the need to construct new power plants. In addition, inflation caused by the recession made large-scale construction projects, such as power plants, economically infeasible. Nuclear power plants were hit the hardest of all, as increased regulatory costs and construction delays made them much more expensive to build than any other kind of power plant.[48]

In spite of increasing efforts to increase the safety of nuclear power plants, a series of highly publicized nuclear accidents in the 1970s and 1980s continued to raise public concerns against the use of nuclear power. On March 28, 1979, the nuclear power industry was dealt another blow when a partial meltdown occurred at one of the reactors at the Three Mile Island Nuclear Generating Station in Pennsylvania. The event was considered the worst nuclear accident in the history of the United States and instigated numerous additional policy changes and regulations to prevent a similar accident from occurring again. Investigations into the cause of the incident led to the creation of the Institute of Nuclear Power Operations (INPO), which established standards of performance against which nuclear plants were regularly measured.[49] This was followed by the Chernobyl accident in Ukraine in 1986. The event had a modest impact on public sentiment toward nuclear power in the U.S., compared to Three Mile Island, but nevertheless contributed to a general unease surrounding the use of nuclear power in the 1980s.[50]

The combination of decreased electricity demand, growing public anti-nuclear sentiment, increased reliance on natural gas, and high costs associated with nuclear power plants as a result of increased regulation led to a virtual halt in proposals for new nuclear power plants for a roughly thirty-year period, starting around 1978. Although essentially no new nuclear power plants were constructed between the late 1970s and early 2000s, the country's reliance on nuclear energy increased, as reactors approved before the late 1970s came online over the following decades. In 1980, American nuclear power plants produced approximately 11% of the country's electricity; by 2019, this had increased to nearly 20% of the country's electricity, roughly on par with coal. [51] However, older nuclear power plants were also being decommissioned after the late 1970s, as they were unable to meet increased regulations or their serviceable life came to an end.

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[47] Roger Eardley-Pryor, "Charles H. Warren and California Energy in the 'Era of Limits,'" Oral History Center, University of California Berkeley Library, January 30, 2019; accessed October 13, 2021, https://update.lib.berkeley.edu/2019/01/30/oral-history-center-from-the-archives-charles-h-warren/.
[48]Stephanie Dalquist, "Timeline: A Chronology of Public Opinion on Nuclear Power in the United States and United Kingdom," April 29, 2004, 7-12.
[49] "Nuclear Power in the USA," World Nuclear Association, accessed October 11, 2021, https://www.world-nuclear.org/information-library/country-profiles/countries-t-z/usa-nuclear-power.aspx.
[50] Dalquist, "Timeline," 11-12.
[51] "Nuclear Power in the USA."

In 2005, the Energy Policy Act offered several incentives aimed at stimulating the domestic nuclear power industry. This was followed by the announcement of plans to build new nuclear power plants. In 2013, construction began on Units 3 and 4 at the Vogtle Electrical Generating Plant in Georgia, the first construction of new nuclear power reactors since the 1970s **(Figure 4)**.[52]

Regulations surrounding the nuclear power industry continue to evolve. In March 2011, an accident at Japan's Fukushima nuclear plant showed the need for greater, more rapid outside assistance in case of a nuclear event. In response, the U.S. nuclear industry established the FLEX accident response strategy. The program resulted in the creation of 61 centers across the country with the capacity to respond to nuclear accidents anywhere within the country within 24 hours.[53]

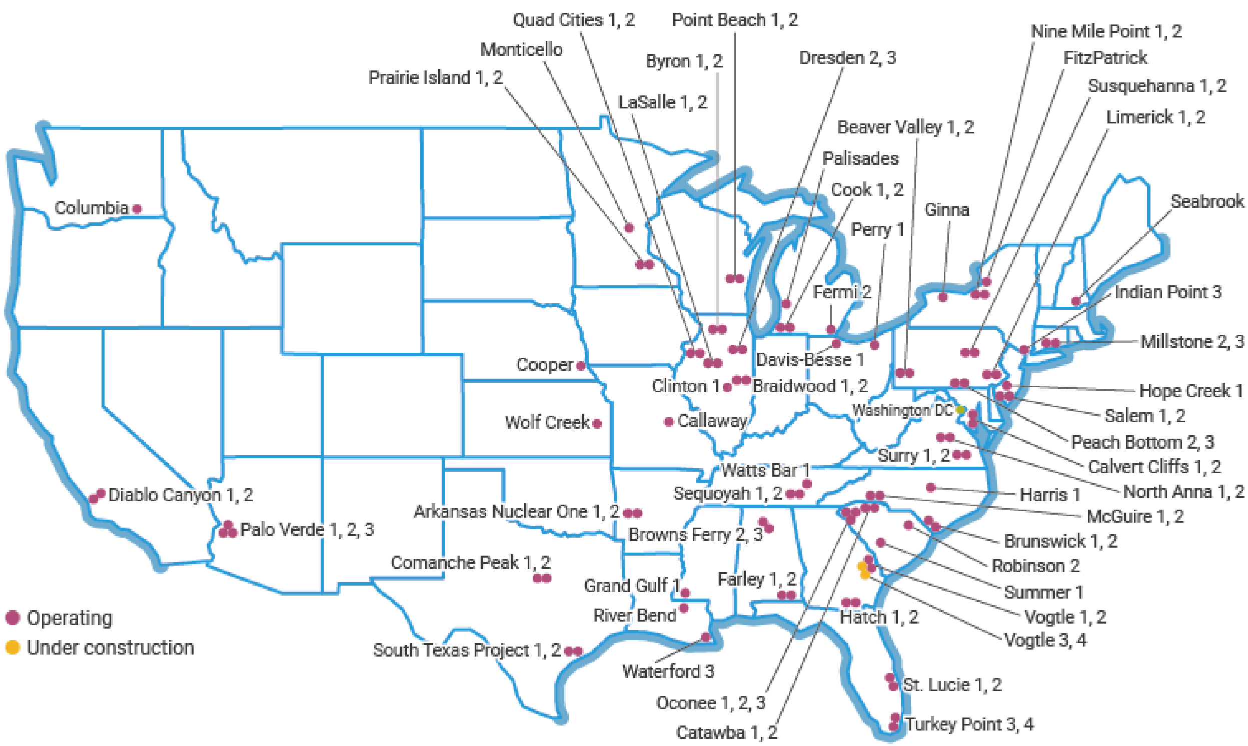

Figure 4. Map showing nuclear reactors in operation and under construction in the United States in 2020. Source: World Nuclear Association.

Nuclear Power in California

While few commercial nuclear power plants were constructed in California, the state has had an outsized role in the development and evolution of nuclear power in the United States. The state's

[52] "Nuclear Power in the USA."
[53] "Nuclear Power in the USA."

first two nuclear power plants went into operation in 1957. The Santa Susana Sodium Reactor Experiment (SRE), in Ventura County in Southern California, was one of the five prototype reactors authorized as part of the Atomic Energy Commission's Five-Year Plan to test the design of different types of nuclear reactors.[54] Built at the Santa Susana Field Laboratory, the experimental reactor used sodium as a coolant. The plant provided power to the City of Moorpark, becoming the first commercial nuclear power plant in the United States to provide electricity to the public. The SRE was closed in 1964, following a partial meltdown of the reactor core. Also in 1957, the Vallecitos Nuclear Power Plant went online to the east of San Francisco near Pleasanton (**Figure 5**). Built jointly by Pacific Gas & Electric (PG&E) and General Electric Company, it was the first privately funded nuclear power plant to supply commercial power at the scale of megawatts to the electrical grid.[55] After completing its planned series of experiments, the plant was shut down in 1967.[56] It remains a nuclear research facility.[57]

Figure 5. The Vallecitos Nuclear Power Plant (undated). Source: Pacific Gas and Electric Company.

Construction began on three additional nuclear power plants in California during the 1960s following this initial experimental phase of research and development, while planning for several

[54] Buck, *The Atomic Energy Commission*, 7,
[55] State of California Energy Commission, "Nuclear Power Reactors in California," March 2020, 7.
[56] John Miller, "Reactor Plant Still Aids Mankind," *Oakland Tribune*, 30 April 1967: 20.
[57] State of California Energy Commission, "Nuclear Power Reactors in California," 7.

others progressed. In 1963, PG&E opened the Humboldt Bay Nuclear Power Plant along the Northern California coast **(Figure 6)**. At the time, it was the seventh licensed nuclear power plant in the United States. One year after Humboldt Bay's reactor went online, construction began on Unit 1 of the San Onofre Nuclear Generating Station (SONGS). Located roughly halfway between Los Angeles and San Diego near San Clemente, SONGS was jointly owned by Southern California Edison, San Diego Gas & Electric, and the City of Riverside Utilities Department. The Unit 1 reactor at SONGS began operation in 1968. This was followed by the start of construction on Units 1 and 2 of PG&E's Diablo Canyon Power Plant near San Luis Obispo in 1969.[58]

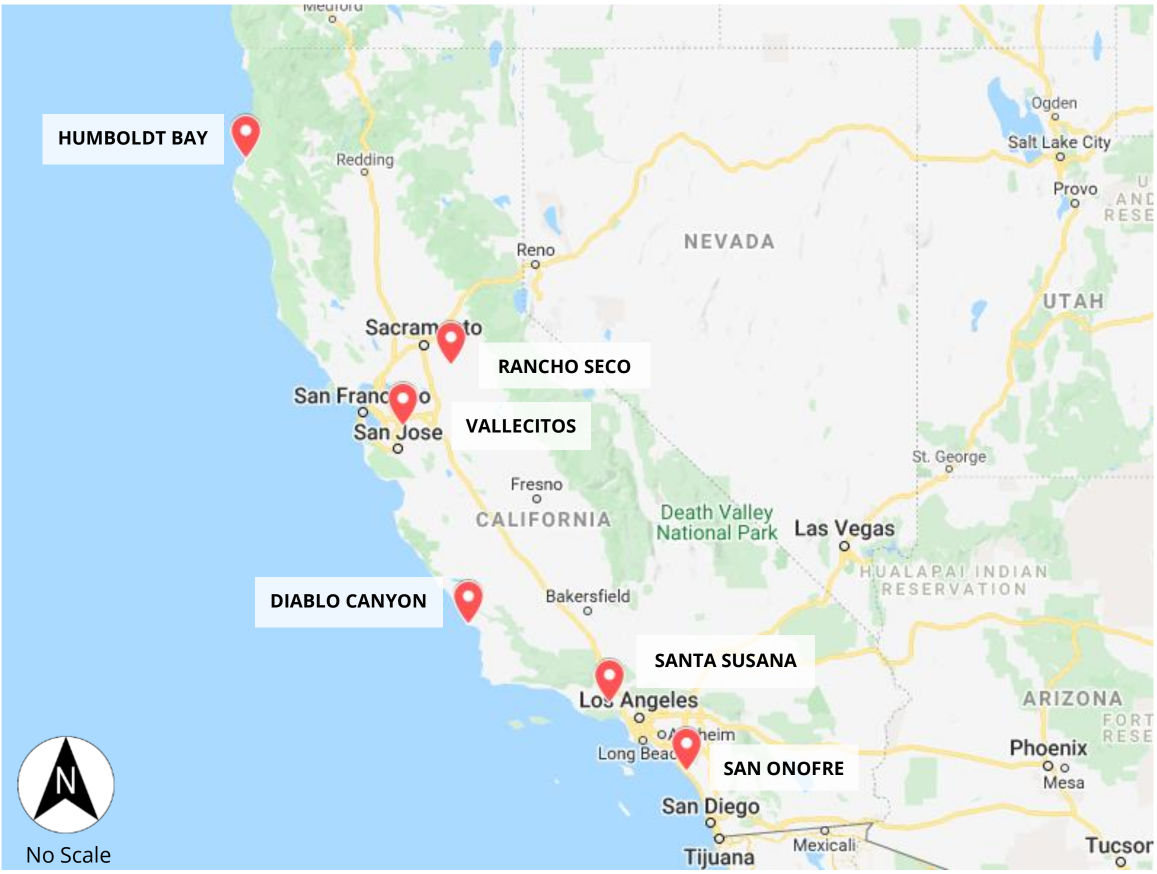

Figure 6. Map of nuclear power plants completed in California. Source: Google Maps, edited by Page & Turnbull.

HALT ON NEW NUCLEAR POWER PLANTS

Orders for commercial nuclear power plants in California peaked in the 1960s. Opposition to nuclear power in California began to grow around this time, largely because of concerns that were relatively unique to the state. The frequency of earthquakes in California called into question the siting and

[58] State of California Energy Commission, "Nuclear Power Reactors in California," 6.

seismic safety of nuclear power plants throughout the state. In 1961, PG&E announced plans to construct a nuclear power plant at Bodega Head near the scenic fishing village of Bodega Bay north of San Francisco. Foreshadowing the later role of the environmental movement in the demise of nuclear power in California, local residents and environmental groups opposed the plant, fearing it would destroy the area's natural beauty. To argue their case, however, opponents successfully used evidence of a seismic fault line running beneath the proposed site of the nuclear power plant to convince the AEC to deny a license for the plant.

As the 1960s came to a close, concerns about seismic safety led to the cancellation of plans to build three other nuclear power plants in California at Corral Canyon near Malibu, Point Arena on the Mendocino coast, and Tulare in San Joaquin Valley. Commercial operation of PG&E's nuclear power plant at Diablo Canyon, which had been substantially completed by the early 1970s, was delayed when a previously unknown fault was discovered near the plant in 1976, forcing PG&E to complete a costly seismic retrofit of the plant.[59] The discovery of active faults near other operating nuclear power plants also led to the permanent shut-down of nuclear reactors at Humboldt Bay in 1976 and Vallecitos in 1977.[60]

These growing safety and environmental concerns were soon accompanied by a national and state-wide energy crisis. In the early 1970s, several reports on California's energy consumption and future energy needs prompted the state legislature to begin reshaping its approach to energy development. In 1971, the state's major electric utilities companies issued a report, stating that California's energy demands due to population growth were increasing so rapidly that brownouts and blackouts of an indefinite duration would soon become inevitable unless immediate action was taken. To meet the demand, the utility companies planned to construct scores of new nuclear power plants across the state. A newly created legislative subcommittee – chaired by the leading Democrat in the State Assembly, Charles H. Warren – was formed to investigate the utility companies' forecast. In 1972, the subcommittee received a report from the Rand Corporation that confirmed the utility companies' warnings. The report indicated that California's electrical production would need to double every 10 years in order to avoid the anticipated blackouts.

Following a series of hearings on the findings of the Rand report in spring 1973, Warren realized that the utility companies' plan to endlessly construct more power plants, powered by dirty or increasingly expensive fuel sources, would be unsustainable and was devoted more toward maximizing profits than toward the best solution for their customers. In response, Warren began

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[59] James C. Williams, *Energy and the Making of Modern California* (Akron, Ohio: The University of Akron Press: 1997), 305-307.
[60] State of California Energy Commission, "Nuclear Power Reactors in California," 2-8; Wallace Turner, "California Nuclear Reactor Closed," *New York Times*, 28 October 1977.

working to shift the state's energy policies toward conservation and the pursuit of alternative, clean energy sources. Warren and his pro-nuclear colleague in the State Senate, Alfred E. Alquist, began to draft legislation, hoping to resolve the conflict between energy production and environmental protection. The resulting Warren-Alquist Act was sent to Governor Ronald Reagan to sign in the fall of 1973. Although the governor vetoed this first iteration of the act, a second iteration, the Warren-Alquist State Energy Resources Conservation and Development Act, passed in 1974, after the 1973 OPEC oil embargo and resulting national energy crisis, laid bare the need to develop new, independent energy sources.[61]

The Warren-Alquist Act of 1974 was the first law to challenge the practices of the state's utility monopolies. The law laid out a new approach in California to energy and the environment, one that was characterized by a focus on energy conservation and diversified energy production that set a precedent for similar laws in other states. To meet these goals, the law established the California Energy Commission (CEC) as the state's primary energy policy and planning agency. [62] The agency was charged with assessing the environmental impact of electrical consumption and proposals, reviewing utility company energy forecasts and plans, approving the siting and certification of new power plants, and conducting research and development into alternative energy sources.[63]

Nuclear power sat at the nexus of the debate surrounding the environment and energy production, as the state government attempted to balance the two competing interests. It was in front of this backdrop of increasing regulation, what Governor Jerry Brown later called the "era of limits," that California's last nuclear power plants were completed.[64] Construction on Units 2 and 3 of the San Onofre Nuclear Generating Station began in 1974. The Rancho Seco Nuclear Plant, owned by the Sacramento Municipal Utilities District (SMUD), began operation in 1975. Unlike most of the other nuclear power plants in California, which had been strategically located with access to the cooling waters of the Pacific Ocean, Rancho Seco was located inland, roughly 25 miles southeast of the city of Sacramento, and featured two massive cooling towers to cool the reactors.[65]

Additional laws passed in 1976 spelled the end of the nuclear power expansion in California. That year, environmentalists placed Proposition 15, known as the Nuclear Power Plants Initiative, on the state ballot. The initiative proposed placing stringent regulations on nuclear power plants to prevent nuclear accidents and require for the safe disposal of radioactive waste. Fearing that the measure would halt all nuclear power development in California, state legislators passed three less draconian

[61] Eardley-Pryor, "Charles H. Warren and California Energy;" Williams, *Energy and the Making of Modern California,* 309-311.
[62] Eardley-Pryor, "Charles H. Warren and California Energy."
[63] Williams, *Energy and the Making of Modern California,* 311.
[64] Eardley-Pryor, "Charles H. Warren and California Energy."
[65] State of California Energy Commission, "Nuclear Power Reactors in California," 6.

amendments to the Warren-Alquist Act just before the election in June 1976. Although Proposition 15 did not pass, the amendments to the Warren-Alquist Act placed a moratorium on the construction and licensing of new nuclear plants in California until the federal government implemented a solution for the disposal of radioactive waste. As a solution has yet to be found, the amendments effectively ended the construction of new nuclear plants in California, as pro-nuclear legislators had feared.[66] Due to the substantial work and funding that had already gone into completing the new reactors at San Onofre and Diablo Canyon, however, these plants were specifically exempted from the moratorium and were allowed to continue construction. They both went into full commercial operation in the early to mid-1980s. [67] Plans for a two-unit Sundesert plant in Riverside County were denied by the CEC in 1978, making San Onofre Units 2 and 3 and the two units at the Diablo Canyon Power Plant the last nuclear reactors to go online in California.[68]

DECOMMISSIONING

Since the moratorium, California's remaining nuclear power plants have been gradually shut down and decommissioned. The plant at Humboldt Bay was shut down in 1976 and placed into inactive safe storage (SAFTOR) status in 1988. Rancho Seco was closed by public referendum in 1989. San Onofre Unit 1 ceased operation in 1992, due to the high costs necessary to seismically retrofit the reactor. San Onofre Units 2 and 3 were closed in 2013 after it was discovered that steam generators that had been replaced a few years prior were showing premature signs of wear. Diablo Canyon Units 1 and 2, the last nuclear reactors in operation in California, are set to be shut down in 2024 and 2025, respectively, as part of a proposal by PG&E to phase out nuclear energy and focus on energy efficiency, renewable energy sources, and energy storage.[69]

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[66] Williams, *Energy and the Making of Modern California,* 303-307.
[67] *Statutes of California, 1975-76 Regular Session*, Chapters 194-196, 374-380.
[68] Williams, *Energy and the Making of Modern California,* 312-314.
[69] State of California Energy Commission, "Nuclear Power Reactors in California," 2-6; PG&E, "Diablo Canyon Power Plant, Bridging to California's Energy Future," accessed October 13, 2021, https://www.pge.com/en_US/safety/how-the-system-works/diablo-canyon-power-plant/energy-bridge/energy-bridge.page.

California Environmentalism Movement

THE CONSERVATION MOVEMENT AND THE SIERRA CLUB

The roots of the environmental movement in California go back to the nineteenth century, with the founding of wilderness conservation organizations and hiking groups, such as the Sierra Club, that were dedicated to preserving and providing public access to areas of pristine natural beauty. Founded in 1892 by Scottish American naturalist John Muir, the Sierra Club's early accomplishments included defeating a proposal to reduce the size of Yosemite National Park and supporting the creation of several additional national parks. In the first decades of the 20th century, the club campaigned against damming the Hetch Hetchy Valley in Yosemite to provide drinking water for the city of San Francisco **(Figure 7)**. Although the campaign was ultimately unsuccessful, it increased the Sierra Club's political clout and brought further public attention to the conservationist cause.[70]

Figure 7. John Muir and a Sierra Club group on a trail to Hetch Hetchy, ca. 1909.
Source: Holt-Atherton Special Collections, University of the Pacific Library.

[70] "Hetch Hetchy." Sierra Club accessed October 25, 2021, https://vault.sierraclub.org/ca/hetchhetchy/history.asp.

Conservation was a mainly patrician endeavor through the mid-twentieth century, led by well-educated, affluent white individuals, usually men, with time and money to devote to recreational activities, such as hiking and conservation campaigns.[71] Conservation supporters typically campaigned for their causes by lobbying or negotiating compromises with local elected officials and business leaders.[72]

In the 1950s, the Sierra Club, which had developed into the largest and most influential conservation organization in the country, began to expand its scope of activities beyond aesthetic preservation. During the period, the club mounted successful campaigns against proposals to dam portions of the Colorado River that flowed through the Grand Canyon and Dinosaur National Monument in Utah.[73] Toward the end of the decade and into the 1960s, the club joined grassroots opposition against PG&E's plans to build a nuclear power plant at Bodega Head near the scenic fishing village of Bodega Bay a few miles north of San Francisco. The Sierra Club's efforts revealed an emerging philosophical rift between old-line members, who preferred the club's traditional strategy of negotiating with corporations and elected officials, and newer, more progressive members who preferred aggressive and direct forms of action, such as protest and civil disobedience, that did not require compromising with their opponent.[74]

These philosophical differences came to a head in the Sierra Club's response to PG&E's plans to build a new nuclear power plant at Diablo Canyon near San Luis Obispo. The organization's response split the organization apart and reflected a general shift away from conservation, as it had been practiced since the nineteenth century, toward what is termed environmentalism. In the aftermath, the Sierra Club fundamentally altered its philosophy from strict wilderness preservation to a broader environmental and anti-nuclear viewpoint that included issues of environmental safety and industrial impacts. Due to the Sierra Club's large membership and reputation as the country's most powerful conservation group, its conversion helped nationalize the ideas of the environmental and anti-nuclear movements while also influencing California energy policy.[75]

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[71] Berkeley Art Center Association, *The Whole World's Watching: Peace and Social Justice Movements of the 1960s & 1970s* (Berkeley: Berkeley Art Center Association, 2001), 127.
[72] Susan R. Schrepfer, "Diablo Canyon and the Transformation of the Sierra Club, 1965-1985, *California History* LXXI, No. 2 (Summer 1992), 222.
[73] Wellock, *Critical Mass,* 25, 41, 70.
[74] Wellock, *Critical Mass,* 31-33.
[75] Wellock, *Critical Mass,* 69-71.

THE TRANSITION FROM CONSERVATION TO ENVIRONMENTALISM

The Sierra Club's conversion also reflected the forces that led to the broad evolution of the conservation movement into the environmental movement that occurred across the country in the 1960s and 1970s, influenced by the growing sense of distrust toward the federal government, large corporate establishments, and the unbridled use of modern technologies in the aftermath of the civil rights movement, Vietnam War and anti-war movement, and the Watergate scandal.[76] Major cultural events, such as the publishing of Rachel Carson's bestselling book, *Silent Spring*, in 1962, which exposed the adverse effects of pesticides, sparked concerns about new issues related to the environment and human health. These movements and events expanded the traditional conservation cause beyond wilderness preservation to embrace a broader and more diverse range of concerns for the natural environment, including the impacts of air and water pollution, pesticides, and nuclear radiation **(Figure 8)**.[77]

Figure 8. A demonstrator at a pollution protest at San Jose State College, 1967.
Source: San Jose State College Library.

[76] John Wills, *Conservation Fallout: Nuclear Protest at Diablo Canyon* (Reno, NV: University of Nevada Press, 2006), 76-77.
[77] Wills, *Conservation Fallout,* 185-186.

This new broad-based form of environmentalism incorporated many of the tactics and approaches of the civil rights and anti-war movements. Both movements introduced a generation of Americans to the power of opposition through direct actions, such as sit-ins and peaceful protests. The tactics of civil disobedience and democratic operation by consensus became key components of the modern environmentalism movement in the 1960s and 1970s. The civil rights and anti-war movements also set a precedent for offering positions of leadership to women, people of color, and non-elites that helped the environmental movement become more diverse and inclusive than its conservationist predecessors.[78] The expansion of issues included under the environmentalism umbrella, populist approach to leadership, and new-found inclusiveness resulted in a decentralized movement comprised of numerous smaller single-issue environmental groups.[79]

The Anti-Nuclear Movement

The anti-nuclear movement was an outgrowth of the broad-based environmental movement that also emerged in the 1960s and 1970s. Opposition to the use of nuclear power had roots in the anti-war movement spurred by the United States' involvement in the Vietnam War. Anti-nuclear activists feared that nuclear power plants could be used to build nuclear weapons for future wars.[80]

This general opposition to war and the proliferation of weapons naturally expanded to include concerns about nuclear safety and the effects of radiation on human health and the natural environment. Unlike the conservationists of the nineteenth and early twentieth centuries, those in the anti-nuclear movement were primarily concerned with the preservation of human life, rather than the preservation of pristine landscapes.[81]

MAJOR ENVIRONMENTAL EVENTS AND POLICIES

The first major catalyst that led to the creation of the modern environmental movement occurred in January 1969 when a blow-out at one of Union Oil's wells off the coast of Santa Barbara released roughly three million gallons of petroleum across the California coastline from Santa Barbara to San Diego. It was the largest oil spill in the nation's history up to that time.[82] The event awakened many Americans to the dangers of unchecked industrial development to the environment and sparked nationwide grassroots and governmental efforts to improve environmental protections. Motivated by the Santa Barbara oil spill, the first Earth Day was held on April 22, 1970. The event attracted more than 20 million people across the country. The Santa Barbara oil spill and nationwide public

[78] Wills, *Conservation Fallout,* 185-186.
[79] Wellock, *Critical Mass,* 31, 38, 61.
[80] Wills, *Conservation Fallout,* 76-77.
[81] Wills, *Conservation Fallout,* 72, 83.
[82] Williams, *Energy and the Making of Modern California,* 300.

display of support for the environmental cause stimulated passage of the National Environmental Protections Act (NEPA) in 1969. California followed quickly behind, passing its own state-level version of NEPA, the California Environmental Quality Act (CEQA), in 1970. The laws required that the environmental impacts of major construction projects be analyzed prior to approval.[83]

The Santa Barbara oil spill, along with intensifying private development of wealthy enclaves such as Sea Ranch in Northern California and Malibu in Southern California that cut off public access to large portions of the coastline, motivated the creation of legislation specifically designed to protect the California coast from development. In 1972, California voters approved Proposition 20. The initiative created the California Coastal Zone Conservation Commission, the predecessor of the California Coastal Commission, which was charged with regulating development along the California coast. The initiative also paved the way for passage of the 1976 California Coastal Act, which prioritized the preservation of public access to the coast and the conservation of natural resources. The act established the requirement for a permit for coastal development, with approval by the California Coastal Commission, that continues to regulate and development along the California's coast.[84]

DIABLO CANYON AND THE ENVIRONMENTAL MOVEMENT

Under construction from the late 1960s to the mid-1980s at a secluded location on the California coast, PG&E's nuclear power plant at Diablo Canyon became a rallying point for the various branches of the modern environmentalism movement that emerged in California. The first wave of opposition to the plant came from traditional conservationists, including prominent members of the Sierra Club, who hoped to protect the undisturbed stretch of the California coast from development. When PG&E first proposed in 1963 to build a new plant at the ecologically unique site of Nipomo Dunes, in the southern part of San Luis Obispo County, opposition from the Sierra Club persuaded the utility company to explore alternative sites or risk another debacle like they had experienced at Bodega Bay a few years earlier. PG&E instead proposed an undeveloped and relatively unknown coastal site in the middle of the county, west of the City of San Luis Obispo, known as Diablo Canyon.

Viewing this as a suitable compromise to save Nipomo Dunes, the board of the Sierra Club, representing a traditional conservation viewpoint, initially approved PG&E's plan in 1966. However, the club's membership was internally deeply divided over the decision.[85] Executive director and prominent environmentalist David Brower and his supporters resigned in opposition and formed

[83] Williams, *Energy and the Making of Modern California,* 300.
[84] Jordan Diamond et al., "The Past, Present, and Future of California's Coastal Act: Overcoming Division to Comprehensively Manage the Coast" (August 2017), 5.
[85] Wills, *Conservation Fallout,* 39-43

their own organization, the Friends of the Earth, a more progressive group based on moral environmentalism. The resulting schism pushed the Sierra Club away from traditional conciliatory conservation toward the modern environmental movement. As questions about the safety of nuclear power plants to the environment and human health increased in the 1970s, the Sierra Club began to campaign against nuclear power development. Shortly after the Three-Mile Island incident in 1979, the club voted to oppose licensing the Diablo Canyon Power Plant, formally revoking its initial support for the project.

The second wave of opposition to the Diablo Canyon nuclear power plant came from anti-nuclear groups. The most prominent of these groups was the Mothers for Peace. Originally founded as a local anti-war group, the Mothers for Peace opposed the nuclear plant at Diablo Canyon out of a concern for the effects of nuclear radiation on the surrounding community. The Mothers for Peace became the primary opposition group to the plant in 1973, following the discovery of the Hosgri earthquake fault.[86] The group used concerns about the seismic safety of the plant as its main weapon against PG&E in AEC hearings. Their efforts brought renewed attention to the Diablo Canyon project and led many members of the local community to question nuclear safety for the first time.[87]

The third wave of opposition was comprised of environmental protest groups that were a direct reflection of the modern environmental movement. The most notable of these groups in the fight against Diablo Canyon was the Abalone Alliance. The group was inspired by the Clamshell Alliance, a collection of citizen and environmental groups formed in 1976 to oppose a planned nuclear plant in Seabrook, New Hampshire. The Abalone Alliance was founded in San Luis Obispo in 1977, after initial testing of the cooling system at the Diablo Canyon plant killed large numbers of abalone in Diablo Cove. The alliance consisted of a network of anti-nuclear groups across California and had offices in San Luis Obispo and San Francisco, where nuclear opposition was strongest. Similar to the Clamshell Alliance, the Abalone Alliance's primary actions against the nuclear power plant at Diablo Canyon consisted of a series of planned nonviolent protests.

As completion of the plant marched forward, the alliance's membership grew from seven member groups in 1977, to 24 by 1979, to more than 60 at its peak in 1981. Reflecting the decentralized character of the modern environmental movement, these member groups managed their own individual anti-nuclear campaigns but periodically united in the San Luis Obispo area for protest actions.[88] Unlike opposition from the Sierra Club and Mothers for Peace, the Abalone Alliance's

[86] Wills, *Conservation Fallout,* 70-72.
[87] Wills, *Conservation Fallout,* 75
[88] Wills, *Conservation Fallout,* 87-89.

position was not limited to concerns about the environment or nuclear radiation but also included layers of social criticism, such as antiauthoritarianism, anti-militarism, and a general distrust of the government and corporations.[89]

The Abalone Alliance planned a series of public rallies and protests at the Diablo Canyon plant throughout the late 1970s, as the power-producing facilities were substantially completed but the nuclear reactors had not yet been activated, pending retrofits and upgrades to address the Hosgri fault, the cooling system's effect on the abalone, and other issues. The organization's first blockade took place in August 1977. Forty-seven people were arrested at the time. One year later, the organization conducted a second blockade that led to 487 arrests.[90]

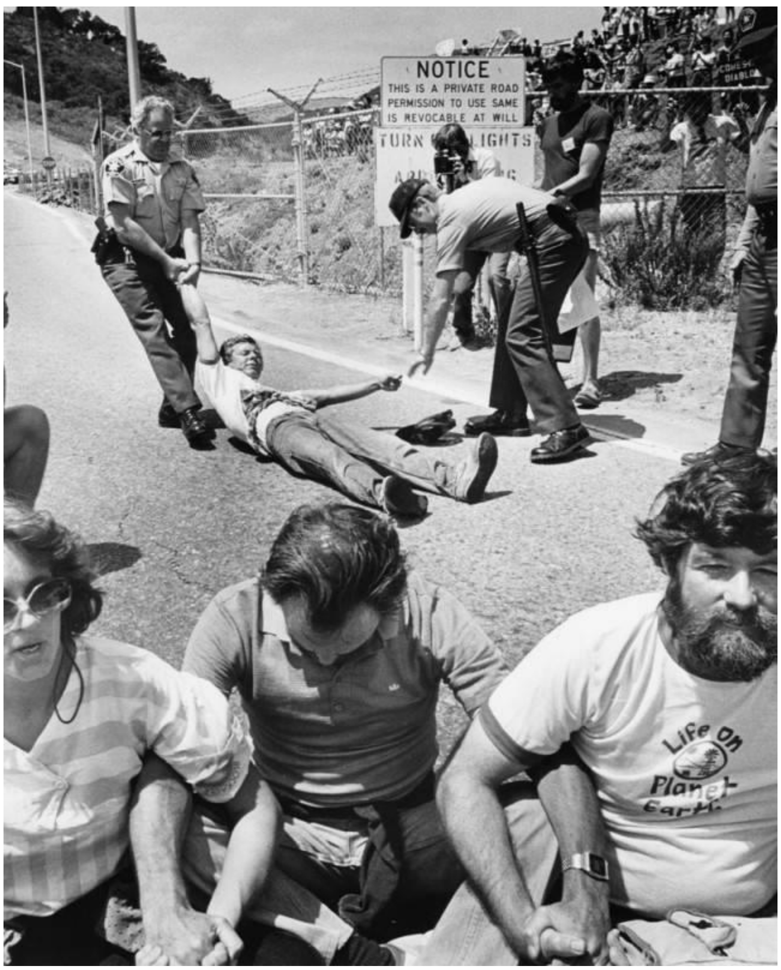

Figure 9. Demonstrators protesting the Diablo Canyon power plant, 1981. Source: Los Angeles Public Library.

[89] Wills, *Conservation Fallout,* 97-98.
[90] Giugni, *Social Protest and Policy Change,*44; Wills, *Conservation Fallout,* 89.

In 1979, the blockbuster anti-nuclear film*, The China Syndrome*, and the nuclear accident at Three-Mile Island brought increased public scrutiny to nuclear power plants across the country and helped to provoke two large protest events against Diablo Canyon.[91] Spurred by these events, 25,000 people attended a "Stop Diablo Canyon" protest outside the San Francisco's city hall that year.[92] In June 1979, between 35,000 and 40,000 demonstrators descended upon Avila Beach, just outside the gates to the Diablo Canyon site.[93] The largest protest events in Diablo Canyon's history took place in 1981, after a low-level operating permit was granted to the plant **(Figure 9)**. The two-week event attracted Governor Jerry Brown, musicians Jackson Brown, Graham Nash, and Bonnie Raitt, and resulted in over 1,000 arrests. Local newspapers described it as the largest anti-nuclear civil disobedience campaign in the nation's history.[94]

In spite of the scale of environmental opposition to the Diablo Canyon plant, protests delayed but did not stop the plant from going into full operation. After 1981, protests decreased in scale, reflecting a general decline in anti-nuclear sentiment across California by the mid-1980s.[95] After the first nuclear reactor at the plant went into operation in 1984, many of the groups that had formed in opposition to it, including the Abalone Alliance, disbanded.[96] Participants, however, used the organizing techniques they had used at Diablo Canyon for protests against nuclear weapons development in the early 1980s.[97]

[91] Wills, *Conservation Fallout,* 91.
[92] Wills, *Conservation Fallout,* 91.
[93] Wills, *Conservation Fallout,* 103.
[94] Giugni, *Social Protest and Policy Change,* 45; Richard F. Harris, "Diablo Canyon's 'green light' means more protests to come," *San Francisco Examiner*, 14 September 1983.
[95] Schrepfer, "Diablo Canyon and the Transformation of the Sierra Club;" Wills, *Conservation Fallout,* 115.
[96] Wills, *Conservation Fallout,* 120.
[97] Berkeley Art Center Association, *The Whole World's Watching,* 128.

Property Type: Nuclear Power Plants

Nuclear power plants, also known as nuclear generating stations, are a type of industrial facility used to generate electric power. Like coal, oil, natural gas, and other thermal power stations, nuclear power plants generate electricity through the production of high amounts of heat. This heat, or thermal energy, is most commonly used to convert water into steam, which turns a turbine and generator to produce electricity. Nuclear power plants differ from other types of thermal power plants in that their heat source comes from continuous, controlled nuclear fission reactions.[98] These nuclear fission reactions occur inside a nuclear reactor. The reactor is the heart of a nuclear power plant, around which all other features are designed and operated. Each individual reactor is connected to its own assigned turbine and generator, which together form a single "unit." Nuclear power plants may contain more than one reactor, and therefore, may be composed of more than one "unit."[99]

Although several different kinds of reactors are used in nuclear power plants around the world, all nuclear reactors share certain essential components: a fuel source, moderator, coolant, control rods, pressure vessel or tubes, and a containment structure. The most common type of fuel consists of rods of uranium that are bundled together. During a fission reaction, neutrons fired at the uranium fuel rods cause the uranium atoms to split into new atoms, producing more neutrons that create a continuous chain reaction. The process of splitting atoms releases energy in the form of heat, which is ultimately used to generate electricity via the turbine-generator. In order to slow the neutrons in the reactor down so that they are more likely to collide with the uranium fuel, the fuel rods are submerged in a moderator, usually consisting of water.[100]

The reactor vessel is housed inside a large, typically domed and cylindrical structure with reinforced concrete walls and an inner steel lining, known as a containment building. The containment building's primary function is to protect the nuclear reactor and prevent the release of nuclear radiation in the event of an accident.

The turbines, generators, condensers, pumps, and other parts of the water and electrical generating systems are located in separate buildings immediately adjacent to the containment building.[101] The

[98] "How Nuclear Power Works," Howstuffworks, accessed October 26, 2021, https://science.howstuffworks.com/nuclear-power3.htm.
[99] American Nuclear Society, "'Building Nuclear,' – A Guide for Writers," Nuclear Newswire, February 1, 2017, accessed October 27, 2021, https://www.ans.org/news/article-1918/building-nuclear-a-guide-for-writers/.
[100] World Nuclear Association, "Nuclear Power Reactors," July 2021, accessed October 26, 2021, https://world-nuclear.org/information-library/nuclear-fuel-cycle/nuclear-power-reactors/nuclear-power-reactors.aspx; U.S. Department of Energy, Office of Nuclear Energy, "Nuclear 101: How Does a Nuclear Reactor Work?," March 29, 2021, accessed October 26, 2021, https://www.energy.gov/ne/articles/nuclear-101-how-does-nuclear-reactor-work.
[101] World Nuclear Association, "Nuclear Power Reactors."

building that contains the turbines and generators usually has a long and narrow form and an open interior plan to accommodate the massive industrial machinery housed inside. Additional equipment and control rooms used to monitor and control the reactor are contained in an auxiliary building. Together, the containment, turbine-generator, and auxiliary buildings comprise the "power block" of a nuclear power plant.[102]

PRESSURIZER WATER REACTORS

The primary difference between the various kinds of nuclear reactors are the type of fuel, moderator, and coolant that are used to power and control the fission reactions. Most reactors in use around the world are light water reactors, such as boiling water reactors (BWRs) and pressurized water reactors (PWRs), that use ordinary water as both the moderator and coolant. PWRs are the most common type of reactor, making up roughly 70 percent of all of the nuclear reactors in the world.[103] BWRs produce steam directly by boiling coolant water in the reactor core, which is sent directly to the turbines. While the simplest type of reactor, this open system is less efficient than other designs and results in radioactive steam being used to turn the turbine.

In contrast, PWRs produce steam indirectly using two or more separate closed water circuits and steam generators **(Figure 10)**. The primary circuit contains coolant water that is circulated through the reactor. As water in this primary, closed-loop circuit is heated, high pressure prevents it from boiling. This heated pressurized water is carried to steam generators within the containment building, where the heat from the primary (radioactive) circuit is used to convert water in a secondary (non-radioactive) water circuit into steam. The steam in the secondary water circuit is used to turn the turbine in the turbine building to generate electricity. After the steam has been used to turn the turbine, condensers convert it back into liquid water, so that it can be recirculated through the secondary water circuit to repeat the process.[104]

The condensers are supplied by a third circuit of cold water, which is typically pulled from a large nearby body of water, such as an ocean, river, lake, or manmade reservoir. For this reason, PWRs are often located on the coast or near large natural sources of water, with intake and discharge structures, drawing water in from the water source and then returning back, as part of the tertiary water circuit. Some pressurized water reactors, particularly those that are inland with smaller

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[102] American Nuclear Society, "'Building Nuclear,' – A Guide for Writers."
[103] World Nuclear Association, "Are there different types of nuclear reactors?" accessed September 8, 2021, https://world-nuclear.org/nuclear-essentials/are-there-different-types-of-reactors.aspx.
[104] World Nuclear Association, "Are there different types of nuclear reactors?"

sources of nearby water, feature large concrete cooling towers to help cool water in this third circuit.[105]

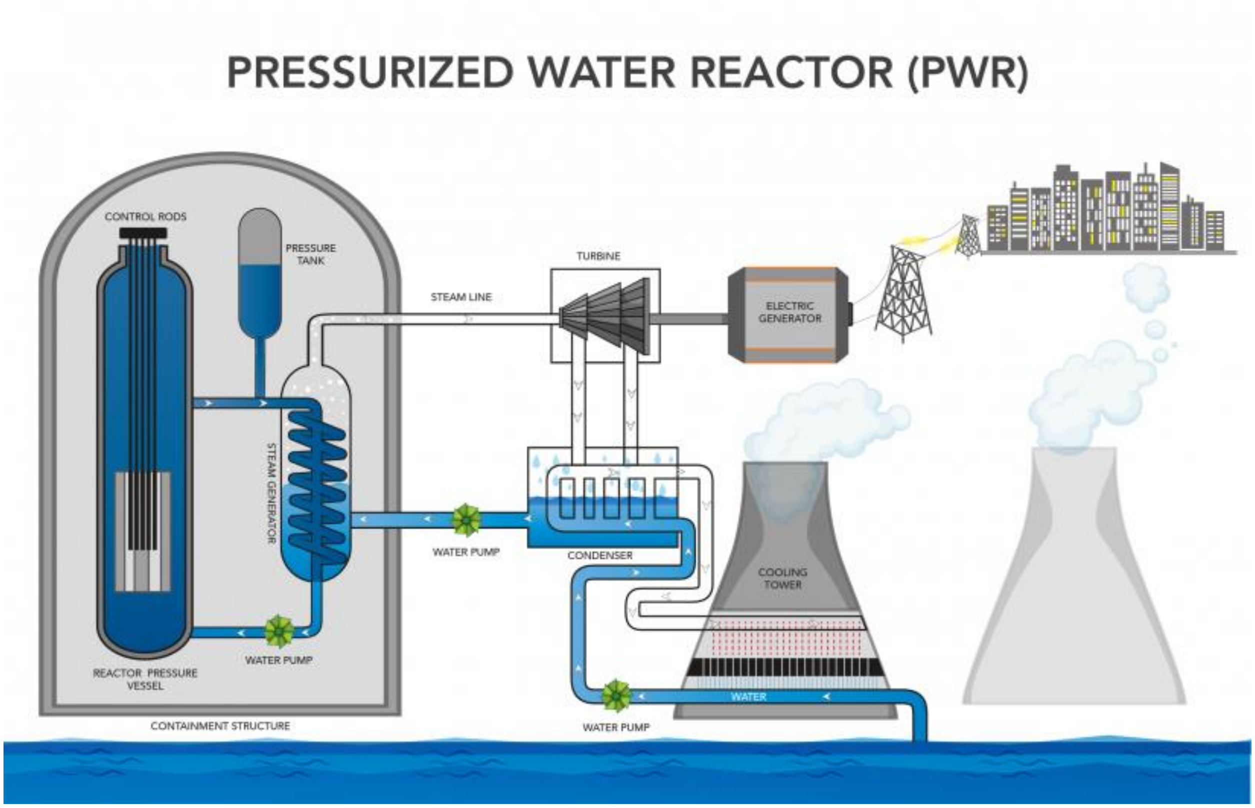

Figure 10. Diagram of how energy is generated with pressurized water reactors. Source: Graphic by Sarah Harman, U.S. Department of Energy, Nuclear 101, https://www.energy.gov/ne/articles/nuclear-101-how-does-nuclear-reactor-work.

SUPPORT FACILITIES

Outside of the power block, nuclear power plants include many additional ancillary buildings that support the overall function and operation of the plant. Electricity generated in the power block is transmitted over transmission lines that connect the turbine-generator building to electrical switchyards, then to the utility company's power grid. The transmission lines and switchyards connected to the main power grid also serve as the primary source of electricity that powers the

[105] Duke Energy, "Why don't all nuclear plants have cooling towers?" Duke Energy Nuclear Information Center, November 13, 2013, accessed October 26, 2021, https://nuclear.duke-energy.com/2013/11/13/why-don-t-all-nuclear-plants-have-cooling-towers.

nuclear power plant during normal operation.[106] Separate diesel generators stored on site are used as backup power sources in case of an accident.[107]

Due to the essential role water plays in the operation of many nuclear power plants, most plants feature several facilities, infrastructural elements, and other features that contribute to the plant's water systems. These often include intake and discharge structures and tunnels that transport water from a nearby water source to the power block for use in the condensers as part of the electricity generation process, water desalination and treatment facilities to purify water for use in the plant and drinking water, as well as tanks and reservoirs to store treated water.[108]

Buildings used to oversee the plant's overall operation and provide for the needs of workers generally include a main administrative building, medical facilities, and various smaller office buildings. The sensitive nature of nuclear power plants also requires stringent safety and security systems that are supported by buildings used to screen workers and visitors prior to entering the plant; training facilities for plant operators, maintenance staff, and security guards; as well as guard towers, fences, and barricades to monitor and control access to various areas of the plant.[109]

The presence of hazardous radioactive nuclear materials necessitates separate, specially designed facilities for the treatment, disposal, and storage of radioactive waste. These may include pools to cool and temporarily store spent nuclear fuel, dry casks for long-term, on-site storage of spent nuclear fuel, and separate buildings to store decommissioned radioactive equipment from the reactor.[110] Additional buildings and structures on site support the ongoing maintenance of the plant. These include warehouses, fabrication shops, and equipment storage facilities.

NUCLEAR POWER PLANTS IN CALIFORNIA

California has had a total of six nuclear power plants throughout its history. The first plant in operation in the state, the Santa Susana Sodium Reactor Experiment, was an experimental 6.5-megawatt sodium-cooled reactor that used sodium, rather than water as the coolant. All of the other nuclear plants that have existed in the state have been either boiling water reactors (BWR) or

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[106] International Atomic Energy Agency, "IAEA Nuclear Energy Series No. NG-T-3.8, Electric Grid Reliability and Interface with Nuclear Power Plants," 2012, 1-4.
[107] International Atomic Energy Agency, "IAEA Nuclear Energy Series No. NG-T-3.8," 8.
[108] Duke Energy, "The Mysterious 'Hot Hole,'" Duke Energy Nuclear Information Center, May 21, 2015, accessed October 28, 2021, https://nuclear.duke-energy.com/2015/05/21/the-mysterious-hot-hole.
[109] Joseph Gonyeau, "Key Areas and Buildings at the Nuclear Power Plant Site," Nuclear Tourist, December 8, 2005, accessed October 27, 2021, http://www.nucleartourist.com/areas/areas.htm.
[110] World Nuclear Association, "Storage and Disposal of Radioactive Waste," May 2021, accessed October 27, 2021, https://world-nuclear.org/information-library/nuclear-fuel-cycle/nuclear-waste/storage-and-disposal-of-radioactive-waste.aspx.

pressurized water reactors (PWR). The Vallecitos Nuclear Power Plant, which began operation in 1957 around the same time as Santa Susana, was a 30-megawatt BWR.[111] The Humboldt Bay Nuclear Power Plant, which began operation in the 1960s, had a unique design. The 63-megawatt BWR featured the world's first pressure suppression system, which became the model for future BWR plants in the United States. Unlike most nuclear power plants, both the reactor and suppression system at Humboldt Bay were located in an underground concrete and steel chamber. The design required less concrete, had fewer seams, provided better radiation shielding, and was less visible than other designs.[112]

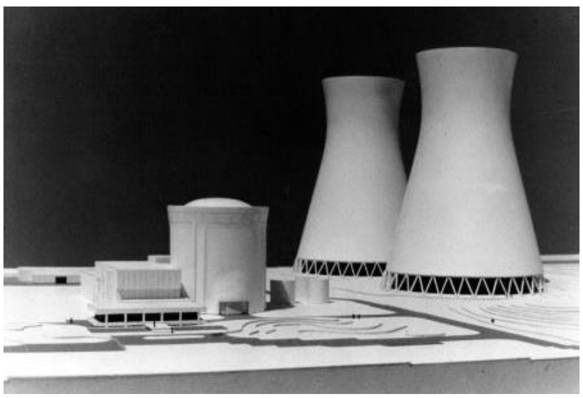

Figure 11. Model of the Rancho Seco nuclear power plant in Sacramento County, 1969 with cooling towers. Source: Los Angeles Public Library.'

Figure 12. San Onofre Nuclear Generating Station Units 2 and 3 Containment Buildings, 1985. Source: Huntington Digital Library.

After the late 1960s, all of the plants that went online in California were PWRs with larger generating capacities. The Rancho Seco Nuclear Power Plant, a 913-megawatt PWR, featured a design similar to that of the Three-Mile Island nuclear plant and was the only nuclear power plant in California that featured cooling towers due to its inland location far from a major body of water **(Figure 11)**. Unit 1 of the San Onofre Nuclear Generating Station was a 450-megawatt PWR, while Units 2 and 3 were larger approximately 1,000 megawatt PWRs **(Figure 12)**. Diablo Canyon Units 1 and 2 are both 1,100-megawatt PWRs.[113]

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111 State of California Energy Commission, "Nuclear Power Reactors in California," 7.
112 Rand Herbert, "Humboldt Bay Power Plant, Photographs Written Historical and Descriptive Data Field Records," Historic American Engineering Record, 2012, 16.
113 State of California Energy Commission, "Nuclear Power Reactors in California," 2-6.

5. MODERN SITE HISTORY – BUILT ENVIRONMENT

Rancho San Miguelito, 1842-1882

During the Mexican and Spanish periods, the site of the Diablo Canyon Power Plant was part of Rancho San Miguelito, a 22,000-acre Mexican land grant comprised of former Mission San Luis Obispo lands. In 1842, the Mexican government granted Rancho San Miguelito to Miguel Ávila. Ávila was awarded an additional league of land in 1846 on the condition that a portion of his land along the coast remain open to the public in order to preserve access to San Luis Bay, which contained the area's only seaport. Ávila raised cattle on the land and made a living from the sale of cattle hides and tallow. He built two houses on the rancho, one on the hill above San Luis Bay and a second near the shore. After the Mexican-American War, Ávila was elected alcalde (mayor) of San Luis Obispo; however, he resigned after only a year of service, due to the difficulty of traveling to town from his rancho. After the deaths of Ávila and his wife, the Rancho San Miguelito was divided between the couple's surviving children. Their son, Juan Vidal Ávila, inherited the largest portion of the former rancho. In 1867, Juan Ávila participated in the subdivision and sale of lots in the town of Avila Beach, named after his father. After some initial successes, Ávila's fortunes began to decline, forcing him to mortgage and gradually sell off the land he had inherited from his parents piece by piece. He sold off the last of his land holdings by the 1920s and died in 1930.[114]

Marre Ranch, 1882-1969

In 1882, Juan Ávila sold 6,000 acres of the former Rancho San Miguelito to Italian immigrant, rancher, and entrepreneur Luigi Marre. Marre used the lands to raise cattle for beef. In addition to the ranchland acquired from Juan Ávila, Marre also purchased the Ocean Hotel and waterfront property in Avila Beach from John Harford and turned it into the successful Hotel Marre. After Marre's death in 1903, his property passed to his sons, Louie and Gaspar. Like their father, they continued to raise beef cattle on the ranch lands near Avila Beach. Around 1930, the brothers constructed a Spanish Colonial Revival duplex, designed by regional architect Louis Noire Crawford, on the hill overlooking San Luis Bay. During World War II, the Marre Ranch was used by the United States Armed Forces, including the Coast Guard and Army, who were stationed at Camp San Luis Obispo nearby.

The Marre family continued to use the land for cattle ranching after the war until the mid-1960s, when they began to look to diversify their activities. The family demolished the remaining ranch buildings on the north side of San Luis Creek below the Marre house and built the Avila Beach Golf

[114] Post/Hazeltine Associates, "Historic Resources Report for APN 076-176-009 San Luis Obispo County, California," 2017, 8-10.

Course and San Luis Inn in their place. In order to raise money for the project, the Marre family began leasing off portions of its ranch lands.[115]

PG&E and Selection of the Diablo Canyon Power Plant Site

Meanwhile, Pacific Gas & Electric Company (PG&E) was in search of a site for a new nuclear power plant in the San Luis Obispo area. Having received opposition from the Sierra Club and other local conservationists to their first planned site at Nipomo Dunes, PG&E proposed a coastal site at Diablo Canyon as an alternative. In spite of substantial opposition from the Sierra Club's membership, including executive director David Brower, the club's board of directors voted to endorse PG&E's plan to site its nuclear plant at Diablo Canyon in June 1966.[116] Plans to build the plant progressed rapidly following the Sierra Club's vote.

In September 1966, PG&E agreed to lease more than 1,000 acres of the Marre Ranch from the Marre Land and Cattle Company for its new nuclear power plant. The lease included 585 acres for the plant site, 420 acres for transmission lines, and an additional 50 acres for a road to the plant. In return, PG&E agreed to underwrite a $6.4 million loan to aid the Marre family's development plans. The lease agreement was backed by a lien on an additional 1,300 acres of the Marre family's lands, which PG&E would acquire if the Marre Land and Cattle Company defaulted on its payments.[117]

In November 1966, PG&E announced that the contract to provide the nuclear reactors, turbine-generator, nuclear fuel, and other plant components for its new $150-million plant had been awarded to Westinghouse Electric Corporation.[118] Shortly afterward, PG&E submitted an application to the California Public Utilities Commission (CPUC) for permission to construct a 1,060,000-kilowatt (1,060 megawatts) nuclear reactor at Diablo Canyon; a formal application for a permit to build the single reactor and plant was submitted to the federal Atomic Energy Commission (AEC) nearly one month later in January 1967.[119]

The applications to the CPUC and AEC launched 20 days of public hearings with the CPUC in the spring of 1967. At hearings in both San Luis Obispo County and San Francisco, members of the public, including Sierra Club member and leader of the Scenic Shoreline Preservation Conference Fred Eissler, expressed concerns about the preservation of California's coastal lands and the

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[115] Post/Hazeltine, "Historic Resources Report for APN 076-176-009," 14-18.
[116] "Sierra Club Endorses PG&E Site," *San Francisco Chronicle*, 28 June 1966, 1.
[117] "A-Plant And PG&E Power Rates," *San Francisco Chronicle*, 13 May 1967: 34.
[118] "PG&E A-Power Contract," *San Francisco Chronicle*, 18 November 1966: 63.
[119] "PG&E Proposes Nuclear Plant Near San Luis," *San Francisco Chronicle*, 24 December 1966: 5; "PG&E's Formal Application for A-Plant Permit," *San Francisco Chronicle*, 19 January 1967: 5.

environmental impacts of the nuclear plant.[120] Despite this opposition, the CPUC unanimously approved plans for the Diablo Canyon plant in November 1967, citing public need and testimony that the proposed plant posed no threat to animal or human life. At the time, PG&E anticipated that the plant would be operational and supplying power to Kern, Santa Barbara, San Luis Obispo, Kings, and Tulare counties by the spring of 1972.[121]

Construction of the Diablo Canyon Power Plant Begins

On April 23, 1968, the AEC's Atomic Safety and Licensing Board authorized PG&E's plans for the Diablo Canyon plant and granted a construction permit for the project.[122] Some preparation had already begun in anticipation of the AEC's approval. By February 1968, a new bridge that was strong enough to carry the heavy industrial equipment for the plant had already been completed between Avila Beach and Port San Luis.[123] In June, construction started on a new access road from Avila Beach along the coast to the plant site.[124] Now known as Diablo Canyon Road, the road was designed to be wide and flat, with gentle turns and grades to safely transport the plant equipment and fuel to the construction site.[125] Excavation work at the plant site began in August 1968 and continued into 1969 (**Figure 13**). This included regrading and trenching the area selected for the power block buildings (the Containment Buildings, Turbine Building, and Auxiliary Building in Zone 1), a large parking lot (roughly Zone 6), as well as leveling an area of the hillside to the northeast of the power block, for a pair of switchyards, worker camp, and raw water reservoir ponds (Zones 10, 11, and 12).[126]

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[120] "PUC Hears Opposition to Nuclear Plant," *San Francisco Chronicle*, 12 May 1967: 38.
[121] "PG&E A-Plant Wins State OK," *San Francisco Chronicle*, 8 November 1967: 10.
[122] "Coast Atom Plant Wins Approval," *San Francisco Chronicle*, 24 April 1968: 11.
[123] "This is the Year PG&E Plans to Start Building Atom-Plant at Diablo Canyon," *The Arroyo Grande Valley Herald Recorder*, 29 February 1968: 88.
[124] Walt Reil, "Pacific Gas & Electric Company, Diablo Canyon Power Plant Construction Timeline through Commercial Operation," 2000, 1.
[125] Conversations with Scott Maze and Al Clark during September 23-24, 2021 site visit.
[126] Historic photographs from PG&E; Reil, "Diablo Canyon Power Plant Construction Timeline."

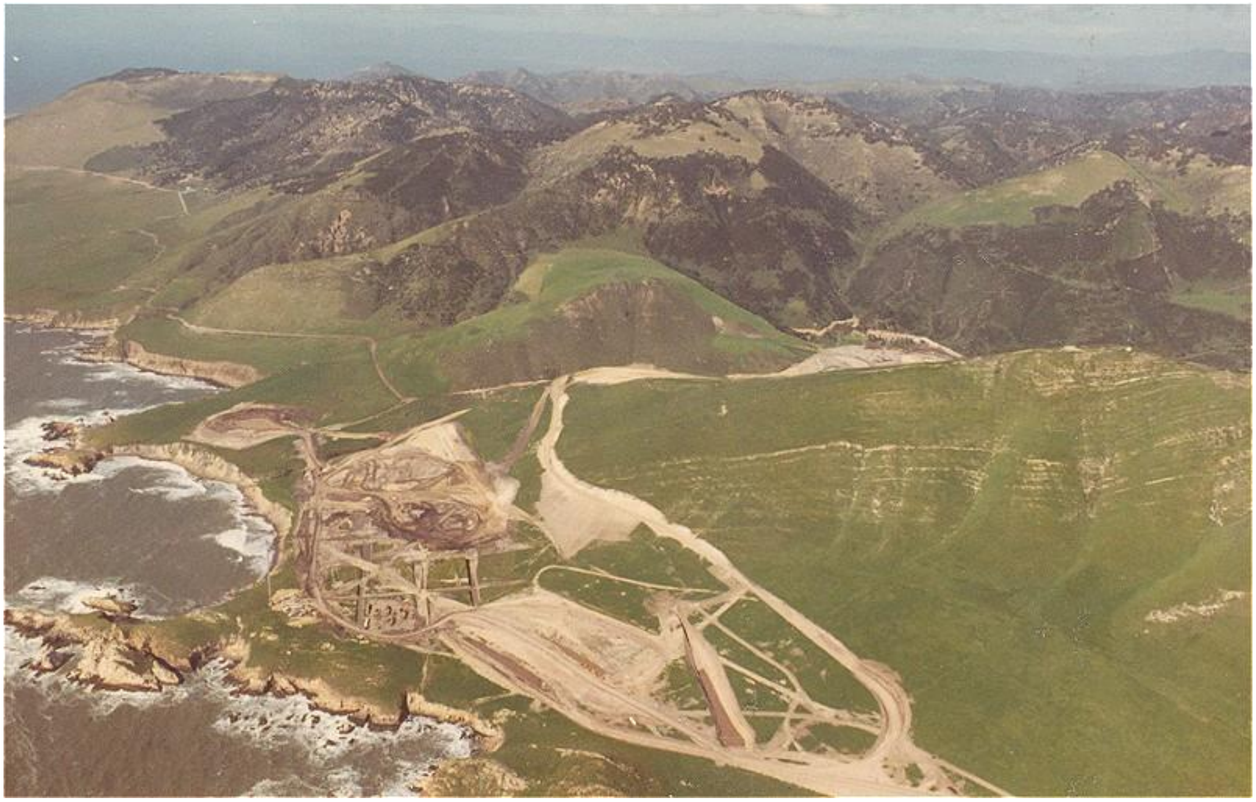

Figure 13. Aerial photograph showing site excavation work to create the flat terrace just above sea level and the leveled plateau (upper terrace) in the hillside above to construct the Diablo Canyon Power Plant in March 1969. Source: Pacific Gas and Electric Company.

The Diablo Canyon Power Plant was originally planned to have six reactors. In March 1969, the CPUC authorized an application from PG&E to construct a second rector unit at the Diablo Canyon plant.[127] Unit 1 was expected to be in operation in early 1973, while the Unit 2 was expected to go online in mid-1974.[128] By May 1969, construction began on the first buildings on the site for Unit 1. A concrete batch plant (Building 331) at the south end of the planned campus (Zone 8), used to produce concrete to construct various buildings and structures of the plant, was one of the first buildings completed (**Figure 14**). This enabled construction to begin on the plant's core buildings. A large warehouse (Building 519, Zone 1) for equipment storage followed shortly after. By the end of 1969, construction of the Unit 1 Containment Building (Building 97) and portions of the Turbine Building (Building 101) and Auxiliary Building (Building 99) associated with the Unit 1 reactor were underway (**Figure 15**).[129]

[127] "2nd Nuclear Plant OKd for Diablo," *San Francisco Chronicle*, 26 March 1969: 40.
[128] "Controversial Power Plant," *San Francisco Chronicle*, 28 January 1969: 38.
[129] Historic photographs from PG&E; Reil, "Diablo Canyon Power Plant Construction Timeline."

Figure 14. Undated photograph of the concrete batch plant. Building 331 is on the far left.
Source: Pacific Gas and Electric Company.

The Unit 1 Containment Building, or "reactor dome," was reportedly designed by well-known modernist architect Pietro Belluschi.[130] It appears Belluschi was a consultant to PG&E along with the San Francisco-based architecture firm of Wurster Bernardi & Emmons (WBE).[131] However, recent scholars on Belluschi's work have noted that while Belluschi was involved with the design of many different building types in the late 1960s, including the Diablo Canyon Power Plant, "in some his participation was critical; in others he appears to have lent no more than his name."[132] To date, research has not confirmed the extent of Belluschi's or WBE's contributions to the design of the containment buildings or any other buildings or structures at the Diablo Canyon Power Plant.[133]

[130] Gerald Adams, "Inside A Nuclear Reactor," *San Francisco Examiner*, 4 November 1973: 38.
[131] Meredith L. Clausen, *Pietro Belluschi: Modern American Architect* (Cambridge, MA: The MIT Press, 1999), 421.
[132] Clausen, *Pietro Belluschi*, 326.
[133] Access to Belluschi's archives at the Oregon Historical Society Research Library was not available due to renovations and COVID-19 restrictions. Email inquiries in December 2021 to the William Wurster Collection at the Environmental Design Archives, UC Berkeley revealed that drawings for the Turbine Building were sent to WBE by PG&E though without title blocks or much information to indicate the purpose of the exchanges.

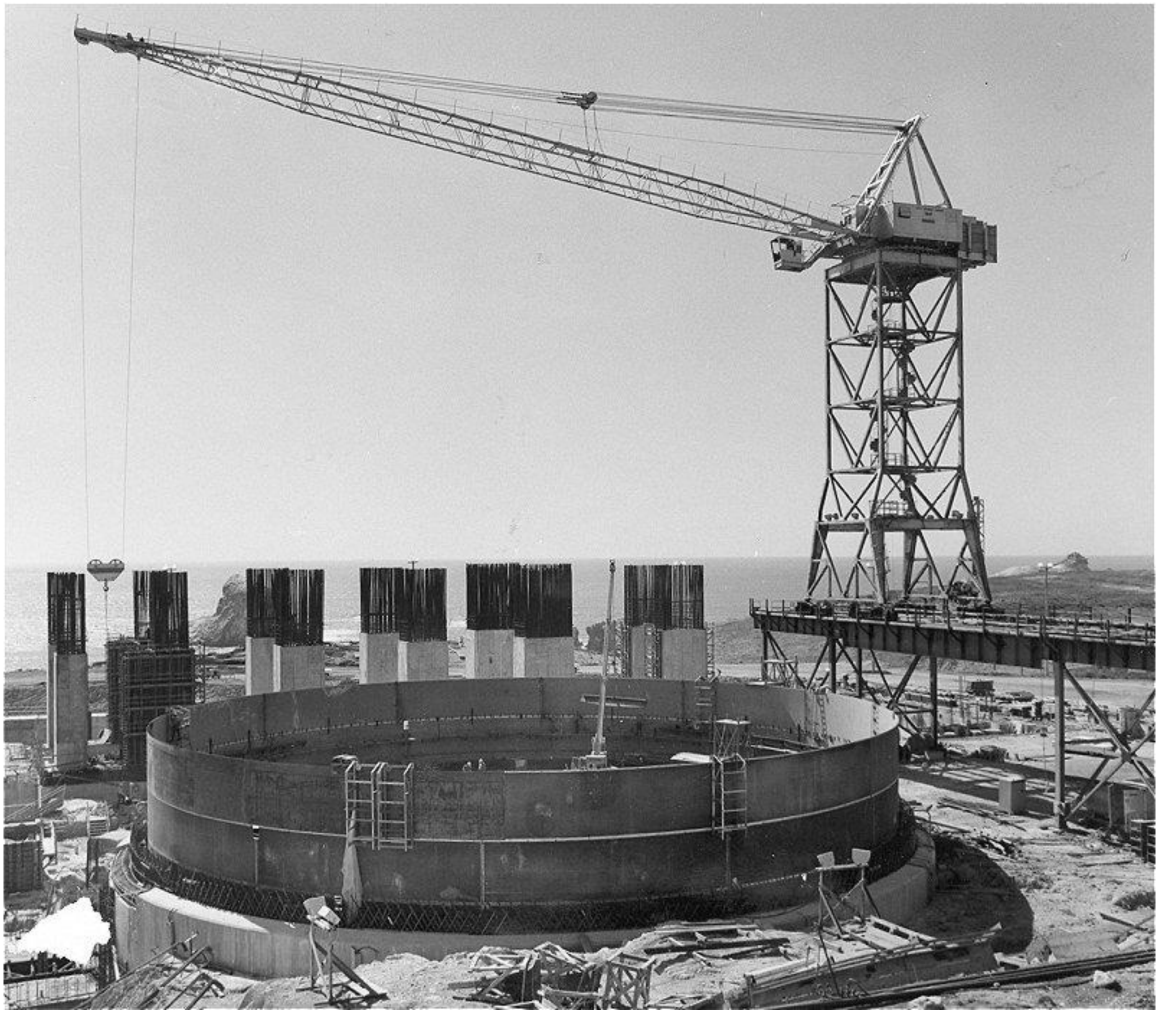

Figure 15. Early progress on the Unit 1 Containment Building and concrete pedestal for the Unit 1 portion of the Turbine Building in April 1970. Source: Pacific Gas and Electric Company.

From 1969 through much of 1971, progress on the Diablo Canyon Power Plant focused primarily on completing the main buildings and infrastructure necessary for the operation of Unit 1. While construction of the Unit 1 power block buildings continued, structural work on the underground concrete cooling water discharge and intake tunnels began in Fall 1969 (**Figure 16**).[134] Transmission lines to relay power generated by the turbines to the power grid were erected in June 1970.[135] By this time, local newspapers reported that while the total amount of work needed to bring the plant online was considered only 14 percent complete, the plant's buildings and structures were nearly 40 percent complete.[136]

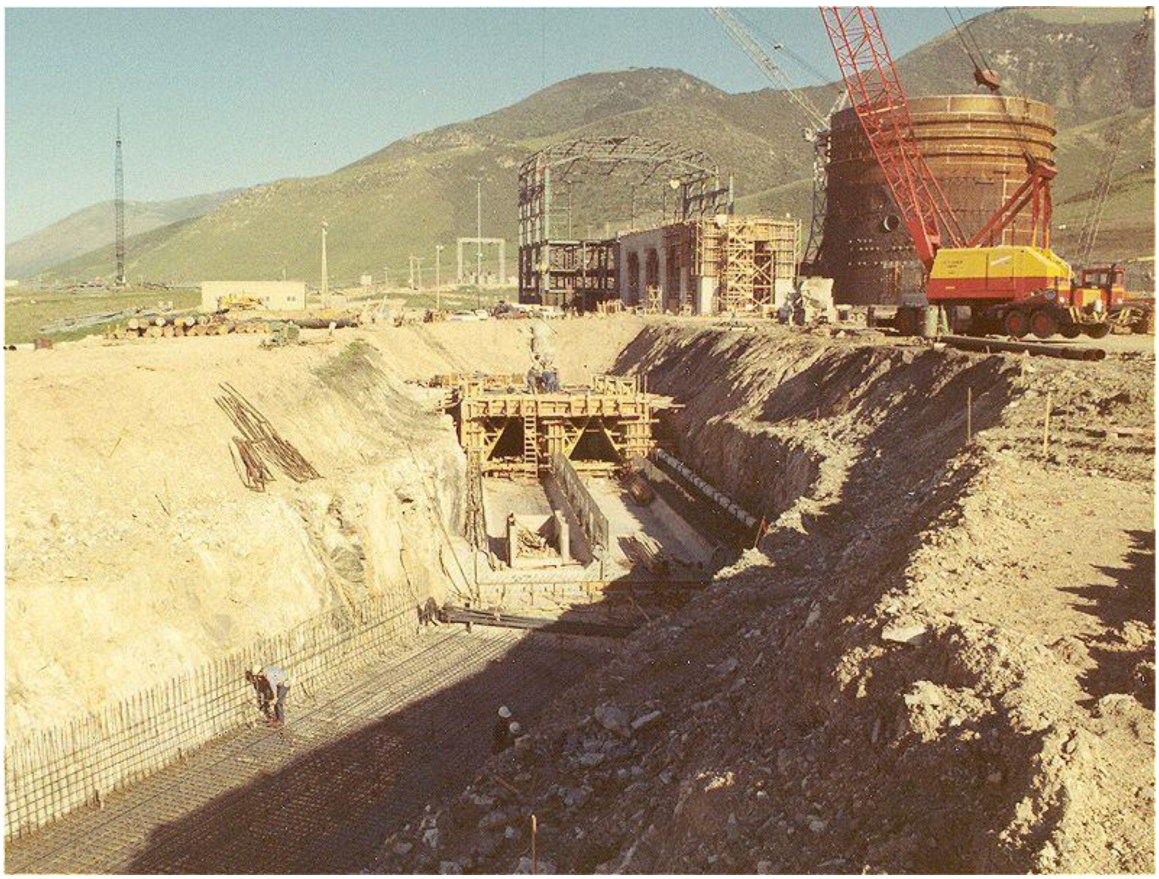

Figure 16. The intake and discharge channels under construction in January 1971. Progress on the Unit 1 Containment Building and half of the Turbine Building are visible in the background.
Source: Pacific Gas and Electric Company.

[134] Historic photographs from PG&E.
[135] "Nuclear Plant Rising Fast at Diablo Canyon," *San Francisco Examiner*, 7 June 1970: 23.
[136] "Huge Generators Arrive for PG&E Atom Plant," *Five Cities Times-Press-Recorder*, 16 July 1970: 1.

The first components of the nuclear reactors started to arrive on site in the summer of 1970. Beginning their journey at Westinghouse's factories on the East Coast, the reactor components were shipped by barge through the Panama Canal to Port San Luis.[137] To prepare for their arrival, a new barge landing was constructed at Port San Luis near Avila Beach. The four steam generators for the Unit 1 reactor reached Port San Luis in July 1970 and were the first reactor components unloaded at the new barge landing.[138] The Unit 1 reactor vessel arrived in September 1970 (**Figure 17**).[139] The equipment shipped to the barge landing was loaded onto special truck trailers and driven over Diablo Canyon Road to the plant site.[140]

Figure 17. Arrival of the reactor vessel for Unit 1 at the barge landing at Port San Luis in September 1970. Source: Pacific Gas and Electric Company.

In December 1970, PG&E received authorization from the AEC to install a second reactor at Diablo Canyon. The decision cleared the way for construction to begin on the buildings and structures associated with the Unit 2 reactor.[141]

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[137] "Nuclear Plant Rising Fast at Diablo Canyon."
[138] "Huge Generators Arrive for PG&E Atom Plant."
[139] Historic photographs from PG&E.
[140] "Huge Generators Arrive for PG&E Atom Plant."
[141] "Second Nuclear Reactor At Diablo Canyon OKd," *San Francisco Chronicle*, 10 December 1970: 6.

Meanwhile, construction on various support buildings and structures commenced outside the power block area. A small gatehouse (the Ávila Gate) used to screen visitors was built at the entrance to Diablo Canyon Road, approximately seven miles from the power block area not far from Port San Luis. From approximately spring 1970 to winter 1971, two long breakwaters began to take shape off the coast next to the power plant site to create a new manmade cove (**Figure 18**). To create the breakwaters, hundreds of tons of rock and multi-ton concrete tribars were dropped into the ocean. Once completed, the manmade cove, also known as the intake cove, served as a sheltered location from which seawater could be drawn into the plant through a massive concrete Intake Structure (Building 108) to cool steam used to turn the turbine-generators. This cooling water would be released back into the ocean through a concrete Discharge Structure (Building 103) located in Diablo Cove, a natural cove directly to the north of the intake cove and just below the Turbine Building, after it had circulated through the plant.[142]

As the breakwaters were taking shape, construction began on the Intake Structure and Discharge Structure in the summer of 1971 (**Figure 19**). Both structures were erected by building coffer dams in the intake cove and Diablo Cove to temporarily remove seawater from the areas during construction. Both were complete or nearly complete by early 1973 (**Figure 20** and **Figure 21**).[143]

By spring 1971, at least a dozen utilitarian support buildings and structures of varying sizes had been erected in a fabrication yard to the east and southeast of the power block and not far from the intake cove (the triangular-shaped Parking Lot 6 in Zone 5 and Parking Lot 7 in Zone 6)) (**Figure 22** and **Figure 23**). The buildings in this area continued to evolve over the course of construction and into the early years of the plant's operation (most of these early support buildings are no longer extant).[144]

[142] Historic photographs from PG&E.
[143] Historic photographs from PG&E.
[144] Historic photographs from PG&E.

Figure 18. One of the breakwaters under construction in June 1971. Source: Pacific Gas and Electric Company.

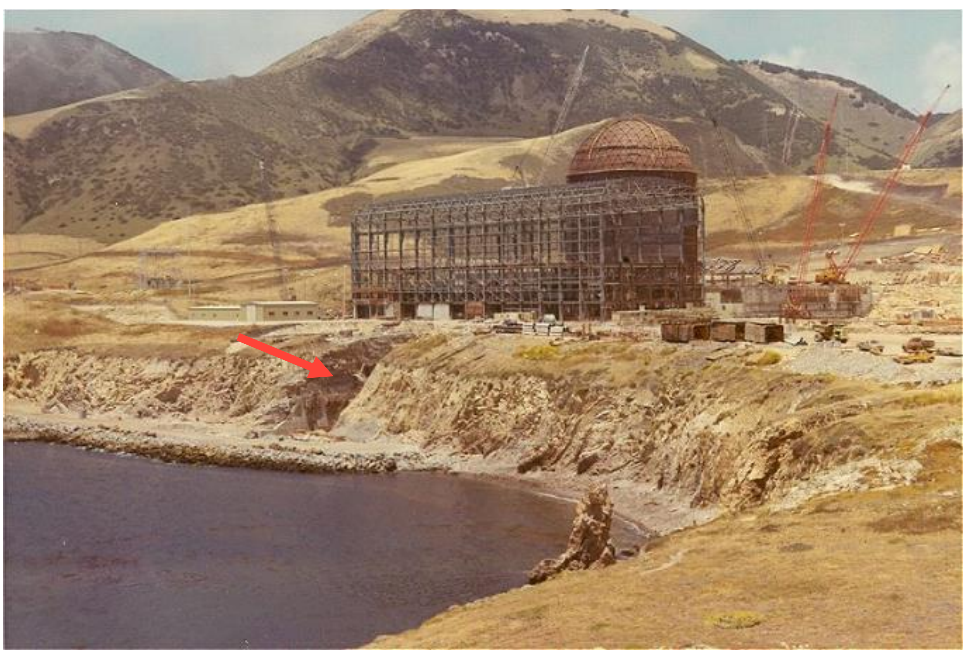

Figure 19. An excavated area of the cliffside adjacent to Diablo Cove (indicated by red arrow) shows progress on the Discharge Structure in June 1971. The Unit 1 Containment Building (with dome) and half of the Turbine Building (for Unit 1) are under construction behind. Source: Pacific Gas and Electric Company.

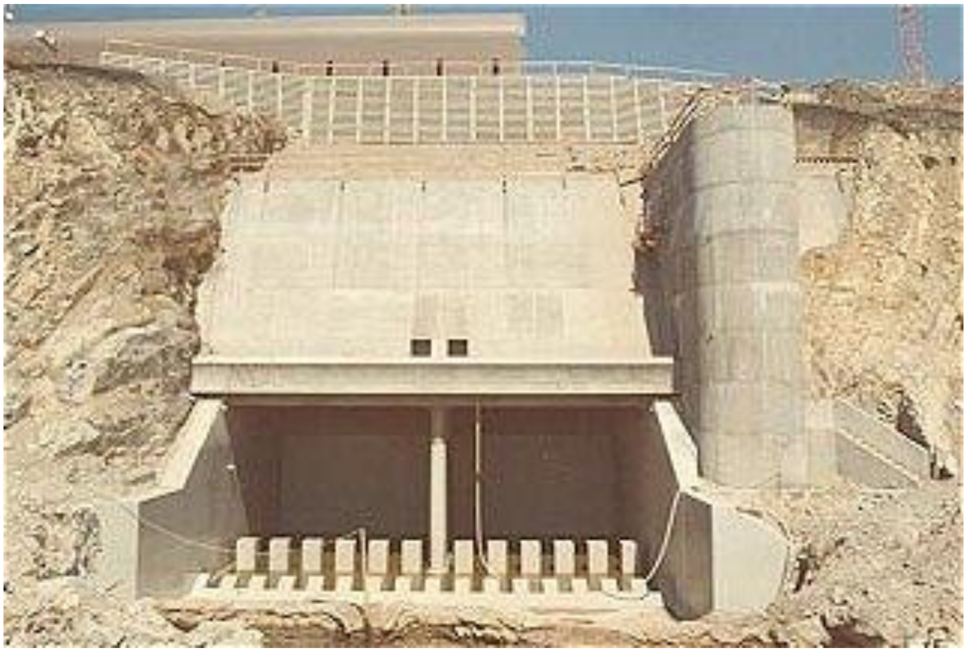

Figure 20. The nearly completed Discharge Structure in August 1972. The Unit 1 half of the Turbine Building is visible in the background. Source: Pacific Gas and Electric Company.

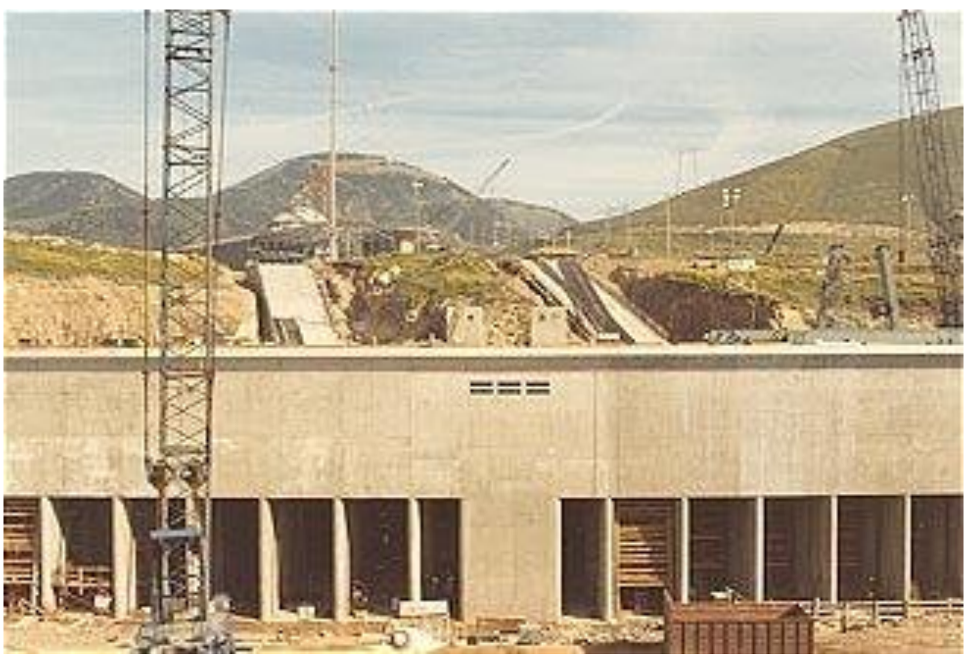

Figure 21. The Intake Structure during construction in February 1973. The dome of the Unit 1 Containment Building is just visible in the background. Source: Pacific Gas and Electric Company.

Figure 22. Support buildings and structures in the fabrication yard in April 1971 (currently Parking Lot 6 in Zone 5). In the background, the breakwaters are under construction in the intake cove.
Source: Pacific Gas and Electric Company.

Figure 23. Support buildings and structures in the fabrication yard adjacent to the intake cove, circa late 1971-early 1972, with the triangular-shaped area corresponding to Parking Lot 6 in Zone 5 and the two larger buildings (demolished) in the foreground at present-day Parking Lot 7 in Zone 6. The completed breakwaters and coffer dam for construction of the Intake Structure are visible in the intake cove. Source: Pacific Gas and Electric Company.

Delays and Modifications

Although Diablo Canyon Power Plant Units 1 and 2 were originally scheduled to be in operation by 1973 and 1974, respectively, numerous unforeseen issues delayed the plant's completion for more than a decade. The first delay occurred in February 1972 when the AEC ordered a partial suspension of construction, pending review of an environmental impact study requested by the Scenic Shoreline Preservation Conference under the recently enacted National Environmental Policy Act (NEPA).[145] By June 1972, the AEC ruled that work could continue at Diablo Canyon pending completion of the studies.[146] It is unclear what impact the temporary halt had on the progress of construction at the Diablo Canyon Power Plant, as historic photographs indicate that a significant amount of construction continued throughout much of the site during this period, including at the Unit 1 and 2 power block buildings and Intake and Discharge Structures (**Figure 24**). Foundations were also laid for two large raw water reservoir ponds (Buildings 1A and 1B) on the upper terrace to the northeast of the power block during this time (**Figure 25**). The Unit 1 reactor vessel was installed inside the Unit 1 Containment Building in the first few months of 1973 (**Figure 26**). The Unit 2 reactor vessel arrived at Port San Luis approximately one year later (**Figure 27**).[147] In May 1973, the AEC ruled that the Diablo Canyon project had cleared environmental review. By this time, the start of operation of Units 1 and 2 had been pushed back to 1975 and 1976, respectively.[148]

[145] Richard F. Harris, "Diablo Canyon's 'Green Light' Means More Protests to Come," *San Francisco Examiner*, 14 September 1983: 25.
[146] "PGE Gets OK for Work on A-Plant," *San Francisco Examiner,* 09 June 1972: 59.
[147] Historic photographs from PG&E.
[148] "Atom Power Plant Gets Another OK," *San Francisco Chronicle*, 1 June 1973: 45; Harris, "Diablo Canyon's 'Green Light' Means More Protests to Come."

Figure 24. Construction progress on the power block in February 1973. The more complete Unit 1 Containment Building with its dome in place, raw water tanks, and portions of the Turbine Building and Auxiliary Building are on the right. Construction has begun on the Unit 2 Containment Building and portions of the Turbine Building and Auxiliary Building on the left. Source: Pacific Gas and Electric Company.

Figure 25. The raw reservoir ponds under construction in November 1972 at the upper terrace above the containment buildings. Source: Pacific Gas and Electric Company.

Figure 26. Installation of the Unit 1 reactor vessel within Unit 1 Containment Building in early 1973. Source: Pacific Gas and Electric Company.

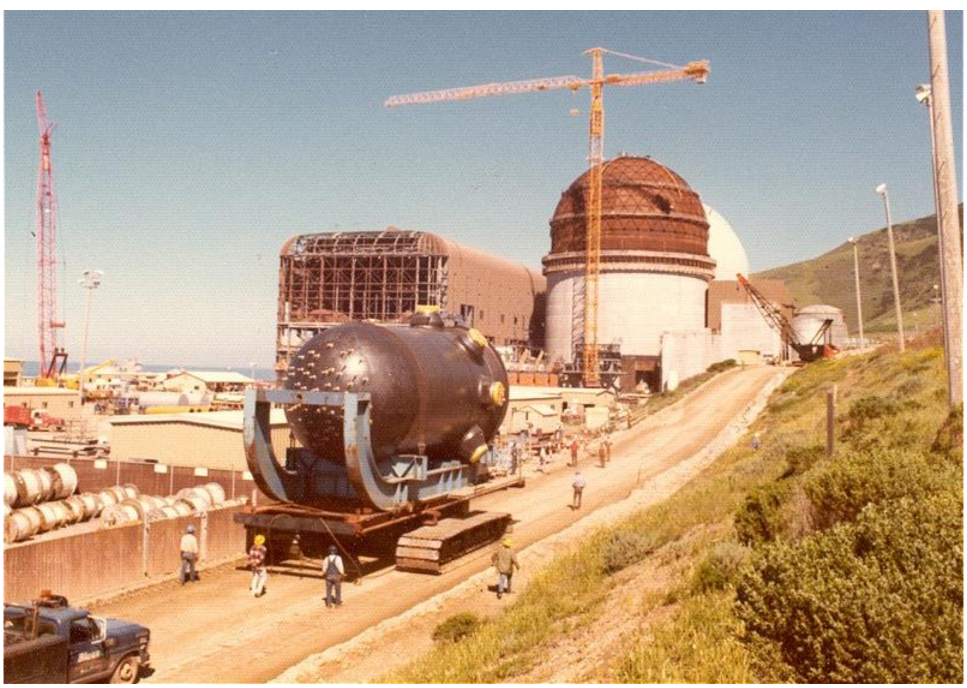

Figure 27. The Unit 2 reactor vessel arrives on site in April 1974. Source: Pacific Gas and Electric Company.

Perhaps the most impactful event in the plant's development occurred at the end of 1973, when a study by the United States Geological Survey (USGS) confirmed that an active seismic fault, named the Hosgri Fault, ran off the coast approximately three miles from the Diablo Canyon Power Plant site.[149] Studies suggested that the fault could produce a magnitude 7.5 earthquake.[150] Licensing of the plant was initially delayed for at least six months while the USGS and Nuclear Regulatory Commission, which had by this time replaced the AEC as the federal regulatory agency in charge of nuclear licensing, analyzed the potential effects of the fault on the Diablo Canyon Power Plant.[151]

While the implications of the Hosgri Fault were being debated, another hurdle emerged in 1975. Following initial tests of the plant's cooling water intake and discharge system in the summer of 1974, staff and biologists from the California Department of Fish and Wildlife and PG&E discovered hundreds of dead abalone in Diablo Cove. By 1975, estimates of the number of abalone killed had risen to the thousands. According to a report released by the California Department of Fish and Wildlife, the abalone deaths were the result of toxins produced by a reaction between salt in the seawater and copper alloy tubing used in the plant's cooling system.[152] Completion of the plant was stalled while PG&E replaced the roughly six million feet of copper alloy tubing in the cooling system with titanium tubing **(Figure 28)**.[153] To address environmental concerns about the impacts of the nuclear plant on the ecology of the intake and discharge coves, a biological testing lab was also added on a small spit of land where the east breakwater met the coastline. This lab remained in use until the 1990s and was demolished in the 2000s, though some concrete remnants, including steps to the ocean, remain.[154]

[149] Pacific Gas & Electric Company, "Diablo Canyon Power Plant, "Diablo from Groundbreaking to Start-up."
[150] David Perlman, "Safety of Atomic Plant Challenged," *San Francisco Chronicle*, 15 January 1976.
[151] David Perlman, "New A-Plant Delays – U.S. Quake Study," *San Francisco Chronicle*, 25 March 1976: 3.
[152] "A-Plant Outflow Poisons Abalone," *San Francisco Chronicle*, 24 January 1975: 5; Harris, "Diablo Canyon's 'Green Light' Means More Protests to Come."
[153] Dale Champion, "PG&E to Replace copy A-Tubing to Save Abalone," *San Francisco Chronicle*, 4 June 1975: 6.
[154] Conversations with Scott Maze and Al Clark during September 23-24, 2021 site visit.

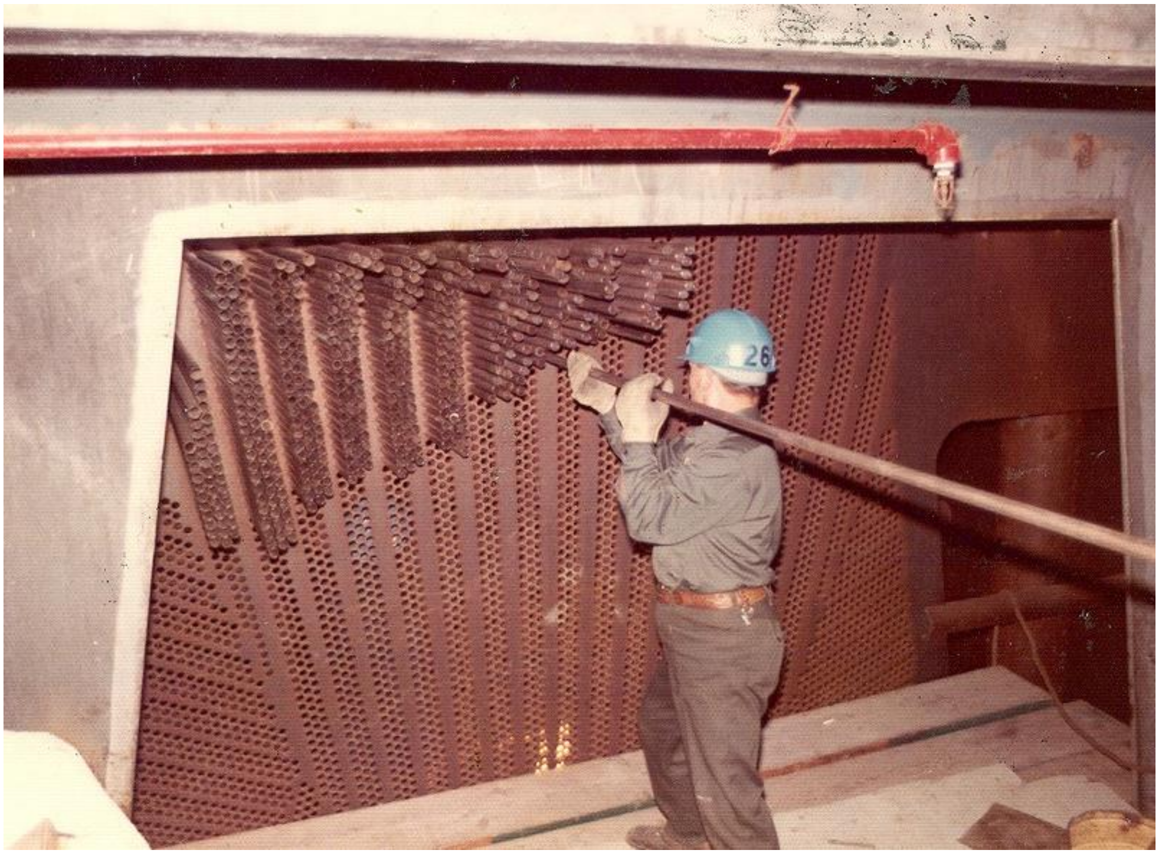

Figure 28. Undated photograph of the copper tubing in the Turbine Building that was replaced with titanium tubing to prevent toxins resulting from the chemical reaction between the copper and salt water. Source: Pacific Gas and Electric Company.

In April 1976, the NRC issued its decision on the question of the seismic safety of the Diablo Canyon Power Plant, as originally designed, and announced that the plant would need to be seismically retrofitted in order to be considered safe for operation.[155] Several years of modifications followed, including adding concrete buttresses along the west side of the Turbine Building; the buttresses were then enclosed in what appears as two one-story additions along the Turbine Building's west façade . The discovery of the Hosgri Fault prompted the first demonstration against completion of the Diablo Canyon Power Plant. In February 1976, eight demonstrators, on a march to Washington, D.C. to protest nuclear power, were arrested at the Diablo Canyon plant site.[156]

Meanwhile, PG&E's property holdings surrounding the Diablo Canyon Power Plant suddenly expanded in the latter half of the 1970s. In 1974, Robert Marre declared bankruptcy and defaulted

[155]Reil, "Diablo Canyon Power Plant Construction Timeline;" "US Halts Nuclear Power Licensing," *Sacramento Bee*, 14 August 1976: 7.
[156] Harris, "Diablo Canyon's 'Green Light' Means More Protests to Come."

on the loan that PG&E had underwritten in 1967 as part of the original lease agreement for the plant. In 1977, a federal court granted PG&E a 99-year lease on the original 585 acres that PG&E had leased from the Marre family, as well as an additional 3,800 acres of Marre family land that surrounded it.[157]

In July 1978, the NRC decided that seismic retrofit work at the Diablo Canyon Power Plant had been completed to a satisfactory level and that the plant was safe to operate. In addition to the buttresses, seismic modifications included replacing floor grating with steel plates and reinforcing roof bracing at the Turbine Building, among other changes.[158] In spite of this ruling, the plant still needed to be licensed by the NRC Safety and Licensing Board before it could begin commercial operation.[159]

Seemingly just as the plant was back on track, another major stumbling block appeared. On March 28, 1979, the worst nuclear accident in the United States' history occurred when one of the reactors at the Three Mile Island Nuclear Generating Station in Pennsylvania experienced a partial meltdown. In response, California Governor Jerry Brown asked the NRC to immediately halt the licensing of the Diablo Canyon Power Plant so that studies of what had happened at Three Mile Island could be completed and continuing concerns about the safety of the Diablo Canyon plant could be addressed.[160] Due to safety questions that had been raised by the Three Mile Island incident, the NRC ordered a temporary moratorium on the licensing of all nuclear power plants in the United States in November 1979.[161] Once new safety regulations and emergency standards were adopted, the moratorium was lifted, and licensing was allowed to continue. In February 1981, the NRC announced that licensing for the Diablo Canyon plant would be delayed at least until March 1982 while the agency reviewed an emergency plan that had been prepared for the plant in response to the Three Mile Island incident.[162]

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[157] Wills, *Conservation Fallout,* 86. Research did not clarify how PG&E's original lien on 1,300 acres of the Marre family's land relates to the 3,800 acres they acquired from the family in 1977.
[158] Alan Cline, "A Hard Look – Diablo Canyon: Ready and Waiting," *San Francisco Chronicle*, 12 November 1978.
[159] "2 A-Plants Are Safe, Panel Says," *San Francisco Chronicle*, 12 July 1978
[160] John Balzar, "Brown Asks Delay for Nuclear Plant," *San Francisco Chronicle*, 5 May 1979: 6.
[161] Harris, "Diablo Canyon's 'Green Light' Means More Protests to Come."
[162] David Perlman, "A New Delay for Diablo Canyon A-Plant," *San Francisco Chronicle*, 7 February 1981.


Figure 29. Historic aerial photograph of the Diablo Canyon Power Plant (1981). Source: HistoricAerials.com.

A historic aerial photograph taken in 1981 reveals the extent of construction that had been completed at the Diablo Canyon Power Plant up to this point (**Figure 29**). The main power block buildings were complete. A security building (Building 105) by Garretson-Elmedorf-Zinov-Reibin and used to screen visitors, had been erected immediately to the southeast of the Turbine Building.[163]

[163] PG&E response to HIS-36 in Data Request 2 noted architect Paul Zinov from the firm of Garretson-Elmendorf-Zinov-Reibin was on the original drawings. The firm is now GEZ Architects and Engineers in San Francisco. Research uncovered little about Zinov, the firm, or their work from this period.

More than a dozen support buildings and structures of varying sizes were clustered in a wedge-shaped area further to the south in Zones 2 and 5, most of which are no longer extant. Two large warehouses were located to the east of this wedge of buildings in Zone 6 (no longer extant). At the far southeast edge of the plant campus (Zone 8), an outdoor firing range and large warehouse (Building 113, altered) had been built to the northwest of the concrete batch plant.

The west breakwater was partially destroyed during storms in 1981. The damaged breakwater is visible in the 1981 aerial photograph. Coastal engineer Omar Lillevang was hired to help redesign and update the east and west breakwaters to withstand future storms. Lillevang had also worked on the coastal design aspects of several other nuclear power plants, including the San Onofre Nuclear Generating Station. Using Lillevang's innovative physical model studies, the breakwaters were successfully rebuilt.[164]

In September 1981, the NRC certified the seismic retrofit work and issued a license for low-level testing at the plant. The license would allow for nuclear fuel to be loaded into the reactors to begin testing the plant at five percent capacity, below the level to generate commercial power.[165] Then, during an NRC sanctioned review of the plant, it was discovered that the wrong blueprints had been used to build supports for the plant's cooling pipe system. Apparently, blueprints for Unit 2, still under construction, had been used to build safety structures for Unit 1. The NRC ordered exhaustive studies to review the plant's safety structures and systems, since some elements of the two units are the same while others are mirror images.[166] PG&E hired Bechtel Power Corp, which had constructed over half of the nuclear reactors in the United States to that date, to complete this review and oversee necessary modifications. During the review process, Bechtel discovered hundreds of errors, mainly related to earthquake proofing. Modifications to fix the errors were completed in the summer of 1983.[167]

Diablo Canyon Power Plant Comes Online

In April 1984, the NRC authorized a second low-level testing license. Although opponents challenged the decision and continued to lobby to stop full licensing for the plant, testing proceeded.[168] Following several months of testing the plant's systems at low power, the NRC finally issued a full-power operating license for the Unit 1 reactor on August 2, 1984.[169] A full-power operating license

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[164] Melissa McGann, "Omar J. Lillevang papers," Online Archive of California, accessed November 5, 2021, https://oac.cdlib.org/findaid/ark:/13030/tf6j49n9h8/entire_text/.
[165] "Diablo Canyon For Test Runs," *Sacramento Bee*, 22 September 1981: A1, A12.
[166] John Fogarty, "A Report on Diablo Error," *San Francisco Chronicle*, 1 October 1981: 7.
[167] Harris, "Diablo Canyon's 'Green Light' Means More Protests to Come."
[168] Reil, "Diablo Canyon Power Plant Construction Timeline."
[169] John Fogarty, "Opponents Vow a New Court Fight," *San Francisco Chronicle*, 3 August 1984: 1.

for the Unit 2 reactor followed almost exactly one year later on August 26, 1985. Both units went into full commercial operation the following year, respectively, thus ending an 18-year saga to complete the plant. The finished plant cost $5.6 billion dollars to complete.[170]

A large number of support buildings and facilities were added to the Diablo Canyon Power Plant campus around 1985 and 1986, immediately after the plant's operating licenses were issued. These included a multi-story Administration Building (Building 104), attributed to PG&E designers and built in 1986 with offices for the plant's staff directly to the south of the Turbine Building; the Cold Machine Shop (Building 116) in 1985 near the Administration Building, and the Main Warehouse (Building 115) in 1985 to the northeast of the power block in Zone 3.[171] The architect who signed the drawings on the Main Warehouse and Cold Machine Shop was James M. Leefe, an architect with experience in large-scale industrial facilities and who was Principal of Urban Design at Bechtel Corporation's Commercial and Industrial organization.[172]

As part of the plant's response to the Three Mile Island incident, robust training facilities were constructed to the southeast of the power block in Zone 5. These included a large Training Building (Building 109), attributed to PG&E designers, which featured a full-scale replica of the reactor control room to help train plant operators, as well as a Maintenance Shop Building (Building 119), also attributed to PG&E designers, with facilities for training the plant's maintenance staff.[173]

Several water treatment facilities were also installed during this period. A seawater reverse osmosis water desalination plant (Building 121) was added north of the east breakwater (Zone 7). This was accompanied by the completion of additional water treatment facilities (Buildings 304, 305, and 307) adjacent to the raw water reservoirs on the upper terrace to the north of the power block (Zone 10). These water treatment facilities provided fresh water for use by the staff at buildings throughout the property, as well as purified feedwater for use in some of the plant's water systems. At the north side of Parking Lot 7 (Zone 6), a series of modular buildings (Buildings 260, 261, 262, 263, 264, and 266) were constructed to provide additional offices, conference rooms, and storage.[174]

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[170] John Fogarty, "Diablo Canyon's Unit 2 Reactor Granted Full-Power," *San Francisco Chronicle*, 2 August 1985.
[171] Dates confirmed by PG&E Response to HIS-36 in Data Request Set 2, which also noted the plans for the Administration Building were by designer R. Hau and stamped by Richard V. Bettinger, the chief civil engineer for PG&E.
[172] PG&E Response to HIS-36 in Data Request Set 2; "6 Bay Area Architects Honored by AIA," *San Francisco Examiner,* 9 April 1978.
[173] Conversations with Scott Maze and Al Clark during September 23-24, 2021 site visit. PG&E Response to HIS-36 in Data Request Set 2 noted that the plans for the Training Building (Building 109) were by designer V. Neal and plans for the Maintenance Shop Building (Building 119) were by designer R. Hau. Both plans were stamped by Richard V. Bettinger, the chief civil engineer for PG&E.
[174] Facility Database for Aspen, provided by PG&E.

Additional Development

The Diablo Canyon Power Plant has continued to be modified and adapted over the decades since it first went online in order to address evolving regulations and world events. In spite of its high profile in the media, the Chernobyl nuclear accident in 1986 did not result in any major physical changes to the Diablo Canyon Power Plant; rather, changes were primarily administrative and procedural in nature. The plant continued to expand in the late 1980s with the addition of more warehouses, storage, and maintenance facilities.

A historic aerial photograph shows that by 1994, many of the older support buildings, constructed in the fabrication yard east and southeast of the power block, had been demolished and Parking Lot 6 (Zone 5) and part of Parking Lot 7 (Zone 6) had been completed (**Figure 30**). The biological testing lab ceased operation in the 1990s and was demolished in the 2000s. Around 1997, an early phase of security modifications was carried out. More extensive security alterations took place in the decade following the September 11, 2001 terrorist attacks, including the construction of security towers and a modern Security Building (Building 105A) in 2012. In 2008, the original steam generators inside the containment buildings were replaced and stored inside a specially constructed concrete building (Building 403) on the upper terrace to the northeast of the power block.

In 2011, a nuclear accident at the Fukishima Daiichi Nuclear Power Plant in Japan prompted the creation of a nationwide FLEX program. The program resulted in the establishment of centers across the United States to respond to nuclear accidents anywhere within the country within 24 hours. In response, Building 113 (Zone 8) was gutted and remodeled, and several new storage facilities were added to house necessary equipment in case of such a situation.[175]

In 2016, PG&E announced a Joint Proposal with several labor and environmental organizations to begin phasing out nuclear power and increase its investment in energy efficiency, renewable energy sources, and energy storage. As part of the proposal, PG&E announced that it would not renew the federal operating licenses for the Diablo Canyon Power Plant when they were set to expire in 2024 and 2025, respectively. The CPUC approved PG&E's proposal in 2018, beginning the process of decommissioning the plant.[176]

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[175] Conversations with Scott Maze and Al Clark during September 23-24, 2021 site visit.
[176] PG&E, "Diablo Canyon Power Plant, Bridging to California's Energy Future," accessed October 13, 2021, https://www.pge.com/en_US/safety/how-the-system-works/diablo-canyon-power-plant/energy-bridge/energy-bridge.page.

Figure 30. 1994 aerial photograph of the main built-up area. Source: HistoricAerials.com.

6. EVALUATION

National Register and California Register Evaluation

The following section examines the eligibility of the Diablo Canyon Power Plant for listing in the National Register and California Register:

- **Criterion A/1 (Events):** Resources that are associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States.

- **Criterion B/2 (Persons):** Resources that are associated with the lives of persons important to local, California, or national history.

- **Criterion C/3 (Architecture):** Resources that embody the distinctive characteristics of a type, period, region, or method of construction, or represent the work of a master, or possess high artistic values.

- **Criterion D/4 (Information Potential):** Resources or sites that have yielded or have the potential to yield information important to the prehistory or history of the local area, California, or the nation.

- **Criteria Consideration G:** Resources of exceptional importance that have achieved significance within the last 50 years.

Criterion A/1 (Events)

None of the individual buildings or structures, nor the Diablo Canyon Power Plant as a whole appear to be associated with any significant events, trends, or patterns in the history of San Luis Obispo County, California, or the United States. Although the Diablo Canyon Power Plant is the last nuclear power plant that remains in operation in California and is one of only six nuclear power plants that were completed over the state's history, research did not indicate that it influenced the construction or development of other nuclear power plants in California or the United States. The Diablo Canyon Power Plant was first authorized in the mid- to late-1960s, after the initial experimental nuclear power plants of the late 1950s and the pioneering commercial nuclear power plants of the early 1960s had been placed into service. It, along with Units 2 and 3 of the San Onofre Nuclear Generating Station also authorized around the same time, was undertaken during a time when nuclear power generation was touted as the way to meet California's increased energy demands, but was no longer considered groundbreaking. While these plants were still being completed, the

California State Legislature enacted a moratorium on the construction and licensing of new nuclear power plants that resulted in the plants at Diablo Canyon and San Onofre becoming the last to be completed in California. As such, the Diablo Canyon plant did not influence the development of later plants in California.

This statewide moratorium, and the general decline of the nuclear power industry in California and across the United States, were not directly caused by events at the Diablo Canyon Power Plant. Rather, they were the result of growing widespread concern about the safety of nuclear power and radioactive waste that arose in the 1960s and 1970s. The most potent argument against nuclear power in California proved to be their safety in the event of an earthquake. While the seismic safety of the Diablo Canyon Power Plant was the most common argument against it, questions about the seismic safety of nuclear power plants preceded the Diablo Canyon plant and were first raised in protests against a planned PG&E nuclear power plant near Bodega Bay in the early 1960s. The same argument was subsequently used to stop or protest against other planned plants and to end the operation of several existing nuclear power plants in California. Though widely covered in the media, the Diablo Canyon plant was one of many that were called into question between the 1960s and 1980s, as scrutiny toward the safety of nuclear power increased across the country.

The roughly 30-year halt in the construction of new nuclear power plants in the United States after 1978 also was not directly caused by events at the Diablo Canyon Power Plant. Rather, it was caused by numerous overlapping and complicated factors, including decreased electricity demand following the 1970s energy crisis, increased reliance on natural gas, growing nationwide anti-nuclear sentiment, and the high costs of constructing nuclear power plants due to increased regulation and inflation. While the Diablo Canyon Power Plant is representative of all of the factors that led to the decline of the development of nuclear power in California and the United States, research did not indicate that it played a major role in this decline.

Nor does the Diablo Canyon Power Plant appear to be individually significant for its association with the environmental movement in California or the United States. Questions about the safety of the Diablo Canyon Power Plant were one of many factors that contributed to rising nationwide concerns about the impact of development and industry on the environment; however, they do not appear to have been the most influential or important causes for this increased awareness. During the protracted process to bring the Diablo Canyon nuclear power plant online, the plant became a lightning rod for the various environmental concerns that were emerging throughout California and the United States because of the unique combination of its scenic location, seismic issues, and timing within the broader development of the environmental movement. As a result, Diablo Canyon became one of many factors, albeit one of the more high-profile, that contributed to a general increase in anti-nuclear sentiment in the United States from the late 1960s to the early 1980s.

Furthermore, in spite of the scale of environmental opposition to the plant, none of the protests or demonstrations appear to have directly resulted in any major policy changes or actions at the local, state, or national level. At nearly every turn, major milestones in the construction or licensing process for the Diablo Canyon Power Plant spurred environmental protests that delayed, but did not ultimately stop, the plant from going into full operation or lead to demonstrable policy changes. Other events, such as the publishing of Rachel Carson's book *Silent Spring* in 1962, 1969 Santa Barbara oil spill, and the first Earth Day in 1970 – are frequently cited as the main influences for major pieces of environmental legislation, including the National Environmental Policy Act and California Environmental Quality Act. The California Coastal Act and increased protections for the California coast were more strongly influenced by the Santa Barbara oil spills and high-profile residential developments in places such as Sea Ranch and Malibu. Meanwhile, major shifts in California energy policy, such as the Warren-Alquist Act of 1974, were passed primarily in response to the 1970s energy crisis. Therefore, research did not indicate that the Diablo Canyon Power Plant is considered the primary cause for any consequential environmental legislation.

Lastly, opposition to the construction of the Diablo Canyon Power Plant is often cited as the cause for a major schism within the Sierra Club that contributed to the organization's shift away from traditional wilderness conservation toward modern environmentalism. Although the Sierra Club was then and remains the most powerful environmental organization in the United States, the historical impact of this shift beyond the organization remains unclear. Further research and information may warrant a reevaluation of the historic significance of Diablo Canyon's role in the evolution of the Sierra Club, and any subsequent contributions to the broad patterns of history, in the future.

In summary, Diablo Canyon Power Plant, proposed in 1966, was among the later group of commercial nuclear power plants authorized in the nation and in California, and did not contribute significantly to the development of the industry. Its construction was a focal point of much protest and scrutiny on the safety of nuclear power and impacts to the environment, but it was one among many such targets in the anti-nuclear and early environmental movements. The protests of Diablo Canyon Power Plant, though a reflection of the shift in public opinion away from nuclear power and of the growing environmental awareness, did not result in significant changes to these movement, to new legislation, nor to the decline of commercial nuclear power plants in the United States or California.

Thus, the Diablo Canyon Power Plant does <u>not</u> meet Criterion A/1 (Events) for listing in the National Register or California Register.

Criterion B/2 (Persons)

Research did not reveal a direct association between the Diablo Canyon Power Plant, or any specific building or structure, and any historically significant individuals. No major leader or figure in the development of the plant emerged in connection to PG&E. Similarly, while several opposition groups were closely associated with the plant over the course of its development, including the Sierra Club, Mothers for Peace, and Abalone Alliance, no major leaders or figures involved with these groups have a strong connection to the Diablo Canyon plant or appear to have changed the course local, state, or national history through their activism. The Sierra Club's executive director David Brower emerged as a prominent figure in the early period of the plant's development and ultimately resigned from the organization in opposition to its endorsement of the project. Although Brower subsequently founded the environmental organization Friends of the Earth, the historic significance of this organization has not yet been established. Brower's contributions to the environmental movement are better represented by other properties.

Thus, the Diablo Canyon Power Plant does <u>not</u> meet Criterion B/2 (Persons) for listing in the National Register or California Register.

Criterion C/3 (Architecture)

The Diablo Canyon Power Plant is an example of a nuclear power plant that generates power using a specific type of nuclear reactor known as a pressurized water reactor (PWR). All of the nuclear power plants in the United States contain either PWRs or boiling water reactors (BWRs), with PWRs making up approximately 70 percent of all nuclear power plants in the United States. Following an early unique and experimental sodium cooled reactor at Santa Susana Sodium Reactor Experiment, the first phase of commercial nuclear power plants in California – including the Vallecitos Nuclear Power Plant and Humboldt Bay Nuclear Power Plant – were BWRs. The rest of the nuclear power plants completed in California – including the Rancho Seco Nuclear Power Plant, San Onofre Nuclear Generating Station, and Diablo Canyon Power Plant – used PWRs. Whereas the BWR at Humboldt Bay introduced an innovative underground design that influenced the design of later nuclear reactors, and the plant at Rancho Seco was the only nuclear plant in California to be built inland and include large cooling towers, the design of the reactors and support buildings at the Diablo Canyon Power Plant are not particularly unique or innovative to PWRs or nuclear power plants in general. The containment buildings at Diablo Canyon are very similar in appearance to those of Units 2 and 3 at the San Onofre Nuclear Generating Station, which were constructed during the same period.

Research did not uncover significant architectural designs or engineering achievements associated with Diablo Canyon Power Plant. It appears that many buildings and structures were designed in-house by PG&E staff, including the Training Building (Building 109), Administration Building (Building

104), and Maintenance Shop Building (Building 119), where the drawings were signed by PG&E's chief civil engineer. Where research revealed the involvement of outside architects and engineers, their contributions have not been recognized as particularly significant. Modernist architect Pietro Belluschi and architecture firm Wurster Bernardi and Emmons (WBE) were consultants to PG&E for the design of the plant's initial power block buildings. However, the project was not published in design journals of the time, nor where the architects' involvement highly touted in newspaper coverage of the plant. Existing scholarship on Belluschi and WBE do not recognize Diablo Canyon Power Plant as among either's significant works, and additional research was unable to confirm the extent of their contributions to a sufficient degree to attribute the design of any specific buildings or structures to Belluschi or WBE. Innovative coastal engineer Omar Lillevang was hired to redesign the breakwaters after one of them failed during storms in 1981. He is credited with designing more than 20 breakwaters over the course of his career, and research did not reveal the importance of the breakwaters at the Diablo Canyon Power Plant within his portfolio of work.

The plans for the two large warehouses from around 1985, the Main Warehouse (Building 115) and Cold Machine Shop (Building 116) were signed by architect James M. Leefe, who was associated with Bechtel Corporation, the firm that conducted the review of Diablo Canyon Power Plant's safety structures and systems in the early 1980s, and that had constructed other nuclear reactors in the United States. Research did not uncover the extent of Leefe's involvement in the design of these two warehouses, or any significance of their design or engineering. Thus, the plant's buildings and structures are not currently considered the work of a master architect or builder and are not significant for their architectural design or construction.

Thus, the Diablo Canyon Power Plant does <u>not</u> meet Criterion C/3 (Architecture) for listing in the National Register or California Register.

Criterion D/4 (Information Potential)

The "potential to yield information important to the prehistory or history of California" typically relates to archeological resources, rather than built resources. The analysis of resources for eligibility under Criterion D/4 is addressed in a separate report.

Criterion Consideration G (Achieved Significance within 50 Years)

The power generation core of Diablo Canyon Power Plant – the containment domes for the two nuclear reactors, the turbine and auxiliary buildings, and the intake and discharge structures – were mostly complete by about 1973, approximately 50 years ago. However, as modifications were made over a decade to address design flaws and additional safety concerns, the plant was not substantially completed until 1985, when the Unit 2 reactor was licensed for full commercial operation by the Nuclear Regulatory Commission. During the decade-long delay, other buildings were constructed at the site that are also less than 50 years of age. Research did not find that Diablo Canyon Power Plant, or any of the individual buildings or structures constructed by the time the plant was licensed for commercial operation met any significance criteria to be eligible for the National Register or California Register. As such, evaluation for exceptional significance under Criteria Consideration G is not necessary.

7. CONCLUSION

The Diablo Canyon Power Plant was originally developed between 1968 and 1985, and both units of the plant went into full commercial operation within the following year. Although the plant attracted substantial attention while it was under construction, it does not appear to meet any criteria for listing in the National Register of Historic Places or the California Register of Historical Resources. The property is not significant in the development of nuclear power in California or the United States or the modern environmental movement, nor are there other known significant historic events associated with the property (Criterion A/1). Research did not identify any individual important in local, state, or national history that has a significant association with the property to meet Criterion B/2. An example of one of many nuclear power plants designed around pressurized water reactors, the Diablo Canyon Power Plant and its supporting buildings and structures are not notable for their design and do not rise to the level to meet National Register and California Register eligibility under Criterion C/3. The only master architects or builders identified with the site were architect Pietro Belluschi and architecture firm Wurster, Bernardi, and Emmons. Existing scholarship has not identified Diablo Canyon Power Plant as a significant work of either Bellluschi or Wurster Bernardi, and Emmons, and additional research did not confirm the extent of their involvement with the design of the plant. As such none of the plant's buildings or structures are considered to be the work of a master architect or builder.

As the Diablo Canyon Power Plant does not meet any criteria for listing in the National Register or California Register, the property is not considered a historic resource for the purposes of the California Environmental Quality Act (CEQA).

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9. APPENDICES

Appendix A – Site Plan and Individual Building Descriptions

Attached for reference is the Revised Facilities Data site plan (SK-002-R1), dated October 10, 2018, and provided by PG&E showing the different buildings and structures within each decommissioning zone.

Page & Turnbull prepared California Department of Parks and Recreation Primary Record (DPR 523A) forms for the buildings and structures listed in the Facilities Database provided by PG&E, and confirmed through Data Request Set 2, with a Year Built date of 1985 or earlier. The 1985 date corresponds to when Diablo Canyon Power Plant's Unit 2 reactor was licensed for full commercial operation by the Nuclear Regulatory Commission, and the plant was considered functionally complete.

Although none of the individual buildings or structures, nor the group collectively, were found to meet the criteria for national or state historic listing, the DPR 523A forms serves to document the physical characteristics of those buildings and structures that remain from this early period of development at Diablo Canyon Power Plant.

DPR 523A forms prepared for the 30 buildings and structure listed below follow in order by Building Number:

Building #	Building Name	Year Built	Decom. Zone
1A	Raw Water Reservoir Pond - East	1972	10
1B	Raw Water Reservoir Pond - West	1972	10
097	Unit 1 Containment	1972	1
097A	Unit 1 Pipe Rack Area	1972	1
098	Unit 2 Containment	1973	1
098A	Unit 2 Pipe Rack Area	1973	1
099	Auxiliary Building	1972-1973	1
100	Outdoor Water Storage Tanks	1973	1
101	Turbine Building	1972-1973	1
103	Discharge Structure	1972	4
105	Security Office Building	1977, expanded 1988 and unknown date	2
108	Intake Structure	1972	4
109	Training Building	1984*	5
111	Turbine Generator and Rotor Equipment Warehouse	1982	7

Building #	Building Name	Year Built	Decom. Zone
114	Firing Range	1978	8
115	Main Warehouse	1985	3
116	Unit 2 Cold Machine Shop	1984	2
117A	RCA Laundry Facility	1975	1
118	Aux Boiler Enclosure	1980	1
121	Seawater Reverse Osmosis Facility	1985	7
304	Chlorination and Domestic Water	1985	10
305	Clarifier and Make-up Pre-Treatment Building	1985	10
306	Chemical Storage	1985	10
331	Soils lab - Concrete Testing Lab	1970	8
527	Start-up – Instrumentation & Control Craft Shop	By 1981**	1
601	Avila Gate Guard House	1970	13
602	Avila Gate Storage Building	1970	13
604	Warehouse Storage	1985	12
D-4	Long Term Cooling Water Pump Storage	1979	10
BW	East and West Breakwater	1972	4

* PG&E confirmed date through Data Request Set 2.

** Confirmed by appearance in 1981 aerial photograph of the plant site.

FACILITIES DATA

BLDG. No.	DESCRIPTION	ZONE No.
090	SERVICE AIR BUILDING	1
097	CONTAINMENT BUILDING UNIT 1	1
097A	UNIT 1 PIPE RACK AREA	1
098	CONTAINMENT BUILDING UNIT 2	1
098A	UNIT 2 PIPE RACK AREA	1
099	AUXILIARY BUILDING	1
100	RCA + OUTDOOR WATER STORAGE TANKS	1
101	TURBINE BUILDING UNITS 1 & 2	1
102	I& C/MEDICAL FACILITY	1
103	DISCHARGE STRUCTURE	4
104	ADMINISTRATION BUILDING	2
105	SECURITY OFFICE BUILDING	2
105A	PROTECTED AREA ACCESS FACILITY	2
106	TELEPHONE TERMINAL BUILDING	5
107	METEOROLOGICAL TOWER NO. 1 & BUILDING	5
108	UNIT 1 & 2 INTAKE STRUCTURE	4
108A	INTAKE ACCESS FACILITY	4
109	TRAINING BUILDING	5
110	SANDBLASTING & SPRAY PAINT FACILITY	7
111	TURBINE GENERATOR AND ROTOR EQUIP. WAREHOUSE	7
112	EQUIPMENT SHELTER - BACK-UP MET TOWER	8
113	WAREHOUSE "B" FUKUSHIMA FLEX EQUIP STORAGE	8
114A	SECURITY TRAINING TOWER	8
114B	SECURITY TRAINING BUILDING	8
115	DCPP MAIN WAREHOUSE	3
116	UNIT 2 COLD MACHINE SHOP	2
117A	RCA LAUNDRY FACILITY	1
117B	RCA RADWASTE STORAGE	1
117C	RCA BUILDING	1
118	AUX BOILER ENCLOSURE	1
119	MAINTENANCE SHOP BUILDING	5
120	HAZARDOUS WASTE FACILITY	7
121	SEAWATER REVERSE OSMOSIS FACILITY	7
122	FABRICATION SHOP	7
123	TES SHOWER/LAB FACILITY	4
124	SEWAGE TREATMENT PLANT	7
125	FIREWATER TANK & PUMPHOUSE	7
127	LIQUIDS STORAGE	3
128	INTAKE CONTROL BUILDING	4
129	INTAKE MAINTENANCE SHOP	4
130	GAS CYLINDER ENCLOSURE	6
131	RCA CALIBRATION FACILITY	1
161	MAINTENANCE SHOP ANNEX BUILDING	5
163	FFD/ACCESS BUILDING	5
165	USED FUEL STORAGE PROJECT	7
180	MODULAR BUILDING	7
181	MODULAR BUILDING	7
182	TCOM BUILDING	7
183	MODULAR BUILDING	7
202	STORAGE	6
203	TELECOMMUNICATIONS/SGI VAULT BUILDING	6
251	INDUSTRIAL FIRE OPERATIONS GARAGE	6
260	STEAM GENERATOR MAINTENANCE	6
261	DAY-ZIMMERMAN/CONSTRUCTION FIELD ENGINEERING	6
262	FACILITY MAINT/CONFERENCE ROOM/IN-PROCESSING	6
263	FIRE DEPARTMENT	6
264	CONFERENCE ROOM/TCOM/STORAGE	6
266	OFFICES	6
267	TOILETS	6
304	CLORINATION & DOMESTIC WATER	10
305	CLARIFIER & MAKE-UP PRE-TREATMENT BUILDING	10
306	CHEMICAL STORAGE	10
307	WASTEWATER HOLDING & TREATMENT EQUIPMENT ENCLOSURE	10
313	SECONDARY FLEX EQUIPMENT STORAGE FACILITY	11
331	SOILS LAB - CONCRETE TESTING LAB	8
402	VEHICLE MAINTENANCE SHOP	8
403	OLD STEAM GENERATOR STORAGE FACILITY (OSGSF)	2
501	SECONDARY MET TOWER AND CONTROL BUILDING	2
508	OFFICE	1
508-OLD	OFFICE - CONDEMNED	1
518	CRAFT FACILITY - STORAGE (ASSEMBLY BUILDING)	1
519	WAREHOUSE A	1
520	PAINT DEPARTMENT	1
521	CSRP OUTAGE OFFICE	1
527	START-UP - I& C CRAFT SHOP	1
528	TOILET TRAILER	13
531	SCAFFOLD STORAGE AREA (HAZ WASTE HANDLING AREA)	13
601	AVILA GATE GUARD HOUSE	12
602	AVILA GATE STORAGE BUILDING	12
603	DOCUMENT STORAGE FACILITY	12
604	WAREHOUSE STORAGE	12
612	TOILET TRAILER	12
NPG037	OFFICE/PAINT STORAGE	8
NPG049	MAKE-UP WATER	10
NPG056	VEHICLE MAINTENANCE OFFICE	12
NPG076	STORAGE - FACILITIES MAINTENANCE	8
NPG077	STORAGE - FACILITIES MAINTENANCE	8
NPG089	STEAM GENERATOR MOCK-UP	5
NPG091	FLEET SERVICES BREAK TRAILER	12
NPG226	ISFSI OFFICE TRAILER	11
GC063	LABORER BREAK ROOM	12
GC068	LABORER BREAK ROOM/OFFICE	12
GC075	INTAKE CREW STORAGE - B-GATE	11
BW	EAST AND WEST BREAKWATER	4
D-1	UNDERGROUND SEWAGE HOLDING TANK/LIFT	4
D-2	SMALL STORAGE BUILDING & TANK	6
D-3	SITE OVERLOOK FACILITY	9
D-4	LONG TERM COOLING WATER PUMP STORAGE	10
D-5	SCAFFOLD STORAGE YARD	11
D-6	B-GATE OFFICE	11
D-7	B-GATE SHADE STRUCTURE	11
D-8	CHEMICAL STORAGE TANKS AND PAD	4
D-9	UNDERGROUND SEPTIC TANKS AND PUMP STATIONS	13
D-10	ABOVE GROUND WATER TANKS	11, 12
D-11	WATER WELLS	12
D-12	LEACH FIELD EAST OF LOT 8 (ABANDONED)	8
D-14	ABANDONED DIESEL STORAGE TANKS	1
D-15	SECURITY STRUCTURES - BBRE'S AND CRASH GATES	13
D-17	CIRCULATING WATER TUNNELS, UNITS 1 & 2	13
D-18	U-1 TRANSFORMER YARD OIL RETENTION BASIN	1
D-19	U-2 TRANSFORMER YARD OIL RETENTION BASIN	1
1A	RAW WATER RESERVOIR POND - EAST	10
1B	RAW WATER RESERVOIR POND - WEST	10

LEGEND

104 PERMANENT FACILITY OCCUPIED OR AVAILABLE FOR OCCUPANCY	INTENSIVE LANDSCAPED AREA INCLUDING PAVED AREAS
SPACE RESERVED FOR FUTURE FACILITY OR EXISTING FACILITY EXPANSION	OUTDOOR EQUIPMENT TANKS AND THE LIKE
MAJOR CONSTRUCTION ACTIVITY AREA	PARKING AREA
OUTDOOR LAYDOWN OR STORAGE AREA	PROTECTED AREA FENCE
EXISTING NATIVE TREES TO BE PRESERVED	VEHICULAR ACCESS
RETAINING WALL	NPG0** TRAILER OR SEATRAIN

REFERENCE DRAWINGS:

1. AERIAL SURVEY MAIN PLANT SITE (JAN 2013)....................522314
2. AERIAL SURVEY CANYON AREA (ISFSI, 500kV YARD) (JAN 2013)..........522315
3. HI-RESOLUTION TOPOGRAPHY SURVEY POWER BLOCK AREA (JAN 2013).....522316
4. SITE MASTER PLAN: HISTORICAL INFO. ....512296 THRU 512296

BASE DRAWINGS	REV
512297	25
512298	17

UNIT 1 & 2

DATE	
10/10/18	
D.D.	CF
R.E.	SXM9
I.V.	SXM9
P.E.	N/A

REVISION DESCRIPTION: REVISED FACILITIES DATA

DCPP DECOMMISSIONING BUILDING DEMOLITION

DIABLO CANYON POWER PLANT
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

DWG SCALE: N.T.S.
BILL OF MATL:
SUPSDS:
SUPSD BY:

DRAWING	SHEET	PAGE	REV
SK-002-R1	1	1	1

RASTER: SK-001.tif, SK-001a.tif
DGN: SK-002-R1.dgn
CAD User: Date:

State of California ♁ The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary #
HRI #
Trinomial
NRHP Status Code
Other Listings
Review Code Reviewer Date

Page 1 of 1 ***Resource Name or #:** (Assigned by recorder) Raw Water Reservoir - East (Building 1A)
P1. Other Identifier:

***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted** ***a. County** San Luis Obispo, CA
***b. USGS 7.5' Quad** Port San Luis **Date** 2018
c. Address 3890 Diablo Canyon Road City Avila Beach Zip 93424
d. UTM: Zone 10S , 695569.87 mE/ 3898966.95 mN
e. Other Data: Within DCPP Decommissioning Zone 10

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)
Raw Water Reservoir - East (Building 1A) is an approximately 40,000 square foot ovoid pool. It is one of two 2.5 million gallon-capacity reservoirs in the DCPP Decommissioning Zone 10; the Raw Water Reservoir-West (Building 1B) is adjacent to the west and mirrored. Both are located north of the Independent Spent Fuel Storage Installation (ISFSI) and south of the 230 KV Switchyard. . The poured concrete reservoir is is lined with a white polymer membrane. The paired reservoirs are surrounded by chain-link fencing. Pumping equipment is between the two reservoirs.

PG&E documents estimate the structure was constructed in 1972. The two reservoirs are part of the site's Raw Water System. The Raw Water System receives water primarily from the property's Sea Water Reverse Osmosis system, which processes seawater into fresh water. The Raw Water Reservoir may also receive water from the Pretreatment System.

P5a. Photograph or Drawing

***P3b. Resource Attributes:** HP11 Engineering Structure

☐ Building ☒ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other

P5b. Description of Photo: Oblique view of subject property, looking east. September 23, 2021

***P6. Date Constructed/Age and Source:** ☒ Historic ☐ Prehistoric ☐ Both
1972 estimated, Facility Database for Aspen provided by PG&E

***P7. Owner and Address:**
Eureka Energy Co. (subsidiary of Pacific Gas and Electric Company)
77 Beale Street, 32nd Floor
San Francisco, CA 94177

***P8. Recorded by:**
Page & Turnbull, Inc.
170 Maiden Lane, 5th Floor
San Francisco, CA 94104

***P9. Date Recorded:**
December 8, 2021

***P10. Survey Type:** Intensive

***P11. Report Citation**: Black & Veatch Corporation, BHI Power Services and Haley Aldrich, "Diablo Canyon Power Plant Historical Site Assessment Report," prepared for Pacific Gas & Electric Company, June 2018.

***Attachments:** ☒NONE ☐Location Map ☐Continuation Sheet ☐Building, Structure, and Object Record ☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐ Other (List):

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary #
HRI #
Trinomial
NRHP Status Code

Other Listings
Review Code Reviewer Date

Page 1 of 1 ***Resource Name or #:** (Assigned by recorder) Raw Water Reservoir - West (Building 1B)
P1. Other Identifier:

***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted** ***a. County** San Luis Obispo, CA
***b. USGS 7.5' Quad** Port San Luis **Date** 2018
c. Address 3890 Diablo Canyon Road City Avila Beach Zip 93424
d. UTM: Zone 10S , 695501.62 mE/ 3898924.43 mN
e. Other Data: Within DCPP Decommissioning Zone 10

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)
Raw Water Reservoir - West (Building 1B) is an approximately 40,600 square foot ovoid pool. It is one of two 2.5 million gallon-capacity reservoirs in the DCPP Decommissioning Zone 10; the Raw Water Reservoir-East (Building 1A) is adjacent to the east and mirrored. Both are located north of the Independent Spent Fuel Storage Installation (ISFSI) and south of the 230 KV Switchyard. The poured concrete reservoir is lined with a white polymer membrane. The paired reservoirs are surrounded by chain-link fencing. Pumping equipment is between the two reservoirs.

PG&E documents estimate the structure was constructed in 1972. The two reservoirs are part of the site's Raw Water System. The Raw Water System receives water primarily from the property's Sea Water Reverse Osmosis system, which processes seawater into fresh water. The Raw Water Reservoir may also receive water from the Pretreatment System.

P5a. Photograph or Drawing

***P3b. Resource Attributes:** HP11 Engineering Structure

☐ Building ☒ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other

P5b. Description of Photo: Oblique view of subject property, looking east. September 23, 2021

***P6. Date Constructed/Age and Source:** ☒ Historic ☐ Prehistoric ☐ Both
1972 estimated, Facility Database for Aspen provided by PG&E

***P7. Owner and Address:**
Eureka Energy Co. (subsidiary of Pacific Gas and Electric Company)
77 Beale Street, 32nd Floor
San Francisco, CA 94177

***P8. Recorded by:**
Page & Turnbull, Inc.
170 Maiden Lane, 5th Floor
San Francisco, CA 94104

***P9. Date Recorded:**
December 8, 2021

***P10. Survey Type:** Intensive

***P11. Report Citation**: Black & Veatch Corporation, BHI Power Services and Haley Aldrich, "Diablo Canyon Power Plant Historical Site Assessment Report," prepared for Pacific Gas & Electric Company, June 2018, 5-6.
***Attachments:** ☒NONE ☐Location Map ☐Continuation Sheet ☐Building, Structure, and Object Record ☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐ Other (List):

State of California ♁ The Resources Agency
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PRIMARY RECORD

Primary #
HRI #
Trinomial
NRHP Status Code

Other Listings
Review Code Reviewer Date

Page 1 of 1 ***Resource Name or #:** (Assigned by recorder) Unit-1 Containment (Building 097)
P1. Other Identifier:

***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted** ***a. County** San Luis Obispo, CA
***b. USGS 7.5' Quad** Port San Luis **Date** 2018
c. Address 3890 Diablo Canyon Road City Avila Beach Zip 93424
d. UTM: Zone 10S , 695245.00 mE/ 3898689.00 mN
e. Other Data: Within DCPP Decommissioning Zone 1

***P3a. Description:**
Unit 1 Containment (Building 097) for the Diablo Canyon Nuclear Power Plant is a 215-foot tall and 147-foot diameter dome-shaped reinforced concrete structure. It is located on the east side of the Turbine Building (Building 101) and north of the similar Unit 2 Containment (Building 098). Both Unit 1 Containment (Building 097) and Unit 2 Containment (Building 098) are bounded to the east and in between the two containment structures by the lower Auxiliary Building (Building 099). The subject structure is accessed through a hatch in the Auxiliary Building (Building 099), which was not visible during the site visit.

Unit 1 Containment sits on a 16,972 square foot concrete slab-on-grade foundation. The structure exterior is three-foot thick, unpainted concrete. An externally mounted sheet metal duct is on the structure's northeast side, which begins at the base and ends at the top of the dome in a conical structure. The dome is lined on the interior in steel as it houses the nuclear reactor and associated systems, such as reactor cavity and sump, reactor coolant system pumps and piping, refueling machine, fuel transfer system up-ender, regenerative heat exchangers, containment recirculation sump, etc. A four-story rigid steel frame structure of catwalks and ladders is also inside the dome.

P5a. Photograph or Drawing

***P3b. Resource Attributes:** HP11 Engineering Structure

☐ Building ☒ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other

P5b. Description of Photo:
View of subject property, looking south September 23, 2021.

***P6. Date Constructed/Age and Source:** ☒ Historic ☐ Prehistoric ☐ Both
1972 estimated, Facility Database for Aspen provided by PG&E

***P7. Owner and Address:**
Eureka Energy Co. (subsidiary of Pacific Gas and Electric Company)
77 Beale Street, 32nd Floor
San Francisco, CA 94177

***P8. Recorded by:**
Page & Turnbull, Inc.
170 Maiden Lane, 5th Floor
San Francisco, CA 94104

***P9. Date Recorded:**
December 8, 2021

***P10. Survey Type:** Intensive

***P11. Report Citation**: Black & Veatch Corporation, BHI Power Services and Haley Aldrich, "Diablo Canyon Power Plant Historical Site Assessment Report," prepared for Pacific Gas & Electric Company, June 2018..
***Attachments:** ☒NONE ☐Location Map ☐Continuation Sheet ☐Building, Structure, and Object Record ☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐ Other (List):

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

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HRI #
Trinomial
NRHP Status Code

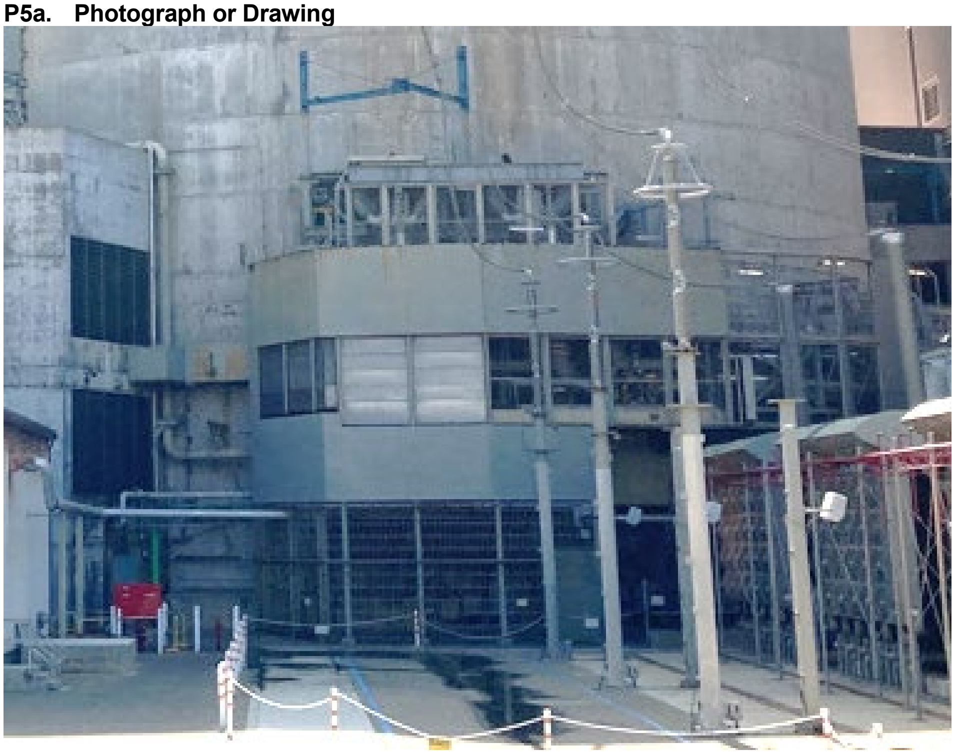
Other Listings
Review Code   Reviewer   Date

Page 1 **of** 1 ***Resource Name or #:** (Assigned by recorder) Unit 1 Pipe Rack Area (Building 097A)
P1. Other Identifier:

***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted** ***a. County** San Luis Obispo, CA
***b. USGS 7.5' Quad** Port San Luis **Date** 2018
c. Address 3890 Diablo Canyon Road City Avila Beach Zip 93424
d. UTM: Zone 10S , 695211.00 mE/ 3898695.00 mN
e. Other Data: Within DCPP Decommissioning Zone 1

***P3a. Description:**
The Pipe Rack Area for Unit-1 (Building 097A) for the Diablo Canyon Nuclear Power Plant is a pipeway structure that appears as a two-story, steel frame, curved, partial enclosure attached to the outside northwest quadrant of Unit 1 Containment building (Building 097). It has steel spandrel panels and metal louvers creating the partial enclosure around the exterior piping. The structure is on a 9,165 square foot concrete slab, originally constructed in 1972.

P5a. Photograph or Drawing



***P3b. Resource Attributes:** HP11 Engineering Structure
***P4. Resources Present:** ☐ Building ☒ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other
P5b. Description of Photo: Oblique view of subject property, looking southeast. September 23, 2021
***P6. Date Constructed/Age and Source:** ☒ Historic ☐ Prehistoric ☐ Both
1972 estimated, Facility Database for Aspen provided by PG&E

***P7. Owner and Address:**
Eureka Energy Co. (subsidiary of Pacific Gas and Electric Company)
77 Beale Street, 32nd Floor
San Francisco, CA 94177

***P8. Recorded by:**
Page & Turnbull, Inc.
170 Maiden Lane, 5th Floor
San Francisco, CA 94104

***P9. Date Recorded:**
December 8, 2021

***P10. Survey Type:** Intensive

***P11. Report Citation**: Black & Veatch Corporation, BHI Power Services and Haley Aldrich, “Diablo Canyon Power Plant Historical Site Assessment Report,” prepared for Pacific Gas & Electric Company, June 2018.
***Attachments:** ☒NONE ☐Location Map ☐Continuation Sheet ☐Building, Structure, and Object Record ☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐ Other (List):

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary #
HRI #
Trinomial
NRHP Status Code

Other Listings
Review Code   Reviewer   Date

Page 1 of 1 ***Resource Name or #:** (Assigned by recorder) Unit 2 Containment (Building 098)
P1. Other Identifier:

***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted** ***a. County** San Luis Obispo, CA
***b. USGS 7.5' Quad** Port San Luis **Date** 2018
c. Address 3890 Diablo Canyon Road City Avila Beach Zip 93424
d. UTM: Zone 10S , 695290.00 mE/ 3898595.00 mN
e. Other Data: Within DCPP Decommissioning Zone 1

***P3a. Description:**
Unit 2 Containment (Building 098) for the Diablo Canyon Nuclear Power Plant is a 215-foot tall and 147-foot diameter dome-shaped reinforced concrete structure. It is located on the east side of the Turbine Building (Building 101) and south of the similar Unit 1 Containment (Building 097). Both Unit 2 Containment (Building 098) and Unit 1 Containment (Building 097) are bounded to the east and in between the two containment structures by the lower Auxiliary Building (Building 099). The subject structure is accessed through a hatch in the Auxiliary Building (Building 099), which was not visible during the site visit.

Unit 2 Containment sits on a 16,972 square foot concrete slab-on-grade foundation. The structure exterior is three-foot thick, unpainted concrete. An externally mounted sheet metal duct is on the structure's southeast side, which begins at the base and ends at the top of the dome in a conical structure. The dome is lined on the interior in steel as it houses the nuclear reactor and associated systems, such as reactor cavity and sump, reactor coolant system pumps and piping, refueling machine, fuel transfer system up-ender, regenerative heat exchangers, containment recirculation sump, etc. A four-story rigid steel frame structure of catwalks and ladders is also inside the dome.

P5a. Photograph or Drawing

***P3b. Resource Attributes:** HP11 Engineering Structure

☐ Building ☒ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other

P5b. Description of Photo: Oblique view of subject property, September 23, 2021

***P6. Date Constructed/Age and Source:** ☒ Historic ☐ Prehistoric ☐ Both
1973 estimated, Facility Database for Aspen provided by PG&E

***P7. Owner and Address:**
Eureka Energy Co. (subsidiary of Pacific Gas and Electric Company)
77 Beale Street, 32nd Floor
San Francisco, CA 94177

***P8. Recorded by:**
Page & Turnbull, Inc.
170 Maiden Lane, 5th Floor
San Francisco, CA 94104

***P9. Date Recorded:**
December 8, 2021

***P10. Survey Type:** Intensive

***P11. Report Citation**: Black & Veatch Corporation, BHI Power Services and Haley Aldrich, "Diablo Canyon Power Plant Historical Site Assessment Report," prepared for Pacific Gas & Electric Company, June 2018.
***Attachments:** ☒NONE ☐Location Map ☐Continuation Sheet ☐Building, Structure, and Object Record ☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐ Other (List):

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PRIMARY RECORD

Primary #
HRI #
Trinomial
NRHP Status Code

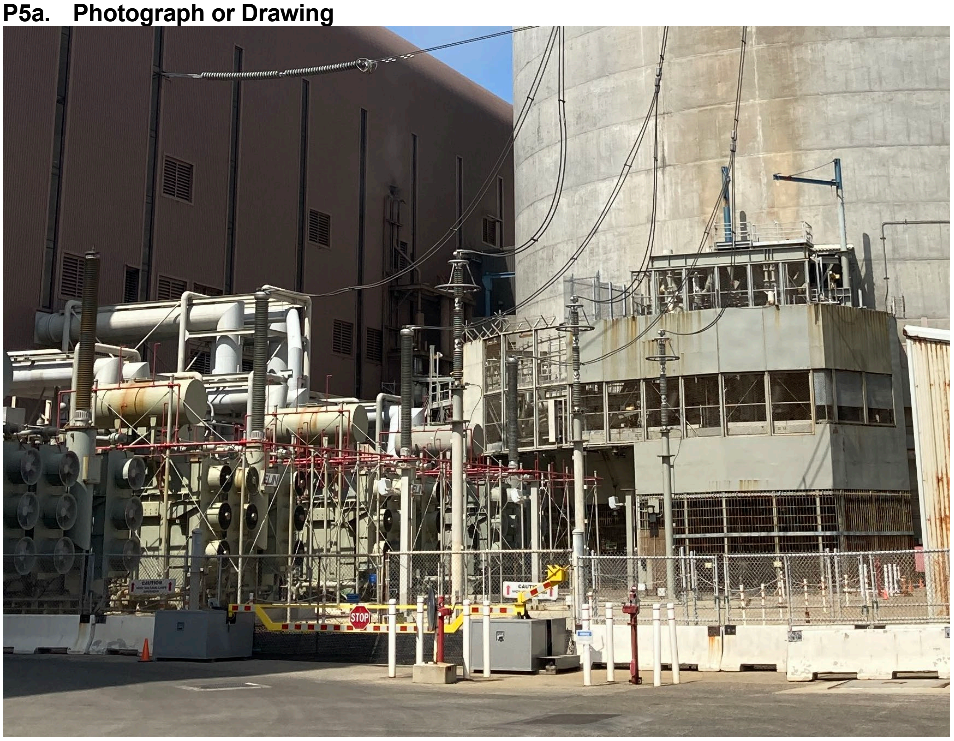
Other Listings
Review Code Reviewer Date

Page 1 **of** 1 ***Resource Name or #:** (Assigned by recorder) Unit-2 Pipe Rack Area (Building 098A)
P1. Other Identifier:

***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted** ***a. County** San Luis Obispo, CA
***b. USGS 7.5' Quad** Port San Luis **Date** 2018
c. Address 3890 Diablo Canyon Road City Avila Beach Zip 93424
d. UTM: Zone 10S , 695282.00 mE/ 3898559.00 mN
e. Other Data: Within DCPP Decommissioning Zone 1

***P3a. Description:**
The Pipe Rack Area for Unit-2 (Building 98A) for the Diablo Canyon Nuclear Power Plant is a pipeway structure that appears as a two-story, steel frame, curved, partial enclosure attached to the outside southwest quadrant of Unit 2 Containment building (Building 098). It has steel spandrel panels and metal louvers creating the partial enclosure around the exterior piping. The structure is on a 9,165 square foot concrete slab, originally constructed in 1973.

P5a. Photograph or Drawing



***P4. Resources Present:** ☐ Building ☒ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other

P5b. Description of Photo: Oblique view of subject property, September 23, 2021

***P6. Date Constructed/Age and Source:** ☒ Historic ☐ Prehistoric ☐ Both
1973 estimated, Facility Database for Aspen provided by PG&E

***P7. Owner and Address:**
Eureka Energy Co. (subsidiary of Pacific Gas and Electric Company)
77 Beale Street, 32nd Floor
San Francisco, CA 94177

***P8. Recorded by:**
Page & Turnbull, Inc.
170 Maiden Lane, 5th Floor
San Francisco, CA 94104

***P9. Date Recorded:**
December 8, 2021

***P10. Survey Type:** Intensive

***P11. Report Citation**: Black & Veatch Corporation, BHI Power Services and Haley Aldrich, “Diablo Canyon Power Plant Historical Site Assessment Report,” prepared for Pacific Gas & Electric Company, June 2018.

***Attachments:** ☒NONE ☐Location Map ☐Continuation Sheet ☐Building, Structure, and Object Record ☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐ Other (List):

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary #
HRI #
Trinomial
NRHP Status Code

Other Listings
Review Code Reviewer Date

 ***Resource Name or #:** (Assigned by recorder) Auxiliary Building (Building 099)

P1. Other Identifier:

***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted** ***a. County** San Luis Obispo, CA

***b. USGS 7.5' Quad** Port San Luis **Date** 2018

c. Address 3890 Diablo Canyon Road City Avila Beach Zip 93424

d. UTM: Zone 10S , 695253.00 mE/ 3898633.00 mN

e. Other Data: Within DCPP Decommissioning Zone 1

***P3a. Description:**

The Auxiliary Building (Building 099) for the Diablo Canyon Nuclear Power Plant is a five-story reinforced concrete building, with a roughly T-shaped footprint on an approximately 70,660 square foot concrete slab on grade foundation. The building is in the DCPP Decomissioning Zone 1 and located on the east side of the Turbine Building (101), extending between and around Unit 1 and 2 Containment domes (Building 097 & Building 098). The exterior walls are made of finished concrete with a central area sheathed in a vertically mounted corrugated metal rainscreen. No windows were visible on the exterior during the site visit.

The building includes the control rooms for Unit 1 and Unit 2 reactors, as well as auxiliary systems for operation and safe shutdown of the reactors. The building was constructed in two parts; the north half, in service of Unit 1 reactor was completed in 1972, and the south half, in service of Unit 2 reactor was completed in 1973. Each half of the building is a mirror of the other, including the control rooms. Although the Auxuilary Building is separated from the Turbine Building, the gap between which they are separated is enclosed and not visible from the exterior. From the Turbine Building, access is available at two areas, one for each unit's control room, bridging across the gap between the two buildings.

P5a. Photograph or Drawing

***P3b. Resource Attributes:** HP8 - Industrial Building

☒ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other

P5b. Description of Photo:
Oblique view of subject property, September 23, 2021

***P6. Date Constructed/Age and Source:** ☒ Historic ☐ Prehistoric ☐ Both
1972-1973 estimated, Facility Database for Aspen provided by PG&E

***P7. Owner and Address:**
Eureka Energy Co. (subsidiary of Pacific Gas and Electric Company)
77 Beale Street, 32nd Floor
San Francisco, CA 94177

***P8. Recorded by:**
Page & Turnbull, Inc.
170 Maiden Lane, 5th Floor
San Francisco, CA 94104

***P9. Date Recorded:**
December 8, 2021

***P10. Survey Type:** Intensive

***P11. Report Citation**: Black & Veatch Corporation, BHI Power Services and Haley Aldrich, "Diablo Canyon Power Plant Historical Site Assessment Report," prepared for Pacific Gas & Electric Company, June 2018.

***Attachments:** ☒NONE ☐Location Map ☐Continuation Sheet ☐Building, Structure, and Object Record ☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐ Other (List):

State of California ♁ The Resources Agency
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PRIMARY RECORD

Primary #
HRI #
Trinomial
NRHP Status Code

Other Listings
Review Code Reviewer Date

Page 1 **of** 1 ***Resource Name or #:** (Assigned by recorder) Outdoor Water Storage Tanks (Building 100)
P1. Other Identifier:

***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted** ***a. County** San Luis Obispo, CA
***b. USGS 7.5' Quad** Port San Luis **Date** 2018
c. Address 3890 Diablo Canyon Road City Avila Beach Zip 93424
d. UTM: Zone 10S , 695300.30 mE/ 3898678.36 mN
e. Other Data: Within DCPP Decommissioning Zone 1

***P3a. Description:**
The Outdoor Water Storage Tanks (Building 100) for the Diablo Canyon Nuclear Power Plant is group of seven tanks of varying sizes with the tallest at approximately three stories. The tanks are located in the DCPP Decommissioning Zone 1, on the east side of the Auxiliary Building (Building 99). Four of the tanks are grouped together at the north end, while three are grouped at the south end. The tanks are continuous poured concrete structures on a 9,418 square foot concrete slab, originally constructed in 1973. They are used for the storage of raw water for use in the reactors. Access hatches were not visible at the time of survey.

P5a. Photograph or Drawing

***P3b. Resource Attributes:** HP11 Engineering Structure

☐ Building ☒ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other

P5b. Description of Photo:
Oblique view of subject property, September 23, 2021

***P6. Date Constructed/Age and Source:** ☒ Historic ☐ Prehistoric ☐ Both
1973 estimated, Facility Database for Aspen provided by PG&E

***P7. Owner and Address:**
Eureka Energy Co. (subsidiary of Pacific Gas and Electric Company)
77 Beale Street, 32nd Floor
San Francisco, CA 94177

***P8. Recorded by:**
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170 Maiden Lane, 5th Floor
San Francisco, CA 94104

***P9. Date Recorded:**
December 8, 2021

***P10. Survey Type:** Intensive

***P11. Report Citation**: Black & Veatch Corporation, BHI Power Services and Haley Aldrich, “Diablo Canyon Power Plant Historical Site Assessment Report,” prepared for Pacific Gas & Electric Company, June 2018.
***Attachments:** ☒NONE ☐Location Map ☐Continuation Sheet ☐Building, Structure, and Object Record ☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐ Other (List):

State of California ♁ The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary #
HRI #
Trinomial
NRHP Status Code

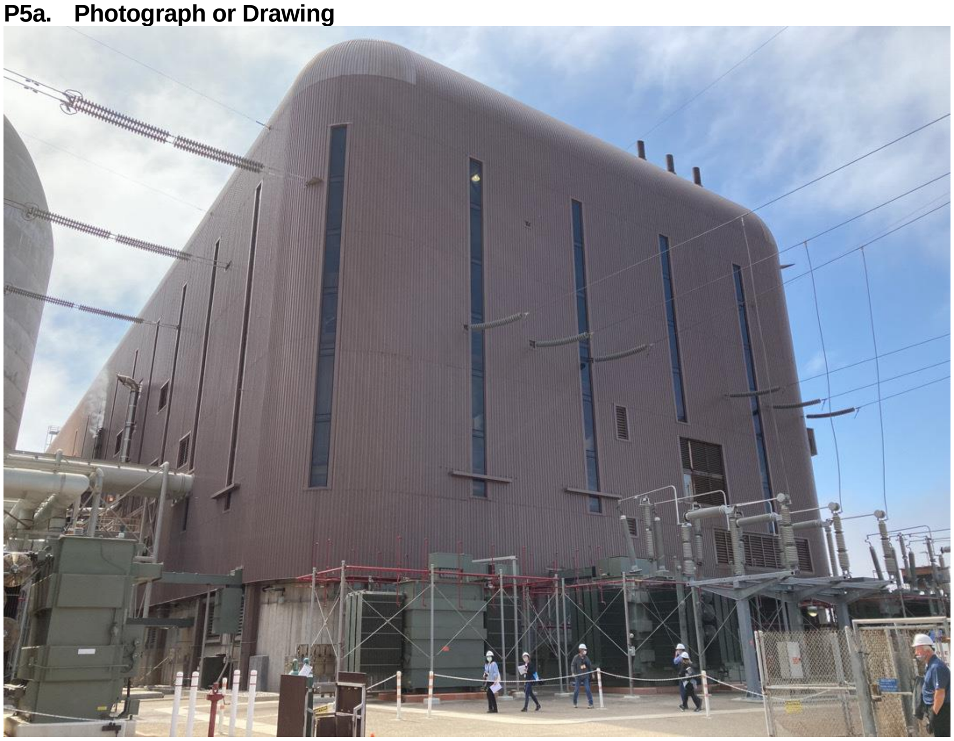
Other Listings
Review Code Reviewer Date

Page 1 **of** 3 ***Resource Name or #:** (Assigned by recorder) Turbine Building (Building 101)
P1. Other Identifier:

***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted** ***a. County** San Luis Obispo, CA
***b. USGS 7.5' Quad** Port San Luis **Date** 2018
c. Address 3890 Diablo Canyon Road City Avila Beach Zip 93424
d. UTM: Zone 10S , 695224.00 mE/ 3898609.00 mN
e. Other Data: Within DCPP Decommissioning Zone 1

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)
The Turbine Building (Building 101) is a four-level rectangular building with two basement levels. The building has an irregular footprint of 102,874 square feet, built atop a concrete foundation with footings. The core structure of the building is reinforced concrete, and the shell is supported on a rigid steel structure. It has concrete five structural bays from east to west (short ends) and 27 from north to south (long sides). The Turbine Building is located in the DCPP Decommissioning Zone 1, west of the Unit 1 and Unit 2 Containment domes (Building 097 and Building 098) and the Auxiliary Building (Building 099). The building's exterior walls and continuous flat roof were originally Galbestos panels, which, according to site personnel, have been covered over on the exterior with similar metal panels to match. Narrow, vertical slotted windows are centered in each structural bay and light each level above the ground level. The slotted windows are steel with glass spandrel panels. Entrances are through partially glazed metal doors at the west and north façades of the building at grade as well as at the fourth level bridge that connects to the Administrative Building (Building 104) to the south. The building does not have standard building "floors"; instead, building levels are referred to as elevations above sea level. (See Continuation Sheet, page 2)

P5a. Photograph or Drawing



***P3b. Resource Attributes:** HP8 - Industrial Building
***P4. Resources Present:** ☒ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other
P5b. Description of Photo: Oblique view of subject property, September 23, 2021
***P6. Date Constructed/Age and Source:** ☒ Historic ☐ Prehistoric ☐ Both
1972 estimated, Facility Database for Aspen provided by PG&E
***P7. Owner and Address:**
Eureka Energy Co. (subsidiary of Pacific Gas and Electric Company)
77 Beale Street, 32nd Floor
San Francisco, CA 94177

***P8. Recorded by:**
Page & Turnbull, Inc.
170 Maiden Lane, 5th floor
San Francisco, CA 94104

***P9. Date Recorded:**
December 8, 2021

***P10. Survey Type:** Intensive

***P11. Report Citation**: Black & Veatch Corporation, BHI Power Services and Haley Aldrich, "Diablo Canyon Power Plant Historical Site Assessment Report," prepared for Pacific Gas & Electric Company, June 2018.
***Attachments:** ☐NONE ☐Location Map ☒Continuation Sheet ☐Building, Structure, and Object Record ☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐ Other (List):

 ***Resource Name or #:** (Assigned by recorder) Turbine Building (Building 101)
P1. Other Identifier:

***P3a. Description (Continued)**

The industrial building is used to convert steam energy into electrical energy and houses eight turbine-generators (four for each unit). It contains steam system piping and other facilities to move steam generated in the Unit 1 and Unit 2 Containment buildings (secondary water system) to the turbine-generators. It also includes the systems to cool and condense the steam back into water using seawater transported from the Intake Structure (Building 108) though through underground concrete tunnels, circulated within the lower levels of the Turbine Building, and released back into the ocean at the Discharge Structure (Building 103) that is located below the Turbine Building at sea level (**Figure 1**).

The Turbine Building was constructed in two halves, each corresponding with the construction of the two reactors. As shown in PG&E construction photos, the north half of the building corresponding to the Unit 1 reactor was substantially complete in approximately 1972, along with the Unit 1 Containment Building (Building 097) and the Unit 1 half of the Auxiliary Building (Building 099). The southern half for Unit 2 was already under construction and substantially completed in 1973, along with the Unit 2 Containment Building (Building 098) and the Unit 2 half of the Auxiliary Building (Building 099 (**Figure 2**)). The distinction between the two halves is not readily apparent on the building's exterior (**Figure 3**).

The turbines were mounted on the reinforced concrete core structures, built with separate foundations from the rest of the building to isolate the vibrations from the turbines. The top level of the core structures (140 feet above sea level) had a 10-foot-thick concrete deck that matched the upper (fourth) level of the Turbine Building to maximize access to the turbines and their pipes.

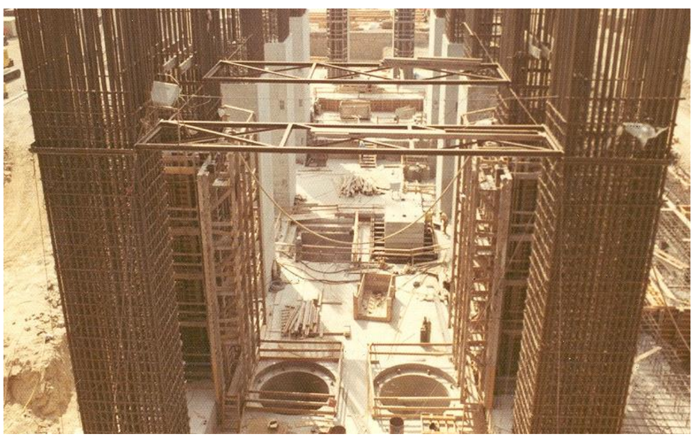


Figure 1: 1972 photo of the ground level of Unit 2 turbine structure under construction, visible are the openings for the intake and discharge tunnels, looking south. Source: PG&E.

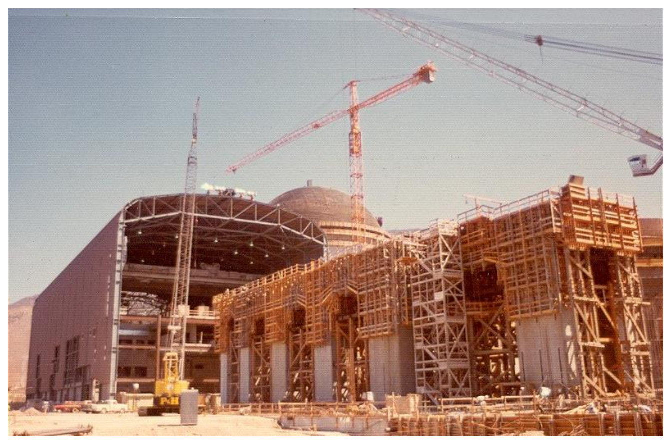


Figure 2: 1972 photo of completed north half of Turbine Building for Unit 1 (left) and the south half for Unit 2 (right, foreground) under construction. Source: PG&E.

After a 1974 test of the plant's cooling system, California Department of Fish and Wildlife determined that toxins from a chemical reaction between the salt in the seawater and the plant's copper tubing had caused the deaths of thousands of Red and Black Abalone.[1] To protect the ecology of Diablo Cove, 6 million feet of copper tubing were substituted for non-corrosive titanium piping in the condensers within the Turbine Building (**Figure 4**).

In 1976, PG&E announced the redesign of the plant structure to address the seismic concerns related to the submarine Hosgri Fault near the plant.[2] The pedestal structures for the turbines were reinforced with concrete buttresses at the ground level of the Turbine Building; these buttresses are enclosed within what appears as one-story additions on the west façade of the Turbine Building (**Figure 5**). Other changes to the building included the addition of the steel grating floor panels with checker plate steel and the replacement of roof bolts.[3] Projecting security enclosed platform were added to the exterior corners after 2001. (See Continuation Sheet, page 3)

[1] Richard F. Harris, "Diablo Canyon's 'green light' means more protests to come," *San Francisco Examiner,* 14 September 1983.
[2] "Diablo from Groundbreaking to Start-up," *The Telegram-Tribune*, 11 August 1984.
[3] "Diablo Canyon: Ready and Waiting," *San Francisco Chronicle*, 12 November 1978: 1.

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Page 1 **of** 3 ***Resource Name or #:** (Assigned by recorder) Turbine Building (Building 101)
P1. Other Identifier:

***P3a. Description (Continued)**

Figure 3: Undated construction photo of south half of Turbine Building nearing completion, looking northeast. Source: PG&E.

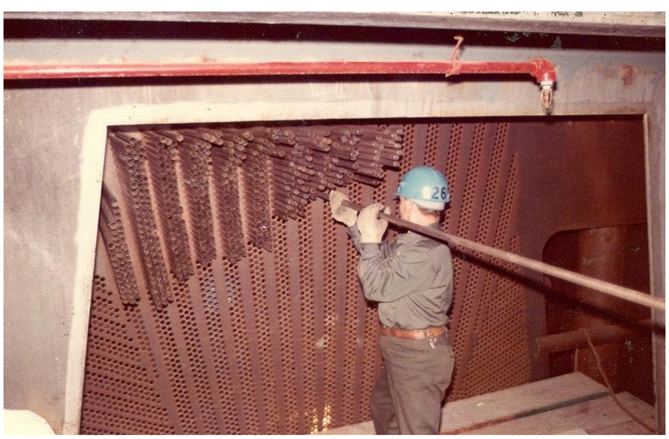

Figure 4: 1972 photo of installation of copper tubing for condenser for Unit 1. Source: PG&E.

Figure 5: One of two one-story additions at the west façade of the Turbine Building enclosing the structural buttress reinforcements and additional equipment, looking south. Source: Page and Turnbull, 2021.

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Trinomial
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 ***Resource Name or #:** (Assigned by recorder) Discharge Structure (Building 103)
P1. Other Identifier:

***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted** ***a. County** San Luis Obispo, CA
***b. USGS 7.5' Quad** Port San Luis **Date** 2018
c. Address 3890 Diablo Canyon Road City Avila Beach Zip 93424
d. UTM: Zone 10S , 695118.00 mE/ 3898568.00 mN
e. Other Data: Within DCPP Decommissioning Zone 4

***P3a. Description:**
The Discharge Structure (Building 103) for the Diablo Canyon Nuclear Power Plant is a reinforced concrete structure on a 12,544 square foot concrete slab foundation with perimetral footings. The rectilinear structure is located in DCPP Decommissioning Zone 4 on the west shoreline of Diablo Cove, directly west and below the Turbine Building (Building 101). It is the discharge point for the tertiary circulating water system within the power block (Containment Buildings, Auxiliary Building, and Turbine Building) that uses seawater collected from the Intake Structure (Building 108) to help cool and condense the steam from the secondary circulating water system used to generate electricity through the turbines in the Turbine Building (Building 101).

Most of the Discharge Structure (Building 103) is below the water level of the cove and not visible. Based on historic construction photos, the structure is an 85-foot tall rectilinear and sloped concrete structure with its highest level at the grade level of the Turbine Building (Building 101) and with its lowest level in Diablo Cove. The only visible part at grade west of the Turbine Building is a low, rectangular concrete structure with four protruding booms for the control gates on the discharge tunnels, below grade (**Figure 1**). The roof of this visible part has two linear ventilation openings along the width each covered with metal grating.
(See Continuation Sheet, page 2)

P5a. Photograph or Drawing

***P3b. Resource Attributes:** HP11 Engineering Structure
***P4. Resources Present:** ☐ Building ☒ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other
P5b. Description of Photo: View of subject property, looking east. September 23, 2021
***P6. Date Constructed/Age and Source:** ☒ Historic ☐ Prehistoric ☐ Both
1972 estimated, Facility Database for Aspen provided by PG&E
***P7. Owner and Address:**
Eureka Energy Co. (subsidiary of Pacific Gas and Electric Company)
77 Beale Street, 32nd Floor
San Francisco, CA 94177
***P8. Recorded by:**
Page & Turnbull, Inc.
170 Maiden Lane, 5th Floor
San Francisco, CA 94104

***P9. Date Recorded:** December 8, 2021

***P10. Survey Type:** Intensive

***P11. Report Citation**: Black & Veatch Corporation, BHI Power Services and Haley Aldrich, “Diablo Canyon Power Plant Historical Site Assessment Report,” prepared for Pacific Gas & Electric Company, June 2018.
***Attachments:** ☒NONE ☐Location Map ☐Continuation Sheet ☐Building, Structure, and Object Record ☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐ Other (List):

 ***Resource Name or #:** (Assigned by recorder) Discharge Structure (Building 103)

P1. Other Identifier:

***P3a. Description (Continued)**

The water is discharged through two large openings or spillways at the level of the cove bed and currently submerged. Poured concrete walls on the north and south sides of the spillways. These openings are protected beneath a sloped concrete slab which acts as a retaining wall. South of these openings, there is a rectangular concrete tower with a base at the level of the cove bed and a top flush with the retaining wall. This tower likely contains a stair for access to the cove floor for maintenance (**Figure 2**).

Figure 1: Top of Discharge Structure at ground level looking south. Source: Page and Turnbull, 2021.

Figure 2: Undated photo of the Discharge Structure's outlet under construction, looking northeast at cove bed with the north half of the Turbine Building visible above. The outlet is currently submerged. Source: PG&E.

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Page 1 **of** 1 ***Resource Name or #:** (Assigned by recorder) Security Office (Building 105)
P1. Other Identifier:

***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted** ***a. County** San Luis Obispo, CA
***b. USGS 7.5' Quad** Port San Luis **Date** 2018
c. Address 3890 Diablo Canyon Road City Avila Beach Zip 93424
d. UTM: Zone 10S , 695282.00 mE/ 3898432.00 mN
e. Other Data: Within DCPP Decommissioning Zone 2

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)
The Security Office Building (Building 105) is a one-story building with an irregular footprint of 9,418 square feet, located south of the Administration Building (Building 104), in the DCPP Decommissioning Zone 2. Built in 1977, the building was the secure entrance for plant personnel, controlling access to the critical plant infrastructure (the containment and turbine buildings).

The Security Office Building sits atop a concrete foundation with a flat built-up membrane roof. A rectangular dark aluminum and glass light monitor is on the roof of the original, center portion. The original portion of the building, along with the 1988 north addition (per San Luis Obispo County permit records), have a top band of vertically scored, exposed aggregate concrete above concrete walls where the same vertical, exposed concrete scoring continues down the lower wall at every other score line. The south, T-shaped addition, constructed at an unknown date, has corrugated metal exterior walls. Windows and doors are dark brown anodized aluminum frame with dark colored glass. The building has entrances at the south and north façades and secondary entrances with metal doors on all façades. With its security screening functions replaced by Protected Area Access Facility (Building 105A) in 2012, the Security Office Building currently contains offices and conference rooms for the security staff.

P5a. Photograph or Drawing

***P3b. Resource Attributes:** HP6 -3 Story Commercial Building

***P4. Resources Present:** ☒ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other

P5b. Description of Photo: Oblique view of subject property, looking northwest. September 23, 2021

***P6. Date Constructed/Age and Source:** ☒ Historic ☐ Prehistoric ☐ Both
1977 estimated, Facility Database for Aspen provided by PG&E

***P7. Owner and Address:**
Eureka Energy Co. (subsidiary of Pacific Gas and Electric Company)
77 Beale Street, 32nd Floor
San Francisco, CA 94177

***P8. Recorded by:**
Page & Turnbull, Inc.
170 Maiden Lane, 5th Floor
San Francisco, CA 94104

***P9. Date Recorded:**
December 8, 2021

***P10. Survey Type:** Intensive

***P11. Report Citation**: Black & Veatch Corporation, BHI Power Services and Haley Aldrich, “Diablo Canyon Power Plant Historical Site Assessment Report, prepared for Pacific Gas & Electric Company, June 2018.”
***Attachments:** ☒NONE ☐Location Map ☐Continuation Sheet ☐Building, Structure, and Object Record ☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐ Other (List):

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Primary #
HRI #
Trinomial
NRHP Status Code

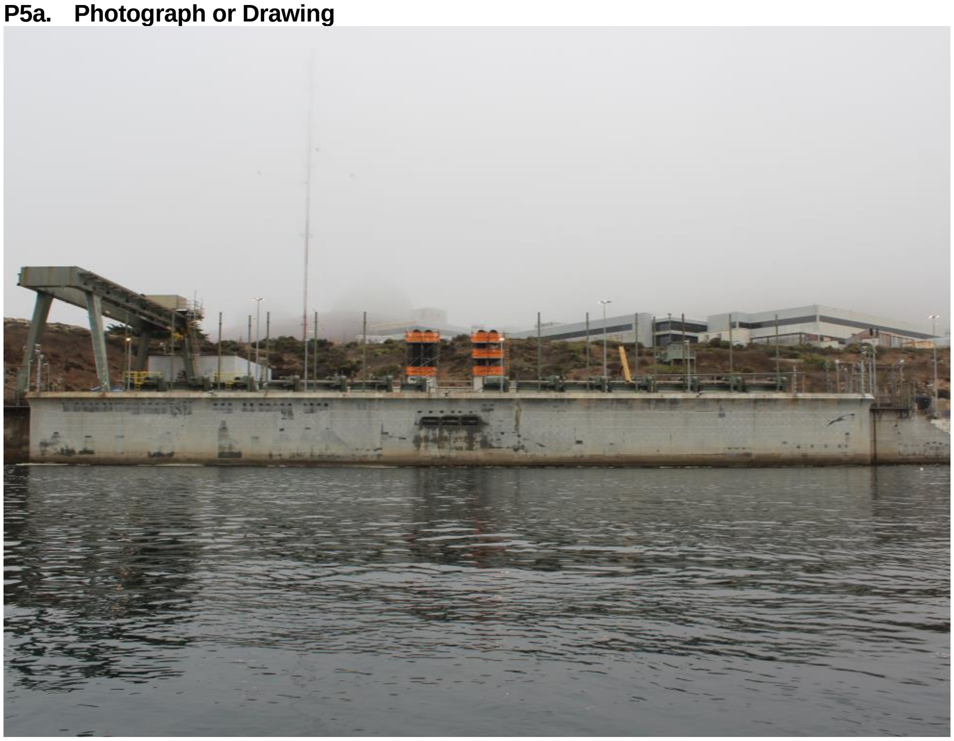
Other Listings
Review Code   Reviewer   Date

 ***Resource Name or #:** (Assigned by recorder) Intake Structure (Building 108)
P1. Other Identifier:

***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted** ***a. County** San Luis Obispo, CA
***b. USGS 7.5' Quad** Port San Luis **Date** 2018
c. Address 3890 Diablo Canyon Road City Avila Beach Zip 93424
d. UTM: Zone 10S , 695179.00 mE/ 3898206.00 mN
e. Other Data: Within DCPP Decommissioning Zone 4

***P3a. Description:**
The Intake Structure (Building 108) for the Diablo Canyon Nuclear Power Plant is a reinforced concrete structure on a 22,547 square foot concrete slab foundation with perimetral footings. The rectilinear structure is located at the manmade Intake Cove, formed by the two breakwaters, in the DCPP Decommissioning Zone 4 and directly west and below the Training Building (Building 109) and the Maintenance Shop Building (Building 119). It is the intake point for the tertiary circulating water system that uses seawater to help cool and condense the steam used to generate electricity through the turbine-generators in the Turbine Building (Building 101). Much of the Intake Structure (Building 108) is below the water level of the cove and not visible. The structure is protected from heavy surf by the breakwaters. Based on historic construction photos, the structure is approximately 40 feet tall with a rectangular concrete structure. Its top portion is at the grade level of the shoreline and the intake openings are at the floor of Intake Cove. The visible part of the structure has a concrete roof with 12 protruding booms for the control doors on the intake gates that are submerged (**Figure 1**). Seawater enters through the 12 gates, which currently have rolling grates over each opening to prevent sea life from passing into the cooling system. Four funnel vents, constructed since 2011 on top of the roof, help prevent tidal back flows. (See Continuation Sheet, page 2)

P5a. Photograph or Drawing



***P3b. Resource Attributes:** HP11 Engineering Structure
***P4. Resources Present:** ☐ Building ☒ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other
P5b. Description of Photo:
View of subject property, looking east. September 23, 2021
***P6. Date Constructed/Age and Source:** ☒ Historic ☐ Prehistoric ☐ Both
1972 estimated, Facility Database for Aspen provided by PG&E
***P7. Owner and Address:**
Eureka Energy Co. (subsidiary of Pacific Gas and Electric Company)
77 Beale Street, 32nd Floor
San Francisco, CA 94177

***P8. Recorded by:**
Page & Turnbull, Inc.
170 Maiden Lane, 5th Floor
San Francisco, CA 94104

***P9. Date Recorded:**
December 8, 2021

***P10. Survey Type:** Intensive

***P11. Report Citation**: Black & Veatch Corporation, BHI Power Services and Haley Aldrich, “Diablo Canyon Power Plant Historical Site Assessment Report,” prepared for Pacific Gas & Electric Company, June 2018.
***Attachments:** ☐NONE ☐Location Map ☒Continuation Sheet ☐Building, Structure, and Object Record ☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐ Other (List):

P1. Other Identifier:

***P3a. Description (Continued)**

Seawater from the Intake Structure are transported to the Turbine Building (building 101) through two large tunnels that are behind (north) the structure and are now below surface cover (**Figure 2**).

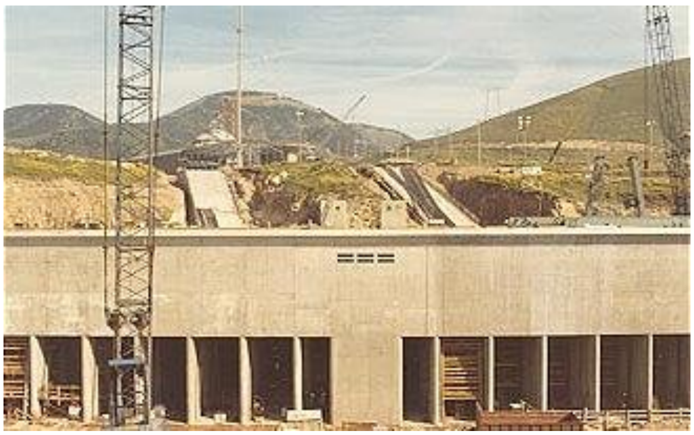


Figure 1: Undated photo of Intake Structure under construction, looking northeast. The openings are the intake gates that are now submerged. The six vents in the center is visible above the waterline. Source: PG&E.

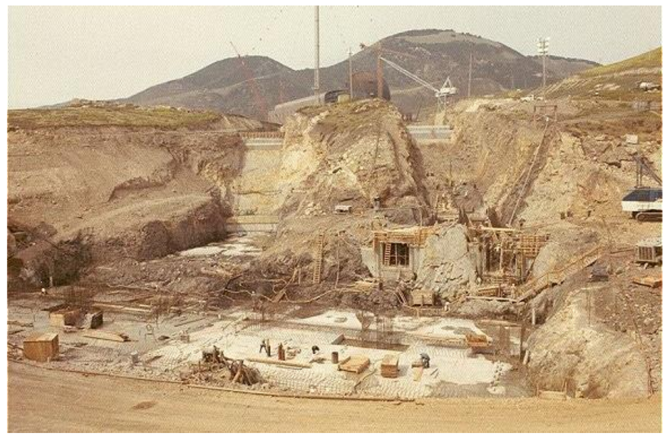


Figure 2: Undated photo of Intake Structure and the tunnels within it construction, looking northeast at cove bed. The north half of the Turbine Building (Building 101) is visible in the background. Source: PG&E Archives.

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NRHP Status Code

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Page 1 **of** 1 ***Resource Name or #:** (Assigned by recorder) Training Building (Building 109)
P1. Other Identifier:

***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted** ***a. County** San Luis Obispo, CA
***b. USGS 7.5' Quad** Port San Luis **Date** 2018
c. Address 3890 Diablo Canyon Road City Avila Beach Zip 93424
d. UTM: Zone 10S , 695274.14 mE/ 3898313.96 mN
e. Other Data: Within DCPP Decommissioning Zone 5

***P3a. Description:**
The Training Building (Building 109) for the Diablo Canyon Nuclear Power Plant is a rectilinear two-story steel frame building on an approximately 21,562 square foot concrete slab on grade foundation. The E-shaped building is located on the west side of Shore Cliff Road, adjacent to Parking Lot 4A in the DCPP Decommissioning Zone 5 and overlooks Intake Cove. The Training Building (Building 109) is north of and perpendicular to the Maintenance Shop Building (Building 119). The two buildings share a partially enclosed exterior breezeway toward their west ends. The Training Building has large classrooms for staff training, as well as numerous office spaces for the training department. It also houses the DCPP control room simulator, a full-size, complete mock-up of the Unit 1 control room, both in form and function. The simulator is used for operator training and performance of Nuclear Regulatory Commission (NRC) exams.

The flat-roof building is clad in painted metal panels and typical windows are vertically-oriented, fixed aluminum frame with tinted glass at a few locations. The main entrance is on the east façade, facing Parking Lot 4A, at a glass-enclosed, shed-roof lobby between the two legs of the E. The paired entrance doors are glass and set within the dark aluminum and glass wall. At least one other entrance is on the south façade in the partially glazed breezeway shared with Maintenance Shop Building (Building 119).

P5a. Photograph or Drawing

***P3b. Resource Attributes:** HP6 - Commercial Building Less than 3 Stories
***P4. Resources Present:** ☒ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other
P5b. Description of Photo:
Oblique view of the subject building, looking northwest. September 23, 2021
***P6. Date Constructed/Age and Source:** ☒ Historic ☐ Prehistoric ☐ Both
1984, provided by PG&E through data request.
***P7. Owner and Address:**
Eureka Energy Co. (subsidiary of Pacific Gas and Electric Company)
77 Beale Street, 32nd Floor
San Francisco, CA 94177
***P8. Recorded by:**
Page & Turnbull, Inc.
170 Maiden Lane, 5th Floor
San Francisco, CA 94104
***P9. Date Recorded:**
December 8, 2021
***P10. Survey Type:** Intensive

***P11. Report Citation**: Black & Veatch Corporation, BHI Power Services and Haley Aldrich,"Diablo Canyon Power Plant Historical Site Assessment Report," prepared for Pacific Gas & Electric Company, June 2018.
***Attachments:** ☒NONE ☐Location Map ☐Continuation Sheet ☐Building, Structure, and Object Record ☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐ Other (List):

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Primary #
HRI #
Trinomial
NRHP Status Code

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Review Code Reviewer Date

 ***Resource Name or #:** (Assigned by recorder) Turbine Generator and Rotor Equipment Warehouse (Building 111)
P1. Other Identifier:

***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted** ***a. County** San Luis Obispo, CA
***b. USGS 7.5' Quad** Port San Luis **Date** 2018
c. Address 3890 Diablo Canyon Road City Avila Beach Zip 93424
d. UTM: Zone 10S , 695480.50 mE/ 3898069.65 mN
e. Other Data: Within DCPP Decommissioning Zone 7

***P3a. Description:**
The Turbine Generator and Rotor Equipment Warehouse (Building 111) for the Diablo Canyon Nuclear Power Plant is a tall one-story steel frame building on an approximately 9,070 square foot concrete slab on grade foundation. Constructed in 1982, the L-shaped building is located on the southwest side of Shore Cliff Road in the northernmost part of the DCPP Decommissioning Zone 7, with other buildings at the flatten plateau overlooking the south shore of the Intake Cove and the Pacific Ocean. The warehouse is used to store the Hi-TRAC equipment and several large turbine related components. The north half is used to store reactor coolant pump-related components, such as a pump impeller, rotating assembly, and motor.

The building has low-pitched side gable roofs on each wing clad in corrugated metal and drain to gutters on the east and west edges. The building's exterior is corrugated metal. It has large roll-up doors on the south façade of the north wing and east façade of the west wing facing the open spaced formed by the two wings. A single person door is on the west façade of the west wing, facing the ocean. The building has no windows. There is a ladder at the north façade of the west wing for roof access.

P5a. Photograph or Drawing

***P4. Resources Present:** ☒ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other
P5b. Description of Photo: Oblique view of the subject property, looking west. September 23, 2021
***P6. Date Constructed/Age and Source:** ☒ Historic ☐ Prehistoric ☐ Both
1982 estimated, Facility Database for Aspen provided by PG&E
***P7. Owner and Address:**
Eureka Energy Co. (subsidiary of Pacific Gas and Electric Company)
77 Beale Street, 32nd Floor
San Francisco, CA 94177

***P8. Recorded by:**
Page & Turnbull, Inc.
170 Maiden Lane, 5th Floor
San Francisco, CA 94104
***P9. Date Recorded:**
December 8, 2021

***P10. Survey Type:** Intensive
***P11. Report Citation**: Black & Veatch Corporation, BHI Power Services and Haley Aldrich,"Diablo Canyon Power Plant Historical Site Assessment Report," prepared for Pacific Gas & Electric Company, June 2018.
***Attachments:** ☒NONE ☐Location Map ☐Continuation Sheet ☐Building, Structure, and Object Record ☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐ Other (List):

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Primary #
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Trinomial
NRHP Status Code

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Page 1 **of** 2 ***Resource Name or #:** (Assigned by recorder) Firing Range (Building 114)
P1. Other Identifier:

***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted** ***a. County** San Luis Obispo, CA
***b. USGS 7.5' Quad** Port San Luis **Date** 2018
c. Address 3890 Diablo Canyon Road City Avila Beach Zip 93424
d. UTM: Zone 10S , 695838.15 mE/ 3898191.38 mN
e. Other Data: Within DCPP Decommissioning Zone 8

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)
The Firing Range (Building 114) consists of a one-story wood framed building constructed atop a concrete slab foundation of 2,061 square feet and a large, open outdoor shooting range built into the hillside. The complex is located northeast of the Warehouse "B" Fukushima FLEX Equipment Storage Building (Building 113) in the DCPP Decommissioning Zone 8. A four-story Security Training Tower (Building 114A) was added to on the north side of the Firing Range building in 2012 with windows facing the range.

The Firing Range building has three sides, with its east side open to the outdoor range **(Figure 1 and Figure 2)**. It has a shed roof that angles down (like a partial gable) at the open side and is clad with corrugated metal. Exterior walls are wood board cladding, windows are aluminum frame sliding sash, and metal doors are partially glazed. The building is primarily accessed through a metal door on the west façade of the building with a secondary sheltered entrance at the southwest corner of the building, accessed by a concrete stair. (See Continuation Sheet, page 2)

P5a. Photograph or Drawing

***P3b. Resource Attributes:** HP39 - Other
***P4. Resources Present:** ☒ Building ☒ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other
P5b. Description of Photo: Oblique view of subject property, looking northeast. September 23, 2021
***P6. Date Constructed/Age and Source:** ☒ Historic ☐ Prehistoric ☐ Both
1978 estimated, Facility Database for Aspen provided by PG&E
***P7. Owner and Address:**
Eureka Energy Co. (subsidiary of Pacific Gas and Electric Company)
77 Beale Street, 32nd Floor
San Francisco, CA 94177
***P8. Recorded by:**
Page & Turnbull, Inc.
170 Maiden Lane, 5th Floor
San Francisco, CA 94104

***P9. Date Recorded:**
December 8, 2021

***P10. Survey Type:** Intensive

***P11. Report Citation**: None

***Attachments:** ☐NONE ☐Location Map ☒Continuation Sheet ☐Building, Structure, and Object Record ☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐ Other (List):

State of California ♁ The Resources Agency Primary #
DEPARTMENT OF PARKS AND RECREATION HRI #
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Page 1 **of** 2 ***Resource Name or #:** (Assigned by recorder) Firing Range (Building 114)
P1. Other Identifier:

***P3a. Description (Continued)**

The outdoor range is an elongated, U-shaped bowl built into the hillside **(Figure 3)**. It has two flat, paved levels each with 10 firing lanes **(Figure 4)**. Additional targets are set into the hillside, where the earth serves as the backstop. Another target area is set higher up in the hill. A few small storage sheds are at the periphery, along with a paved pedestrian path at the north end connecting the two levels. Concrete block walls and chain-link fencing secure the complex.

PG&E documents estimate the complex was constructed in 1978. The Firing Range is used for regular tactical training of security personnel.

Figure 1: Oblique view of the rear (east) open side of the Firing Range building, the later added tower is visible in the background, looking northeast. Source: Page and Turnbull, 2021.

Figure 2: View of exposed interior of Firing Range building, looking north. Source: Page and Turnbull, 2021.

Figure 3: View of the outdoor range with two levels of firing lanes and hillside beyond, looking southeast. Source: Page and Turnbull, 2021.

Figure 4: Detailed view of backstop at firing lanes. Source: Page and Turnbull, 2021.

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HRI #
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NRHP Status Code

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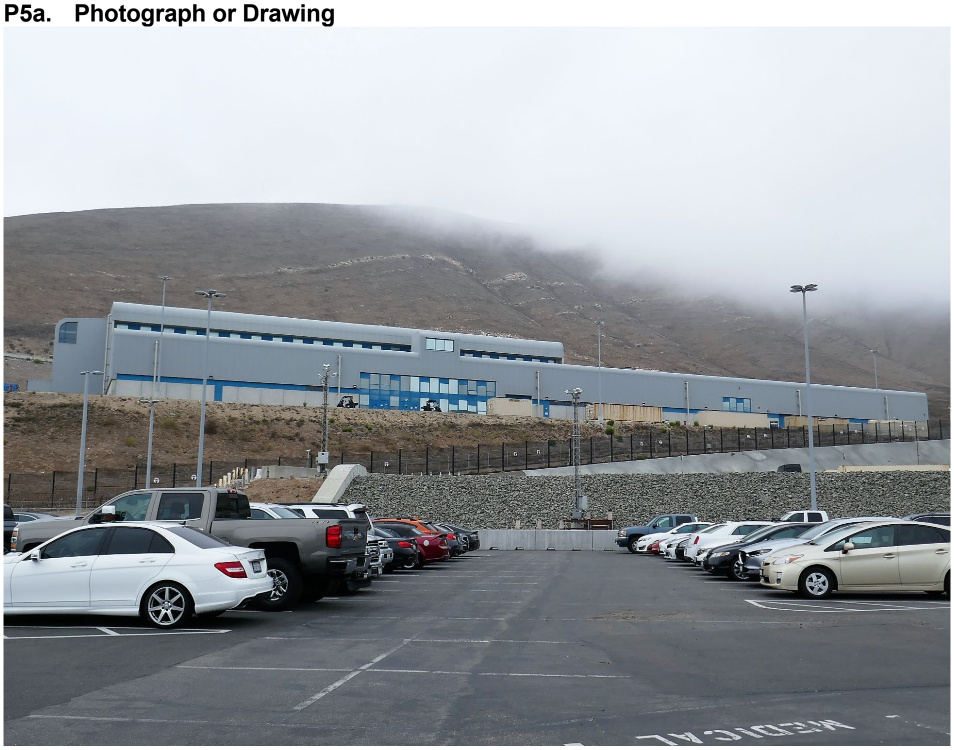
Review Code Reviewer Date

 ***Resource Name or #:** (Assigned by recorder) Main Warehouse (Building 115)
P1. Other Identifier:

***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted** ***a. County** San Luis Obispo, CA
***b. USGS 7.5' Quad** Port San Luis **Date** 2018
c. Address 3890 Diablo Canyon Road City Avila Beach Zip 93424
d. UTM: Zone 10S , 695570.00 mE/ 3898383.00 mN
e. Other Data: Within DCPP Decommissioning Zone 3

***P3a. Description:**
The Main Warehouse (Building 115) for the Diablo Canyon Nuclear Power Plant is a rectilinear two story with mezzanine steel frame building on an approximately 99,278 square foot concrete slab on grade foundation. The building is located on an elevated plateau above Parking Lot 7 and north of Parking Lot 8, in DCPP Decommissioning Zone 3. It is used as a large warehousing facility to support the plant, containing multiple racks and storage bins for parts and other materials. The second floor and intermediate mezzanine contain office space, currently housing engineering staff. The second floor is only on the northwestern quadrant of the building and is set back from the ground level's west façade. The flat-roof building has curved edges at the roofline in the long direction. The base of the building is clad in concrete-fiber panels, and the upper portions are sheathed in corrugated metal panels. At the north façade is an entrance for the warehouse space with a roll-up door. The main entrance to the mezzanine and second floor is at a projecting section housing the stairwell and an elevator, which has a curved window toward the top on the east and west sides. Two single person doors are set into a recessed metal and glass window wall to access the upper floors. Secondary doors are found on the other façades. Typical windows on the building are fixed steel windows. A section of the west façade, toward the center, has a metal and glass window wall. At the second story, windows for the offices are a continuous, recessed strip.

P5a. Photograph or Drawing



***P3b. Resource Attributes:** HP8 - Industrial Building

☒ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other

P5b. Description of Photo:
Oblique view of the subject property, looking northeast. September 23, 2021

***P6. Date Constructed/Age and Source:** ☒ Historic ☐ Prehistoric ☐ Both
1985 estimated, Facility Database for Aspen provided by PG&E

***P7. Owner and Address:**
Eureka Energy Co. (subsidiary of Pacific Gas and Electric Company)
77 Beale Street, 32nd Floor
San Francisco, CA 94177

***P8. Recorded by:**
Page & Turnbull, Inc.
170 Maiden Lane, 5th Floor
San Francisco, CA 94104

***P9. Date Recorded:**
December 8, 2021

***P10. Survey Type:** Intensive

***P11. Report Citation**: Black & Veatch Corporation, BHI Power Services and Haley Aldrich,"Diablo Canyon Power Plant Historical Site Assessment Report," prepared for Pacific Gas & Electric Company, June 2018.

***Attachments:** ☒NONE ☐Location Map ☐Continuation Sheet ☐Building, Structure, and Object Record ☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐ Other (List):

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PRIMARY RECORD

Primary #
HRI #
Trinomial
NRHP Status Code

Other Listings
Review Code Reviewer Date

Page 1 **of** 2 ***Resource Name or #:** (Assigned by recorder) Unit 2 Cold Machine Shop (Building 116)
P1. Other Identifier:

***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted** ***a. County** San Luis Obispo, CA
***b. USGS 7.5' Quad** Port San Luis **Date** 2018
c. Address 3890 Diablo Canyon Road City Avila Beach Zip 93424
d. UTM: Zone 10S , 695371.00 mE/ 3898425.00 mN
e. Other Data: Within DCPP Decommissioning Zone 2

***P3a. Description:**
The Unit 2 Cold Machine Shop (Building 116) for the Diablo Canyon Nuclear Power Plant is a rectilinear tall, two-story steel frame and tilt-up concrete building on an approximately 27,282 square foot concrete slab on grade foundation. Constructed in 1984, the building is located south of the Administration Building (Building 104) and east of the Protect Area Access Facility (Building 105A) in DCPP Decommissioning Zone 2. It is used primarily for the repair and maintenance of mechanical components onsite and contains maintenance offices. The second story appears to only be at the south end of the building.

The building is composed of three volumes; exterior walls on the east and west volumes are finished concrete with score lines or reveals creating a panelized appearance while the central volume is sheathed in corrugated metal panels. At the south façade, a metal and glass window wall, with a band of operable hopper window at each floor, is at the central volume under the corrugate roof element, and a projecting one-story, metal and glass volume with a curved roof is attached, which appears to be an entrance vestibule or stairwell. The central volume has a low-pitched front gable roof with two curved light monitors at the east and west edges running along the length of the volume. The light monitors face each other across the volume's roof and feature both glazed and vented openings. (See Continuation Sheet, page 2)

P5a. Photograph or Drawing

***P3b. Resource Attributes:** HP8 - Industrial Building

☒ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other

P5b. Description of Photo:
Oblique view of the subject property, looking southwest. September 23, 2021

***P6. Date Constructed/Age and Source:** ☒ Historic ☐ Prehistoric ☐ Both
1984 estimated, Facility Database for Aspen provided by PG&E

***P7. Owner and Address:**
Eureka Energy Co. (subsidiary of Pacific Gas and Electric Company)
77 Beale Street, 32nd Floor
San Francisco, CA 94177

***P8. Recorded by:**
Page & Turnbull, Inc.
170 Maiden Lane, 5th Floor
San Francisco, CA 94104

***P9. Date Recorded:**
December 8, 2021

***P10. Survey Type:** Intensive

***P11. Report Citation**: Black & Veatch Corporation, BHI Power Services and Haley Aldrich,"Diablo Canyon Power Plant Historical Site Assessment Report," prepared for Pacific Gas & Electric Company, June 2018.

***Attachments:** ☒NONE ☐Location Map ☐Continuation Sheet ☐Building, Structure, and Object Record ☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐ Other (List):

 ***Resource Name or #:** (Assigned by recorder) Unit 2 Cold Machine Shop (Building 116)
P1. Other Identifier:

***P3a. Description (Continued)**

The roofs of the west and east volume are flat and lower than the light monitors. The east volume also has a curved, linear corrugated metal canopy over a work area and loading zone along the east façade. A large rolling door opens the entire north façade of the central volume. The east and west volumes are accessed by sixteen-foot-tall roll-up steel doors on their north façade. Windows on the east and west volumes are large metal frame openings filled with glass block; a metal spandrel is between window assemblies that span the two floors.


Figure 1: South (left) and east (foreground) façades of the Cold Machine Shop (Building 116), looking northwest. Source: Page and Turnbull, 2021.


Figure 2: North façade of the Cold Machine Shop (Building 116) with roll-up doors at the three volumes, looking southeast. Source: Page & Turnbull, 2021.

State of California ♁ The Resources Agency Primary #
DEPARTMENT OF PARKS AND RECREATION HRI #
PRIMARY RECORD
Trinomial
NRHP Status Code

Other Listings
Review Code Reviewer Date

Page 1 of 1 ***Resource Name or #:** (Assigned by recorder) RCA Laundry Facility (Building 117A)
P1. Other Identifier:

***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted** ***a. County** San Luis Obispo, CA
***b. USGS 7.5' Quad** Port San Luis **Date** 2018
c. Address 3890 Diablo Canyon Road City Avila Beach Zip 93424
d. UTM: Zone 10S , 695341.07 mE/ 3898639.44 mN
e. Other Data: Within DCPP Decommissioning Zone 1

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)
The Radiation Controlled Area (RCA) Laundry Facility (Building 117A) is a two-story linear reinforced concrete structure with footprint of 12,795 square feet, built atop a concrete slab foundation. The building is located in the DCPP Decommissioning Zone 1, east of the Auxiliary Building (Building 099) and Outdoor Water Storage Tanks (Building 100). The roof appears to be flat or a low-pitch side gable roof. Exterior walls are made of corrugated metal; windows and doors were not visible during a site visit. A partially enclosed metal stair is at the south façade of the building. The lower level may be partially open as well.

PG&E documents estimate the building was constructed in 1975. The RCA Laundry Facility contains protective clothing washers and dryers, as well as facilities for the decontamination of tools and equipment. To the south is the RCA Radwaste Building (Building 117B, estimated construction in 1990) that is used for preparing, packaging, and storage of radioactive waste, though some of these functions may also be at the lower level of the RCALaundry Facility (Building 117A).

P5a. Photograph or Drawing

***P3b. Resource Attributes:** HP8 - Industrial Building

☒ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other

P5b. Description of Photo:
Oblique view of subject property, looking north. September 23, 2021

***P6. Date Constructed/Age and Source:** ☒ Historic ☐ Prehistoric ☐ Both
1975 estimated, Facility Database for Aspen provided by PG&E

***P7. Owner and Address:**
Eureka Energy Co. (subsidiary of Pacific Gas and Electric Company)
77 Beale Street, 32nd Floor
San Francisco, CA 94177

***P8. Recorded by:**
Page & Turnbull, Inc.
170 Maiden Lane, 5th Floor
San Francisco, CA 94104

***P9. Date Recorded:**
December 8, 2021

***P10. Survey Type:** Intensive

***P11. Report Citation**: Black & Veatch Corporation, BHI Power Services and Haley Aldrich, "Diablo Canyon Power Plant Historical Site Assessment Report," prepared for Pacific Gas & Electric Company, June 2018.

***Attachments:** ☒NONE ☐Location Map ☐Continuation Sheet ☐Building, Structure, and Object Record ☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐ Other (List):

State of California ♁ The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary #
HRI #
Trinomial
NRHP Status Code

Other Listings
Review Code | Reviewer | Date

Page 1 **of** 1 ***Resource Name or #:** (Assigned by recorder) Auxiliary Boiler Enclosure (Building 118)
P1. Other Identifier:

***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted** ***a. County** San Luis Obispo, CA
***b. USGS 7.5' Quad** Port San Luis **Date** 2018
c. Address 3890 Diablo Canyon Road City Avila Beach Zip 93424
d. UTM: Zone 10S , 695233.00 mE/ 3898726.00 mN
e. Other Data: Within DCPP Decommissioning Zone 1

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)
Auxiliary Boiler Enclosure (Building 118) is a rectangular one-story steel frame structure built atop a concrete slab foundation of 1,841 square feet. The building is located north of the Auxiliary Building (Building 099) and Unit 1 Containment (Building 097) in the DCPP Decommissioning Zone 1. Exterior walls and flat roof are corrugated metal; windows were not visible during the site visit. The building is primarily accessed by a large roll-up door on the north façade. The west façade has large square ventilation grills with metal louvers. There is a large exhaust stack protruding from the roof and attached to the north wall of the Auxiliary Building (Building 099).

PG&E documents estimate the building was constructed in 1980. The building houses the auxiliary boiler for the plant.

P5a. Photograph or Drawing

***P3b. Resource Attributes:** HP8 - Industrial Building
***P4. Resources Present:** ☒ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other
P5b. Description of Photo: Oblique view of subject property, looking south. September 23, 2021
***P6. Date Constructed/Age and Source:** ☒ Historic ☐ Prehistoric ☐ Both
1980 estimated, Facility Database for Aspen provided by PG&E
***P7. Owner and Address:**
Eureka Energy Co. (subsidiary of Pacific Gas and Electric Company)
77 Beale Street, 32nd Floor
San Francisco, CA 94177

***P8. Recorded by:**
Page & Turnbull, Inc.
170 Maiden Lane, 5th Floor
San Francisco, CA 94104

***P9. Date Recorded:**
December 8, 2021

***P10. Survey Type:** Intensive

***P11. Report Citation**: Black & Veatch Corporation, BHI Power Services and Haley Aldrich, “Diablo Canyon Power Plant Historical Site Assessment Report,” prepared for Pacific Gas & Electric Company, June 2018.
***Attachments:** ☒NONE ☐Location Map ☐Continuation Sheet ☐Building, Structure, and Object Record ☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐ Other (List):

State of California ♁ The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary #
HRI #
Trinomial
NRHP Status Code

Other Listings
Review Code Reviewer Date

Page 1 **of** 1 ***Resource Name or #:** (Assigned by recorder) Seawater Reverse Osmosis Facility (Building 121)
P1. Other Identifier:

***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted** ***a. County** San Luis Obispo, CA
***b. USGS 7.5' Quad** Port San Luis **Date** 2018
c. Address 3890 Diablo Canyon Road City Avila Beach Zip 93424
d. UTM: Zone 10S , 695520.03 mE/ 3898035.10 mN
e. Other Data: Within DCPP Decommissioning Zone 7

***P3a. Description:**
The Seawater Reverse Osmosis Facility (Building 121) for the Diablo Canyon Nuclear Power Plant consists of a rectilinear one-story steel frame building on an approximately 3,500 square foot concrete slab on grade foundation, as well as seawater reverse osmosis (SWRO) equipment on a 5,200 square-foot concrete pad to the east and various water tanks, pipes, and other equipment directly to the west of the building. The facility is located on the southwest side of Shore Cliff Road in DCPP Decommissioning Zone 7, between the Turbine Generator and Rotor Equipment Warehouse (Building 111) to the north and the Fabrication Shop (Building 122) to the south, overlooking the coastline. The facility creates potable water from seawater for use throughout the plant.

The building has a low-pitched gable roof and is clad in corrugated metal panels. It has no windows and access is through metal doors on the east and west façades along with large roll-up doors on the south and east facades. There is a ladder on the north façade for roof access.

P5a. Photograph or Drawing

***P3b. Resource Attributes** HP8 - Industrial Building

☒ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other

P5b. Description of Photo:
Oblique view of the subject property, looking northwest. September 23, 2021

***P6. Date Constructed/Age and Source:** ☒ Historic ☐ Prehistoric ☐ Both
1985 estimated, Facility Database for Aspen provided by PG&E

***P7. Owner and Address:**
Eureka Energy Co. (subsidiary of Pacific Gas and Electric Company)
77 Beale Street, 32nd Floor
San Francisco, CA 94177

***P8. Recorded by:**
Page & Turnbull, Inc.
170 Maiden Lane, 5th Floor
San Francisco, CA 94104

***P9. Date Recorded:**
December 8, 2021

***P10. Survey Type:** Intensive

***P11. Report Citation**: Black & Veatch Corporation, BHI Power Services and Haley Aldrich,"Diablo Canyon Power Plant Historical Site Assessment Report," prepared for Pacific Gas & Electric Company, June 2018.

***Attachments:** ☒NONE ☐Location Map ☐Continuation Sheet ☐Building, Structure, and Object Record ☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐ Other (List):

State of California ♁ The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary #
HRI #
Trinomial
NRHP Status Code

Other Listings
Review Code Reviewer Date

Page 1 **of** 1 ***Resource Name or #:** (Assigned by recorder) Chlorination & Domestic Water (Building 304)
P1. Other Identifier:

***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted** ***a. County** San Luis Obispo, CA
***b. USGS 7.5' Quad** Port San Luis **Date** 2018
c. Address 3890 Diablo Canyon Road City Avila Beach Zip 93424
d. UTM: Zone 10S , 695661.99 mE/ 3898982.10 mN
e. Other Data: Within DCPP Decommissioning Zone 10

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)
The Chlorination & Domestic Water (Building 304) is a one-story, steel frame building built on an approximately 1,376 square concrete slab foundation. The building is located in the DCPP Decomissioning Zone 10, east of the East Raw Water Reservoir (Building 1B). It is in a cluster with Clarifier & Make-up Pre-Treatment Building (Building 305) and Chemical Storage (Building 306). The walls of the building are corrugated metal while the gable roof appears to be a standing seam metal roof. No doors or windows were visible during a site visit. There is storage tank on the north side of the building.

PG&E documents estimate the building was constructed in 1985, as were the Clarifier & Make-up Pre-Treatment Building (Building 305) and Chemical Storage (Building 306). The building houses chlorination and domestic water treatment for the plant.

P5a. Photograph or Drawing

***P3b. Resource Attributes:** HP8 - Industrial Building

☒ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other

P5b. Description of Photo:
View of subject building (behind Building 305), looking east, indicated with arrow. September 23, 2021

***P6. Date Constructed/Age and Source:** ☒ Historic ☐ Prehistoric ☐ Both
1985 estimated, Facility Database for Aspen provided by PG&E

***P7. Owner and Address:**
Eureka Energy Co. (subsidiary of Pacific Gas and Electric Company)
77 Beale Street, 32nd Floor
San Francisco, CA 94177

***P8. Recorded by:**
Page & Turnbull, Inc.
170 Maiden Lane, 5th Floor
San Francisco, CA 94104

***P9. Date Recorded:**
December 8, 2021

***P10. Survey Type:** Intensive

***P11. Report Citation**: Black & Veatch Corporation, BHI Power Services and Haley Aldrich, “Diablo Canyon Power Plant Historical Site Assessment Report,” prepared for Pacific Gas & Electric Company, June 2018.
***Attachments:** ☒NONE ☐Location Map ☐Continuation Sheet ☐Building, Structure, and Object Record ☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐ Other (List):

State of California ♁ The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary #
HRI #
Trinomial
NRHP Status Code

Other Listings
Review Code   Reviewer   Date

Page 1 **of** 1 ***Resource Name or #:** (Assigned by recorder) Clarifier & Make-up Pre-Treatment Building (305)
P1. Other Identifier:

***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted** ***a. County** San Luis Obispo, CA
***b. USGS 7.5' Quad** Port San Luis **Date** 2018
c. Address 3890 Diablo Canyon Road City Avila Beach Zip 93424
d. UTM: Zone 10S , 695651.00 mE/ 3898983.40 mN
e. Other Data: Within DCPP Decommissioning Zone 10

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)
Clarifier & Make-up Pre-Treatment Building (Building 304) is a one-story, steel frame building built on an approximately 480 square concrete slab foundation. The building is located in the DCPP Decommissioning Zone 10, east of the East Raw Water Reservoir (Building 1B). It is in a cluster with Chlorination & Domestic Water Building (Building 304) and Chemical Storage (Building 306). The walls of the gable-roofed building are corrugated metal, and no doors or windows were visible during the site visit. There is a small treatment plant on the north side of the building.

PG&E documents estimate the building was constructed in 1985, as were the Chlorination & Domestic Water Building (Building 304) and Chemical Storage (Building 306). The building contains a multimedia filter and chlorination injection to minimize algae growth in the water that is then stored in the Raw Water Reservoirs; also prevents fouling of filters in the Raw Water System with slime.

P5a. Photograph or Drawing

***P3b. Resource Attributes:** HP8 - Industrial Building

☒ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other

P5b. Description of Photo: View of subject building, looking east, indicated with arrow. September 23, 2021

***P6. Date Constructed/Age and Source:** ☒ Historic ☐ Prehistoric ☐ Both
1985 estimated, Facility Database for Aspen provided by PG&E

***P7. Owner and Address:**
Eureka Energy Co. (subsidiary of Pacific Gas and Electric Company)
77 Beale Street, 32nd Floor
San Francisco, CA 94177

***P8. Recorded by:**
Page & Turnbull, Inc.
170 Maiden Lane, 5th Floor
San Francisco, CA 94104

***P9. Date Recorded:** December 8, 2021

***P10. Survey Type:** Intensive

***P11. Report Citation**: Black & Veatch Corporation, BHI Power Services and Haley Aldrich, “Diablo Canyon Power Plant Historical Site Assessment Report,” prepared for Pacific Gas & Electric Company, June 2018.
***Attachments:** ☒NONE ☐Location Map ☐Continuation Sheet ☐Building, Structure, and Object Record ☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐ Other (List):

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DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary #
HRI #
Trinomial
NRHP Status Code

Other Listings
Review Code Reviewer Date

Page 1 **of** 1 ***Resource Name or #:** (Assigned by recorder) Chemical Storage (Building 306)
P1. Other Identifier:

***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted** ***a. County** San Luis Obispo, CA
***b. USGS 7.5' Quad** Port San Luis **Date** 2018
c. Address 3890 Diablo Canyon Road City Avila Beach Zip 93424
d. UTM: Zone 10S , 695651.96 mE/ 3898974.58 mN
e. Other Data: Within DCPP Decommissioning Zone 10

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)
Chemical Storage (Building 306) is a one-story, steel frame building built on an approximately 480 square concrete slab foundation. The building is located in the DCPP Decomissioning Zone 10, east of the East Raw Water Reservoir (Building 1B). It is in a cluster with the Chlorination & Domestic Water Building (Building 304) and Clarifier & Make-up Pre-Treatment Building (Building 305). The walls of the gable-roof building are corrugated metal, and no doors or windows were visible during the site visit.

PG&E documents estimate the building was constructed in 1985, as were the Chlorination & Domestic Water Building (Building 304) and Clarifier & Make-up Pre-Treatment Building (Building 305). The building is used for storage of chemicals for the production of make-up water and domestic water for the plant.

P5a. Photograph or Drawing

***P3b. Resource Attributes:** HP8 - Industrial Building

☒ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other

P5b. Description of Photo:
View of subject building, looking east indicated with arrow. September 23, 2021

***P6. Date Constructed/Age and Source:** ☒ Historic ☐ Prehistoric ☐ Both
1985 estimated, Facility Database for Aspen provided by PG&E

***P7. Owner and Address:**
Eureka Energy Co. (subsidiary of Pacific Gas and Electric Company)
77 Beale Street, 32nd Floor
San Francisco, CA 94177

***P8. Recorded by:**
Page & Turnbull, Inc.
170 Maiden Lane, 5th Floor
San Francisco, CA 94104

***P9. Date Recorded:**
December 8, 2021

***P10. Survey Type:** Intensive

***P11. Report Citation**: Black & Veatch Corporation, BHI Power Services and Haley Aldrich, “Diablo Canyon Power Plant Historical Site Assessment Report,” prepared for Pacific Gas & Electric Company, June 2018.
***Attachments:** ☒NONE ☐Location Map ☐Continuation Sheet ☐Building, Structure, and Object Record ☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐ Other (List):

State of California ♁ **The Resources Agency**
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary #
HRI #
Trinomial
NRHP Status Code

Other Listings
Review Code Reviewer Date

Page 1 **of** 1 ***Resource Name or #:** (Assigned by recorder) Soils and Concrete Testing Lab (Building 331)
P1. Other Identifier:

***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted** ***a. County** San Luis Obispo, CA
***b. USGS 7.5' Quad** Port San Luis **Date** 2018
c. Address 3890 Diablo Canyon Road City Avila Beach Zip 93424
d. UTM: Zone 10S, 695959.00 mE/ 3898075.00 mN
e. Other Data: Within DCPP Decommissioning Zone 8

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)
Soils and Concrete Testing Lab (Building 331) is a rectangular one-story steel frame building with a side gable roof constructed atop a concrete slab foundation of 1,824 square feet. The building is located south of the Warehouse “B” Fukushima FLEX Equipment Storage Building (Building 113), on the east side of Diablo Canyon Drive and across from Parking Lot 1 in DCPP Decommissioning Zone 8. The exterior walls are clad in corrugated metal and the roof is clad in metal as well. The building is primarily accessed through a double door on the center of the west façade, with a secondary double door entrance on the south façade. The metal doors are partially glazed. Punched window openings in a regular pattern have metal sliding sashes. On the west façade, a round exhaust fan is mounted in a previous window opening. There are gutters along the east and west edges of the roof.

Constructed around 1970, the building is among the oldest extant buildings at the site. It has housed concrete strength and soils testing since the original construction of the plant, when it was testing the quality of the concrete being mixed and manufactured adjacent to the building on site. It continues to house the testing facilities.

P5a. Photograph or Drawing

***P3b. Resource Attributes:** HP8 - Industrial Building
***P4. Resources Present:** ☒ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other
P5b. Description of Photo: Oblique view of subject property, looking northeast, September 23, 2021
***P6. Date Constructed/Age and Source:** ☒ Historic ☐ Prehistoric ☐ Both
1970 estimated, Facility Database for Aspen provided by PG&E
***P7. Owner and Address:**
Eureka Energy Co. (subsidiary of Pacific Gas and Electric Company)
77 Beale Street, 32nd Floor
San Francisco, CA 94177

***P8. Recorded by:**
Page & Turnbull, Inc.
170 Maiden Lane, 5th Floor
San Francisco, CA 94104

***P9. Date Recorded:**
December 8, 2021

***P10. Survey Type:** Intensive

***P11. Report Citation**: None

***Attachments:** ☒NONE ☐Location Map ☐Continuation Sheet ☐Building, Structure, and Object Record ☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐ Other (List):

State of California ♁ The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary #
HRI #
Trinomial
NRHP Status Code

Other Listings
Review Code Reviewer Date

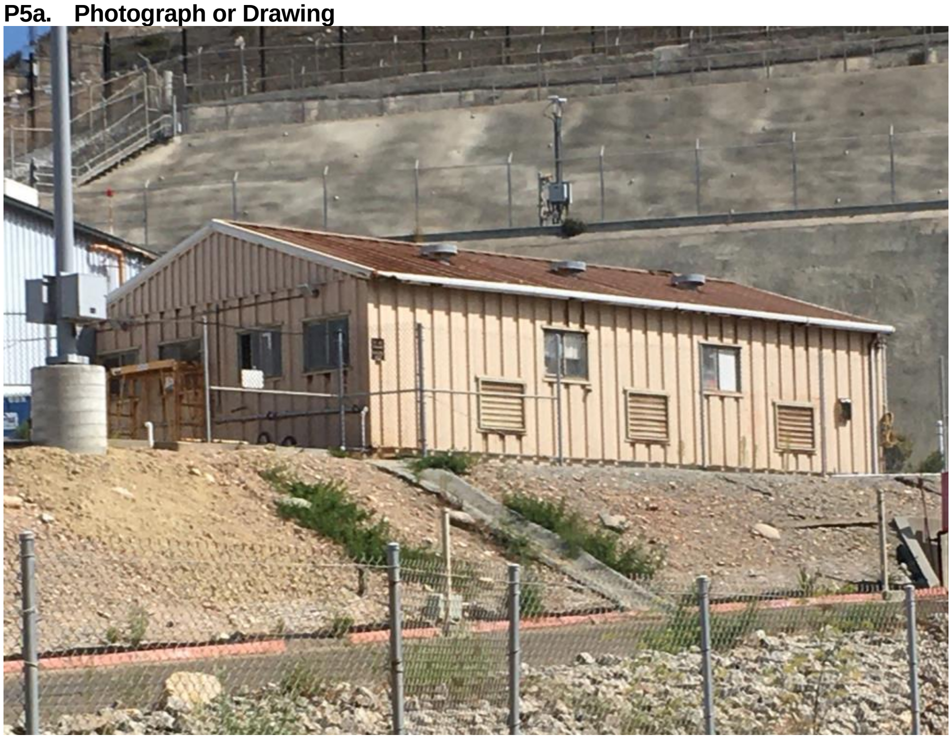
Page 1 of 1 ***Resource Name or #:** (Assigned by recorder) Start-Up – I&C Craft Shop (Building 527)
P1. Other Identifier:

***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted** ***a. County** San Luis Obispo, CA
***b. USGS 7.5' Quad** Port San Luis **Date** 2018
c. Address 3890 Diablo Canyon Road City Avila Beach Zip 93424
d. UTM: Zone 10S , 695224.00 mE/ 3898795.00 mN
e. Other Data: Within DCPP Decommissioning Zone 1

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)
The Start-Up – Instrumentation and Controls (I&C) Craft Shop (Building 527) is a one-story, steel frame building with a rectangular footprint of 1,056 square feet, built atop a concrete slab foundation. The building is located in the DCPP Decommissioning Zone 1, on a small plateau north of the Unit 1 Containment (Building 097) and Auxiliary Building (Building 099), with a group of other small buildings around Warehouse A (Building 519). Exterior walls and gable roof are clad with corrugated metal panels. The building is entered at the front (east) and north façades through partially glazed double doors. Similar-sized windows openings are on all four sides in different numbers; the windows are metal frame sliding sashes. The north and south façades have large square ventilations grilles with metal louvers. There are gutters along the top of the north and south façades.

A 1981 aerial photograph shows the building in its current location. No other documentation has a construction date for the building. The building currently houses Instrumentation and Controls operations, a Motor Controls Center electrical panel, and small fabrication facilities.

P5a. Photograph or Drawing



***P3b. Resource Attributes:** HP8 - Industrial Building
***P4. Resources Present:** ☒ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other
P5b. Description of Photo: Oblique view of subject property, looking northeast September 23, 2021
***P6. Date Constructed/Age and Source:** ☒ Historic ☐ Prehistoric ☐ Both
By 1981, according to aerial photograph, HistoricAerials.com
***P7. Owner and Address:**
Eureka Energy Co. (subsidiary of Pacific Gas and Electric Company)
77 Beale Street, 32nd Floor
San Francisco, CA 94177

***P8. Recorded by:**
Page & Turnbull, Inc.
170 Maiden Lane, 5th Floor
San Francisco, CA 94104

***P9. Date Recorded:**
December 8, 2021

***P10. Survey Type:** Intensive

***P11. Report Citation**: Black & Veatch Corporation, BHI Power Services and Haley Aldrich, “Diablo Canyon Power Plant Historical Site Assessment Report,” prepared for Pacific Gas & Electric Company, June 2018.
***Attachments:** ☒NONE ☐Location Map ☐Continuation Sheet ☐Building, Structure, and Object Record ☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐ Other (List):

State of California ♁ The Resources Agency Primary #
DEPARTMENT OF PARKS AND RECREATION HRI #
PRIMARY RECORD
Trinomial
NRHP Status Code

Other Listings
Review Code Reviewer Date

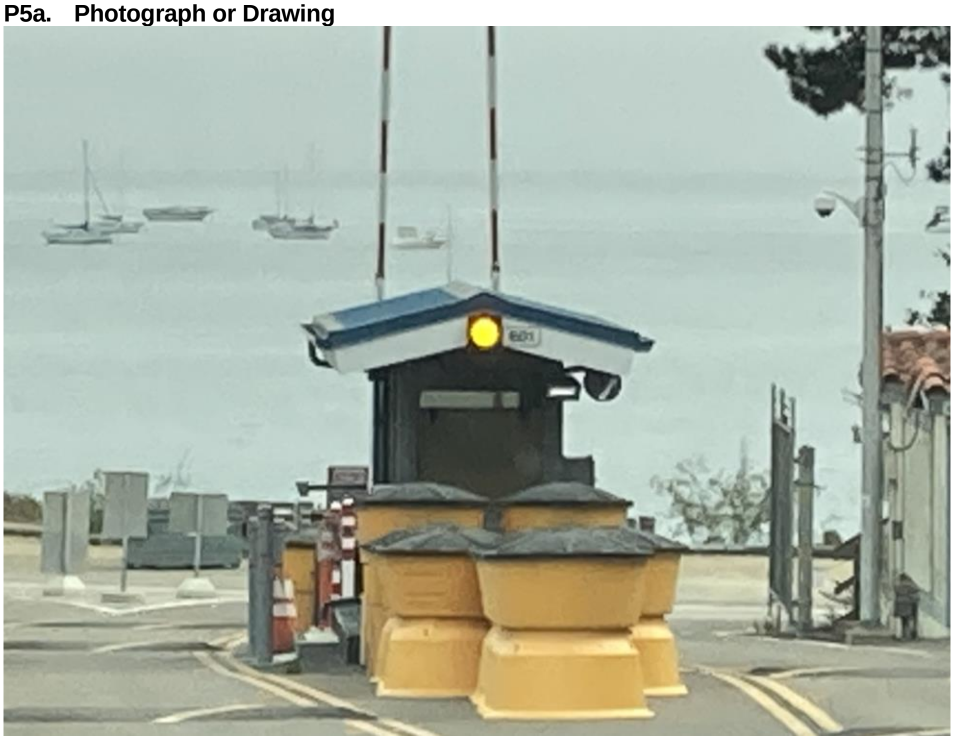
Page 1 **of** 1 ***Resource Name or #:** (Assigned by recorder) Avila Gate Guard House (Building 601)
P1. Other Identifier:

***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted** ***a. County** San Luis Obispo, CA
***b. USGS 7.5' Quad** Port San Luis **Date** 2018
c. Address 3890 Diablo Canyon Road City Avila Beach Zip 93424
d. UTM: Zone 10S , 704354.00 mE/ 3894779.00 mN
e. Other Data: Within DCPP Decommissioning Zone 13

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)
Avila Gate Guard House (Building 601) is a one-story building on an approximately 41 square-foot rectangular concrete slab foundation. It is located in DCPP Decommissioning Zone 13 at the Avila Gate entrance to the Diablo Canyon Nuclear Power Plant from Avila Beach Drive. It is within a median of Diablo Canyon Road (or Drive) where the road starts. The guard house is wood frame with painted stucco walls. The gable roof is corrugated metal with gutters on the east and west edges. The building is accessed through a partially glazed door on the north façade. Metal windows are on all the other sides. According to online street view maps, the building had red clay tile roofing until at least 2019.

PG&E documents estimate the building was constructed in 1970. The building is used for the controlled entry to the plant campus.

P5a. Photograph or Drawing



***P3b. Resource Attributes:** HP4 - Ancillary Building
***P4. Resources Present:** ☒ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other
P5b. Description of Photo: view of subject property, looking southeast. September 23, 2021
***P6. Date Constructed/Age and Source:** ☒ Historic ☐ Prehistoric ☐ Both
1970 estimated, Facility Database for Aspen provided by PG&E
***P7. Owner and Address:**
Eureka Energy Co. (subsidiary of Pacific Gas and Electric Company)
77 Beale Street, 32nd Floor
San Francisco, CA 94177

***P8. Recorded by:**
Page & Turnbull, Inc.
170 Maiden Lane, 5th Floor
San Francisco, CA 94104

***P9. Date Recorded:**
December 8, 2021

***P10. Survey Type:** Intensive

***P11. Report Citation**: None
***Attachments:** ☒NONE ☐Location Map ☐Continuation Sheet ☐Building, Structure, and Object Record ☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐ Other (List):

State of California ♁ The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary #
HRI #
Trinomial
NRHP Status Code

Other Listings
Review Code Reviewer Date

Page 1 **of** 1 ***Resource Name or #:** (Assigned by recorder) Avila Gate Storage Building (Building 602)
P1. Other Identifier:

***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted** ***a. County** San Luis Obispo, CA
***b. USGS 7.5' Quad** Port San Luis **Date** 2018
c. Address 3890 Diablo Canyon Road City Avila Beach Zip 93424
d. UTM: Zone 10S , 704371.75 mE/ 3894763.22 mN
e. Other Data: Within DCPP Decommissioning Zone 13

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)
Avila Gate Storage Building (Building 602) is a one-story wood framed building on an approximately 96 square-foot concrete slab foundation. The L-shaped building is in DCPP Decommissioning Zone 13 at the Avila Gate entrance to Diablo Canyon Nuclear Power Plant. It is at the southwest corner of Avila Beach Drive and Diablo Canyon Road (or Drive). The storage building consists of two volumes separated by an open-air area and connected by a solid wall the partially encloses the storage yard. The larger, rectangular volume is on the southwest side, while the smaller, square volume is at the northwest side and may be partially open. Both have red clay tiles on gable roofs. The walls are painted stucco. The enclosed portion of the southwest building is accessed through a metal double door on the north façade.

PG&E documents estimate the building was constructed in 1970. The building is used for storage in support of the controlled entry to the plant.

P5a. Photograph or Drawing

***P3b. Resource Attributes:** HP4 - Ancillary Building
***P4. Resources Present:** ☒ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other
P5b. Description of Photo: view of subject property, looking southeast, indicated with arrow. September 23, 2021

***P6. Date Constructed/Age and Source:** ☒ Historic ☐ Prehistoric ☐ Both
1970 estimated, Facility Database for Aspen provided by PG&E

***P7. Owner and Address:**
Eureka Energy Co. (subsidiary of Pacific Gas and Electric Company)
77 Beale Street, 32nd Floor
San Francisco, CA 94177

***P8. Recorded by:**
Page & Turnbull, Inc.
170 Maiden Lane, 5th Floor
San Francisco, CA 94104

***P9. Date Recorded:**
December 8, 2021
***P10. Survey Type:** Intensive

***P11. Report Citation**: None

***Attachments:** ☒NONE ☐Location Map ☐Continuation Sheet ☐Building, Structure, and Object Record ☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐ Other (List):

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DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary #
HRI #
Trinomial
NRHP Status Code

Other Listings
Review Code Reviewer Date

 ***Resource Name or #:** (Assigned by recorder) Warehouse Storage (Building 604)

P1. Other Identifier:

***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted** ***a. County** San Luis Obispo, CA

***b. USGS 7.5' Quad** Port San Luis **Date** 2018

c. Address 3890 Diablo Canyon Road City Avila Beach Zip 93424

d. UTM: Zone 10S , 696268.24 mE/ 3899065.95 mN

e. Other Data: Within DCPP Decommissioning Zone 12

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

Warehouse Storage (Building 604) is a one-story, steel frame building built on an approximately 2,408 rectangular concrete slab foundation. The building is located in the area east of the 500 KV Switchyard, in the DCPP Decommissioning Zone 12. The walls and gable roof are corrugated metal. The building is primarily accessed through a partially glazed metal door on the west façade and has a roll-up garage door on the north façade. No windows were noted during the site visit.

PG&E documents estimate the building was constructed in 1985. The building is used for storage of old project files for the plant.

P5a. Photograph or Drawing

***P3b. Resource Attributes:** HP8 - Industrial Building

***P4. Resources Present:** ☒ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other

P5b. Description of Photo: Oblique view of subject property, looking southeast. September 23, 2021

***P6. Date Constructed/Age and Source:** ☒ Historic ☐ Prehistoric ☐ Both
1985 estimated, Facility Database for Aspen provided by PG&E

***P7. Owner and Address:**
Eureka Energy Co. (subsidiary of Pacific Gas and Electric Company)
77 Beale Street, 32nd Floor
San Francisco, CA 94177

***P8. Recorded by:**
Page & Turnbull, Inc.
170 Maiden Lane, 5th Floor
San Francisco, CA 94104

***P9. Date Recorded:** December 8, 2021

***P10. Survey Type:** Intensive

***P11. Report Citation**: None

***Attachments:** ☒NONE ☐Location Map ☐Continuation Sheet ☐Building, Structure, and Object Record ☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐ Other (List):

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DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary #
HRI #
Trinomial
NRHP Status Code

Other Listings
Review Code Reviewer Date

Page 1 **of** 1 ***Resource Name or #:** (Assigned by recorder) Long Term Cooling Water Pump Storage (Building D-4)
P1. Other Identifier:

***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted** ***a. County** San Luis Obispo, CA
***b. USGS 7.5' Quad** Port San Luis **Date** 2018
c. Address 3890 Diablo Canyon Road City Avila Beach Zip 93424
d. UTM: Zone 10S , 695632.96 mE/ 3898990.79 mN
e. Other Data: Within DCPP Decommissioning Zone 10

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)
Long Term Cooling Water Pump Storage (Building D-4) is a one-story, steel frame building built on an approximately 144 square concrete slab foundation. The building is located in the DCPP Decomissioning Zone 10, east of the East Raw Water Reservoir Building 1B). The walls and flat roof are corrugated metal, and no doors or windows were visible during the site visit.

PG&E documents estimate the building was constructed in 1979. The building houses a cooling water pump.

P5a. Photograph or Drawing

***P3b. Resource Attributes:** HP8 - Industrial Building

☒ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other

P5b. Description of Photo: view of subject property, looking east, indicated with arrow. September 23, 2021

***P6. Date Constructed/Age and Source:** ☒ Historic ☐ Prehistoric ☐ Both
1979 estimated, Facility Database for Aspen provided by PG&

***P7. Owner and Address:**
Eureka Energy Co. (subsidiary of Pacific Gas and Electric Company)
77 Beale Street, 32nd Floor
San Francisco, CA 94177

***P8. Recorded by:**
Page & Turnbull, Inc.
170 Maiden Lane, 5th Floor
San Francisco, CA 94104

***P9. Date Recorded:**
December 8, 2021

***P10. Survey Type:** Intensive

***P11. Report Citation**: None

***Attachments:** ☒NONE ☐Location Map ☐Continuation Sheet ☐Building, Structure, and Object Record ☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐ Other (List):

State of California ♁ The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary #
HRI #
Trinomial
NRHP Status Code

Other Listings
Review Code Reviewer Date

Page 1 of 2 ***Resource Name or #:** (Assigned by recorder) East & West Breakwaters
P1. Other Identifier:

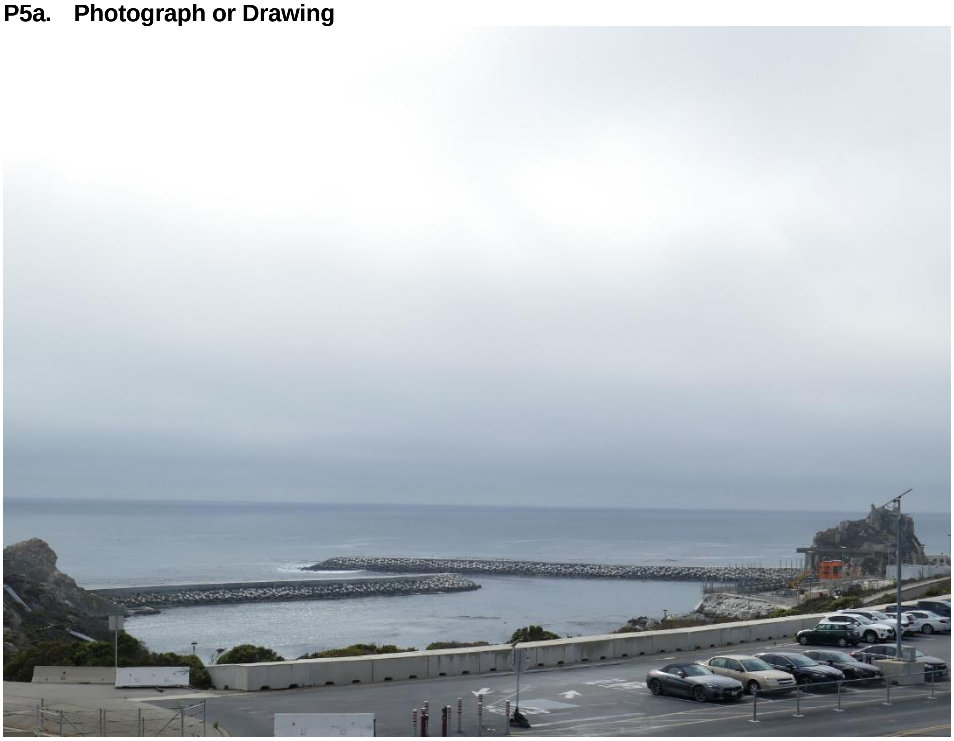
***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted** ***a. County** San Luis Obispo, CA
***b. USGS 7.5' Quad** Port San Luis **Date** 2018
c. Address 3890 Diablo Canyon Road City Avila Beach Zip 93424
d. UTM: Zone 10S , 695157.00 mE/ 3898060.00 mN
e. Other Data: Within DCPP Decommissioning Zone 4

***P3a. Description:**
The East & West Breakwaters for the Diablo Canyon Nuclear Power Plant are two structures of approximately a combined 280,000 square feet. The curvilinear structures form the man-made Intake Cove on the west shoreline of the DCPP Decommissioning Zone 4. They protect the Units 1 & 2 Intake Structure (Building 108) from large waves and allows it to intake seawater from a calm cove.

Most of the East & West Breakwaters are below the water level and not visible. The East & West Breakwaters are made of prefabricated concrete tribar units over a boulder mound. Their highest level are at the grade level of the shoreline with their lowest level are at the floor of Intake Cove (**Figure 1 to Figure 3**). At their highest level, the East & West Breakwaters are capped with a flat concrete slab to provide access for plant personnel.

Construction on the breakwaters started in 1970 and were completed around 1972, according to PG&E documents. The west breakwater was partially destroyed during storms in 1981. Both were re-designed and rebuilt to withstand future storms.
(See Continuation Sheet, page 2)

P5a. Photograph or Drawing



***P3b. Resource Attributes:** HP11 Engineering Structure
***P4. Resources Present:** ☐ Building ☒ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other
P5b. Description of Photo: View of structure, looking west. September 23, 2021
***P6. Date Constructed/Age and Source:** ☒ Historic ☐ Prehistoric ☐ Both
1972 estimated, Facility Database for Aspen provided by PG&E
***P7. Owner and Address:**
Eureka Energy Co. (subsidiary of Pacific Gas and Electric Company)
77 Beale Street, 32nd Floor
San Francisco, CA 94177

***P8. Recorded by:**
Page & Turnbull, Inc.
170 Maiden Lane, 5th Floor
San Francisco, CA 94104

***P9. Date Recorded:**
December 8, 2021

***P10. Survey Type:** Intensive

***P11. Report Citation**: None

***Attachments:** ☐NONE ☐Location Map ☒Continuation Sheet ☐Building, Structure, and Object Record ☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐ Other (List):

State of California ♁ The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
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Primary #
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Other Listings
Review Code Reviewer Date

Page 1 **of** 2 ***Resource Name or #:** (Assigned by recorder) East & West Breakwaters
P1. Other Identifier:

***P3a. Description (Continued)**

The area around the East & West Breakwaters includes an access road and a small dock on the southern edge of the Intake Cove for plant maintenance craft. There are large sea rocks at the north and south sides of the cove; these have been incorporated into the structure and design of the East & West Breakwaters. There is a small stair on the southwest side of the East Breakwater. Accounts by plant staff indicate this stair was used for access to the water for biologists studying the coastal ecology (**Figure 4**).

Figure 1: East Breakwater from Intake Cove, with visible concrete tribars, looking west.

Figure 2: Stored concrete tribar at west side of Intake Cove, looking north.

Figure 3: 1971 photo of West Breakwater under construction, looking south. Source: PG&E Archives.

Figure 4: Concete stairs for ocean side access on south side of East Breakwater, looking southwest.

Appendix B – Preparer Qualifications

This Historic Built Environment Evaluation Report was prepared by Page & Turnbull of San Francisco, California. Page & Turnbull staff responsible for this report include: Ruth Todd, FAIA, Principal-in-charge; Flora Chou, Associate Principal and Project Manager; Clare Flynn, Cultural Resources Planner and primary author, all of whom meet or exceed the Secretary of the Interior's Professional Qualification Standards for Historic Architecture, Architectural History, or History. Intern Jeronimo Roldan also assisted with the project.

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Appendix G

Radiological Hazards

G1. Baseline Conditions for the Management, Storage, Transportation, and Disposal of Spent Nuclear Fuel and High-Level Waste at Diablo Canyon Power Plant

G2. Radioactive Materials Transportation Experience and Risk Assessments

G3. US Nuclear Regulatory Commission Environmental Impact Evaluation

G4. Radiation Basics

G5. DOT 2008 Radiological Review

Appendix G1

Baseline Conditions for the Management, Storage, Transportation, and Disposal of Spent Nuclear Fuel and High-Level Waste at Diablo Canyon Power Plant

Appendix G1
Baseline Conditions for the Management, Storage, Transportation, and Disposal of Spent Nuclear Fuel and High-Level Waste at Diablo Canyon Power Plant

The purpose of this appendix is to summarize the requirements and assumptions that Pacific Gas & Electric Company (PG&E) has made in its planning documents and the current ("baseline") plan and schedule for the management of spent nuclear fuel (SNF) and high-level radioactive waste (HLW) associated with the decommissioning of the Diablo Canyon Power Plant (DCPP), including on-site storage and off-site transportation and disposal. By definition, HLW includes the spent (or used) nuclear fuel produced by the operation of commercial nuclear power plants, as well as the waste materials remaining after spent fuel is reprocessed (for example at the defense reprocessing facilities at DOE's Hanford site in Washington and Savannah River site in Georgia, and the commercial spent fuel reprocessing facility at DOE's West Valley site in New York). At DCPP, all of the HLW is SNF.

This report describes the current regulatory requirements and contractual agreements relevant to the storage and disposal of SNF and HLW, and assesses whether PG&E's assumptions represent an appropriate baseline for analysis in this EIR. It also identifies and evaluates whether alternative assumptions might be appropriate to consider, given that circumstances beyond PG&E's control could impact the plan. Several potentially feasible alternatives to continued on-site storage are discussed that have been proposed by stakeholders or members of the public.

Description of the Current Plan and Schedule

The Post Shutdown Decommissioning Activities Report (PSDAR) (PG&E, 2019a), the Irradiated Fuel Management Plan (IFMP) (PG&E, 2019b), and the Site Specific Decommissioning Cost Estimate (SSDCE) (PG&E, 2019c) for DCPP Units 1 and 2, describe the assumptions and schedule for decommissioning of the DCPP site. These planning documents are based on regulatory and contractual requirements related to the on-site storage and eventual off-site shipment of SNF, HLW, and Greater Than Class C Waste (GTCC). GTCC is Low Level Radioactive Waste (LLRW) with concentrations of radionuclides that exceed the limits established by the NRC for Class C LLRW.

The key elements of the IFMP for decommissioning include:

- Wet storage of SNF in spent fuel pools until it can be transferred to dry storage at the Diablo Canyon Independent Spent Fuel Storage Installation (ISFSI);
- Dry storage of SNF from decommissioning activities at the Diablo Canyon ISFSI, and a separate facility for GTCC waste; and
- Transportation of SNF and HLW to a geologic repository for disposal by the US Department of Energy (DOE).

This report focuses primarily on the spent fuel and waste stored on-site at DCPP, which currently includes both dry storage in an existing ISFSI and wet storage in the spent fuel pools (SFPs) for both Units 2 and 3. That fuel is currently expected to remain in storage until it is shipped to the DOE for disposal between 2038 and 2067.

The initial interim storage of DCPP Units 1 and 2 SNF will be "wet storage" in each unit's respective SFP, which are located in the Fuel Handling Building (FHB). The FHB is a shared structure that encloses the SFPs, the fuel handling cranes, fuel racks, and related equipment. The equipment in the FHB must be operated and maintained properly to provide the capability to safely store SNF, remove decay heat generated by SNF, and provide shielding from the radiation emitted by SNF. The operational activities involve the monitoring of system parameters, periodic testing of important equipment functions, performing inspections, and facility security. The SFP facility equipment requiring maintenance includes instrumentation, pumps, valves, heat exchangers, filters, ventilation fans, ducting, and dampers.

Approximately 18 months after shutdown, the SFPs will be isolated from the existing support systems and those systems will be replaced by a spent fuel pool island (SFPI). The implementation of a SFPI will allow use of a smaller system that discharges heat to the ambient air outside of the FHBs rather than relying on existing plant systems. The implementation of the SFPI will reduce the footprint and facilitate abandonment of the buildings and parallel decommissioning activities.

Transfer of SNF and HLW to On-site Dry Storage

After the shutdown, the remaining irradiated fuel will be removed and transferred to the SFPs, where it will cool for approximately four years. It will then be transferred to dry storage at the ISFSI, which is licensed under a Nuclear Regulatory Commission (NRC) Part 72 site-specific license. In addition to SNF, the nuclear industry typically stores fuel debris and damaged SNF assemblies (which are HLW), and GTCC waste in dry cask storage systems. Consistent with industry standard practice, PG&E also plans to store these materials in dry cask storage systems. The current dry cask storage system utilized at the ISFSI includes several components to transfer and store SNF and GTCC waste:

- A HI-STORM 100 System
  - A Multi Purpose Canister (MPC) capable of storing up to 32 SNF assemblies
  - a dry cask storage overpack for SNF, referred to as a HI-STORM 100SA
  - a HI-TRAC1250 transfer cask
- A low-profile transporter
- A vertical cask transporter
- A cask transfer facility

The ISFSI Technical Specifications limit the materials that can be stored in the MPC-32 canisters. Specifically, the MPC-32 is currently allowed to contain only intact SNF assemblies and non-fuel hardware with specific dimensions, enrichment, and cladding material. Fuel debris, damaged SNF assemblies, and GTCC waste cannot be stored in the MPC-32 under current ISFSI Technical Specifications. PG&E plans to obtain NRC approval to store the fuel debris and damaged assemblies at the ISFSI, and the GTCC waste at a GTCC Storage Facility that would be constructed near the ISFSI. This plan is consistent with the assumptions included in the SSDCE. Dry storage of these items is also considered interim storage pending transfer to the DOE (PG&E, 2019b).

The ISFSI is a separately licensed facility (from the operating reactors) located approximately 0.22 miles northeast of the Unit 1 Containment Building at an elevation of approximately 310 feet situated directly on bedrock. It consists of a security boundary and concrete storage pads that securely anchor the casks storing the SNF (PG&E, 2019b).

The IFMP describes PG&E's plans to expand the size and capability of the storage system in the future to include:

- non-fuel waste storage canisters for GTCC waste (similar to an MPC)
- non-fuel waste storage overpack dry casks or storage modules for GTCC waste
- an MPC capable of storing SNF (intact and damaged) and fuel debris
- a dry cask storage overpack capable of storing SNF (intact and damaged) and fuel debris

PG&E announced on April 6, 2022, that it had selected Orano USA as its vendor to safely transfer the remaining spent fuel from the DCPP spent fuel pools to the existing ISFSI. The Orano NUHOMS EOS System differs in several respects from the current Holtec HI-Storm 100 System, but both systems perform the same key functions to safely store SNF while protecting workers and the public from radiation. In addition to the remaining SNF, the Orano system will be used to store the materials that cannot currently be stored in the existing Holtec system, including GTCC waste and damaged fuel and fuel debris. Table G1-1 summarizes the key components and characteristics of the existing and planned systems.

Table G1-1. Summary Comparison of the Holtec and Orano Systems for the DCPP ISFSI

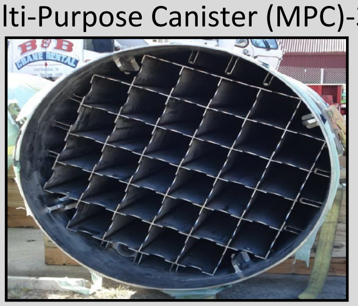
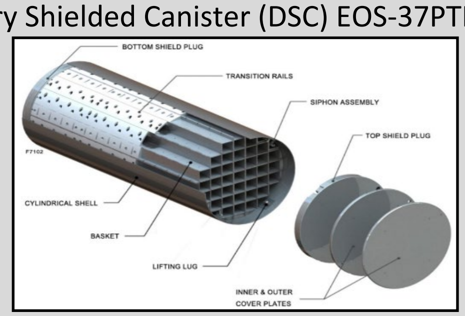
Attributes	Holtec HI-STORM 100 System	Orano NUHOMS EOS System
Licenses	NRC Certificate of Compliance (CoC) 72-1014 (initially in 2000)	CoC 72-1042 (initially in 2016)
	ISFSI site-specific 72-26	N/A
	CoC 71-9261 (low/med burnup only)	CoC 71-9382 not-yet-licensed (under NRC review as of Dec 2020)
	Must meet the site-specific hazards and accidents, including seismic	
Canisters	Multi-Purpose Canister (MPC)-32 	Dry Shielded Canister (DSC) EOS-37PTH 
Allowable Contents	Spent fuel assemblies (including high burnup), nonfuel assembly hardware	Spent fuel assemblies (incl. high burnup), nonfuel assembly hardware, damaged fuel, fuel debris
Capacity	32 spent fuel assemblies	37 spent fuel assemblies
Canister Max. Heat Load	28.7 kW	50 kW

Table G1-1. Summary Comparison of the Holtec and Orano Systems for the DCPP ISFSI

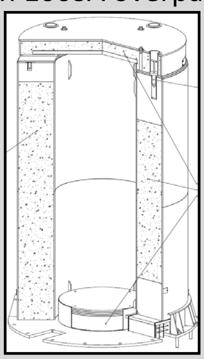
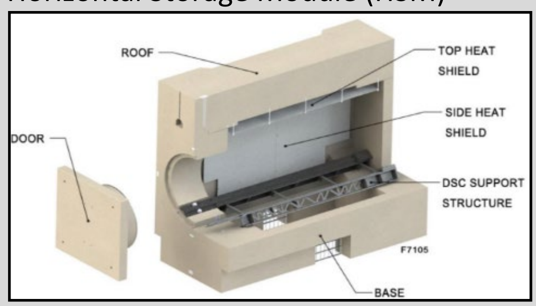
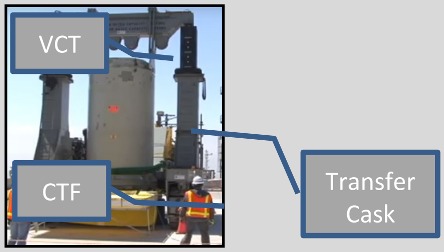
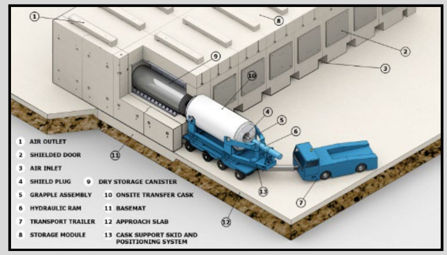
Attributes	Holtec HI-STORM 100 System	Orano NUHOMS EOS System
Max. Assembly Heat Load	~0.9 kW	4.5 kW (in upcoming CoC amd. request)
Dimensions (outer)	~69" diam.; 181" long	~76" diam.; length: site-specific
Shell Thickness	0.5"	0.5"
Loaded Weight	90,000 lbs. (45 tons) – 32 assemblies	124,000 lbs. (62 tons) – 37 assemblies
Shell Materials	Stainless steel Grades 304, 304/304L, and 316/316L (Dual Certs)	Stainless steel Grade 316L
Overpacks	HI-STORM 100SA overpack 	Horizontal Storage Module (HSM) 
Dimensions	~12' diam. ~19' tall Concentric metal shells: 1" thick 30"-thick concrete Baseplate: 2" thick Bolted lid: 19" thick	~25' long ~20' tall 4'-thick roof, front/back walls
Concrete Volume	~42 cubic yards per overpack (~3,360 cubic yards for 80 overpacks needed for full offload)	~72 cubic yards per HSM (~4,968 cubic yards for 69 HSMs needed for full offload)
Color	Metal shell painted grey	Sealed concrete (natural grey color)
Storage Config.	Vertical (MPC on pedestal)	Horizontal (DSC on rails)
Tip-Over Design	Anchorages preclude tip-over	HSMs rely on sliding and low center-of-gravity to preclude tip-over
Cooling Method	Convection via air vents	Convection via air vents

Table G1-1. Summary Comparison of the Holtec and Orano Systems for the DCPP ISFSI

Attributes	Holtec HI-STORM 100 System	Orano NUHOMS EOS System
Transportation Components		
Transfer Cask	HI-TRAC 125D transfer cask	EOS TS-125 Transfer Cask
Dimensions	94" diam. for majority; 192" tall	95" diam.; 208" tall
Weight	125 tons fully loaded	93 tons fully loaded
Transporter	Vertical Cask Transporter (VCT)	Transfer Trailer (TT)
Configuration	Vertical transport; suspended	Horizontal transport
Power	Self-powered	Self-powered or towed by conventional heavy-haul truck tractor
Rated Load	425,000 lbs. (212.5 tons)	291,000 lbs. (145.5 tons)
Loading Process		
Closure Activities in FHB	Loaded MPC/transfer cask → cask washdown area for drying/ helium backfill (via forced helium dehydration); MPC lid welding	Loaded DSC/transfer cask → cask washdown area for vacuum drying/ helium backfill and DSC lid welding
Transfer to Transporter	Cask washdown area → low-profile transporter → VCT	Cask washdown area → TT
Transporter Movement	VCT transports → Cask Transfer Facility (CTF) for transfer from the transfer cask to the overpack	TT transports → ISFSI pad
Loading at ISFSI	Overpack CTF → ISFSI pad via VCT	Hydraulic ram pushes DSC into HSM
Estimated Total Worker Dose	~340 mrem per canister (actuals from DCPP loading of 24kW)	~157 mrem per canister (actuals from PWR loading of 30-33kW)

Source: PG&E, 2022.

Both systems use welded steel canisters to store the SNF: in the Holtec system, the canisters are stored vertically, while the Orano system stores them horizontally. Both canister types have baskets inside that provide structural support and assist in fuel heat transfer. Although the basket materials are different for each system, the basket performs the same function and determines the heat load capacity as approved by the NRC.

In both systems, the canister is stored within a larger structure designed to reduce radiation dose to workers and the public by providing shielding, and to physically protect the canisters. The Holtec outer container (called an overpack) uses steel and concrete (~ 32 inches thick on the sides), whereas the Orano outer container (called a horizontal storage module) uses steel and concrete (~ 48 inches thick on the tops/sides) to shield from radiation. This means hotter fuel can be stored with no impact to radiation shielding. Although the size and shape of the structures differ, both are approved by the NRC. The larger capacity of the Orano system means that fewer storage systems are required (69) than with the Holtec system (80).

Both of the dry cask storage systems provide radiation shielding, heat transfer capability, missile protection, and protection against natural phenomena and accidents. The ISFSI Updated Final Safety Analysis Report (FSAR) provides additional information related to the design and performance of the ISFSI (PG&E, 2018a). An update to the FSAR will be necessary to revise the analyses to incorporate the Orano System in addition to the existing Holtec system.

The safe and secure operation of the ISFSI also requires that PG&E maintain and operate the transfer equipment properly, deploy qualified and trained resources to monitor and oversee storage operations, and provide forces to maintain security during SNF transfer operations. This includes implementing the measures required by NRC to control personnel, vehicles, and materials during the transfers of SNF and GTCC waste from the power plant to the ISFSI, and to ensure adequate protection of worker and public health and safety and the environment.

At present, there are 1,856 SNF assemblies stored at the ISFSI in 58 casks with 32 assemblies per cask. As of August 2019, there were 828 and 768 SNF assemblies stored in the Unit 1 and 2 SFPs, respectively. Assuming no loading campaigns between now and the end of operations, PG&E anticipates at the time of shut down, there will be approximately 1,261 and 1,281 SNF assemblies stored in the Unit 1 and 2 SFPs, respectively. As a result, with the use of the Orano storage systems (which accommodate 37 assemblies per canister), there will be up to a total of 127 casks of SNF stored at the ISFSI once all transfers are complete (58 Holtec, and 69 Orano). Although the ISFSI system has adequate capacity for all fuel-related storage (including fuel debris and damaged SNF assemblies), it does not have capacity for GTCC waste. Therefore, PG&E plans to design, license, and construct an additional storage pad near the Security Building to address these additional GTCC waste capacity requirements. GTCC waste will be stored and transported using the Orano NUHOMS EOS systems. The SSDCE includes the approximate costs to perform these activities (PG&E, 2019c). PG&E plans to store up to 10 casks of GTCC waste at the GTCC storage facility. Table G1-2 shows the current schedule for transferring the existing and planned inventory of spent fuel assemblies from wet storage in the SFPs to dry storage at the ISFSI.

Table G1-2. Schedule for Transferring Fuel Assemblies from SFPs to the ISFSI

	Assemblies in Wet Storage[2]		Assemblies in Dry Storage		Casks at ISFSI[3]	
Year[1]	Unit 1	Unit 2	Unit 1	Unit 2	Unit 1	Unit 2
2025	1261	1281	928	928	29	29
2026	1261	1281	928	928	29	29
2027	1261	1281	928	928	29	29
2028	1261	1281	928	928	29	29

Table G1-2. Schedule for Transferring Fuel Assemblies from SFPs to the ISFSI

	Assemblies in Wet Storage[2]		Assemblies in Dry Storage		Casks at ISFSI[3]	
Year[1]	**Unit 1**	**Unit 2**	**Unit 1**	**Unit 2**	**Unit 1**	**Unit 2**
2029	1261	1281	928	928	29	29
2030	877	1281	1312	928	41	29
2031	0	654[4]	2189	1555	69	48
2032	0	0	2189	2209	69	69

Note 1 – Inventories are as of end of the year
Note 2 – Actual number of assembles depends on final fuel cycle design
Note 3 – Schedule assumes no transfers to ISFSI until after both units are shutdown
Note 4 – Based on estimated number of assemblies, the last Unit 1 cask will contain Unit 2 assemblies

Source: PG&E, 2019b - Table 2a.
Note: The total number of casks has changed because of the switch to the Orano System.

Transfer of SNF and HLW for Off-Site Disposal

The DOE's repository program assumes that SNF allocations will be accepted for disposal from the nation's commercial nuclear plants, with limited exceptions, in the order (the "queue") in which it was discharged from the reactor (10 CFR 961.11). PG&E's SNF management plan for the DCPP SNF is based on two assumptions:

- DOE will begin transferring commercial SNF to a federal facility in 2031, and DCPP will begin transferring SNF to DOE in 2038, and
- SNF and GTCC waste receipt will be completed by year 2067 (PG&E, 2018b).

The start date for the off-site transfer shipments was established in accordance with the Standard Contract between PG&E and DOE in 10 CFR Part 961.11 (DOE, 2004a). DOE's schedule for completion of the shipments is based upon DOE's generator allocation/receipt schedules which assume the oldest fuel receives the highest priority for DOE acceptance. In accordance with the annual allotment in the Standard Contract, and as described in the IFMP (PG&E 2019b), PG&E would be able to load a maximum of five full MPCs into five DOE-supplied transportation casks each year, beginning in the year 2038. The schedules do not represent a contractual commitment by the DOE or the utilities and are used only as a planning basis (DOE, 2004a). The Standard Contracts do contain provisions allowing for "exchanges" of acceptance obligations, and priority for retired units such as DCPP would become, so it is possible that PG&E could negotiate an alternative schedule, if a facility becomes available. If the assumptions described in the IFMP are valid, the ISFSI would be subsequently decommissioned by the ISFSI's 2076 final license termination date.

The DOE's recent lack of progress on the repository program (or another alternative storage facility) would indicate that PG&E's schedule is achievable only if significant progress restarting the US nuclear waste management program is made in the near future. As a result, there is a chance that extended on-site storage in the ISFSIs may be necessary.

Existing Regulatory Framework and Federal Program Plans

This section describes the current status of the Federal (DOE) efforts to develop facilities for the storage and disposal of SNF in the US, as well as recent activities in Congress to restart the waste management program. These programs represent a range of potential opportunities to provide for the transport of SNF from the DCPP site, but none are currently progressing.

The Nuclear Waste Policy Act and the Repository Program

The Nuclear Waste Policy Act (NWPA) of 1982, as amended in 1987 (DOE, 2004b), established the Federal program, requirements, and process applicable to the management, storage, and disposal of SNF and HLW. The primary goal of the NWPA was "to provide for the development of repositories for the disposal of high-level radioactive waste and spent nuclear fuel." The NWPA created the Office of Civilian Radioactive Waste Management (OCRWM) within the DOE to implement Federal government responsibilities specified by the Act, and also established the Nuclear Waste Fund (Section 302), which imposed a fee of 0.1 cents per kilowatt-hour (approximately $750 million per year) on electricity generated by civilian nuclear power reactors. As of the end of 2020 (the date of the most recent audit), the Nuclear Waste Fund had a balance of about $45.1 billion (DOE, 2021a). In exchange for the payment of this fee, utilities were authorized to enter into contracts with the Secretary of Energy for the acceptance of title, transportation, and long-term storage and disposal of SNF and HLW. PG&E entered into a single Standard Contract on June 10, 1983, covering the two DCPP units. The NWPA further specified that the Secretary "shall take title to the high-level radioactive waste or spent nuclear fuel involved as expeditiously as practicable, upon the request of the generator or owner, … beginning not later than January 31, 1998." (DOE, 2004)

The NWPA defined a process for the identification and selection of candidate repository sites, and the characterization and analysis of these sites, to determine whether they were suitable for the development of a repository. In 1986, the DOE published a Final Environmental Assessment that documented the selection of three sites for further characterization (i.e., Yucca Mountain, Nevada; the Hanford Site in Washington; and a site in salt deposits in Deaf Smith County, Texas). However, in the 1987 Amendment to the Act, Congress directed the DOE to characterize only the Yucca Mountain site in Nevada and to develop the repository there, if it was found to be suitable.

Following the process prescribed in the amended NWPA, the Secretary recommended to the President in February 2002, and the President recommended to Congress, that Yucca Mountain be developed as the nation's first geologic repository (DOE, 2002). In accordance with the NWPA, the governor of Nevada exercised his right to veto the President's recommendation, a veto which could only be overturned by majority votes in both houses of Congress. The House passed a resolution on April 25, 2002, approving Yucca Mountain by a margin of 306 to117, and the Senate voted (by voice vote) on July 9, 2002, to override the governor's veto.

Although the selection of Yucca Mountain was confirmed by the congressional resolutions, the site recommendation was not the final step in the regulatory approval process, because the NWPA further required that the DOE must demonstrate that the proposed repository meets the radiological health and safety standards established and regulated by the NRC. That process is not complete, and is described below.

Status of the License Application for Yucca Mountain

The DOE submitted an application to the NRC on June 3, 2008, for a license to construct the repository at Yucca Mountain (DOE, 2008). The NRC's role is to assess whether the proposed facility meets NRC's regulatory requirements. The NRC staff's technical review, documented in its Safety Evaluation Report (SER), is one part of the licensing process. The process also includes hearings before the NRC's Atomic Safety and Licensing Board (ASLB), which will adjudicate challenges by a number of parties to the technical and legal aspects of the DOE application, and the Commission's review of contested and uncontested issues. On March 3, 2010, the DOE filed a motion with the Board asking to withdraw its application. The Board denied that request on June 29, 2010, finding that "… the [NWPA] does not permit the Secretary [of the DOE] to withdraw the Application that the NWPA mandates the Secretary file. Specifically, the NWPA does not give the Secretary the discretion to substitute his policy for the one established by Congress in the NWPA that, at this point, mandates progress towards a merits decision by the [NRC] on the construction permit" (NRC, 2010). On appeal, the Commission found itself evenly divided on whether to overturn or uphold the Board's decision. During this time period, Congress had reduced funding for the NRC's review of the application, with no funds appropriated for fiscal year 2012 (and none in subsequent years). Recognizing the budgetary limitations, the Commission directed the Board to complete case management activities by the end of September 2011, and the Board suspended the adjudicatory proceeding on September 30. At the same time, the NRC staff also completed orderly closure of its Yucca Mountain technical review activities.

The Obama Administration had decided to terminate the Yucca Mountain Project during fiscal year (FY) 2009, claiming that it was "unworkable." In February 2010, the President issued the FY 2011 Budget Request with a zero budget request for OCRWM. Despite the ASLB ruling denying the DOE's motion to withdraw its license application, the Administration directed the DOE to dissolve OCRWM. Cases were filed in the U.S. Court of Appeals by the states of Washington and South Carolina, and several other parties, challenging the termination of the Yucca Mountain repository proceedings. Nevertheless, on October 1, 2010, the DOE shifted OCRWM program responsibilities to various DOE Offices, and, as of September 30, 2010, OCRWM employed no staff (DOE, 2010).

In August 2013, the D.C. Circuit Court of Appeals ordered the NRC to resume its review using existing funds from previous appropriations. The NRC staff completed and published the five-volume SER in January 2015. In the SER, the NRC staff found that the DOE's license application met the regulatory requirements for the proposed repository, with two exceptions: the DOE had not obtained certain land withdrawal and water rights necessary for construction and operation of the repository. Therefore, the NRC staff recommended that the Commission not authorize construction of the repository until, among other things, these regulations were met and a supplement to the DOE's environmental impact statement was completed. After the DOE declined to complete the supplement and deferred to the NRC, the Commission directed the NRC staff to develop the supplement, which was completed in early 2016.

Although the program has not been funded since 2010 and the OCRWM has been dismantled, the NWPA remains the legislation applicable to nuclear waste management in the US, and the license application to the NRC remains active. The adjudicatory process undertaken by the ASLB remains suspended. According to the NWPA, the ASLB hearings were required to be completed within 18 months (NRC may request a 12-month schedule extension if necessary). Additional funding from Congress for both the NRC and DOE would be required to support resumption of the License Application hearings.

At the time that the DOE attempted to withdraw the License Application in 2010, DOE's schedule for the licensing and construction of the repository showed Construction Authorization by NRC in 2012, initial receipt of waste in 2017, and full operation of the facility in 2020 (DOE, 2008). Therefore, the schedule projected that a fully-funded program would require on the order of 7 to 10 years to reach operational readiness, not counting the time associated with re-starting the program. Start-up costs and schedules would need to include the re-establishment of OCRWM or an alternative management organization (within or independent from the DOE) that would take its place.

Nuclear Waste Fund Suspension

After termination of the Yucca Mountain Project, the Nuclear Energy Institute (NEI) and the National Association of Regulatory Utility Commissioners filed a lawsuit challenging the DOE's continued collection of the surcharge to pay for SNF and HLW management. In a unanimous decision, the US Court of Appeals for the D.C. Circuit found that, "Because the Secretary is apparently unable to conduct a legally adequate fee assessment, the Secretary is ordered to submit to Congress a proposal to change the [nuclear waste] fee to zero until such time as either the Secretary chooses to comply with the [Nuclear Waste Policy] Act as it is currently written, or until Congress enacts an alternative waste management plan."

"Today's decision confirms that the Federal government cannot continue to defy Congress' explicit direction to implement a viable program to manage reactor fuel from America's nuclear power plants. The court's ruling reinforces the fundamental principle that the federal government's obligation is to carry out the law, whether or not the responsible agency or even the president agrees with the underlying policy" (US Court of Appeals, 2013).

As noted above, the Nuclear Waste Fund balance at the end of 2020 was approximately $45.1 billion. Although the courts have barred the DOE from continuing to collect fees, investment income continues to accrue at about $1.5 billion per year (DOE, 2021a).

DOE Interim Storage Activities

Although the primary focus of the NWPA was on developing a solution for the permanent final disposal of SNF and HLW (i.e., the repository), the Act does contain provisions that guide the development of facilities for interim storage. Section 111(a)(5) specified that the generators and owners of SNF and HLW have the primary responsibility to provide for, and to pay the costs of, interim storage until such waste and spent fuel is accepted by the Secretary of Energy. Subtitle B of the NWPA (Sections 131 through 137) authorizes interim storage of spent fuel until a geologic repository is ready, and it encouraged the development of expanded at-reactor interim storage facilities. In the event that any operator of civilian nuclear power reactor could not reasonably provide adequate spent nuclear fuel storage capacity, Subtitle B authorized the DOE to develop a federally owned and operated interim storage system with not more than 1,900 metric tons of capacity to prevent disruptions to the orderly operation of the plant.

The NWPA also authorized the siting and construction of a large-scale federally operated Monitored Retrievable Storage (MRS) Facility that could store larger volumes (up to 15,000 metric tons) of SNF and HLW (Subtitle C, Sections 141 through 149). However, the implemen-tation of the MRS program was subject to several conditions designed to ensure that the MRS did not become a de facto repository. Most significantly, construction of such a facility may not begin until the Commission has issued a license for the construction of a repository (Section 148(d)(1)).

A Congressionally chartered MRS Commission (authorized by the 1987 Amendment to the NWPA) in 1989 recommended a 2,000-ton Federal Emergency Storage facility and a 5,000-ton User-Funded Interim Storage Facility. However, the MRS Commission's recommendations were not pursued, and no effort to develop a federally-operated interim storage facility was ever authorized when the Yucca Mountain Repository program was active.

Lawsuits Resulting from DOE's Failure to Receive Waste

After passage of the NWPA, DOE entered into 68 Standard Contracts with nuclear utilities, including PG&E. As a result of the DOE's failure to begin receiving waste in 1998, every nuclear utility, including PG&E, has sued the DOE to recover the costs associated with the DOE's breach of contract (i.e., the costs incurred by the requirement to store SNF and HLW for a longer period of time than originally anticipated). PG&E filed suit (Case No. 04-74C) on January 28, 2004, with the US Court of Federal Claims, seeking damages in the amount of $92.1 Million to cover costs incurred through December 31, 2004. After several amendments to the lawsuit, the Court awarded PG & E approximately $42.76 million in damages in 2006 (Pac. Gas & Elec. Co. v. United States, 73 Fed.Cl. 333, 432 (2006). The major categories of costs included construction of the ISFSI.

PG&E will continue to file claims in the future (and be reimbursed) for costs incurred after 2004 for the continued storage resulting from the DOE's breach, including construction of the expanded ISFSI. These reimbursements are made from the Federal Judgment Fund administered by the US Department of the Treasury, which is paid for by taxpayers, and is used to pay awards and settlements from claims against the federal government. The Nuclear Waste Fund can only be used for the purposes defined in the NWPA; therefore, it cannot be used to pay for the judgments related to the DOE's breach of contract. Over the past 20 years, the Judgment Fund has paid approximately $9 billion in settlements or judgments resulting from 110 lawsuits, and 17 cases are still pending that will likely result in additional liabilities. Estimates of future liability calculated by DOE's Office of the Inspector General are approximately $30.9 billion (DOE, 2021a).

Blue Ribbon Commission and Recent DOE Activities

Following termination of the Yucca Mountain Project, the DOE chartered the Blue Ribbon Commission (BRC) on America's Nuclear Future to recommend a new strategy for managing the back end of the nuclear fuel cycle. Over the course of nearly two years, the BRC conducted numerous public meetings and hearings, and developed a series of recommendations (DOE, 2012). The strategy they recommended in their final report has eight key elements:

(1) A consent-based approach to siting future nuclear facilities
(2) A new organization dedicated solely to implementing the waste management program
(3) Access to the funds nuclear utility ratepayers are providing for nuclear waste management
(4) Prompt efforts to develop one or more geologic disposal facilities

(5) Prompt efforts to develop one or more consolidated storage facilities
(6) Prompt efforts to prepare for large-scale transport of SNF and HLW
(7) Support for continued U.S. innovation in nuclear technology
(8) Active US leadership in international efforts.

After the release of the Blue Ribbon Commission Report in 2012, the DOE published a document describing a proposed revised schedule and strategy for the siting and construction of facilities for the storage and disposal of SNF and HLW (DOE, 2013). Because the proposed strategy is not consistent with the NWPA, the implementation of the revised strategy is contingent on the passage by Congress of new legislation and funding that would allow the implementation of the DOE's revised strategy (referred to here as the DOE 2013 Strategy):

The revised strategy proposed to implement a program over the next 10 years that would:

- Site, design, license, construct, and begin operations of a federally operated pilot interim storage facility by 2021, with an initial focus on accepting used nuclear fuel from shut-down reactor sites;
- Advance toward the siting and licensing of a larger interim storage facility to be available by 2025 that would have sufficient capacity to provide flexibility in the waste management system and allow for the acceptance of enough used nuclear fuel to reduce expected government liabilities; and
- Make demonstrable progress on the siting and characterization of repository sites to facilitate the availability of a geologic repository by 2048.

In the nine years since the publication of the revised strategy, Congress has not authorized any funding for its implementation, or made the changes to the NWPA that would be required to allow it. The DOE has not developed or submitted proposed legislation to Congress. The schedules proposed in the revised strategy assumed that funding and modifications to the NWPA would be made expeditiously, so it is reasonable to assume that the 9-year delay in implementation of the program would result in at least a 9-year delay in the target dates identified (i.e., 2030 for a pilot project, 2034 for a larger interim facility).

In the absence of progress toward the the development of a waste management system that included a repository, DOE began in 2015 to develop a consent-based process for siting storage or disposal facilities collaboratively with members of the public, communities, stakeholders, and governments at the Tribal, State, and local levels. As part of this initiative, the Department issued an Invitation for Public Comment and conducted a series of public meetings to seek feedback and inform future efforts. Based on that feedback, as well as the findings of several expert groups, DOE developed and requested public comment on the *Draft Consent-Based Siting Process for Consolidated Storage and Disposal Facilities for Spent Nuclear Fuel and High-Level Radioactive Waste (* the " *Draft Consent-Based Siting Process,"*) in January 2017(DOE, 2017).

In 2021, Congress appropriated funds for DOE to begin analyzing how to implement a nuclear waste management program focused (in the near term) on the use of a consent-based siting process to identify a site or sites suitable for the development of a Federal consolidated interim storage facilitys. Interim storage could be an important component of a comprehensive waste management system and could enable near-term consolidation and temporary storage of spent nuclear fuel. This strategy could allow for removal of spent nuclear fuel from stranded or decommissioned reactor sites, provide useful research opportunities, and build trust and confidence with stakeholders and the public by demonstrating a consent-based approach to siting. DOE anticipates that an interim storage facility would need to operate until the fuel can be moved to final disposal. The duration of the interim period would depend on the completion of a series of significant steps, such as the need to modify the NWPA; identify, license, and construct a facility; and plan, develop, and operate a transportation system to move the SNF to an interim facility. At the same time, progress on siting and developing a geologic repository would also be necessary to ensure that interim facilities can eventually be closed. Therefore, on December 1, 2021, DOE issued a "*Request for Information (RFI) on Using a Consent-Based Siting Process to Identify Federal Interim Storage Facilities"* (DOE, 2021b) in the Federal Register (86 FR 68244). The RFI specifically requested input into three areas of consideration, and included a series of detailed questions related to how consent based siting could and should be implemented, and to what extent the consent based siting process should be linked to the development of geologic repository for final disposal. The three areas are:

- Area 1: Consent-Based Siting Process
- Area 2: Removing Barriers to Meaningful Participation, especially for groups and communities who have not historically been well-represented in these conversations
- Area 3: Interim Storage as Part of a Waste Management System

The comment period for the RFI remained open for 90 days and closed on March 4, 2022.

DOE received 225 submissions in response to the RFI from a wide variety of commenters, including Tribal, State, and local governments; non-governmental organizations; members of academia and industry; other stakeholders; and individual commenters. In September 2022, DOE released a document entitled "*Consent Based Siting Request for Information Comment Summary and Analysis*" (DOE, 2022). This document summarizes DOE's analysis and response to the comments received. DOE identified six major themes in the responses received. They include:

- Distrust of DOE and of the federal government's nuclear waste management efforts more broadly;
- An emphasis on "fairness"— both in the way the siting process itself is conducted and in terms of outcomes from the siting process;
- An appreciation of the challenges inherent in defining consent and successfully implementing a consent-based siting process;
- Significant differences of opinion about whether the federal government should pursue consolidated interim storage for commercial spent nuclear fuel, including related concerns about progress toward a deep geologic repository and transportation requirements and risks;
- Support for changes in the Nation's overall approach to nuclear waste management and for a new, independent organization to lead waste management efforts; and
- Strong differences of opinion about the need for and merits of nuclear energy technology.

DOE indicated that they recognize a successful consent-based siting process for a federal consoledated interim storage facility for spent nuclear fuel requires strong and trusting relationships—built on a foundation of collaboration, two-way communication, information sharing, and accountability—among DOE, potential host communities, and other partners and stakeholders.

To build and sustain these relationships, the DOE committed to (1) implementing congressional direction in a way that maximizes the potential benefits of consolidated interim storage, (2) addressing the current deficit of trust in DOE by making changes internally and externally, (3) ensuring that its consent-based siting process is fair and inclusive, (4) focusing on fairness in siting outcomes by putting communities' needs and well-being at the center of the siting process, (5) continuing and expanding ongoing efforts to address transportation issues and related planning needs, and (6) rigorously applying safety, security, and other criteria in all aspects of the siting process, including by supporting communities that wish to conduct independent studies related to safety and other issues of concern.

DOE intends to use public feedback and other outreach efforts to inform development of a consent-based siting process, the strategy for an integrated waste management system, and consideration of a funding opportunity for interested groups and communities. DOE anticipates that consent-based siting should be done in close collaboration with the public, interested groups, and governments at the Tribal, state, and local levels.

Recent Congressional Efforts to Address Nuclear Waste Management Issues

In response to the lack of progress since the dissolution of OCRWM, and termination of the Yucca Mountain Project, several members of Congress have proposed legislative initiatives to restart or reinvigorate the repository program, and to accelerate the establishment of interim storage alternatives to provide near-term alternatives for the storage of SNF.

In the Senate, Senator Bingamon proposed a new Nuclear Waste Administration Act in 2012, and Senators Alexander, Murkowski, Feinstein, and Cantwell proposed the Nuclear Waste Administration Act of 2013 with a revised version in 2015. Their proposal would have implemented some (but not all) of the recommendations of the Blue Ribbon Committee, and DOE's 2013 Strategy. The 2015 Act would have:

- Established an independent agency to manage the country's nuclear waste program in place of the DOE;
- Defined a consent-based process for the development of consolidated storage facilities and a repository;
- Established a new working capital fund in the U.S. Department of the Treasury, into which the fees collected from the utilities would be deposited; and
- Authorized the Secretary of Energy to revisit the decision to commingle defense waste with commercial spent fuel.

In the House of Representatives, Rep. Robert Dold of Illinois introduced the Stranded Nuclear Waste Accountability Act (H.R. 5632) in July 2016, which would have directed the Secretary of Energy to implement a program to provide compensation to communities that are hosts to closed nuclear power plants that must continue to store spent nuclear fuel onsite because of the government's failure to establish a geologic repository.

On June 26, 2017, Rep. John Shimkus (R-IL) introduced H.R. 3053, the Nuclear Waste Policy Amendments Act of 2017. That bill would have amended the 1982 NWPA in several significant ways. Title I of the bill would have directed DOE to initiate a program to consolidate and temporarily store commercial SNF during the development, construction, and initial operation of a repository, with preference for the Department to take ownership of SNF from facilities that have ceased commercial operation. It also would have authorized DOE to enter into an agreement with a non-Federal entity for the purposes of storing SNF to which the Department holds title.

Title II would have addressed Federal “land withdrawal,” and related management issues associated with the licensing and construction of a permanent geologic repository at Yucca Mountain, including the permanent withdrawal of Federal land for a repository, and removed potential impediments to the NRC licensing process and conditions for the repository. It also would have limited activities relating to a separate repository for HLW generated by atomic energy defense activities.

Title III would have provided DOE with consolidated storage options to help fulfill the Federal government's obligations to take title to SNF, including provisions to amend the NWPA to authorize DOE to modify contracts to allow the transfer of commercial SNF to DOE for monitored retrievable storage in addition to DOE's existing legal obligations to ensure the permanent disposal of commercial spent fuel.

Title IV would have provided benefits to the repository host State and units of local governments, including provisions to requalify the State of Nevada to enter into an agreement with DOE to help mitigate potential impacts that may result from hosting the repository. The title also would have allowed qualified covered units of local government to enter into separate benefits agreements with DOE.

Title V would have amended the method by which DOE funds its nuclear waste management activities through the collection and usage of the Nuclear Waste Fund. The bill would have made specific portions of of the fund available to DOE without further appropriation throughout the multi-decade life cycle of the repository program.

Title VI would have made additional changes to the NWPA, including updating the generic (non-Yucca Mountain specific) standards for a repository, setting a fixed-term appointment for the OCRWM Director, and expanding the qualified usage of DOE financial assistance to state and local organizations to support SNF transportation activities.

The House of Representatives held several hearings related to H.R. 3053, and the bill was passed by a bipartisan majority of the House on a roll call vote on May 10, 2018. The bill was forwarded to the Senate Committee on Environment and Public Works on May 14, but was never considered by the full Senate.

In 2019, Representative McNerney (D-CA) introduced the Nuclear Waste Policy Amendments Act of 2019. This bill included numerous provisions to address the storage and disposal of nuclear waste. Among other things, it would have:

- Directed the DOE to initiate a program to consolidate and temporarily store commercial spent nuclear fuel during the development, construction, and operation of a permanent nuclear waste repository;
- Addressed federal land withdrawal and related management issues, including the permanent withdrawal of specific federal land for repository use by DOE;
- Updated the NRC licensing process and conditions for the permanent repository;

- Limited activities relating to developing a separate defense waste repository used for storing high-level radioactive waste and spent nuclear fuel derived from the atomic energy defense activities of DOE;
- Authorized DOE to enter into agreements to provide benefits to state, local, and tribal governments that might host or be affected by facilities related to storing nuclear waste;
- Revised the method by which DOE funds its nuclear waste management activities though the collection and usage of the Nuclear Waste Fund;
- Created an Office of Spent Nuclear Fuel within DOE; and
- Required DOE to establish a Stranded Nuclear Waste Task Force to study existing resources and funding for communities that contain stranded nuclear waste and develop economic adjustment plans for such communities.

The Nuclear Waste Policy Amendments Act of 2019 never advanced in either the House or the Senate. As a result, efforts to update the regulatory framework for nuclear waste management have not progressed. In addition to the efforts in both the House and Senate to authorize revisions to the regulatory framework for the program, the House of Representatives included funding for both DOE and NRC in their budgets for licensing of the Yucca Mountain repository program from 2011 through 2017, including $150 Million in 2016 and 2017. The Trump Administration also requested $120 Million in their budget requests for 2018, 2019, and 2020 for the restart of the licensing of the Yucca Mountain Repository. However, neither Yucca Mountain funding, nor funding for a revised program to implement the Administration's 2013 Strategy, has been authorized in any year since 2010.

Private Initiatives for Spent Fuel Storage

In addition to DOE's current effort to develop a federal facility, there have been several initiatives in the past 30 years to develop a privately funded, commercially operated Consolidated Interim Storage Facility (CISF). In theory, the availability of such a facility could enable operators of closed and/or decommissioned nuclear power plants such as DCPP to transfer SNF and reactor-related GTCC waste to an off-site CISF, which is not included in the current planning or baseline. There is no regulatory prohibition on the development of a private facility to provide interim storage of SNF. However, there are significant regulatory and management issues and challenges that would need to be overcome in order for a commercial facility to become a viable option. Three private entities that have attempted to establish interim storage programs are discussed briefly below. The first (Private Fuel Storage LLC [PFS] in Utah) was an effort funded by multiple utilities that was licensed but never opened due mainly to opposition at the state level. Two other commercial ventures are currently in development: these proposed CISFs are located in Andrews County, Texas and in Lea County, New Mexico. The proposed facility in Texas is now licensed for construction and operation (NRC, 2021). In January 2023, the NRC indicated that they had received Holtec's final revision to the safety analysis report, and supplemental analyses of the license application; and their staff had determined that the supplements contained sufficient information for them to complete their review. NRC expects to publish the final safety evaluation report and the licensing decision for the CISF in New Mexico in Spring 2023 (NRC, 2023).

Private Fuel Storage, LLC

PFS was formed by multiple nuclear utilities in the mid-1990s to provide an option for storage of spent fuel when it became apparent that DOE would be unable to meet their contract date for initial waste acceptance in 1998. The member utilities originally included PG&E, but PG&E withdrew from the project shortly after it was organized. The Private Fuel Storage project would have stored approximately 44,000 metric tons of SNF from over 100 power plants in Holtec International dry casks on 98 acres of Goshute land in Utah and cost approximately $3 billion. The license application was initially submitted in 1997, and after a long and highly contentious review process, the PFS facility was issued a license by the NRC in 2006. Opposition to the project by the State of Utah, and many other parties resulted in the extended period of review. Although licensed, the facility was never opened due to the refusal of the US Department of the Interior (regarding right-of-way for rail access to the site) and the Bureau of Indian Affairs (regarding uncertainties over land trust issues) to grant needed approvals, which precluded the facility from becoming operational (PFS, 2014). PFS notified the NRC in 2012 that they intended to terminate their license unless they were granted an exemption from Part 171 Annual Fees as long as the facility is not operational. After review, the NRC granted the exemption, so the license remains in effect, but the access issues remain unresolved.

Interim Storage Partners LLC

Interim Storage Partners LLC (ISP), a joint-venture between Waste Control Specialists LLC (WCS) in Andrews County, Texas, and Orano USA, prepared and submitted a license application to the NRC on April 28, 2016 for a CISF, in accordance with the requirements of 10 CFR Part 72. The CISF would be constructed and operated on an approximately 100-acre initial footprint within a 320-acre parcel, where security would be maintained, within the currently controlled WCS property of 14,000 acres. The site is approximately 32 mile west of Andrews Texas. ISP requested initial authorization to store up to 5,000 metric tons of uranium (MTU) in Phase 1, but has analyzed the environmental impacts of storing up to 40,000 MTU at the CISF (WCS, 2015).

The license application was accepted by the NRC for review on January 26, 2017. NRC approved the Environmental Impact Statement for the site on July 29, 2021, and approved the license application on September 14, 2021 (NRC, 2021). ISP is continuing to pursue the CISF project, but no progress regarding agreements with DOE or individual utilities has been reported publically since the NRC approval of the license application.

Eddy Lea Energy Alliance, LLC

A second private venture for a CISF has been proposed by the Eddy Lea Energy Alliance, LLC (ELEA), a partnership of Holtec International and the Cities of Carlsbad & Hobbs and the Counties of Eddy & Lea in New Mexico (Alliance). The Alliance has purchased 1,000 acres of land approximately halfway between Carlsbad and Hobbs, New Mexico for potential use, and has proposed using Holtec's existing designs for below-grade SNF storage (HISTORM UMAX).

Holtec International submitted a license application for the facility on March 31, 2017. Their application included a Final Safety Analysis Report and Technical Specifications for a HI-STORM UMAX canister storage system (Holtec, 2016). Holtec and the Alliance originally proposed a development schedule similar to that proposed by ISP, with licensing completed before 2020 and construction and initial operation possible by 2021. However, delays in the licensing process have extended their proposed schedule. NRC review of the license application is continuing; NRC approved the Environmental Impact Statement for the CISF in July, 2022 (NRC, 2022 – NUREG 2237), and ELEA reportedly expects approval of the license application in 2023.

Potential Constraints to the Use of Private Fuel Storage Facilities

Although in theory there are no regulatory barriers to the construction and operation of private fuel storage facilities, there are significant legal and contractual constraints that would have to be overcome in order for PG&E to contemplate shipment of DCPP SNF to a private facility. These relate to both the costs and potential liabilities that would be associated with the transfer of the SNF to a third party.

Cost Issues: The question of who would pay for PG&E to move and store SNF and HLW from DCPP to an off-site facility is not simple to answer. As noted previously, the NWPA specifies that owners and generators of SNF and HLW are responsible for interim storage until the DOE accepts it for transportation and disposal. As a result, PG&E (and other utilities) decommissioning plans (such as the PSDAR, IFMP, and the SSDCE) and trust funds for decommissioning activities do not include any money for transportation or storage at off-site facilities, because those costs are solely the responsibility of the DOE. The Decommissioning Trust Funds are funded by charges to utility ratepayers and overseen by the California Public Utilities Commission, and it seems unlikely they would approve the use of the Trust Funds for costs that are the responsibility of the Federal government. The DOE does not currently have authority or access to any funds to pay for transportation or interim storage of SNF. The Nuclear Waste Fund can only be used for the development and construction of a permanent repository, and according to the NWPA, funds could only be expended on interim storage after construction of a repository was in progress. Title I of H.R. 3053 (discussed above) which passed the House but not the Senate in 2018, would have authorized DOE to develop a plan to assume ownership of SNF at decommissioned reactors during the development of the repository, and then transport it and store it at a non-federal commercial site. Since 2018, Congress has not authorized DOE to enter into negotiations regarding the transportation or interim storage of SNF.

Additionally, the breach of contract lawsuit settlements administered by the Department of the Treasury do not currently anticipate costs that would be incurred for off-site transportation and temporary storage, and include only costs incurred by the utilities (e.g., PG&E) resulting from the DOE's breach. It is not clear whether the administrators of the Judgment Fund would approve the reimbursement of third party vendors for transportation or storage above and beyond the costs already incurred for on-site storage. Currently, utilities such as PG&E are reimbursed for their costs, but may not collect a fee or profit. Private vendors could not be expected to participate if they could not earn a profit.

In order for the DOE to contribute in any way, Congress would have to authorize funding, either through access to the Fund, or through another source of new appropriations. As noted previously, the primary focus of the program historically (and the primary purpose of the fund) was the development of a repository for permanent disposal. Given the lack of progress on the direction of the US nuclear waste management policy and program over the last 12 years, it seems unlikely that Congress would authorize the use of the Waste Fund for interim storage.

As discussed above, some of the Senate proposals for reform of the nuclear waste management program did include a proposal for a new “working capital” fund (separate from the Nuclear Waste Fund) that could in theory be used to support interim storage, but it is not clear how or if such funding will materialize.

Contractual (Liability) Issues: The issue of responsibility or liability for SNF and HLW is similar in many ways to the cost issue. Under the NWPA, utilities hold title to and responsibility for managing SNF and HLW until the DOE accepts it (and title) for transportation and disposal. The NWPA did not contemplate the addition of third parties to the waste management equation, and therefore does not explicitly address it. If PG&E decided to transport and store waste at an off-site facility, it would presumably want to be released from future liability, in the unlikely event of any accidents or other incidents.

A third party that was storing waste temporarily would likely not be willing to accept long-term liability for SNF or HLW, particularly in the absence of a permanent disposal option such as a repository. As a result, it appears that the proposals by ISP and ELEA assume that DOE would be willing to negotiate a contract that would take legal title and pay them for interim storage until a repository is available for permanent disposal. On their website describing the Holtec ELEA CISF, Holtec does state that they believe the Price Anderson Act would apply to transportation and storage at a commercial CISF. Therefore, a modification of the NWPA by Congress would likely be required to implement private storage. Since OCRWM was disbanded in 2010, there is no single organization within the government that is currently responsible for the management of nuclear waste, although many of the legal functions of OCRWM were assigned to other departments or offices within the DOE.

In summary, although some of the earlier proposed amendments to the NWPA did include provisions that would enable DOE to accept title, and pay a third party to store SNF at an interim storage facility, such as the proposed facilities at ISP and ELEA, Congress is not currently considering any such modifications.

Moving DCPP SNF and HLW to another Existing ISFSI

As is the case for potential storage of SNF at a private facility, there is no regulatory prohibition on the possible use of an existing ISFSI for interim storage. However, there are no operating ISFSI’s in the US that currently accept SNF or HLW from outside parties.

Although it is true that another ISFSI could theoretically be expanded to accommodate DCPP waste, many of the same cost and liability issues that would apply to a private facility would also apply to an existing ISFSI. Neither PG&E nor any of the existing nuclear generating stations has access to funds to pay for transportation or off-site storage (the Judgment Fund only pays the costs of on-site storage). It is possible that the DOE or a new Nuclear Waste Administration could be authorized and funded to pay the costs of and assume liability for off-site storage of SNF from DCPP through the passage of legislation, but there has been no indication that DOE or any new waste management organization would consider the possibility of using an existing facility or what the other requirements new legislation might impose.

Expanding the capacity of an existing ISFSI would also require amendment of the NRC license for the facility, and would presumably trigger additional review by state regulatory agencies (e.g., the California Public Utilities Commission), as well as other State and Federal agencies responsible for land use. Estimating the likelihood of success of such efforts, or the time that would be required, would be speculative.

Summary

The plan and schedule for the management of SNF and HLW during DCPP decommissioning are based on assumptions consistent with existing law (the Nuclear Waste Policy Act) and contracts (the Standard Contracts) that provide a defensible basis for projections of the activities and time required to complete decommissioning. Current nuclear waste management policy in the U.S. encourages on-site ("at reactor") storage of SNF and HLW until it can be shipped to the DOE for permanent disposal in a geologic repository. The schedule for the transportation of waste from DCPP to the repository is constrained by the rate at which the DOE can receive shipments from all of the operating and closed commercial nuclear power plants, as well as DOE sites shipping HLW and SNF. Based on the assumption that the DOE will be ready to begin accepting fuel in 2031 (at a repository if the Yucca Mountain Project is restarted, or at an interim storage facility if one becomes available), the IFMP projection that all of the DCPP SNF and HLW will be shipped by 2067 is reasonable and would support the projected completion of DCPP decommissioning activities in 2075.

There are certain scenarios (e.g., involving interim storage facilities) that could potentially support a faster transfer of SNF and HLW to off-site facilities, but there is presently no reliable basis for defining them in more detail or analyzing them. Such scenarios would require modifications of current regulations and other policy changes that cannot currently be reliably predicted.

In any event, it is clear that the broad sequence of waste management events required to complete DCPP decommissioning will not change: (1) transfer of SNF from the Spent Fuel Pools to the on-site ISFSIs; (2) extended storage in the ISFSIs; and (3) transportation of SNF and HLW off-site to a repository or interim storage facility. As a result, despite uncertainty regarding the timing of the availability of a final disposal or interim storage facility, the schedule reflected in DCPP's PSDAR, IFMP, and other planning documents represents a reasonable baseline for analysis in the DCPP Decommissioning EIR.

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Appendix G2

Radioactive Materials Transportation Experience and Risk Assessments

Appendix G2
Radioactive Materials Transportation Experience and Risk Assessments

As discussed in Section 1.0, *Introduction*, and in Section 2, *Project Description (Phases 1 and 2)*, the US Nuclear Regulatory Commission (NRC) has exclusive jurisdiction and regulatory authority over the radiological aspects of decommissioning nuclear power plants including activities related to the approved Independent Spent Fuel Storage Installation (ISFSI) and the transportation and off-site storage of spent nuclear fuel (SNF). Pacific Gas and Electric (PG&E) announced on April 6, 2022, that Orano USA was selected as the vendor to transfer remaining spent fuel from operations to dry storage. As indicated in Table 2-1, Decommissioning Project Activities Summary, after a cooling and decay period (i.e., time to reduce radioactivity), SNF and Greater Than Class C (GTCC) waste would be moved to the ISFSI and new GTCC Waste Storage Facility, respectively, for storage (SNF will be transferred to dry cask storage within approximately 4 years after each reactor shutdown).

To maximize disclosure to the public, this appendix has been prepared to provide background information on transportation of SNF, High-Level Radioactive Waste (HLW), and radioactive materials generally. It also provides an overview of the transportation of radioactive materials both nationally and internationally, including a discussion of some of the issues and constraints associated with the handling, packaging, and preparation of SNF and HLW for transport off-site, and identification of the regulatory permits and certifications that are required. The appendix summarizes several aspects of the transportation of SNF and HLW, including the respective roles and responsibilities of federal, state, and local agencies (in regulation, security, and accident/ emergency response), evaluation of the risks associated with transportation, assessment of the impacts associated with transportation of SNF and HLW to a geologic repository, and discussion of the physical protection and safeguards regulations require which are designed to protect against sabotage, terrorism, or acts of malice.

National and International Experience

The United States and many other countries have successfully managed, stored, and transported SNF and HLW since the advent of commercial nuclear power over 40 years ago. Internationally, over that time, there have been approximately 20,000 shipments of over 80,000 tons of used nuclear fuel covering a total distance of over 30 million kilometers (Stahmer, 2009). In the US alone, there have been more than 3,000 used nuclear fuel shipments covering a total distance of over 1.55 million miles (2.5 million kilometers [km]). Only nine transportation accidents have been reported to the US Atomic Energy Commission and the US Department of Energy (DOE) (Nuclear Energy Institute [NEI], 2019) in over 40 years of used nuclear fuel transport. Four of these involved empty casks (Holt, 1998). In the most severe accident, a tractor-trailer carrying a 25-ton used nuclear fuel cask swerved to avoid a head-on collision and overturned. The cask separated from the trailer and came to rest in a ditch. The cask was slightly damaged but did not release any radioactive materials. No accident involving SNF or HLW has resulted in a release of radioactive materials causing damage to the environment, workers, or the public.

In addition to SNF and HLW, DOE has also managed the transportation and disposal of transuranic waste[1] to the Waste Isolation Pilot Plant (WIPP) in New Mexico for over 20 years, using transportation practices and methods that are similar to those that would be used for SNF. During that time, WIPP has received approximately 13,000 shipments that traveled over 15 million cumulative miles without a radiological release (DOE, 2022).

The United States nuclear industry has a well-demonstrated track record for safety during decommissioning; 10 reactors have completed decommissioning safely to either the point of license termination or the point where the remaining activities are limited to management of an ISFSI. Currently, 18 commercial power reactors are in decommissioning, with no significant radiological issues (NEI, 2021). The decommissioning of reactors includes the safe transportation of radioactive wastes to an ISFSI or to a licensed and approved repository.

PG&E has expertise in the decommissioning process as evidenced by the successful remediation and recent termination of the license for PG&E's Humboldt Bay Unit 3 nuclear power plant near Eureka, California, on November 18, 2021. That site has been released for unrestricted use. Humboldt Bay Unit 3 was a 65-megawatt boiling water reactor plant, operated commercially from 1963 to 1976 (NRC, 2021c).

At Humboldt Bay, the NRC conducted performance-based in-process inspections of the licensee's Final Status Survey (FSS) program during the decommissioning process. The purpose of the inspections was to verify that the FSSs were being conducted in accordance with the commitments made by the PG&E in the License Termination Plan (LTP), and to evaluate the quality of the FSSs by reviewing the FSS procedures, methodology, equipment, surveyor training and qualifications, document quality control, and survey data supporting the FSS Reports. In addition, the NRC conducted numerous independent confirmatory surveys to verify the FSS results obtained and reported by PG&E. Confirmatory surveys consisted of surface scans for beta and gamma radiation, direct measurements for total beta activity, and collection of smear samples for determining removable radioactivity levels (NRC, 2021c).

After decommissioning Humboldt Bay to meet the NRC's radiation protection standards, PG&E submitted FSSs of the Unit 3 site and requested license termination. The NRC said that its staff evaluated the surveys, conducted inspections, and reviewed confirmatory analyses before concluding that the site meets its criteria for license termination for unrestricted use (NRC, 2021c).

International experience has been similarly successful. France has 56 commercial nuclear reactors that provide approximately 399 terawatt-hour electricity or 70 percent of all electricity consumed. Orano, the French company in charge of nuclear fuel cycle activities, provides the fuel for and manages the waste (1,150 tonnes of used nuclear fuel produced each year) from the country's nuclear power plants. The nuclear fuel recycling process involves converting spent

[1] Transuranic radioactive waste is waste that contains manmade elements heavier than uranium (with atomic numbers greater than 92) on the periodic table. By definition (40 CFR 191.02), it is waste containing more than 100 nanocuries of alpha-emitting transuranic isotopes, with half-lives greater than twenty years, per gram of waste. It is produced during nuclear fuel assembly, nuclear weapons research and production, and during the reprocessing of SNF. Transuranic waste generally consists of protective clothing, tools, and equipment used in these processes. The WIPP Land Withdrawal Act specifically excludes high-level waste and SNF from the definition, as neither is allowed to be disposed of at the WIPP.

plutonium, formed in nuclear power reactors as a by-product of burning uranium fuel, and uranium into a "mixed oxide" (MOX) that can be reused in nuclear power plants to produce more electricity. Reprocessing is carried out at the La Hague reprocessing plant on the Normandy coast and at Marcoule MOX fuel manufacturing plant (International Atomic Energy Agency, 2019). HLW in France is predominantly shipped by rail. About 300 fresh fuel, 250 used nuclear fuel, 30 "Mixed Oxide" MOX fuel, and 60 plutonium oxide powder shipments are made annually in France (Stahmer, 2009).

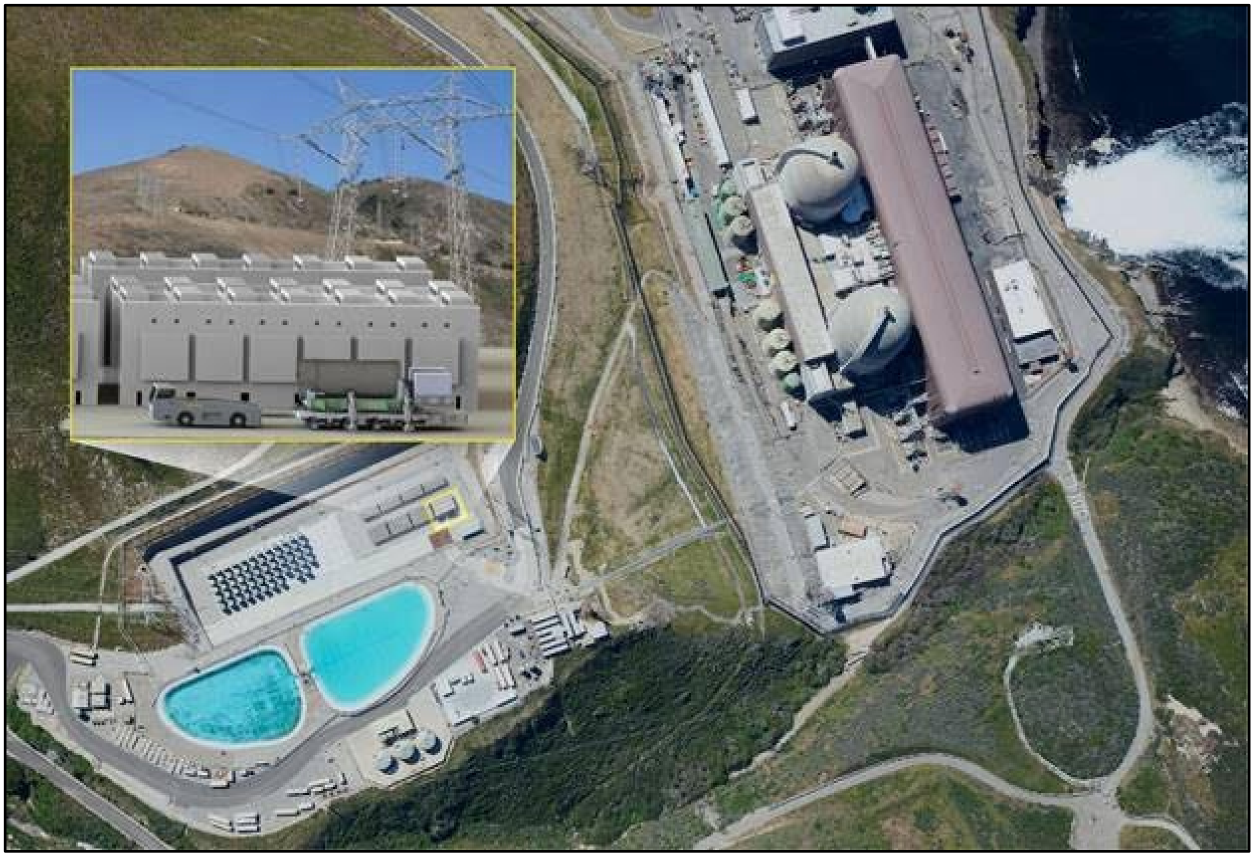
The United Kingdom, Canada, Germany, Sweden, Japan, and other countries are currently safely and successfully managing the storage and transportation of SNF and HLW. According to Stahmer (2009), in over 45 years of used nuclear fuel transport, not a single incident or accident has resulted in a significant radiological impact on people or the environment.

Transportation Packaging and Casks

The current dry cask storage system at the Diablo Canyon Power Plant (DCPP) uses the Holtec International HI-STORM 100SA overpack, HI-TRAC 125D transfer cask, and Multi-Purpose Canister (MPC) capable of holding 32 fuel assemblies (MPC-32). This system is approved for use by general licensees under NRC Docket Number 72-1014. The canisters are half-inch thick stainless steel nestled within a concrete "overpack" that is 27-1/2 inches thick and lined with a 1 inch thick stainless steel liner around both the inner and outer diameters. No mechanism for inspecting the canisters for cracking or loss of helium currently exists, though research is underway. As stated in Section 2, *Project Description (Phases 1 and 2)*, the ISFSI consists of seven storage pads containing space for 20 fuel storage casks each. PG&E began transferring spent fuel to the ISFSI in 2009. On January 19-21, 2021, NRC inspectors evaluated the licensee's operation of the ISFSI during an on-site inspection. The DCPP ISFSI consists of seven concrete pads for a total area of 49,980 square feet. Each pad was designed to hold 20 Holtec International HI-STORM 100SA storage casks which are securely anchored to steel embedment plates in the concrete. At the time of the inspection, the ISFSI contained 58 storage casks (out of 140 total possible) loaded with Multi-Purpose Canisters, each with 32 spent fuel assemblies (MPC-32) (NRC, 2021b).

The Orano contract includes engineering and licensing to implement their NUHOMS® system at DCPP, design of a new Greater Than Class C waste (GTCC) dry storage facility, fabrication of storage canisters at Orano's Trans Nuclear Fuel manufacturing facility in North Carolina, construction and installation of onsite concrete storage modules utilizing the existing ISFSI storage pads, and conducting the pool-to-pad transfer operations for both the SNF and GTCC waste. The Orano system design to be used at DCPP includes enhanced thermal and seismic capabilities, which will require additional NRC safety reviews. Once approved, the transfer of all SNF to dry storage is planned to be completed by 2029. The site concept provided by Orano is shown in Figure G2-1.

Figure G2-1. NUHOMS® Installation Concept at DCPP



Source: Orano, 2022.

The UCLA-PG&E study evaluated the risks associated with transportation of both radiological and non-radiological materials away from DCPP for disposal at off-site facilities out of state. The analysis considered multiple transport modes (truck, rail and barge) along multiple different routes, and thoroughly assessed both conventional risks (i.e., accident, injury and fatality rates for transport by truck, rail and barge respectively) and radiological risks resulting from the potential exposure of workers and the public to radiation and/or radiological materials. The study found that risks are very low for all the scenarios examined, and that radiological risks were a small fraction of natural background radiation (PG&E, 2020).

Section 2 provides a discussion regarding the approved and licensed sites to accept the radio-active waste from DCPP. Table G2-1 presents the disposal site options discussed.

Table G2-1. Potential Disposal Sites of Radioactive Waste Shipped Off-site

Classification	Potential Destination
LLRW	Energy Solutions, Clive Utah
	WCS, Andrews, Texas
	US Ecology, Idaho
Class A	Energy Solutions, Clive Utah
	WCS, Andrews, Texas
Class B/C	WCS, Andrews, Texas

The non-radioactive materials would be transported in standard 20-foot dry containers in batches of 40,000 pounds or in industrial bags that can hold the same quantity. LARW and Class A wastes would also be transported in the same industrial packaging. The Class B/C wastes would be transported in robust, certified casks that are designed to withstand most traffic accidents. The GTCC wastes and SNF would be transported in highly engineered certified casks that have been shown by analysis and field testing to withstand impacts and fires that are beyond the events expected in traffic accidents (NRC, 2021a; NEI, 2019). Example photos of Special Purpose Modular Transporters, the Class A waste packaging, and Class B/C waste packaging are provided in Figures 2-16, 2-17, and 2-18, respectively.

REGULATION OF TRANSPORTATION OF SNF AND RADIOACTIVE MATERIALS

The NRC and the US Department of Transportation (DOT) jointly oversee the transportation of radioactive materials including SNF (NRC, 2021a).

The DOT's role is to:

- Regulate shippers of hazardous materials, including radioactive material
- Oversee vehicle safety, routing, shipping papers, emergency response, and shipper training

DOT has published a review with guidance on the DOT Hazardous Materials Regulations contained in Title 49, Code of Federal Regulations (49 CFR) Parts 171-185, which govern the packaging and shipment of radioactive material. Radiological materials packaged, labeled, marked, and transported in accordance with these regulations have an excellent safety record. This review is found in its entirety as Appendix G5 – DOT Radioactive Material Regulation Review December 2008 (DOT, 2008).

The role of the NRC is to:

- Maintain all radiological controls of nuclear power plants.
- Regulate other users of radioactive material in 13 states (37 states, including California, regulate users within their borders)
- Approve the design, fabrication, use, and maintenance of shipping containers for the most hazardous radioactive materials, including SNF
- Regulate the physical protection of commercial SNF in transit against malicious acts

The NRC requires radioactive materials shipments to comply with the DOT's safety regulations (49 CFR Parts 171-185) for transporting hazardous materials. Millions of packages of radioactive material are shipped throughout the US each year by rail, air, sea, and road. They contain small amounts of radioactive material that are used in industry and medicine. Examples include smoke detectors, watch dials, nuclear material to diagnose and treat illnesses, and slightly contaminated equipment such as syringes used for radioactive medicines.

More stringent DOT packaging requirements apply as the potential risk posed by the contents increase. DOT regulations limit how much radioactivity can be transported in each package. That way, the dose from any accident does not pose a serious health risk.

NRC regulations for the safety of transport packages for large quantities of radioactive materials, including SNF, can be found in 10 CFR Part 71. The NRC requires packaging of SNF, under both normal and accident conditions of transport, to:

- Prevent the loss of radioactive contents
- Provide shielding and heat dissipation
- Prevent nuclear criticality (a self-sustaining nuclear chain reaction)

Normal conditions that a SNF transport package must be able to withstand include hot and cold environments, changes in pressure, vibration, water spray, impact, puncture, and compression. To show that it can withstand accident conditions, a package must pass stringent impact, puncture, fire, and water immersion tests. Transportation packages must survive these tests in sequence, including a 30-foot drop onto a rigid surface followed by a fully engulfing fire of 1,475 degrees Fahrenheit (°F) for 30 minutes. These very severe tests equate to the package hitting a concrete highway overpass at high speed and being involved in a severe and long-lasting fire. The test sequence encompasses more than 99 percent of vehicle accidents.

The NRC reviews each package design to confirm that it meets the required conditions. Before a package can be used to transport SNF, the NRC must issue an approval certificate.

The NRC's regulatory controls apply to every US shipment of SNF from commercial reactors. For more than 40 years, this oversight has resulted in an outstanding record of safety and security. Thousands of domestic SNF shipments have been completed safely. After the September 11, 2001, terrorist attacks, the NRC further enhanced controls and monitoring of shipments of SNF.

NRC regulations reflect the International Atomic Energy Agency transportation safety standards and supplement DOT regulations. The NRC looks at its transportation regulations every few years and proposes changes, if needed, to address new requirements, policies, or technical improvements.

To ensure that large quantities of radioactive materials are transported safely, the NRC:

- Reviews and certifies transport package designs
- Requires designers to follow strict quality assurance programs for package design, fabrication, use, and maintenance
- Inspects package designers and fabricators to ensure that packages conform to NRC-approved designs and quality assurance programs and
- Inspects some shipments

Many additional requirements help to ensure shipments of radioactive materials are safe:

- DOT regulations require shipper and carrier training
- The DOT and the Federal Emergency Management Agency oversee emergency response coordination, training, and communication
- The DOT carries out its own transportation inspection and enforcement programs

There is no way to completely eliminate risk. Still, the NRC has found both the likelihood of an accident that releases nuclear material and the risk to the public to be small. The NRC regulates the transportation of radioactive waste as an essential part of its mission.

Transportation Risks (NRC Risk Assessments and Safety Studies)

The NRC has carefully studied and evaluated the risks associated with the transportation of SNF and other radiological materials for over 40 years. Over time, these analyses have incorporated increasingly complex methods, technology, and more comprehensive datasets. As computer modeling programs have become more sophisticated, simulations have addressed and incorporated more data and scenarios taken from actual SNF transportation experience, including the simulation of numerous actual and postulated severe accidents.

In 1977, the NRC published the *Final Environmental Impact Statement on the Transportation of Radioactive Material by Air and Other Modes* (NUREG-0170) (NRC, 1977), which showed that the NRC's transportation regulations adequately protect public health and safety. Additional studies by the NRC and their contractors (e.g., Fischer et al., 1987; Sprung et al., 2000) found the risks were even smaller than the 1977 study predicted. The 2000 study used improved risk assessment techniques to analyze the ability of containers to withstand an accident.

In 2014, the NRC published a comprehensive *Spent Fuel Transportation Risk Assessment* (NRC, 2014). This study modeled the radiation doses people might receive if SNF is shipped from reactors to a central facility. The results indicate that NRC regulations for SNF transport are adequate to ensure safety of the public and the environment. The study found:

- Doses from routine transport would be less than 1/1000 the amount of radiation people receive from background sources each year.
- There is less than a 1 in 1 billion chance that radioactive material would be released in an accident.
- If an accident did release radioactive material, the dose to the most affected individual would not cause immediate harm.

The NRC also studies major transportation accidents across the country to understand the actual accident conditions. These studies allow NRC to determine whether its regulations would protect the public if large quantities of radioactive materials were involved. These studies, coupled with the risk assessments, give the NRC added confidence in the safety of SNF shipments.

Transportation Security

The NRC and DOE jointly operate a system to track domestic and foreign nuclear materials shipments. The NRC also requires those involved in SNF or HLW shipments to:

- Follow only approved routes
- Provide armed escorts through heavily populated areas
- Provide monitoring and redundant communications
- Coordinate with law enforcement agencies before shipments
- Notify, in advance, the NRC, local tribes, and states through which the shipments will pass

After the terrorist attacks on September 11, 2001, the NRC enhanced security requirements for transporting SNF and large quantities of radioactive materials. Through advisories and orders to licensees, the NRC requires:

- More pre-planning and coordination with affected states
- Additional advance notification of shipments

- Enhanced control and monitoring
- Trustworthiness checks for individuals with access to or information about the shipment
- Stronger security controls over shipment routes and schedules

These newer requirements and other enhancements were formally added to the NRC's transport regulations through a rulemaking, finalized in May 2013 (NRC, 2013).

Accident Response Assistance

State and local governments have primary responsibility to oversee the response to any accident involving a nuclear materials shipment. They would ensure the carrier and others take the actions required to protect public health and safety.

Any event involving NRC-licensed material that could threaten public health and safety or the environment would trigger special NRC procedures. The NRC may activate its Headquarters Operations Center. It also may activate one of its four Regional Incident Response Centers (Region I-King of Prussia, Pennsylvania; Region II-Atlanta, Georgia; Region III-Lisle, Illinois; and Region IV-Arlington, Texas).

The NRC's highest priority in any accident is to provide expert consultation, support, and assistance to state and local responders. Teams of NRC specialists evaluate information, assess the potential impact on the public and environment, and evaluate possible recovery strategies. Other experts consider the effectiveness of different protective actions, including sheltering in place or evacuation.

Transportation Impacts (Yucca Mountain)

DOE studied the effects associated with the transportation of SNF and HLW in detail as part of the Environmental Impact Statement (EIS) for the proposed Yucca Mountain Repository (DOE, 2002; DOE, 2008). If the repository is opened, 72 commercial and five DOE sites would begin loading and shipping waste. Most shipments would be on legal-weight trucks and trains travelling on the nation's highways and railroads. Barges and heavy-haul trucks could be used for the short-distance transport of SNF from some commercial sites to nearby railroads. Shipments of SNF and HLW arriving in Nevada would travel to the Yucca Mountain site by legal-weight truck, rail, or heavy-haul truck. Legal-weight truck shipments would use existing highways in accordance with DOT regulations. The EIS identified nationwide routes and alternatives for legal-weight highway and rail shipping. Within the State of Nevada, DOE also identified and analyzed alternative rail corridor and intermodal transfer station locations, and associated heavy-haul truck routes, respectively.

DOE then analyzed the impacts of transporting SNF and HLW to the repository under the mostly legal-weight truck and mostly rail scenarios. Under the mostly legal-weight truck scenario, most of the SNF and HLW would be shipped to Nevada by legal-weight truck, while naval fuel would be shipped by rail. Under the mostly rail scenario, commercial SNF from most sites, and DOE and naval SNF and HLW, would arrive in Nevada by rail. However, commercial fuel from a few commercial sites would initially be shipped by legal-weight truck because those sites do not currently have the capability to load a rail cask.

The EIS evaluated the impacts of these two alternative scenarios for transporting SNF and HLW to the Yucca Mountain site. Much of the difference in the impacts between the mostly legal-weight truck and mostly rail scenarios results from the differing number of shipments over the 24-year transportation period and differences in the characteristics of the truck and rail modes of transport. The mostly legal-weight truck scenario would involve about 53,000 shipments (2,200 annually), and the mostly rail scenario would involve approximately 10,700 shipments (450 annually). Because of the larger number of shipments, the mostly legal-weight truck scenario would have somewhat greater radiological impacts during routine operations, even though each individual truck shipment would carry less radioactive material than a rail shipment.

The EIS analysis also considered potential accidents based on various accident cases presented in NUREG-6672, Reexamination of Spent Fuel Shipment Risk Estimates (Sprung et al., 2000). The analysis estimated impacts of postulated releases from accidents in three population zones: urban, suburban, and rural, under a set of meteorological (weather) conditions that represent the national average meteorology. The analysis used state-specific accident data, the lengths of routes in the population zones in states through which the shipments would pass, and the number of shipments that would use the routes to determine accident probabilities (Sprung et al., 2000).

In addition to the risk due to accidents involving a release of radioactive material, the analysis examined the impacts of loss-of-shielding accidents. The loss-of-shielding scenarios range from an accident with no loss of shielding to a low-probability severe accident involving both a loss of shielding (and any increased direct exposure) and a release of some of the contents of the cask.

The EIS analysis also estimated impacts from an unlikely but severe accident called a maximum reasonably foreseeable accident to provide perspective about the consequences for a population that might live nearby. For maximum reasonably foreseeable accidents, the consequences were estimated for each of the accidents and for both truck and rail casks from the spectrum of accidents presented in NUREG-6672. For each accident, the possible combinations of weather conditions, population zones, and transportation modes were considered. The accidents were then ranked according to those that would have a likelihood greater than 1 in 10 million per year and that would have the greatest consequences.

Although every potential accident that could occur cannot feasibly be analyzed, the EIS analyzed several types of accidents that represent groups of initiating events and conditions having similar characteristics. For example, the EIS analyzed the impacts of a collection of collision accidents in which a cask would be exposed to impact velocities in the range of 60 to 90 miles (97 to 145 km) per hour. The EIS also analyzes a maximum reasonably foreseeable accident in which a collision would not occur, but where the temperature of a rail cask containing SNF would rise to between 1,400°F and 1,800°F (between 750°C and 1,000°C). The conditions of the maximum reasonably foreseeable accident analyzed in the EIS envelop conditions reported for the Baltimore Tunnel fire (a train derailment and fire that occurred in July 2001 in a tunnel in Baltimore, Maryland). Temperatures in that fire were reported to be as high as 1,500°F (820°C), and the fire was reported to have burned for up to 5 days.

The estimated radiological accident risk of a single latent cancer fatality for the entire population within 80 kilometers (50 miles) of the rail and truck transportation routes would be about 0.0025 (1 chance in 400) during as many as 50 years of shipments to the repository. Because this risk is for the entire population of individuals along the transportation routes, the risk for any single individual would be very small (DOE, 2008).

The maximum reasonably foreseeable transportation accident analyzed in the EIS was estimated to occur with a frequency of about 8 × 10-6 per year (DOE, 2008). If the accident occurred in an urban area, DOE estimated that there would be 9 cancer fatalities in the exposed population. If the accident occurred in a rural area, DOE estimated that the probability of a single latent cancer fatality in the exposed population would be 0.012 (1 chance in 80) in the exposed population.

DOE also evaluated the potential consequences of an accidental crash of a large jet aircraft into a truck cask or rail cask. The analysis determined that penetration of the cask would not occur; however, potential seal failure could result in releases of radiological materials. The consequences associated with this event would be very low (less than 1 latent cancer fatality in an urban population).

The consequences of the maximum reasonably foreseeable transportation accident would be higher under the mostly rail scenario than under the mostly legal-weight truck scenario, principally because the amount of material in a rail shipment would be larger than that in a legal weight truck shipment.

Protection from Intentional Acts of Malice

The NRC has developed a set of rules specifically aimed at protecting the public from harm that could result from sabotage of SNF casks, which may also be used for HLW. Known as physical protection and safeguards regulations (10 CFR 73.37), these security rules are distinguished from other regulations that deal with issues of safety affecting the environment and public health. The objectives of the regulations are to:

- Minimize the possibility of sabotage
- Facilitate recovery of SNF shipments that could come under control of unauthorized persons

The same cask safety features that provide containment, shielding, and thermal protection also provide protection against sabotage. The casks are massive, and the SNF in a cask would typically be only about 10 percent of the gross weight; the remaining 90 percent would be shielding and structure.

It is not possible to predict with any certainty whether sabotage events would occur and, if they did, the nature of such events. Nevertheless, DOE examined various accidents, including an intentional aircraft crash into a transportation cask. The analysis (DOE, 2002; DOE, 2008) evaluated the ability of large aircraft parts to penetrate shipping casks and found that that neither the engines nor shafts would penetrate a cask and cause a release of radiological materials if an aircraft were to crash into a SNF cask.

DOE also evaluated the potential consequences of a sabotage event in which a high-energy density device penetrates a rail or truck cask. The results of this analysis (DOE, 2008) indicate that the risk of the maximally exposed individual incurring a fatal cancer would increase when compared to the current risk of incurring a fatal cancer from all other causes. DOE estimated that there would be 28 latent cancer fatalities in the exposed population if the sabotage event occurred in an urban area. If the sabotage event took place in a rural area, DOE estimated that the probability of a single latent cancer fatality in the exposed population would be 0.055 (1 chance in 20).

CONCLUSION

This review describes the existing conditions related to temporary on-site storage at the existing approved ISFSI (SNF storage), GTCC Waste Storage Facility, and DCPP plans for transportation and disposal of radiological materials generated during decommissioning, as well as SNF, HLW and GTCC waste. National and international experience in the storage and transportation of SNF and HLW (as well as lower levels of radioactive and hazardous waste) were also described briefly, and the risks associated with transportation summarized. The Orano USA NUHOMS® system to be installed at DCPP, design of a new GTCC Waste Storage Facility, fabrication of storage canisters at Orano's Trans Nuclear Fuel manufacturing facility in North Carolina, construction and installation of on-site concrete storage modules, and conducting the pool-to-pad transfer operations for both the SNF and GTCC waste in compliance with NRC and EPA regulatory standards will ensure that decommissioning, storage and transport operations at DCPP will protect the health and safety of workers, the public and the environment.

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Appendix G3

US Nuclear Regulatory Commission
Environmental Impact Evaluation

Appendix G3
US Nuclear Regulatory Commission Environmental Impact Evaluation

As discussed in Section 1.0, *Introduction*, and in Section 2, *Project Description (Phases 1 and 2),* the US Nuclear Regulatory Commission (NRC) has exclusive jurisdiction over the radiological aspects of decommissioning and has prepared National Environmental Policy Act (NEPA) documents relating to the decommissioning of nuclear facilities. (See Section 1.2.3.1, *US Nuclear Regulatory Commission*, for additional discussion.) To maximize disclosure to the public, the EIR includes this appendix to provide an overview of how these NEPA documents evaluate environmental impacts of the decommissioning of nuclear facilities.

The NRC uses terms from NEPA documents, such as those for license renewal or new reactors, to define the standard of significance for assessing environmental issues (NRC, 2014), as shown below.

- SMALL: Environmental effects are not detectable or are so minor that they will neither destabilize nor noticeably alter any important attribute of the resource.
- MODERATE: Environmental effects are sufficient to alter noticeably, but not to destabilize, important attributes of the resource.
- LARGE: Environmental effects are clearly noticeable and are sufficient to destabilize important attributes of the resource.

Pacific Gas and Electric Company (PG&E) describes the potential environmental impacts from decommissioning activities at the Diablo Canyon Power Plant (DCPP) in the Post-Shutdown Decommissioning Report (PSDAR) (PG&E, 2019). Each resource area was assessed using evaluations in NUREG-0586, Supplement 1 *Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities,* (issued in 2002) as a guide (NRC, 2002). Like the evaluations in NUREG-0586, the analysis assumed that operational mitigation measures are continued and would not rely on the implementation of new mitigation measures unless specified. Environmental releases, waste volumes, and other environmental interfaces were estimated. These data were assessed against the potential for impact and the existing radiological environmental conditions at DCPP to identify impacts. A significance level of SMALL was determined (PG&E, 2019).

The NRC reviewed the potential environmental impacts of stored SNF in NUREG-2157, *Generic Environmental Impact Statement for Continued Storage of Spent Nuclear Fuel* (GEIS), published in September 2014 (NRC, 2014). The NUREG-2157 generically determines the environmental impacts of continued storage, including those impacts identified in the remand by the Court of Appeals in the *New York v. NRC* decision, and provides a regulatory basis for a revision to 10 CFR 51.23 that addresses the environmental impacts of continued storage for use in future NRC environmental reviews. In this context, "the environmental impacts of continued storage" means those impacts that could occur as a result of the storage of SNF at "at-reactor" and "away-from-reactor" sites after a reactor's licensed life for operation and until a permanent repository becomes available. The GEIS evaluates potential environmental impacts to a broad range of resources. Cumulative impacts are also analyzed (NRC, 2014).

Because the timing of repository availability is uncertain, the GEIS analyzes potential environmental impacts over three possible timeframes (NRC, 2014):

- The *short-term storage timeframe* (60 years of continued storage after the end of the reactor's licensed life) includes routine maintenance and monitoring of the spent fuel pool and ISFSI, and transferring SNF from pools to dry cask storage. Because decommissioning is required to be completed within 60 years after a reactor shuts down (unless additional time is necessary to protect public health and safety), the NRC assumes that all SNF would be moved from spent fuel pools to dry cask storage by the end of the short-term storage timeframe.
- The *long-term storage timeframe* (100 years beyond the initial 60-year [short-term] storage timeframe) includes activities such as continued facility maintenance, construction and operation of a Dry Transfer System (DTS), and replacement of ISFSI and DTS facilities, including casks.
- The *indefinite storage timeframe*, which addresses the possibility that a repository never becomes available, assumes that the activities associated with long-term storage continue indefinitely, with ISFSI and DTS facilities being replaced at least once every 100 years.

All potential impacts in each resource area are analyzed for each continued storage timeframe. The GEIS also contains several appendices that discuss specific topics, including the technical feasibility of continued storage and repository availability as well as the two technical issues involved in the remand of *New York v. NRC* — spent fuel pool leaks and spent fuel pool fires.

The SNF storage facility is part of the fuel handling building and is a Seismic Category I structure.[1] SNF assemblies are stored under water in SNF storage racks in the spent fuel pool. A separate fuel-handling building is provided for each reactor unit. The SNF storage racks and spent fuel pool provide for storage of fuel assemblies in the spent fuel pool, while maintaining spacing between assemblies for adequate cooling water flow. This prevents nuclear criticality and protects the fuel assemblies from excess mechanical or overheating. Without these preventative actions, overheating could lead to loss of water through boiling and then potential fires, nuclear criticality, and meltdown. The design basis of the spent fuel pool must meet the requirements of 10 CFR 50.68 (PG&E, 2019).

The NRC also looked at ongoing regulatory activities that could affect the continued storage of SNF, including regulatory changes resulting from lessons learned from the September 11, 2001, terrorist attacks and the March 11, 2011, earthquake and tsunami that damaged the Fukushima Daiichi plant in Japan.

NUREG-2157 summarizes the NRC's conclusions related to the evaluation of the following topics, which are detailed below (NRC, 2014):

- Environmental Impacts of Postulated Accidents
- Potential Acts of Sabotage or Terrorism
- Natural Phenomena Hazards

[1] Seismic Category I – SSCs that are designed and built to withstand the maximum potential earthquake stresses for the particular region where a nuclear plant is built.

- Spent Fuel or ISFSI Leakage
- Spent Fuel Pool Fire

ENVIRONMENTAL IMPACTS OF POSTULATED ACCIDENTS

Because the accident risks for spent fuel pool storage only apply during the short-term timeframe and the accident risks for dry cask storage are substantially the same across the three timeframes, the GEIS does not present the various accident types by timeframe, but rather by accident type (i.e., design basis and severe) and storage facility type (i.e., spent fuel pool and dry cask storage system).

- **Design Basis Accidents in SNF Pools.** Impacts would be SMALL. The postulated design basis accidents considered in this GEIS for spent fuel pools include hazards from natural phenomena, such as earthquakes, floods, tornadoes, and hurricanes; hazards from activities in the nearby facilities; and fuel handling related accidents. In addition, potential effects of climate change are also considered. Based on the NRC's assessment, the environmental impacts of these postulated accidents involving continued storage of SNF in pools are SMALL because all important safety SSCs involved with the SNF storage are designed to withstand these design basis accidents without compromising the safety functions.
- **Design Basis Accidents in Dry Cask Storage Systems and Dry Transfer Systems**. Impacts would be SMALL. All NRC-licensed dry cask storage systems are designed to withstand all postulated design basis accidents without any loss of safety functions. A DTS or a facility with equivalent capabilities may be needed to enable retrieval of SNF for inspection or repackaging. Licensees of DTS facilities are required to design the facilities so that all safety-related SSCs can withstand the design basis accidents without compromising any safety functions. Based on the GEIS assessment, the environmental impact of the design basis accidents is SMALL because safety-related SSCs are designed to function in case of these accidents.
- **Severe Accidents in Spent Fuel Pools.** Probability-weighted impacts would be SMALL. A spent fuel pool may encounter severe events, such as loss of off-site power or beyond design basis earthquakes. Although it is theoretically possible that these events may lead to loss of spent fuel pool cooling function resulting in a spent fuel pool fire, the likelihood of such events is extremely small. Although some handling accidents, such as a postulated drop of a canister, could exceed NRC's public dose standards, the likelihood of the event is very low. Therefore, the environmental impact of severe accidents in a dry storage facility is SMALL.
- **Severe Accidents in Dry Cask Storage Systems.** Probability-weighted impacts would be SMALL. Although some handling accidents such as a postulated drop of a canister could exceed NRC's public dose standards, the likelihood of the event is very low. Therefore, the environmental impact of severe accidents in a dry storage facility is SMALL.

POTENTIAL ACTS OF SABOTAGE OR TERRORISM

The GEIS finds that even though the environmental consequences of a successful attack on a spent fuel pool beyond the licensed life for operation of a reactor are large, the very low probability of a successful attack ensures that the environmental risk is SMALL. Similarly, for an operational ISFSI or DTS during continued storage, the NRC finds that the environmental risk of a successful radiological sabotage attack is SMALL (NRC, 2014).

The potential for theft or diversion of light water reactor SNF from the ISFSI with the intent of using the contained special nuclear material for nuclear explosives is not considered credible because of (1) the inherent protection afforded by the massive reinforced concrete storage module and the steel storage canister; (2) the unattractive form of the contained special nuclear material, which is not readily separable from the radioactive fission products; and (3) the immediate hazard posed by the high radiation levels of the SNF to persons not provided radiation protection (NRC, 2014).

Although a successful act of sabotage or terrorism by an armed attack is low in probability, the consequences of such an act could be severe. A discussion of a postulated spent fuel pool fire resulting from loss of pool water resulting from a successful attack was assessed in the GEIS. The conditional consequences described include downwind collective radiation doses above one million person-rem, up to 191 early fatalities, and economic damages exceeding $50 billion. However, given the very low probability of a successful attack with these consequences, the NRC determined that the risk of successful attack is SMALL (NRC, 2014).

NATURAL PHENOMENA HAZARDS

The postulated design basis accidents considered in the GEIS for spent fuel pools include hazards from natural phenomena, such as earthquakes, flood, tornadoes, and hurricanes; hazards from activities in the nearby facilities; and fuel-handling-related accidents. In addition, the potential effects of climate change are also considered. Based on the GEIS analysis, the environmental risk of these postulated accidents involving continued storage of SNF in pools is SMALL. The SSCs involved with the fuel storage are designed to withstand these design basis accidents without compromising the safety functions. If climate change influences on natural phenomena create conditions adverse to safety, the NRC has sufficient time to require corrective actions to ensure SNF storage continues with minimal impacts (NRC, 2014).

SPENT FUEL POOL OR ISFSI LEAKAGE

Continued storage of SNF could result in non-radiological and radiological impacts to groundwater quality. In the unlikely event a spent fuel pool leak remained undetected for a long period of time, contamination of a groundwater source above a regulatory limit could occur (e.g., a Maximum Contaminant Level for one or more radionuclides). The GEIS analysis concludes that (1) there is a low probability of a leak of sufficient quantity and duration to affect off-site locations; and (2) physical processes associated with radionuclide transport, site hydrologic characteristics, and environmental monitoring programs, ensure that impacts from spent fuel pool leaks would be unlikely. Impacts to groundwater from continued storage in ISFSIs would be minimal because ISFSI storage requires minimal water and produces minimal, localized, and easy-to-remediate liquid effluents on or near ground surface.

The GEIS estimated an annual discharge rate for leakage from the spent fuel pool of 100 gallons per day with contaminants at certain concentrations assumed to be present at the start of short-term storage. The GEIS compared these concentrations to annual effluent ranges for reactors. Even in the unlikely event that spent fuel pool leakage flowed continuously (24 hours per day, 365 days per year) undetected to local surface waters, the quantities of radioactive material discharged to nearby surface waters would be comparable to values associated with permitted, treated effluent discharges from operating nuclear power plants. Based on these considerations, the NRC concluded that the impact of spent fuel pool leaks on surface water would be SMALL (NRC, 2014).

SPENT FUEL POOL FIRE

A spent fuel pool accident could develop into a spent fuel pool fire in a number of ways. Spent fuel pool accidents can arise from either the loss of spent fuel pool cooling, drainage of the spent fuel pool, or the dropping of heavy items into the spent fuel pool. Additionally, the NRC has assessed various accident sequences including spent fuel pool failure due to wind-driven missiles, aircraft crashes, heavy-load drop, seal failure, inadvertent draining, loss of cooling, and seismic events (NRC, 2014). The GEIS describes the NRC's finding that the probability-weighted consequences of atmospheric releases, fallout onto open bodies of water, and societal and economic impacts of spent fuel pool fires are SMALL (NRC, 2014).

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Appendix G4

Radiation Basics

Appendix G4
Radiation Basics

As discussed in Section 1.0, *Introduction*, and in Section 2, *Project Description (Phases 1 and 2),* the US Nuclear Regulatory Commission (NRC) has exclusive jurisdiction and regulatory authority over the radiological aspects of decommissioning.

To maximize public disclosure and understanding, the EIR includes this appendix that provides an overview of the various types of radiation and introduces the concepts of human health impacts as a result of exposure to radiation and potentially toxic materials.

RADIATION

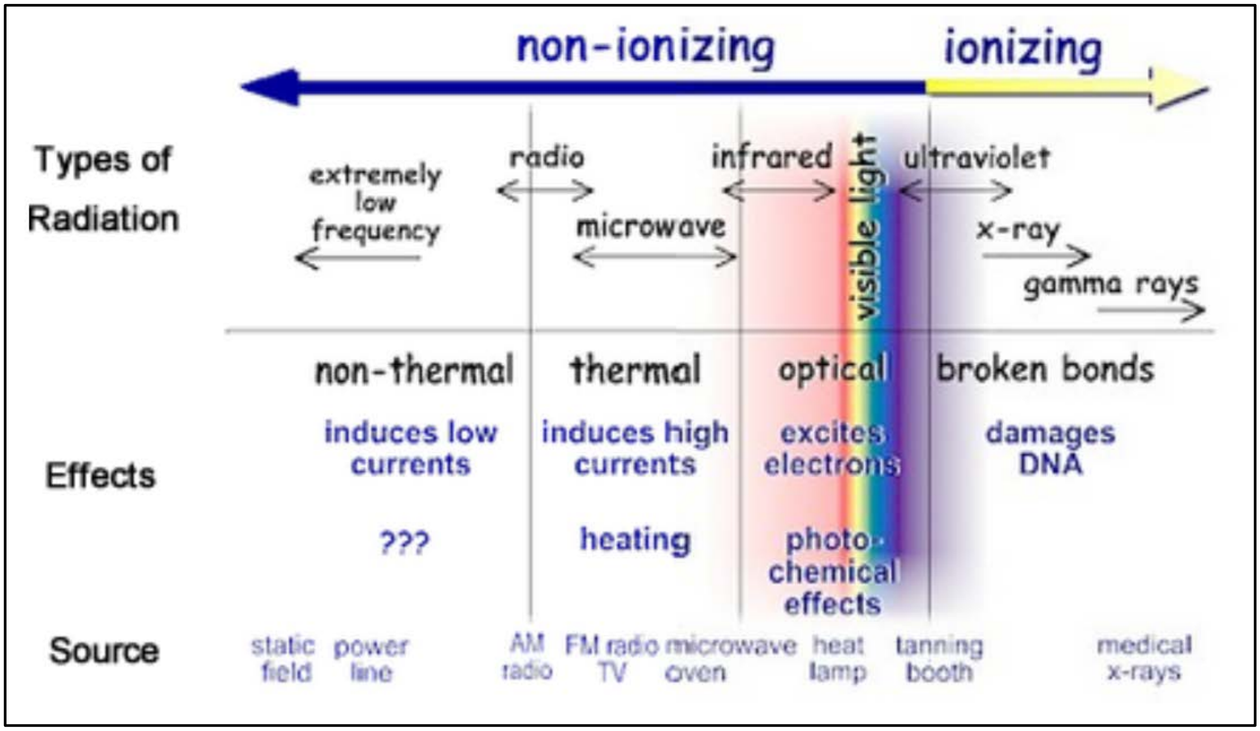
Radiation is the emission and propagation of energy through space or through a material in the form of waves or bundles of energy called photons, or in the form of high-energy subatomic particles. Radiation generally results from atomic or subatomic processes that occur naturally.

The most common kind of radiation is **electromagnetic radiation**, which is transmitted as photons. Electromagnetic radiation is emitted over a range of wavelengths and energies. Visible light is the most familiar form of electromagnetic radiation. Radiation of longer wavelengths and lower energy includes infrared radiation, which transmits heat and radio waves. Electromagnetic radiation of shorter wavelengths and higher energy, which is more penetrating, includes ultraviolet radiation (the cause of sunburn), x-rays, and gamma radiation. Figure G4-1 illustrates the types of radiation that compose the electromagnetic spectrum. As shown in Figure G4-1, electromagnetic energy increases from left to right as the frequency increases. An increase in energy and frequency corresponds with a decrease in wavelength.

RADIATION

Radiation occurs on Earth in many forms, either naturally or as the result of human activities. Natural forms include light, heat from the sun, and the decay of unstable radioactive elements in the Earth and the environment. Some elements that exist naturally in the human body and in the environment are radioactive and emit ionizing radiation. For example, one of the naturally occurring isotopes of potassium (essential for health) is radioactive. In addition, isotopes of the naturally occurring uranium and thorium decay series are widespread in the human environment. Human activities have also led to sources of ionizing radiation for various uses, such as diagnostic and therapeutic medicine and nondestructive testing of pipes and welds. Nuclear power generation produces ionizing radiation as well as radioactive materials, which undergo radioactive decay and can continue to emit ionizing radiation for long periods of time.

Figure G4-1. Types of Radiation in the Electromagnetic Spectrum



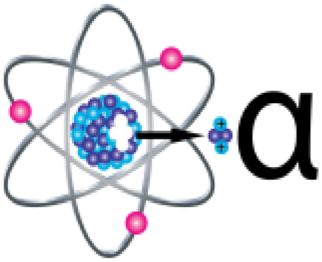
Source: U.S. Environmental Protection Agency (USEPA), 2017.

Ionizing radiation is radiation that has sufficient energy to displace electrons from atoms or molecules to create ions. Some forms of ionizing radiation are electromagnetic (for example, X-rays or gamma radiation), while other forms of ionizing radiation are subatomic particles (for example, alpha and beta radiation). The ions formed by ionizing radiation have the ability to interact with other atoms or molecules. In biological systems, this interaction can cause damage in the tissue or organism.

Radioactive Decay and Fission

Radioactivity is the property or characteristic of an unstable atom to undergo spontaneous transformation (to *disintegrate* or *decay*) with the emission of energy as radiation. Usually, the emitted radiation is ionizing radiation. The result of the process, called **radioactive decay**, is the transformation of an unstable atom (a *radionuclide*) into a different atom, accompanied by the release of energy (as radiation) as the atom reaches a more stable, lower energy configuration.

Radioactive decay produces three main types of ionizing radiation: (1) alpha particles, (2) beta particles, and (3) gamma or X-rays. These types of ionizing radiation, which are described below, have different characteristics and levels of energy, as well as varying abilities to penetrate and interact with atoms in the human body.

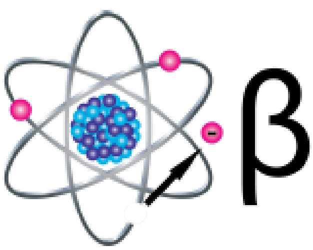


Alpha Particles

Alpha particles (α) are positively charged and made up of two protons and two neutrons from the atom's nucleus. Alpha particles come from the decay of the heaviest radioactive elements, such as uranium, radium, and polonium. Even though alpha particles are very energetic, they are so heavy that they use up their energy over short distances and are unable to travel very far from the atom.

The health risk from exposure to alpha particles depends greatly on how a person is exposed. Alpha particles lack the energy to penetrate even the outer layer of skin, so exposure to the outside of the body is not a major concern. Alpha particles can be stopped by a thin layer of material such as a single sheet of paper. Inside the body, however, these particles can be very harmful. If alpha-emitters or radioactive atoms (called radionuclides) are inhaled, swallowed, or get into the body through a cut, the alpha particles can damage sensitive living tissue. The ionizations caused by alpha-emitters are very close together, which results in more severe damage to cells and DNA. For this reason, alpha particles are more dangerous than other types of radiation (USEPA, 2017).

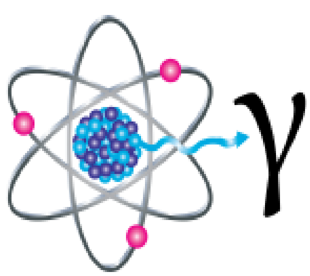
Beta Particles



Beta particles (β) are small, fast-moving particles with a negative electrical charge that are emitted from an atom's nucleus during radioactive decay. These particles are emitted by certain unstable atoms such as hydrogen-3 (tritium), carbon-14, and strontium-90.

Beta particles are more penetrating than alpha particles but are less damaging to living tissue and DNA because the ionizations they produce are more widely spaced. They travel farther in air than alpha particles, but can be stopped by a layer of clothing, several reams of paper, several inches of wood or water, or by a thin layer of a substance such as aluminum. Some beta particles are capable of penetrating skin and causing damage such as skin burns. As with alpha-emitters, beta-emitters are most hazardous when inhaled or swallowed (USEPA, 2017).

Gamma Rays



Gamma rays (γ) are packets of energy called photons. Gamma rays are similar to visible light but have higher energy. Unlike alpha and beta particles, which have both energy and mass, gamma rays are pure energy. Gamma rays are often emitted along with alpha or beta particles during radioactive decay.

Gamma rays are a radiation hazard for the entire body. They can easily penetrate barriers that can stop alpha and beta particles, such as skin and clothing. Gamma rays have substantial penetrating power and require a dense material to be stopped, such as several inches to several feet of heavy material (for example, concrete or lead). The energy associated with gamma radiation is dispersed across the body in contrast to the local energy deposition caused by alpha particles. In fact, some gamma rays can pass completely through the human body; as they pass through, they can cause ionizations that damage tissue and DNA (USEPA, 2017).

X-Rays

Because of their use in medicine, x-rays are a familiar type of radiation. X-rays are similar to gamma rays in that they are photons of pure energy. X-rays and gamma rays have the same basic properties but come from different parts of the atom. X-rays are emitted from processes outside the nucleus, while gamma rays originate inside the nucleus. X-rays are also generally lower in energy and therefore less penetrating than gamma rays. X-rays can be produced naturally or by machines using electricity.

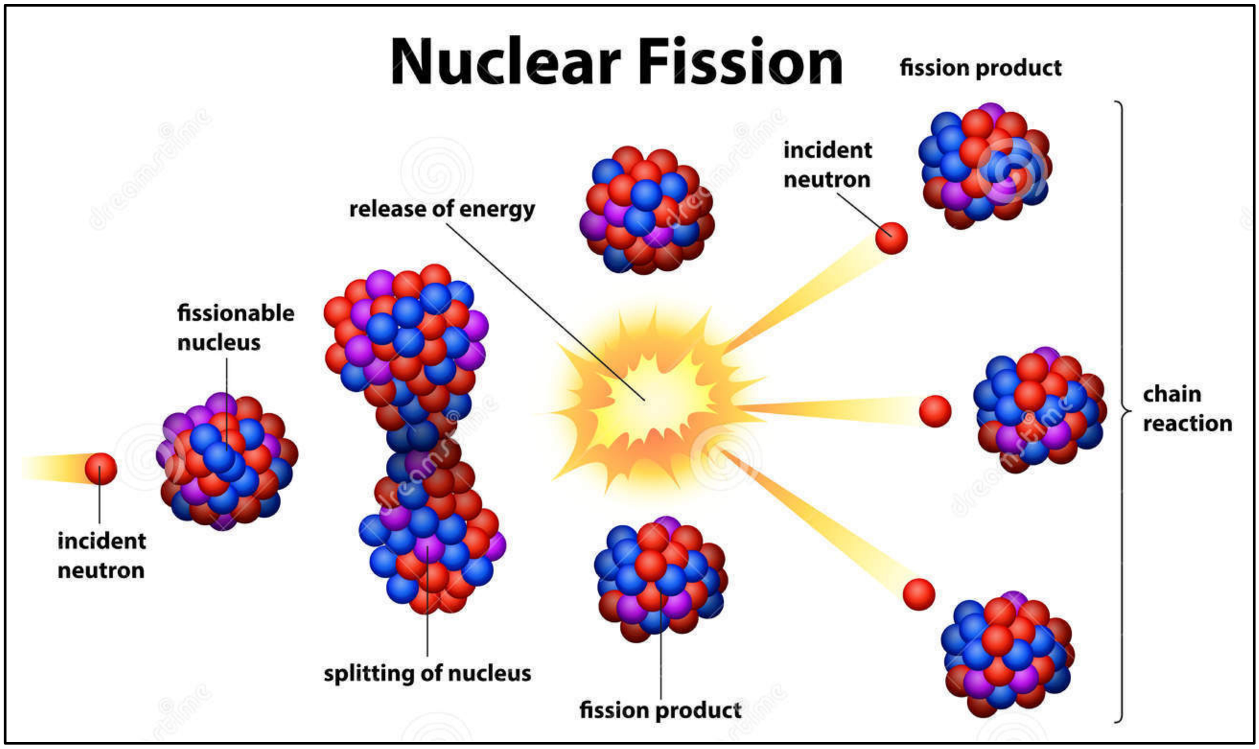
FISSION

In a nuclear reactor, heavy atoms such as uranium and plutonium undergo a process called fission after the absorption of a subatomic particle (usually a neutron). In fission, a heavy atom splits into two lighter atoms and releases energy in the form of radiation and the kinetic energy of the two new lighter atoms (see Figure G4-2). The new lighter atoms are called fission products. The fission products are often unstable and undergo further radioactive decay to reach a more stable state.

FISSION

Fission is the process whereby a large nucleus (for example, uranium-235) absorbs a neutron, becomes unstable, and splits into two fragments, resulting in the release of large amounts of energy per unit of mass. Each fission releases an average of two or three neutrons that can go on to produce fissions in nearby nuclei. If one or more of the released neutrons on the average causes additional fissions, the process keeps repeating. The result is a self-sustaining chain reaction and a condition called criticality. When the energy released in fission is controlled (as in a nuclear reactor), it can be used for various benefits such as to propel submarines or to provide electricity that can light and heat homes.

Figure G4-2. Nuclear Fission Chain Reaction



Source: ExtremeTech, 2017.

Some heavy atoms do not immediately undergo fission after absorbing a subatomic particle. Rather, a new nucleus is formed that tends to be unstable (like fission products) and undergoes radioactive decay.

The radioactive decay of fission products and unstable heavy atoms is the source of radiation from spent nuclear fuel and high-level radioactive waste, which makes these materials hazardous in terms of risk to human health.

EXPOSURE TO RADIATION AND RADIATION DOSE

Radiation that originates outside an individual's body is called external or direct radiation. Such radiation can come from an x-ray machine or from radioactive materials (materials or substances that contain radionuclides), such as radioactive waste or radionuclides in soil. Internal radiation originates inside a person's body following intake of radioactive material or radionuclides through ingestion or inhalation. Once in the body, the fate of a radioactive material is determined by its chemical behavior and how it is metabolized. If the material is soluble, it might be dissolved in bodily fluids and deposited in various body organs; if insoluble, it might move rapidly through the gastrointestinal tract or be deposited in the lungs. Whether it emits alpha or beta particles, gamma rays, x-rays, or neutrons, a quantity of radioactive material is expressed in terms of its radioactivity, which refers to the amount of ionizing radiation released by a material (i.e., how many atoms in the material decay in a given time period). The units of measurement for radioactivity are the curie (Ci, U.S. unit) and becquerel (Bq, the international unit). One becquerel represents the amount of a radioactive material that will undergo one transformation per second. Becquerels are not used to measure radiation dose or radiation exposure.

Exposure describes the amount of radiation traveling through the air. Many types of radiation monitors measure exposure. The units for exposure are the roentgen (R, U.S. unit) and coulomb/kilogram (C/kg, international unit).

Absorbed dose describes the amount of radiation absorbed by an object or person. The unit for absorbed radiation dose is the rad (U.S. unit) or the gray (Gy, international unit). One gray is equal to 100 rads.

Effective dose describes the amount of radiation absorbed by a person, adjusted to account for the type of radiation received and the effect on particular organs. The unit used for effective dose is rem (U.S. unit) or sievert (Sv, international unit). More commonly, dose is measured in much smaller units defined as millirems (**mrem**) or millisieverts. The millirem is the U.S. unit used to measure effective dose, and is one-thousandth of a rem. The potential effects from a one-time ingestion or inhalation of radioactive material are calculated over a period of 50 years as adults to account for radionuclides that have long half-lives and long residence time in the body. The result is called the *committed effective dose equivalent (CEDE).* The unit of effective dose equivalent is also the *rem. Total effective dose equivalent (TEDE)* is the sum of the committed effective dose equivalent from radionuclides in the body plus the dose equivalent from radiation sources external to the body (also in rem).

The NRC has adopted a concept of a “critical group” to regulate radiation dose to the public following license termination. The "critical group" is that group of individuals reasonably expected to receive the highest exposure to residual radioactivity within the assumptions of a particular scenario. The average dose to a member of the critical group is represented by the average of the doses for all members of the critical group, which in turn is assumed to represent the most likely exposure situation. For example, when considering whether it is appropriate to “release” a building that has been decontaminated (allow people to work in the building without restrictions), the critical group would be the group of employees who would regularly work in the building. If radiation in the soil is the concern, then the scenario used to represent the maximally exposed individual is that of a resident farmer. The assumptions used for this scenario are prudently conservative and tend to overestimate the potential doses. The added “sensitivity” of certain members of the population, such as pregnant women, infants, children, and any others who may be at higher risk from radiation exposures, are accounted for in the analysis (NRC, 2002).

1 mrem Dose Equals…

3 days of background radiation in Atlanta.

2 days of background radiation in Denver.

1 year of wearing a watch with a luminous dial.

1 coast-to-coast airline flight.

1 year of living next door to a normally operating nuclear power plant.

The radiation dose to an individual or to a group of people can be expressed as the total dose received or as a **dose rate**, which is dose per unit time (usually an hour or a year). The NRC has established a 0.25 mSv/year (25 mrem/year) total effective dose equivalent (TEDE) to an average member of the critical group as an acceptable criterion for release of any site for unrestricted use.

Collective dose is the total dose to an exposed population. Person-rem is the unit of collective dose. Collective dose is calculated by summing the individual dose to each member of a population. For example, if 100 workers each received 0.1 rem, then the collective dose would be 10 person-rem (100 × 0.1 rem).

Dose conversion factors are the factors used to convert estimates of radionuclide intake (by inhalation or ingestion) to dose. The external dose rate conversions used by the NRC are obtained directly from the USEPA Federal Guidance Report (FGR) No. 12[1] developed by Oak Ridge National Laboratory (Eckerman and Ryman, 1993). These factors provide the external effective dose equivalent by summing the product of individual organ doses and organ weighting factors over the body organs. For inhalation and ingestion of radioactive materials, unit CEDE conversion factors are obtained from USEPA Federal Guidance Report No. 11 (Eckerman et al., 1988). These factors are generally consistent with International Commission on Radiological Protection (ICRP) Publication 26 (1977) and ICRP Publication 30 (1979-1988) (NRC, 1992).

All estimates of dose presented in this Environmental Impact Report, unless specifically noted as something else, are total effective dose equivalents, which are quantified in terms of rem or millirem.

BACKGROUND RADIATION FROM NATURAL SOURCES

Natural background radiation comes from the following three sources:

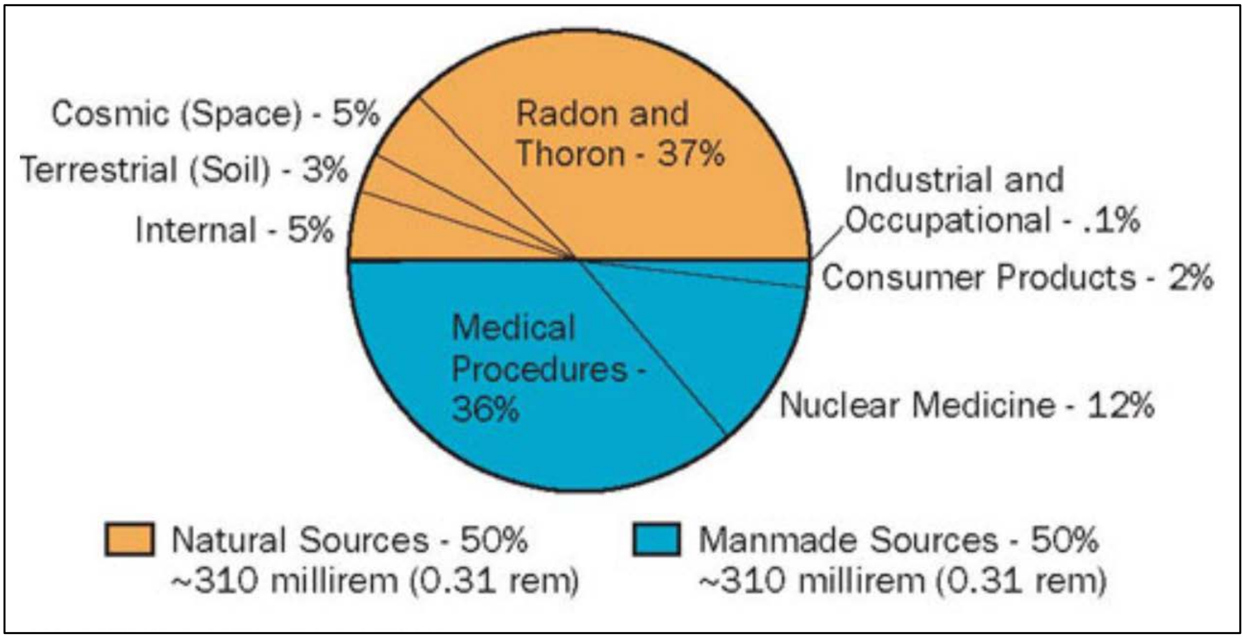
- **Cosmic Radiation.** The sun and stars send a constant stream of cosmic radiation to Earth. Differences in elevation, atmospheric conditions, and the Earth's magnetic field can change the amount of cosmic radiation exposure.
- **Terrestrial Radiation.** The Earth is a source of terrestrial radiation. Radioactive elements (e.g., uranium, thorium, and radium) exist naturally in the minerals in soils and rock. The atmosphere contains radon, which is responsible for most of the dose that people receive each year from natural sources. Water contains small amounts of dissolved uranium and thorium, and all organic matter (both plant and animal) contains radioactive carbon and potassium. Some of these materials are ingested with food and water, while others (such as radon) are inhaled.
- **Internal Radiation.** All people have internal radiation, mainly from radioactive potassium-40 and carbon-14 inside their bodies from birth. This internal radiation is a source of exposure to others.

There can be large variances in natural background radiation levels from place to place, as well as changes in the same location over time (USEPA, 2017). Nationwide, on average, members of the public are exposed to approximately 620 millirem per year from natural and manmade sources (National Council on Radiation Protection and Measurements [NCRP], 2009). Figure G4-

[1] FGR 12 was superseded by FGR 15 (Belamy, 2019) but the NRC has not yet updated.

3 shows the relative contributions of radiation sources to people living in the U.S. (NRC, 2017; NCRP, 2009).

Figure G4-3. Sources of Radiation Exposure



Source: NRC, 2017; NCRP, 2009.

As illustrated in the above figure, natural sources of radiation account for about 50 percent of radiation exposure in the U.S., while man-made sources account for the remaining 50 percent. The largest natural sources are radon-222 and its radioactive decay products in homes and buildings, which contribute approximately 229 millirem per year or 37 percent of the total annual dose. Additional natural sources include radioactive material in the Earth (primarily the uranium and thorium decay series, and potassium-40) and cosmic rays from space filtered through the atmosphere.

With respect to exposures resulting from human activities, medical exposure accounts for about 48 percent of the annual dose, and the combined doses from weapons testing fallout, consumer and industrial products, and air travel (cosmic radiation) account for the remaining 2 percent of the total annual dose. Nuclear fuel-cycle facilities contribute less than 0.1 percent (0.005 millirem per year per person) of the total dose (NRC, 2017; NCRP, 2009).

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Appendix G5

DOT 2008 Radiological Review

U.S. Department
of Transportation
**Pipeline and
Hazardous Materials
Safety Administration**

RADIOACTIVE MATERIAL

December 08

Regulations Review

Note: This document is for general guidance only and must not be used to determine compliance with 49 CFR Parts 100-185.

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I. INTRODUCTION

This review provides guidance on the Department of Transportation (DOT) Hazardous Materials Regulations (HMR) contained in Title 49, Code of Federal Regulations (49 CFR) Parts 171-185, which govern the packaging and shipment of radioactive material. These materials have an excellent safety record when packaged, labeled, marked and transported in accordance with these regulations.

This review serves as a reference document and is not an official interpretation or restatement of the regulations. This review of the radioactive material regulations was designed as a guidance document and should not be used without simultaneous reference to all applicable and current regulations pertaining to the transportation of radioactive material. **Users of this review are strongly encouraged to obtain the latest copy of the HMR** from the Government Printing Office (http://bookstore.gpo.gov). Amendments to the HMR are published in the Federal Register (http://www.gpoaccess.gov/fr/index.html). The current HMR may be found at: http://www.gpoaccess.gov/cfr/index.html.

Additional information on DOT's hazardous materials transportation regulations and programs may be found at http://hazmat.dot.gov.

The first version of this document was issued in 1972, with subsequent revisions issued in 1974, 1976, 1977, 1980, 1983, and 1998. This version updates the contents to be consistent with changes in the regulations since the last edition. These changes include those made in rulemaking RSPA-99-6283 (HM-230) to be compatible with changes contained in the International Atomic Energy Agency (IAEA) publication, "IAEA Safety Standards Series: Regulations for the Safe Transport of Radioactive Material," 1996 Edition, No. TS-R-1.

Comments, suggestions, corrections or requests for additional training aids should be mailed to: U.S. Department of Transportation, Office of Hazardous Materials Initiatives and Training, PHH-50, 1200 New Jersey Avenue, SE, Washington, DC 20590.

II. BACKGROUND

A. Uses of Radioactive Material

Radioactive materials are used for a wide range of purposes, including the generation of electric power, research, manufacturing, industrial processes, and medical diagnosis and therapy. Industrial applications of radioactive material include inspection and gauging operations such as examining the integrity of welded joints or measuring the thickness of paper as it is produced. Sealed radioactive sources are also used extensively in oil and gas exploration drilling operations and to check the compactness of roadbeds during paving operations. Every major hospital in the United States has a nuclear medicine department in which radionuclides are used to diagnose and treat a wide variety of diseases.

Millions of radioactive materials packages are shipped annually in the United States; a large percentage of these are radiopharmaceutical shipments. To date, there have been no known deaths or injuries to transport workers, emergency services personnel, or the general public as a result of the radioactive nature of materials in transport. This safety record can be attributed to the proper packaging of radioactive material and the effectiveness of the transportation safety standards and regulations.

B. Review of Radioactivity and Radiation

If there are too few neutrons or too many neutrons in the nucleus of an atom, the atom is unstable. Such an unstable atom will try to become more stable by emitting energy in the form of radiation, and it is said to be radioactive. When it emits radiation to become more stable, it is said to disintegrate or decay.

Each radioactive isotope has a specific known time in which half of the atoms will decay, called the "half-life," measured in years, days, hours, minutes or seconds. The activity of a radioactive material is the number of decays per unit of time measured in becquerels (Bq) (or curies (Ci)). The activity per unit mass is called the "specific activity," often measured in becquerels (or curies) per gram.

When an isotope decays, one or more of the following may be emitted:

- A particle consisting of two neutrons and two protons, called an alpha particle (α-radiation),
- Electrons or positrons, called beta particles (β-radiation),
- Electromagnetic energy in the form of gamma radiation (γ-radiation) or X-rays, and/or
- Neutrons.

Alpha radiation consists of high-energy particles that are relatively large, heavy, and only travel a short distance. Alpha particles lose their energy very rapidly, have a low penetrating ability and a short range of travel - only a few inches in air. Because of the alpha particle's short range and limited penetrating ability, external shielding is not required. A few inches of air, a sheet of paper, or the dead (outer) layer of skin that surrounds our bodies easily stops alpha particles. Alpha radiation poses minimal biological hazard outside the body. The greatest hazard from alpha-emitting material occurs when the material is inhaled, ingested, or absorbed through open wounds. Once inside the body, the alpha radiation can cause harm to individual cells or organs. Common alpha emitters transported include smoke detectors containing americium-241.

Beta radiation consists of particles that are smaller, lighter, and travel farther than alpha radiation. Beta radiation is more penetrating than alpha radiation. The range of penetration in human tissue is less than ¼ inch. In air, beta radiation can travel several feet. Beta radiation may be blocked or shielded by plastic, aluminum, thick cardboard, several layers of clothing or the walls of a building. Outside the body, beta radiation constitutes only a slight hazard. Because beta radiation penetrates only a fraction of an inch into living skin tissue, it does not reach the major organs of the body. However, exposure to high levels of beta radiation can cause damage to the skin and eyes. Internally, beta radiation is less hazardous than alpha radiation because beta particles travel farther than alpha particles and, as a result, the energy deposited by the beta radiation is spread out over a larger area. This causes less harm to individual cells or organs. Common beta emitters transported include medical isotopes such as iodine-131, carbon-14, tritium (H-3), and sulfur-35.

Gamma radiation frequently accompanies the emission of alpha and beta radiation. Gamma radiation, like X-rays, is electromagnetic radiation. This means that it does not consist of particles like alpha and beta radiation but, rather, waves of energy that have no mass and no electrical charge. Because they have no mass and no electrical charge, they are able to travel great distances and require dense material for shielding. Gamma radiation poses a hazard to the entire body because it can easily penetrate human tissue. Lead, steel, and concrete are commonly used to shield gamma radiation. Common gamma emitters transported include radiography sources such as cobalt-60 and iridium-192.

Neutron radiation can travel great distances and is highly penetrating like gamma radiation. Thus, neutron radiation is an external and internal hazard. It is best shielded with material having a high hydrogen content (e.g., water, plastic). The ease with which neutrons can be shielded and detected depends on their energy; fast neutrons can be shielded by hydrogenous material while cadmium or boron can be used to shield slow thermal neutrons. In transportation situations, neutron radiation is not commonly encountered. Neutron emitters transported include californium-252 and spent nuclear fuel.

C. <u>Radiation Protection Principles</u>

A key principle of radiation protection is the minimization of dose. The external dose received is the product of the dose rate and the time exposed. Dose from external radiation can be reduced by either:

- reducing the activity of the source,
- increasing shielding around the source
- increasing the distance from the source, or
- reducing the time spent near the source.

Transport packages provide distance and shielding from the contained material, as needed to maintain safe dose rates at the surface of the package. Transport packages also provide for containment of the radioactive material. If the containment is breached, the material can contaminate objects and potentially be inhaled or ingested by people. Contamination can be either fixed or removable. Removable, or non-fixed contamination, is contamination that is deposited on the surface of objects or personnel that can readily be picked up or wiped up by physical or mechanical means during a survey or through decontamination efforts. Fixed contamination is bound to the contaminated surface and not easily removed and so presents primarily a radiation hazard and not a contamination hazard.

D. SI and Customary Radiological Units

To ensure compatibility with international transportation standards, units of measure in the HMR are expressed using International System of Units (SI) units. U.S. standard or customary units, which appear in parentheses following the SI units, are for informational purposes only and are not intended to be the regulatory standard. Shipping papers and labels must use the International System of Units (SI) units, which may be followed by customary units in parentheses.

The basic SI unit for quantity of radioactive material is the becquerel (Bq), and the customary unit is the curie (Ci). One becquerel is equivalent to one atom decaying (or disintegrating) each second. A curie (Ci), originally defined as the activity of 1.0 g of radium, is equal to 3.7×10^{10} Bq.

For radiation levels, or dose rates, the basic SI unit is the sievert per hour (Sv/h), and the customary unit is rem per hour (rem/h). The information in Appendix A may be useful in converting values between SI Units and customary units.

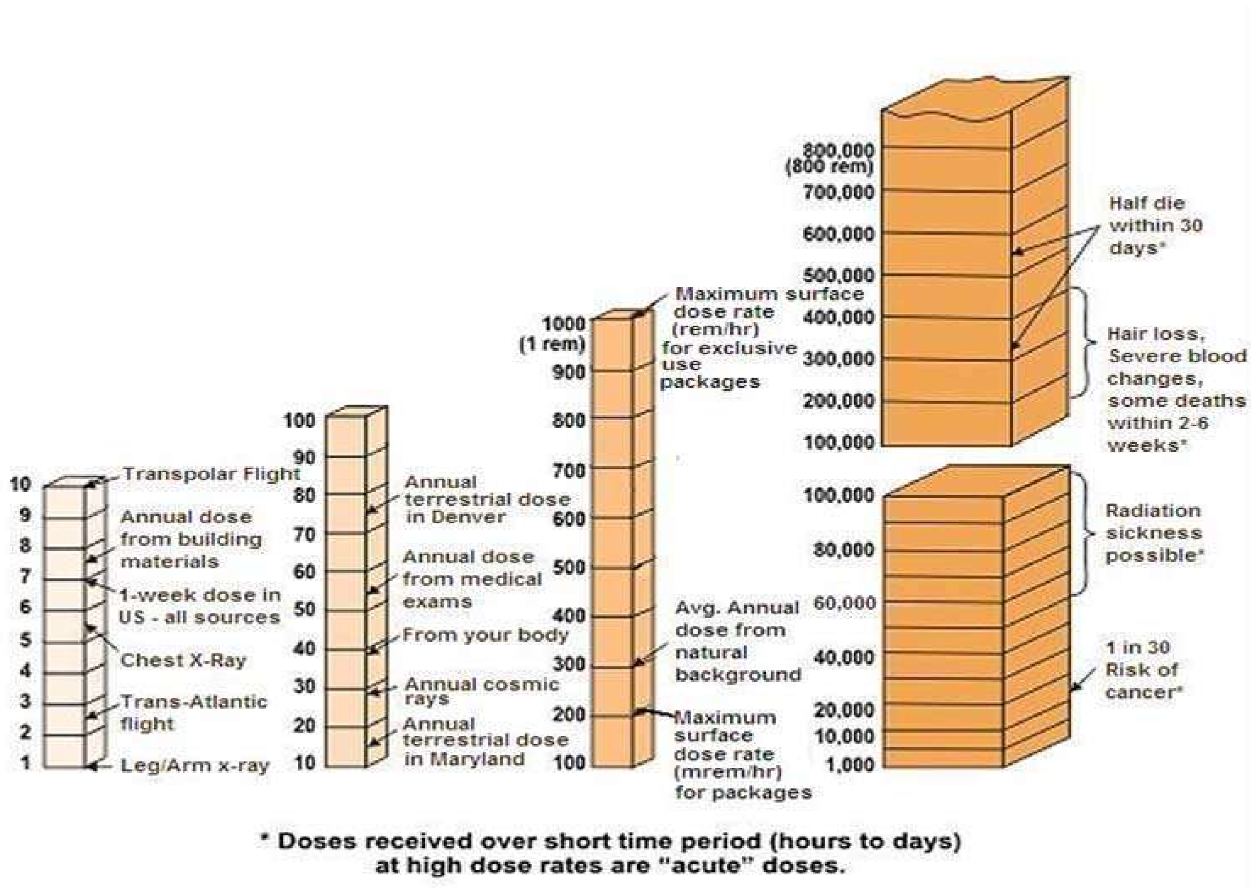
E. Radiation Exposures and Biological Effects

The average annual radiation exposure from natural sources to an individual in the United States is about 3 millisieverts (mSv) (equivalent to 300 millirem (mrem)); however, levels of background radiation vary greatly from one location to the next. Radon gas accounts for two-thirds of this exposure, while cosmic, terrestrial, and internal radiation account for the remaining third. Man-made sources of radiation from medical, commercial, and industrial activities contribute about another 0.6 mSv (60 mrem) annually, with diagnostic medical procedures accounting for about 0.4 mSv (40 mrem) of this. Consumer products such as tobacco, fertilizer, welding rods, gas mantles, luminous watch dials, and smoke detectors contribute another 0.1 mSv (10 mrem) to annual radiation exposure.

Radiation is known to be carcinogenic at high doses. The association between radiation exposure and the development of cancer is mostly based on populations exposed to high levels of radiation. Currently there are no data to unequivocally establish the occurrence of cancer following exposure to low doses and dose rates, i.e., those below about 100 mSv (10,000 mrem). However, it is conservatively assumed that any amount of radiation exposure may pose some risk for causing cancer and hereditary effects, and that the risk is higher for higher radiation exposures.

The following figure provides some radiation doses in perspective.

Figure 1 – Radiation Doses In Perspective
(in millirem)



III. TRANSPORT SAFETY REGULATIONS

A. International Regulations

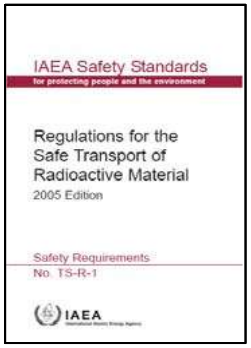
There are a number of international bodies and organizations which deal with the transportation of radioactive material. The majority of these international bodies are sanctioned by or affiliated with the United Nations (UN). These agencies write regulations and recommend their adoption by member states as a basis for national regulations. Additional information on international standards may be found at: http://hazmat.dot.gov/regs/intl/intstandards.htm. A list of suppliers of these documents may be found at: http://hazmat.dot.gov/regs/intl/interpub.htm.

1. United Nations

The United States participates as a member of the United Nations (UN) Committee of Experts on the Transportation of Dangerous Goods which produces the "Recommendations on the Transport of Dangerous Goods - Model Regulations" commonly referred to as the UN "Orange Book." The Model Regulations cover principles of classification and definition of classes, lists of the principal dangerous goods, general packing requirements, testing procedures, marking, labeling or placarding, and transport documents. There are, in addition, special requirements related to particular classes of goods, including performance standards for packaging. Although only recommendations, the Model Regulations are written in the mandatory sense (i.e., the word "shall" is used rather than "should") in order to facilitate direct use of the Model Regulations as a basis for national and international transport regulations.

The United Nations Economic Commission for Europe (UNECE) publishes "European Agreement Concerning the International Carriage of Dangerous Goods by Road" (ADR). The UNECE also coordinates the ADR with the "Regulations Concerning the International Carriage of Dangerous Goods by Rail" (RID) (produced by the Intergovernmental Organisation for International Carriage by Rail) which regulate rail shipments in Europe.

2. International Atomic Energy Agency

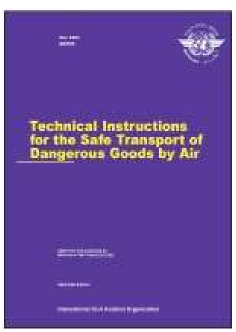


Beginning in the 1950s, there was an effort to develop an international consensus on how radioactive materials should be transported. The initial effort relied heavily on the standards used in the United States, which at that time were found in the Bureau of Explosives regulations. The first publication of the international standards was the 1961 edition of Regulations for the Safe Transport of Radioactive Materials, Safety Series No. 6, issued by the International Atomic Energy Agency (IAEA). The 1967 edition of Safety Series No. 6 was adopted into the domestic regulations in 1968. Since that time, the United States has continued to incorporate these standards (with certain exceptions) into its domestic regulations.

3. International Maritime Organization

The International Maritime Organization (IMO) implements the UN recommendations in the International Maritime Dangerous Goods (IMDG) Code. The IMDG Code contains regulations applicable to the transport of dangerous goods by sea. If all or part of a shipment of hazardous materials is made by vessel to, from, or within the United States, the HMR allow the shipment to be made in accordance with the IMDG Code, provided certain additional provisions are satisfied. These additional provisions are found in 49 CFR, §§ 171.22, 171.23, and 171.25.

4. International Civil Aviation Organization



The International Civil Aviation Organization's "Technical Instructions on the Safe Transport of Dangerous Goods by Air" (ICAO TI) establishes requirements necessary to ensure hazardous materials are safely transported in aircraft while providing a level of safety that protects the aircraft and its occupants from undue risk. The ICAO TI is based on the UN Recommendations on the Transport of Dangerous Goods and the International Atomic Energy Agency Regulations for the Safe Transport of Radioactive Material.

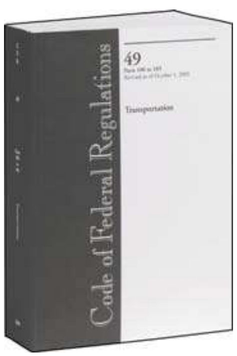
Virtually all shipments of hazardous materials transported internationally by air, as well as most domestic U.S. shipments, are transported in accordance with the ICAO TI. The U.S. Hazardous Materials Regulations authorize transport in accordance with the ICAO TI provided all of the conditions of 49 CFR §§ 171.22, 171.23, and 171.24 are met. Note that shipments made in accordance with the ICAO TI remain subject to Part 175 of the HMR and the emergency response information provisions of Subpart G of Part 172.

Air carriers have adopted their own regulations through the International Air Transportation Association (IATA). These IATA dangerous goods regulations are based on the ICAO TI, but they are generally more restrictive in certain operational respects. Most domestic carriers have chosen to only accept shipments prepared under the ICAO TI as implemented by the IATA.

B. Federal Regulations

The regulations of the United States of America concerning the transportation of radioactive materials are published by four agencies: DOT, the Nuclear Regulatory Commission (NRC), the Transportation Security Administration (TSA), and the United States Postal Service (USPS).

1. Department of Transportation



The Secretary of the Department of Transportation has the authority to regulate the transportation of hazardous materials per the Hazardous Materials Transportation Act (HMTA), as amended and codified in 49 U.S.C. 5101 et seq. The Secretary is authorized to issue regulations to implement the requirements of the statute.

DOT's Pipeline and Hazardous Materials Safety Administration (PHMSA) (formerly the Research and Special Programs Administration (RSPA)) has been delegated the responsibility for the hazardous materials regulations, which are contained in 49 CFR Parts 100-185.

The hazardous materials regulations have changed significantly over the last several years. These changes include the harmonization of the United State's hazardous materials regulations with international standards, extension of the applicability of the hazardous materials regulations to all intrastate shipments of hazardous materials by highway, and the introduction of additional security requirements.

The hazardous materials regulations are applicable to the transportation of hazardous materials in commerce and apply to the following activities:

- Transport by interstate, intrastate, and foreign carriers by rail car, aircraft, motor vehicle and vessel.
- Shipper's pre-transportation activities to present for shipment a hazardous material in a package, container, rail car, aircraft, motor vehicle or vessel with accompanying marking, labeling, placarding and shipping papers.
- The manufacture, fabrication, marking, maintenance, reconditioning, repairing or testing of a package or container which is represented, marked, certified or sold for use in the transportation of hazardous materials.

The HMR defines nine Classes of hazardous materials. Radioactive material is Class 7.

The Parts of the HMR are as follows:

- 49 CFR 171 General information, regulations, and definitions
- 49 CFR 172 Hazardous materials table, special provisions, hazardous materials communications, emergency response information, and training requirements
- 49 CFR 173 Shippers-general requirements for shipments and packagings
- 49 CFR 174 Carriage by rail
- 49 CFR 175 Carriage by aircraft
- 49 CFR 176 Carriage by vessel
- 49 CFR 177 Carriage by public highway
- 49 CFR 178 Specifications for packagings
- 49 CFR 179 Specifications for tank cars
- 49 CFR 180 Continuing qualification and maintenance of packagings

Sections of the HMR specific to radioactive materials are:

- 49 CFR 173, Subpart I (§§ 173.401 – 173.477) Class 7 (Radioactive) Materials
- 49 CFR 174, Subpart K (§§ 174.700 – 174.750) Detailed Requirements for Class 7 (Radioactive) Materials
- 49 CFR 175, Subpart C, (§§ 175.700 – 175.706) Specific Regulations Applicable According to Classification of Material
- 49 CFR 176, Subpart M (§§ 176.700 – 176.720) Detailed Requirements for Radioactive Materials
- 49 CFR 177, Subpart B, (§§ 177.842) Class 7 (Radioactive) Material
- 49 CFR 178, Subpart K (§§ 178.350 – 178.360) Specifications for Packagings for Class 7 (Radioactive) Materials

DOT's Federal Motor Carrier Safety Administration (FMCSA) has additional requirements for transporting radioactive materials by highway. FMSCA provides routing requirements for motor carriers and drivers who transport radioactive material in 49 CFR Part 397, Subpart D. FMCSA also requires motor carriers to obtain a Hazardous Materials Safety Permit (HMSP) prior to transporting certain highly hazardous materials, including a highway route controlled quantity of radioactive material (see 49 CFR 385, Subpart E).

2. Nuclear Regulatory Commission

Under the Atomic Energy Act of 1954, as amended, the NRC also has responsibility for safety in the possession, use and transfer (including transport) of by-product, source, and special nuclear materials, i.e., "licensed material." Due to this overlap in statutory authorities of NRC and DOT, the two Agencies signed a 1979 Memorandum of Understanding (MOU) with regard to regulation of the transport of radioactive material. The principal objective of the MOU was to avoid conflicting and duplicative regulations and to clearly delineate the areas in which each Agency establishes regulations.

Except for certain small quantities and specific products, a license is required from the NRC for possession and use of licensed materials. The NRC has promulgated, in 10 CFR Part 71, requirements which must be met by licensees for packaging used to deliver certain types of licensed material to a carrier for transport if fissile material or quantities exceeding Type A are involved. NRC also assists and advises DOT in the establishment of both national and international safety standards and in the review and evaluation of packaging designs. In 1979, NRC adopted by reference (10 CFR § 71.5) portions of the DOT regulations, enabling NRC to inspect its licensees for compliance with DOT regulations applicable to shipper/licensees and to take enforcement actions on violations.

Many states have entered into formal agreements with the NRC whereby the NRC transfers to states the regulatory authority over licensed by-product, source, and less than critical quantities of special nuclear material (fissile materials). These 35 Agreement States (and 3 states that have filed intent to become Agreement States) are illustrated in Figure 2**.**

Figure 2 – NRC Agreement States
(Source: Nuclear Regulatory Commission)

3. <u>Transportation Security Administration</u>

Under the Aviation and Transportation Security Act (ATSA), Public Law 107-71, 115 Stat. 597 (November 19, 2001), and delegated authority from the Secretary of Homeland Security (DHS), the Assistant Secretary of DHS for the Transportation Security Administration (TSA) has broad responsibility and authority for "security in all modes of transportation". TSA's authority with respect to transportation security is comprehensive and supported with specific powers related to the development and enforcement of regulations, security directives, security plans, and other requirements. On September 28, 2004, DOT and DHS signed a Memorandum of Understanding (MOU) on Roles and Responsibilities and on August 7, 2006, PHMSA and TSA signed an annex to the MOU. The MOU recognizes that DHS has primary responsibility for security in all modes of transportation.

4. <u>United States Postal Service</u>

The carriage of U.S. mail by the Postal Service (USPS) is not subject to the HMR as commercial carriers are. However, for legal and safety reasons, the postal mailing standards for hazardous materials not only closely adhere to the HMR, but also include many additional limitations and prohibitions. Radioactive materials are prohibited in domestic mail via air transportation. Quantities of radioactive material in excess of those authorized in USPS Publication 52, "Hazardous, Restricted, or Perishable Mail" are prohibited in surface mail. For international mail, the standards in Section 135.6 of the "Mailing Standards of the United States Postal Service, International Mail Manual" apply.

IV. RADIOACTIVE MATERIALS TERMINOLOGY

This section explains the various terms used to define and categorize radioactive materials in the HMR. The regulatory definitions for these terms and other terms specific to radioactive materials transportation may be found in § 173.403; other terms used throughout the HMR are defined in § 171.8.

A. Radioactive Material

Prior to 2004, the HMR used a specific activity threshold of 70 Bq/g (0.002 μCi/g) for defining a material as radioactive for purposes of transportation, and material was not subject to the requirements of the HMR if its specific activity was equal to or below that value. In 2004, the HMR was revised and the single activity concentration threshold of 70 Bq/g was replaced with radionuclide-specific values. In addition, the 2004 revision established threshold values for the total activity in a consignment, below which the risk is so small that the material could be transported without being subject to transportation regulatory requirements ("consignment" means a package or group of packages or load of radioactive material offered by a person for transport in the same shipment). To be considered a radioactive material under the HMR, the material must exceed ***both*** the nuclide specific exemption concentration limit ***and*** the consignment exemption activity limit.

These nuclide specific values are given in § 173.436. Those nuclides shown with a reference to footnote (b) have the activity of their daughters included, and therefore, shippers need only compare the activity and activity concentration of the parent nuclide to the exemption value. If the daughter products are not included, or if other radionuclides are present, the mixture of nuclides must be evaluated using the equations in §§ 173.433(d)(6) and (7) to determine if the material is radioactive material under the HMR. (Some materials which may be exempt from regulation during transportation still might be subject to licensing requirements of NRC, or an Agreement State with respect to use, possession, materials control or waste disposal; or they may be subject to EPA requirements as a hazardous substance or hazardous waste.)

For example, using § 173.436, it can be seen that ^{241}Am has a concentration exemption value of 1 Bq/gram (g) and a consignment activity exemption value of 10,000 Bq. Therefore, a material containing ^{241}Am would be regulated as radioactive material if it is shipped with more than 10,000 Bq in a single consignment ***and*** in a concentration greater than 1 Bq/g.

B. Special Form Radioactive Material

Special form materials are those materials which, if released from a package, would present a hazard due to direct external radiation only. Usually, due to the high physical integrity of a special form material, radioactive material contamination is not expected even under severe accident conditions. Therefore, larger quantities can typically be shipped in any given package than if the material were not special form (i.e., “normal form”). This high physical integrity is occasionally the result of inherent natural properties of the material, such as its being in an indispersible solid form. Most often, however, it is an acquired characteristic, resulting from being welded (encapsulated) into an extremely durable metal capsule.

Special form sources must have at least one external physical dimension which exceeds 5 mm (0.197”). The minimum dimension requirement makes the capsule easier to see and recover in the event of its release from the package during an accident. Special form encapsulations are required to be constructed in a manner that they can only be opened by destroying the capsule. This requirement prevents the inadvertent loosening or opening of the capsule, either during transport or following an accident.

The testing requirements for determination of whether radioactive materials qualify as “special form” are found in § 173.469, which describes tests for high temperature, impact, percussion, bending, and leakage. (An encapsulated sealed source need not be subjected to the impact and percussion tests of § 173.469(b)(1) and (2), provided that it satisfies the Class 4 impact test prescribed in International Standards Organization (ISO) document ISO 2919, Sealed Radioactive Sources Classification. Also, it need not be subjected to the heat test listed in § 173.469(b)(4) if it satisfies the Class 6 temperature test specified in ISO 2919.)

For the purposes of import or export, a shipper must furnish the carrier and the foreign consignee a Certificate of Competent Authority for the special form material. For domestic shipments, the DOT does not require special form certificates when offering the material as special form. However, the shipper must have evidence that the source, if offered as special form radioactive material, meets the special form standards. Such evidence must be maintained on file by the shipper for at least one year after shipment in accordance with § 173.476(a).

A special form certificate issued by the DOT or by a foreign competent authority is acceptable evidence of a source being special form. Special form source manufacturers or suppliers often provide customers with special form Certificates of Competent Authority. The requirements for certification of special form sources are listed in § 173.476.

Figure 3 displays several typical special form radioactive material sources.

Figure 3- “Special Form” Radioactive Material

Figure A - Neutron Source
(showing empty inner and outer capsules with plugs to be welded for sealing)

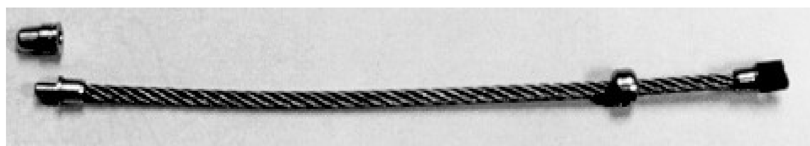


Figure B - Industrial Radiography Source
(with 15 cm connector cable “pigtail”)

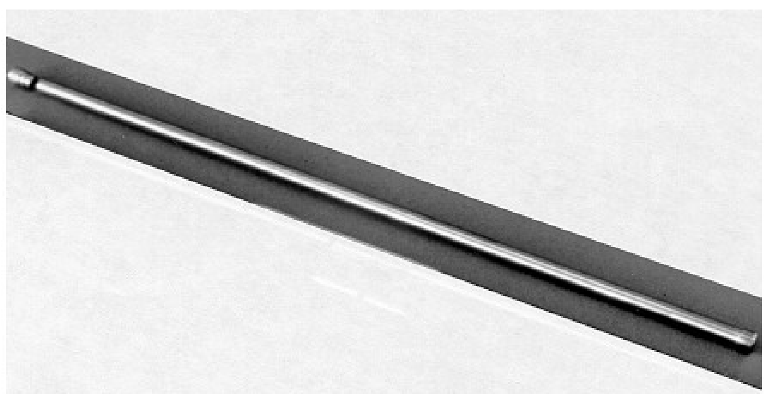
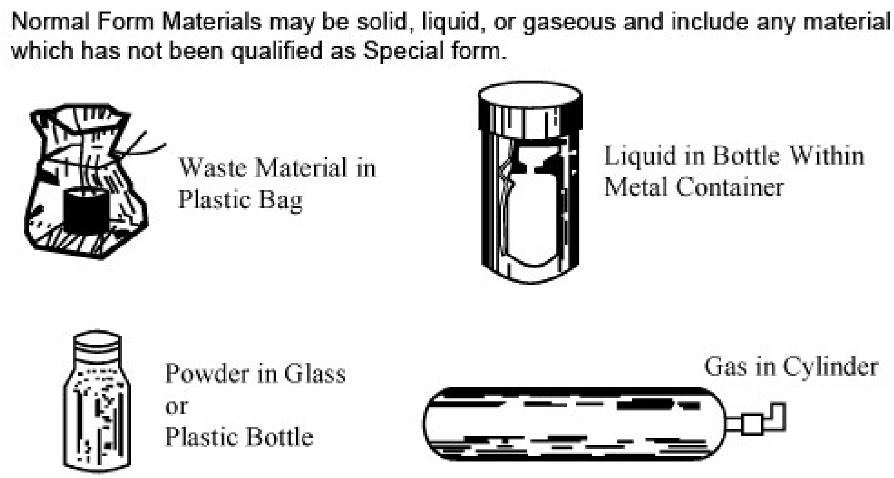


Figure C - Industrial Radiography Source Sterilizer/Process Irradiator Source

C. Normal Form Radioactive Material

Normal form radioactive material means a radioactive material which does not qualify as a “special form material”. Illustrated in Figure 4 are typical physical forms for normal form radioactive material.

Figure 4- “Normal Form” Radioactive Material



D. A_1 and A_2 Quantity Limits

A_1 and A_2 are quantities of radioactivity which are used in the regulations to determine such things as the type of packaging necessary for a particular radioactive material shipment. Each radionuclide is assigned an A_1 and an A_2 value. **A_1** applies to **special form** and **A_2** applies to **normal form** material; A_1 is the maximum activity of special form material that is permitted in a type of package called a Type A package, and A_2 is the maximum activity of normal form radioactive material that is permitted in a Type A package.

A_1 and A_2 values have been determined for most common radionuclides and are listed in the table in § 173.435 (instructions are provided in § 173.433 for unlisted radionuclides and § 173.433(d) details how to determine Type A quantities for mixtures of radionuclides). For each radionuclide, both the A_1 value for materials in special form and the A_2 value for materials in normal form are listed in terabecquerels (TBq) and curies (Ci) (the values in curies are approximate and for information only; the regulatory standard units are terabecquerels, equal to 10^{12} becquerels). Table 1 gives examples of A_1 and A_2 values for a number of typical radionuclides.

Table 1 - Type A Package Quantity Limits for Selected Radionuclides

Symbol of radionuclide	Element and Atomic number	A_1 TBq (Ci) (Special Form)	A_2 TBq (Ci) (Normal Form)
^{14}C	Carbon (6)	40 (1100)	3 (81)
^{137}Cs	Cesium (55)	2 (54)	0.6 (16)
^{226}Ra	Radium (88)	0.2 (5.4)	0.003 (0.081)
^{60}Co	Cobalt (27)	0.4 (11)	0.4 (11)
^{192}Ir	Iridium (77)	1 (27)	0.6 (16)
Thorium (Natural)	Thorium (90)	Unlimited	Unlimited
Uranium (Natural)	Uranium (92)	Unlimited	Unlimited
Uranium (Enriched 20% or less and unirradiated)	Uranium (92)	Unlimited	Unlimited
^{99}Mo	Molybdenum (42)	1 (27)	0.6 (16) {0.74 TBq (20 Ci) for domestic shipments}

The A_1 and A_2 values are used in the regulations as a normalized measurement of radiological risk for all radionuclides. Their uses go beyond the activity limits for Type A packages. Other uses involving large multiples of A_1 or A_2 or different fractions of A_1 or A_2 include the following:

- Special routing of packages with large quantities,
- Total activity in packages and conveyances,
- Designating the limits for packages excepted from most requirements, and
- Designating the specific activity of a contaminated material and associated packaging.

The derivation of the A_1 and A_2 values in the IAEA regulations is based on a series of dosimetric models. The limiting value for A_1 results from the worst case assumptions of external direct γ radiation levels from an unshielded source at a certain distance. Generally, the A_1 value for a radionuclide is the quantity of that radionuclide that will result in a dose rate of 0.1 Sv/h (10 rem/h) at a distance of 1 meter. The A_2 value, however, is based on the applicability of the most conservative worst case value for five different scenarios, which include the A_1 scenario plus external β radiation to skin, inhalation, ingestion, and external γ radiation from immersion in a gaseous cloud of material released from a breached package.

As a result of a limitation established by the IAEA, no radionuclides have been assigned A_1 or A_2 values greater than 40 TBq (1,080 Ci). However, based on their low specific activity and low toxicity, some radionuclides have been assigned "unlimited" A_1 and A_2 values.

E. Excepted Quantities

When a small fraction of the A_1 or A_2 activity is being shipped, some shipments are excepted from some of the requirements of the HMR and can be shipped in an "excepted package" (see Section V.B). The following types of materials may be eligible for such exceptions:

- limited quantity of radioactive material
- radioactive instruments or articles
- articles manufactured from natural or depleted uranium or natural thorium
- empty packagings.

A "limited quantity of radioactive material" is a quantity of radioactive material that does not exceed the material's package limits specified in § 173.425 (see Table 2) and conforms to the requirements specified in § 173.421.

"Radioactive instruments or articles" are manufactured items such as instruments, clocks, electronic tubes, gauges, smoke detectors, electronic apparatus or similar devices having radioactive material in gaseous or non-dispersible solid form as a component part. Allowance is made for the additional protection provided by the structure of the instrument or article and they are considered excepted quantities if they do not exceed the limits in § 173.425 (see Table 2) and conform to the requirements specified in § 173.424. As shown in Table 2, there are two sets of limits: one for the item and another for the package.

Table 2 - Activity Limits for Limited Quantities, Instruments, and Articles

Nature of contents	Instruments and articles		Limited quantity package limits[1]
	Limits for each instrument or article[1]	Package Limits[1]	
Solids:			
Special Form	10^{-2} A_1	A_1	10^{-3} A_1
Normal Form	10^{-2} A_2	A_2	10^{-3} A_2
Liquids:			
Tritiated water:			
<0.0037 TBq/L (0.1 Ci/L)			37 TBq (1,000 Ci)
0.0037 TBq to 0.037 TBq/L (0.1 Ci to 1.0 Ci/L)			3.7 TBq (100 Ci)
>0.037 TBq/L (1.0 Ci/L)			0.037 TBq (1.0 Ci)
Other Liquids	10^{-3} A_2	10^{-1} A_2	10^{-4} A_2
Gases:			
Tritium[2]	2 x 10^{-2} A_2	2 x 10^{-1} A_2	2 x 10^{-2} A_2
Special Form	10^{-3} A_1	10^{-2} A_1	10^{-3} A_1
Normal Form	10^{-3} A_2	10^{-2} A_2	10^{-3} A_2

[1]For mixtures of radionuclides see § 173.433(d).
[2]These values also apply to tritium in activated luminous paint and tritium adsorbed on solid carriers.

A manufactured article in which the sole radioactive material is natural uranium, unirradiated depleted uranium, or natural thorium may be transported in any quantity in an excepted package. This is under the condition that the outer surface of the uranium or thorium is enclosed in an inactive sheath of metal or some other durable protective material as stated in § 173.426.

The empty packaging provisions in § 173.428 provide exceptions for a radioactive material packaging which has been emptied of its radioactive contents as far as practicable, but still contains residual radioactivity. The residual radioactivity limit on internal contamination is 100 times the removable (non-fixed) contamination limits for exterior package surfaces. Wipe contamination sampling techniques are often not practical or feasible for the interior of the containment system of some radioactive material packages; if total (fixed and non-fixed) can be measured, and is below the limit, then the non-fixed component would be below the limit. If it cannot be demonstrated that the non-fixed contamination is less than 100 times the limits in § 173.443, the empty classification cannot be used."

F. Highway Route Controlled Quantities (HRCQ)

"Highway route controlled quantity" is defined as a quantity of radioactive material within a single package which exceeds:

- 3,000 times the A_1 value of the radionuclides for special form material or 3,000 times the A_2 value of the radionuclides for normal form material; or
- 1,000 TBq (27,000 curies), whichever is less.

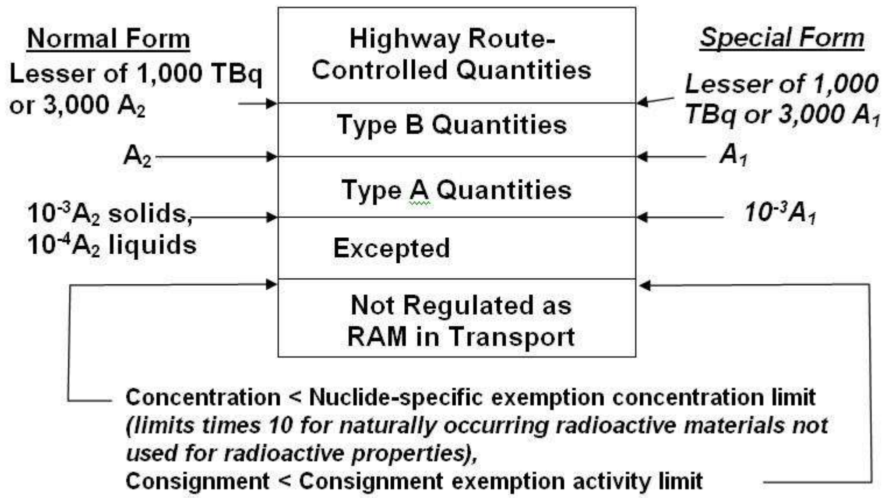
For example, consider a package which contains 777 TBq of cobalt-60 in special form. The A_1 value for cobalt-60 is 0.4 TBq. Since 3,000 times 0.4 TBq = 1,200 TBq and this is greater than 1,000 TBq, the 777 TBq quantity should be compared to 1,000 TBq. Since the amount in the package does not exceed 1,000 TBq, the amount in the package is not an HRCQ.

It is important to note that HRCQ shipments can be made by all modes of transport, not just by highway. If a package contains a quantity in excess of the HRCQ definition, it is an HRCQ shipment, regardless of the mode used.

There are specific requirements for the highway routing of HRCQ shipments as discussed in Section XI of this document. In addition, § 173.22(c) requires shippers of highway route controlled quantities to notify the consignee of the expected arrival date and any special loading/unloading requirements.

Figure 5 illustrates HRCQ in relation to the other categories of radioactive materials discussed previously.

Figure 5 - Material Quantity Categories



G. Low Specific Activity (LSA) Material

Low specific activity (LSA) material is radioactive material that has a low activity per unit mass (specific activity). LSA material is divided into three groups of increasing specific activities: LSA-I, LSA-II, and LSA-III. Most LSA materials have a characteristic of presenting limited radiation hazard, because of their relatively low concentration of radioactivity. When the specific activity of an LSA material is computed, the radioactivity is divided by the mass of material in which the radioactivity is distributed; the mass of the packaging that may surround the LSA is excluded from the calculation.

LSA-1 generally consists of unirradiated natural or depleted uranium and thorium compounds and processing ores, other radionuclides with unlimited A_2 values, or material with a specific activity not exceeding 30 times the exempt concentration. The radioactive concentration is such that a person cannot physically breathe or ingest enough of the material to give significant radiation exposures.

LSA-II material includes material for which the average specific activity does not exceed 10^{-4} A_2/g for solids and gases and 10^{-5} A_2/g for liquids. The activity must be distributed throughout the material. For water with tritium, the concentration limit is 0.8 TBq/L.

LSA-III material consists of solids in which radioactive material is distributed throughout, or is essentially uniformly distributed in a solid binding agent such as concrete, bitumen, or ceramic. It must be relatively insoluble with a leach rate of 0.1 A_2, or less, per week and have a specific activity not exceeding 2×10^{-3} A_2/g. Test requirements for LSA-III material are given in § 173.468.

The quantity of LSA material in a single package must be restricted so that the external radiation level from the unshielded material does not exceed 10 mSv/h (1 rem/h) at 3 meters from the unshielded material.

The definitions of LSA-I, LSA-II, and LSA-III all use the term "*distributed throughout*". The definition of LSA-III also uses "*essentially uniformly distributed*". "*Distributed throughout*" means that the activity should not be localized in small portions of the volume of the material, but there may be some degree of non-homogeneity. In LSA-III, "*essentially uniformly distributed"* in a solid compact binding agent indicates a greater degree of homogeneity. While not defined in the regulations, activity *distributed throughout* should not vary by more than a factor of 10 and activity *essentially uniformly distributed* should not vary by more than a factor of 3.

Further information on shipment of LSA materials is provided in Section VII of this document.

H. Surface Contaminated Objects (SCO)

A surface contaminated object (SCO) is a solid object which is not itself radioactive but which has *radioactive material* distributed on its surfaces (rather than distributed within the material as for LSA materials). There are two categories of SCO, and SCO-II allows for higher contamination levels than SCO-I. The limits for the categories are shown in Table 3.

Table 3 - Contamination Limits for SCOs

Contamination Type	Limits in Bq/cm^{2*}		Limits in $\mu Ci/cm^{2*}$	
On Accessible Surfaces	**SCO-I**	**SCO-II**	**SCO-I**	**SCO-II**
Non-fixed, most α	0.4	40	10^{-5}	10^{-3}
Non-fixed, β, γ, low-toxicity α**	4.0	400	10^{-4}	10^{-2}
Fixed, most α	4×10^3	8×10^4	0.1	2.0
Fixed, β, γ, low-toxicity α**	4×10^4	8×10^5	1.0	20
On Inaccessible Surfaces	**SCO-I**	**SCO-II**	**SCO-I**	**SCO-II**
Fixed + non-fixed, most α	4×10^3	8×10^4	0.1	2.0
Fixed + non-fixed, β, γ, low-toxicity α**	4×10^4	8×10^5	1.0	20

* Contamination values are to be averaged over 300 cm^2, or the area of the surface if it is less than 300 cm^2.

** Low toxicity alpha emitters means natural uranium; depleted uranium; natural thorium; uranium-235 or uranium-238; thorium-232; thorium-228 and thorium-230 when contained in ores or physical and chemical concentrates; and alpha emitters with a half-life of less than 10 days.

SCO-II limits exceed SCO-I limits by a factor of twenty, except for non-fixed contamination on accessible surfaces of objects, in which case, the SCO-II limits exceed SCO-I by a factor of 100. For both SCO-I and SCO-II, the beta, gamma and low-toxicity alpha limits are a factor of ten greater than the limits for other alpha contamination. For inaccessible surfaces of both SCO-I and SCO-II, the total fixed plus non-fixed contamination limits are the same as the fixed contamination limits on accessible surfaces of both SCO-I and SCO-II.

The quantity of SCO in a single package must be restricted so that the external radiation level from the unshielded material does not exceed 10 mSv/h (1 rem/h) at 3 meters from the unshielded material.

The definition of SCO uses several terms which must be understood to properly categorize an item as an SCO. These terms are: *contamination, fixed radioactive contamination, non-fixed radioactive contamination, accessible surfaces,* and *inaccessible surfaces*.

Contamination means the presence of a radioactive substance on a surface in quantities in excess of 0.4 Bq/cm^2 for beta and gamma emitters and low toxicity alpha emitters or 0.04 Bq/cm^2 for all other alpha emitters. Contamination exists in two phases:

- *Fixed radioactive contamination* means radioactive contamination that cannot be removed from a surface during normal conditions of transport.

- *Non-fixed radioactive contamination* means radioactive contamination that can be removed from a surface during normal conditions of transport.

An *accessible surface* is any surface which can readily be wiped by hand, using standard radiation-measuring techniques; any other surface is an *inaccessible surface*. Examples of *inaccessible surfaces* are:

- Inner surfaces of pipes the ends of which have been securely closed with end plugs or caps;
- Inner surfaces of equipment which are suitably blanked off or formally closed;
- Interiors of glove boxes with access ports blanked off.

A solid object which is not radioactive that has contamination on its surface is not an SCO unless the contamination is in sufficient quantity to meet the definition of radioactive material. The radioactive material definition given in §173.403 notes that to be considered radioactive material, the material must exceed both the nuclide specific exemption concentration limit and the consignment exemption activity limits. Thus, if the total activity of the contamination on the surface of items in a consignment does not meet the consignment limit needed to meet the definition of radioactive material, those items, while slightly contaminated, would not be considered to be SCO.

Problems in determining the proper classification for an object with surface contamination may involve methods of measuring the non-fixed and fixed contamination and determining whether the surfaces should be considered accessible or inaccessible. The joint DOT/NRC document “Categorizing and Transporting Low Specific Activity Materials and Surface Contaminated Objects” (NUREG-1608) provides guidance on these issues (available online at http://www.rampac.energy.gov/NRCinfo/NUREG_1608.pdf).

Further information on shipment of SCO materials is provided in Section VII.

I. Fissile Material

Fissile material is material that has the capability of undergoing nuclear fission with the potential to produce a criticality event which would result in significant releases of radiation and heat. Thus, fissile material requires additional package design considerations and controls to assure nuclear criticality safety during transport. Fissile material is defined as plutonium-239, plutonium-241, uranium-233, uranium-235, or any combination of these radionuclides. The definition applies to the nuclides themselves and not the material containing them. For example, fissile mass restrictions in the regulations apply to the mass of uranium-235 and not to the mass of uranium metal containing the uranium-235. While there are other nuclides that are fissionable, the HMR only regulates as fissile material those materials that are capable of having a sustained criticality by accumulation of mass alone. Therefore, the fissile material definition does not apply to unirradiated natural uranium and unirradiated depleted uranium, or to natural uranium or depleted uranium that has been irradiated in thermal reactors only.

Certain quantities and configurations of fissile material cannot become critical under any circumstances associated with transportation. To allow for this, there are several exceptions to the fissile material requirements in the HMR. Generally, the exceptions are for small quantities. If fissile material meets the requirements of § 173.453, it is excepted from the packaging and controls that are required for fissile materials. Paragraphs (a)-(f) of § 173.453 are independent, and only one paragraph needs to be met to take the fissile exception.

J. Radioactive Materials Not Covered by the HMR

There are several categories of radioactive material that are not subject to the HMR, as follows (see § 173.401):

- Materials that are not in transportation,
- Materials that have been implanted or incorporated into, and are still in, a person or live animal for diagnosis or treatment,
- Material that is an integral part of the means of transport,
- Natural material and ores containing naturally occurring radionuclides which are not intended to be processed for use of these radionuclides, provided the activity concentration of the material does not exceed 10 times the values specified in § 173.436.

Materials not in transport may be covered by other regulations, but are not subject to transportation regulations. § 171.1 explains the applicability of the HMR to persons and functions. The HMR apply to the transportation of hazardous materials in commerce, the manufacture and maintenance of packagings used for such transportation, pre-transportation functions (such as filling a package, marking, labeling, and shipping paper preparation), and transportation functions. Movement of materials within facility boundaries where public access is restricted is not subject to the HMR.

Material that is an integral part of the means of transport refers to such items as thoriated metallic engine parts, depleted uranium counterweights, tritium exit signs, and similar items containing radioactive material which are an integral part of, and are routinely used in the normal operation of a transport vehicle.

The radioactive material transport regulations are intended to apply to natural materials or ores that form part of the nuclear fuel cycle, or that will be processed in order to utilize their radioactive properties. They do not apply to other natural materials or ores that may contain small amounts of naturally occurring radionuclides, when those materials or ores are to be used because of some other physical or chemical characteristics, provided that their activity concentrations do not exceed 10 times the exemption values given in the table in § 173.436. Examples of such natural occurring radioactive materials (NORM) are cement, coal, fertilizers, non-radioactive metals, gypsum, and residues from mining and smelting processes.

V. CATEGORIES OF RADIOACTIVE MATERIALS PACKAGES

In the HMR, "package" means the packaging together with its radioactive contents as presented for transportation. For radioactive materials, "packaging" means the assembly of components necessary to ensure compliance with the packaging requirements of the HMR. The packaging may consist of one or more receptacles, absorbent materials, spacing structures, thermal insulation, radiation shielding, service equipment for filling, emptying, venting and pressure relief, and devices for cooling or absorbing mechanical shocks. The conveyance, tie-down system, and auxiliary equipment may sometimes be designated as part of the packaging.

Fundamental to a good understanding of radioactive material transportation safety and packaging requirements is the basic premise that:

Safety in transporting radioactive material primarily depends upon the use of the proper packaging for the type, quantity, and form of the radioactive material to be transported. In addition, packaging design is performance oriented, with the packaging integrity being dictated by the hazards of the radioactive content.

That is, proper packaging is the primary means of providing safety, and contents which present higher hazards are to be contained in stronger packagings.

The following categories of radioactive material packages are defined in the HMR:

- Excepted packages
- Industrial packages (IP-1, IP-2, IP-3)
- Type A packages
- Type B packages
- Fissile material packages
- Packages containing uranium hexafluoride

Each of these is discussed below.

A. General Packaging Requirements

Unless excepted, all packages are subject to applicable general requirements in 49 CFR Part 173, Subparts A and B. General requirements for packagings and packages may be found in § 173.24, additional requirements for non-bulk packagings and packages are given in § 173.24a and requirements for bulk packagings are given in § 173.24b. Radioactive materials packages are also subject to § 173.410, "General Design Requirements."

An example of a requirement that is applicable to all packages is the performance capability requirement for vibration in §§ 173.24a (a)(5) and 173.410(f). Packages do not require vibration-testing in a laboratory. Demonstrating compliance by methods other than testing is allowed in § 173.461(a)(4). The DOT has provided letters of interpretation that the vibration requirement in § 178.608 is a performance capability requirement that may be reasonably satisfied by documented evidence that packages of a particular design have been transported extensively without failure.

B. Excepted Packages

As described in Section IV.E of this document, packages containing excepted quantities of materials (limited quantity of radioactive material, radioactive instruments or articles, articles manufactured from natural or depleted uranium or natural thorium, and empty packagings) are excepted from some requirements of the HMR.

Excepted packages are not required to be tested or designed to survive any transportation accidents, and it is assumed that under accident conditions all the contents could be potentially released. Therefore, the total activity and maximum allowable dose rates associated with these packages are significantly lower than those allowed for other packages. By severely limiting the contents, excepted packages provide a standard of safety comparable to that of more robust packages.

Excepted packages are excepted from specification packaging, marking (except for the UN identification number marking), labeling, and shipping paper requirements. However, they are not exempt from regulation during transportation as would materials not meeting the definition of "radioactive material" for purposes of transportation. In addition to the general packaging requirements for all hazardous material packaging, excepted packaging must meet the general requirements for radioactive material packaging in § 173.410.

Excepted packages must meet the following:

- The general design requirements cited above;
- The outside of each package must be marked with the four digit UN identification number for the material preceded by the letters **UN**, as shown in column (4) of the Hazardous Materials Table in § 172.101;

- Non-fixed contamination limits on package surfaces must not exceed the limits of § 173.443(a);
- The radiation level at any point on the surface of the package must not exceed 0.005 mSv/h (0.5 mrem/h);
- For limited quantities, the outside of the inner packaging, or if there is no inner packaging, the outside of the package itself must bear the marking "**Radioactive**";
- An "**Empty**" label is required on empty packagings;
- For instruments or articles, the radiation level at four inches from any point on the surface of the unpackaged instrument or article shall not exceed 0.1 mSv/h (10 mrem/h).

The specific sections of 49 CFR for the various categories of excepted radioactive packages are:

- § 173.421 Excepted packages for limited quantities of Class 7 (radioactive) materials
- § 173.422 Additional requirements for excepted packages containing Class 7 (radioactive) materials
- § 173.423 Requirements for multiple hazard limited quantity Class 7 (radioactive) materials
- § 173.424 Excepted packages for radioactive instruments and articles
- § 173.426 Excepted packages for articles containing natural uranium or thorium
- § 173.428 Empty Class 7 (radioactive) materials packaging.

Figure 6 shows an example of an excepted packaging and its contents.

Figure 6 - Example Excepted Package

C. Industrial Packages (Type IP-1, IP-2, IP-3)

"Industrial packagings" (IP) may be used for materials with sufficiently limited specific activity (LSA materials) and certain SCO. There are three categories of IP: IP-1, IP-2, and IP-3. The requirements for each IP category are given in § 173.411. IP-1 packagings must meet the general packaging requirements of § 173.410 and are, therefore, equivalent in design requirements to excepted packagings.

IP-2 packagings must also meet the general design requirements and, when subjected to the free drop and stacking (compressive load) tests specified in § 173.465(c) and (d) or evaluated against these tests by any of the authorized methods of § 173.461(a), each IP-2 must prevent the following:

- Loss or dispersal of the radioactive contents
- Any significant increase in the radiation levels recorded or calculated at the external surfaces for the condition before the test.

IP-3 packaging must meet the requirements of an IP-1 and IP-2 and must also meet the requirements specified in § 173.412(a)-(j). IP-3 packagings are, therefore, identical to Type A packagings authorized for solid Type A quantities of radioactive materials.

The following types of packagings may be ***used as*** IP-2 and IP-3 packages if they meet requirements for an IP-1 and the cited requirements, including containment and shielding requirements (they do not need to meet the other IP-2 and IP-3 requirements):

- Tank containers meeting the requirements of § 173.411 (b)(4)
- Other tanks meeting the requirements of § 173.411(b)(5)
- Freight containers (for solid materials only) that are built to the ISO 1496-1 standards meeting the requirements in § 173.411 (b)(6)
- Metal intermediate bulk containers meeting the requirements in § 173.411 (b)(7).

Shippers of any IP-2 and IP-3 packages must maintain the packaging documentation on file for one year after shipment that shows, by test results or analysis, that the packaging met the IP-2 or IP-3 criteria.

Figure 7 shows two examples of IP packages.

Figure 7 - Industrial Packages (IP)

Figure A – An IP-1 Package

Figure B - An IP-2 Package

D. <u>Type A Packages</u>

Type A packages are required to maintain their integrity under conditions of normal transport. However, it is assumed that a Type A package may be damaged in a severe accident and could then release some of its contents. Therefore, the maximum amount of radioactivity that can be transported in such packages is limited to Type A quantities (A_1 for special form materials, A_2 for normal form materials).

Type A packaging must comply with the applicable general packaging requirements of §§ 173.24, 173.24a (non-bulk) or § 173.24b (bulk), and § 173.410, and the additional requirements of § 173.412, and § 173.415. These packagings must prevent the loss or dispersal of the radioactive contents and maintain the radiation shielding properties during normal conditions of transportation, which include rough handling conditions, for which tests are specified in § 173.465. These rough handling conditions include: falling from a transport vehicle or handling equipment; being struck by irregularly shaped freight or other packages with sharp corners; sitting on an uncovered loading dock during inclement weather; and having heavy freight loaded on top of the package. The packaging, with contents, must be capable of withstanding the water spray, free drop, stacking and penetration tests described below. One prototype may be used for all tests if the requirements of § 173.465(b) are met. The water spray test must precede each test or test sequence.

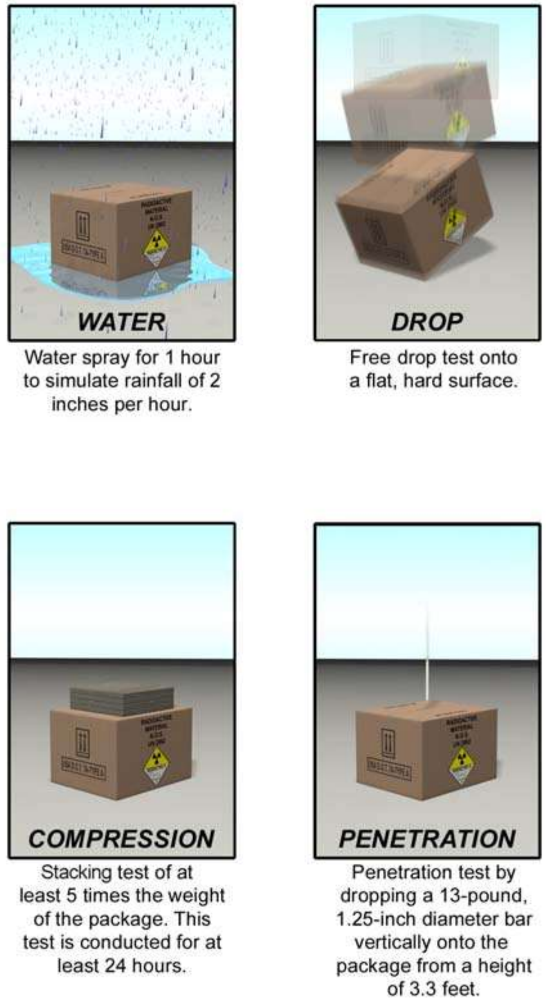
The tests that simulate the types of damage that could result from these conditions are:

- **Water Spray Test**, which simulates the package having been left in rain at a rate of about 2 inches/h for a period of at least one hour, followed by;
- **Free Drop Test** of 1- 4 feet (depending on the package mass, with 4 feet for packages under 11,000 pounds) onto a hard surface, in a most damaging orientation - simulating falling off a vehicle or loading platform (there are additional requirements for fiberboard, wood, and fissile material packages),
- **Stacking Test** equal to a force of at least 5 times the weight of the package for at least 24 hours - simulating the damp package being at the bottom of a stack of packages, and
- **Penetration Test** with a 13.2 pound, 1.25 inch diameter steel rod being dropped at least 3.3 feet onto the damp package - simulating a loose object hitting the package.

The performance requirements for Type A packages containing liquids and gases are more stringent than the requirements for solids, because of the greater potential for materials spreading if the package containment system fails. The more stringent requirements relate to containment, and the height in the drop (30 feet) and puncture (5.5 feet) tests, and are found in § 173.412 (k) and § 173.466.

Figure 8 illustrates the Type A packaging tests.

Figure 8 - Type A Packaging Tests



Essentially, the only authorized Type A package in the DOT regulations is the DOT specification 7A (see § 178.350), which is based totally on performance test conditions rather than on hardware or design requirements. This provides the package designer with maximum latitude in the use of engineering creativity to produce optimally useful and economic designs. Using any of the methods authorized in § 173.461, each shipper of a DOT-7A package must determine if the design meets the performance requirements in §§ 173.412 and 173.465, and then must document and maintain this evaluation or "self-certification" on file for at least one year after the latest shipment, per § 173.415(a). Consequently, each design must be specifically certified as meeting the DOT-7A requirements. Each time the *contents or packaging components* change, the performance capability of the modified package must be re-evaluated with respect to the requirements before the Type A designation may be assigned.

Shippers are cautioned that often, additional documentation beyond that provided by the packaging supplier is needed to fulfill all of the requirements for a particular shipment; most importantly that the contents to be shipped have been evaluated for compatibility with the packaging and that their characteristics have been bounded by the simulated contents used in qualification testing (see § 173.461). To satisfy the documentation requirements of § 173.415(a), each shipper must maintain complete documentation of tests and an engineering evaluation or comparative data showing that the construction methods, packaging design, and materials of construction comply with the 7A specification. It is recommended that the documentation identify each requirement and state how each is met. The statements can contain references to supporting documentation, such as engineering evaluations. The documentation shall be provided to DOT upon request.

DOT-7A designs do **not** require the approval of either DOT or NRC, for domestic shipment or for international transportation of non-fissile radioactive material. Type A quantities may also be shipped in certified fissile or Type B packaging or in foreign-made Type A packaging which meets IAEA TS-R-1 requirements. If foreign-made packages are to be used for domestic shipments, the domestic shipper must obtain and maintain on file the applicable Type A evaluation and documentation performed by the foreign package designer.

Each packaging built to DOT Specification 7A Type A must be marked on the outside as "**USA DOT 7A Type A**" and also in accordance with the marking requirements in § 178.3. Section 178.350 (c) requires that the package also be marked with the name and address of the person certifying that the package (including the contents) meets the applicable requirements. This may be the shipper, if the packaging supplier has not tested for contents comparable to what is being shipped.

Figure 9 illustrates several representative Type A packaging configurations.

Figure 9 - Typical Type A Packaging Configurations

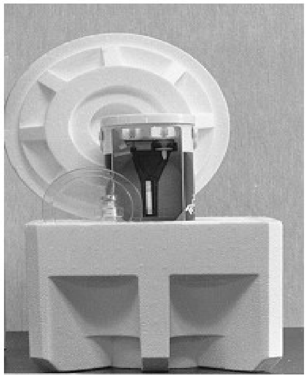


Figure A - Molybdenum 99 Generator
(Cutaway shows outer carton, foam spacer, shielding, ion column, and tubing for saline solution)

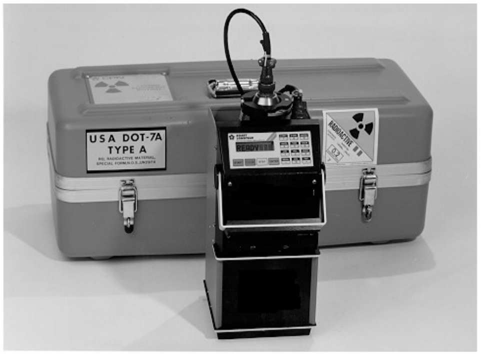


Figure B - Moisture Density Gauge & Carrying Case

Figure C - 55 Gallon Steel Drum

Figure D - Components of a Type A Package for Isotopes

E. Type B Packages

Type B packages must meet the general packaging and performance standards for Type A packages and additionally must have the ability to survive serious accident damage tests (hypothetical accident conditions). After testing, there may be only a very limited loss of shielding capability and no loss of containment, as measured by leak-rate testing of the containment system of the package.

Most domestic Type B packages are fabricated to designs certified by the NRC. Each design is approved under a NRC certificate of compliance and general license issued pursuant to 10 CFR 71.17. DOT authorizes use of NRC-approved Type B packages in § 173.416(a) and the standard requirements applicable to their use are in § 173.471. In addition, numerous Type B packages are approved by the U.S. Department of Energy (DOE) under the authority provided by DOT in § 173.7(d). Many of these DOE-certified packages are also certified by the NRC.

Type B Packages of foreign origin which meet the applicable requirements of TS-R-1, and for which the foreign competent authority certificate has been revalidated by DOT pursuant to § 173.473, are authorized only for export shipments from, import shipments into, and shipments traveling through the U.S. For purely domestic shipments of such packages, NRC certification of the package must be obtained.

The performance criteria which the package designer must use to assess a Type B package design against the established hypothetical accident conditions are prescribed in 10 CFR 71.73 of the NRC regulations and include the following tests, which are to be done sequentially (except the immersion test for all packages which may be done on a separate specimen):

- **Free Drop**: A 9 m (30 ft) free fall of the test package onto an unyielding surface in a position for which maximum damage is expected;
- **Crush**: For packages with mass not greater than 500 kg (1,100 lb), overall density not greater than 1,000 kg/m^3 (62.4 lb/ft^3) and for normal form non-fissile material, contents greater than 1,000 A_2 - subjecting the test specimen to a dynamic crush test by positioning the specimen on a flat unyielding horizontal surface so as to suffer maximum damage by the drop of a 500 kg (1,100 lb) steel plate mass from 9 meters (30 ft) onto the test package;
- **Puncture**: A puncture test as a free drop of the test package from a height of 1 m (40 in) onto a 15 cm (6 in) diameter vertical steel peg which has a length as to cause maximum damage to the package, at least 20 cm (8 in) long;
- **Thermal**: Exposure to a fully engulfing thermal environment of at least 800^{o}C (1,475^{o}F) for 30 minutes;
- **Immersion – fissile material:** For fissile packages where water in-leakage is not assumed in the criticality analysis, immersion of the test package under a head of water of at least 0.9 meters (3 ft) in the attitude for which maximum leakage is expected; and

- **Immersion – all packages**: Water immersion of the test package under at least 15 meters (50 ft) depth.
  In addition, packages containing more than 10^5 A_2 must be designed to withstand an external water pressure of 2 MPa (290 psi) for a period of not less than one hour without collapse, buckling, or in-leakage of water (see 10 CFR § 71.61).

  Figure 10 illustrates the hypothetical accident conditions for Type B packages except for the crush test and the fissile material package immersion test.

Figure 10 - Type B Hypothetical Accident Conditions

Certified Type B packagings are designated as Type B(U), or Type B(M). The (U) designation indicates a design requiring only unilateral approval—approval by the country of origin only. The receiving country does not need to review these designs, but in general, they will revalidate the certification. The (M) indicates a design requiring multilateral approval, i.e., approval by all countries into or through which the package is transported. A Type B(U) and a Type B(M) package are identical except that a Type B(M) package design has a maximum normal operating pressure greater than 700 kiloPascal or a pressure-relief device that allows the release of radioactive material to the environment under the hypothetical accident condition tests. Certificates of Type B packaging that are authorized for fissile materials have an "F" in the identification, e.g., USA/9126/B(U)F-85.

Type B(U) and B(M) package designs without a -85 or -96 at the end of their designation were approved to the 1973 IAEA regulations and were approved prior to April 1, 1996. Package designs with the -85 designation were approved after April 1, 1996, and meet the 1985 IAEA regulations. Package designs with -96 designations meet the 1996 IAEA regulations. Use or fabrication of package designs without the -96 designation is restricted in 10 CFR § 71.19.

Type B Packages cover a wide range of physical sizes, from small radiographic devices to large waste casks and spent nuclear fuel casks.

Figure 11 provides illustrations of several Type B Packages.

Figure 11 - Example Type B Packages

Figure A - RH-TRU 72B Cask

Figure B - CNS 10-160B

Figure C - 3 TRUPACT-II Packages

Figure D - Industrial Radiography Exposure Device (cutaway shows "S" tube for source in the shielding material)

F. **Fissile Radioactive Material Packages**

As discussed in Section IV.I, fissile material is defined as plutonium-239, plutonium-241, uranium-233, uranium-235, or any combination of these radionuclides. Authorized fissile material packages are provided in § 173.417; acceptable Type A packages are listed in paragraph (a) and acceptable Type B packages are listed in paragraph (b) (paragraph (c) provides the DOT Specification Type A and Type B packages that are being phased out after October 1, 2008).

All Type A and Type B fissile packages are certified by the NRC as indicated in § 173.417(a)(4) and (b)(3) or by DOE pursuant to the authority of § 173.7(d). Fissile packages of foreign origin are subject to the same DOT requirements as non-fissile Type B packages, and they must be revalidated by the DOT before they can be used for import or export of shipments.

When the DOT Specification 7A, Type A package is used for fissile material contents, the package must have been evaluated for the additional drop test from a height of 1 foot on each corner, or in the case of cylindrical packages, onto each of the quarters of each rim (see § 172.465(b)(2)).

In addition to the accident condition tests for Type B packaging, fissile material packaging designs for air transport must remain subcritical after being subjected to enhanced puncture, thermal, and drop tests in addition to the 10 CFR§ 71.73 free drop and crush tests. These additional requirements are stated in 10 CFR § 71.55(f). In addition, 10 CFR §§ 71.74 and 71.88 address additional requirements for shipments of plutonium by air.

Figure 12 illustrates some typical packages used in the transportation of fissile radioactive material.

Figure 12 - Fissile Radioactive Material Packaging

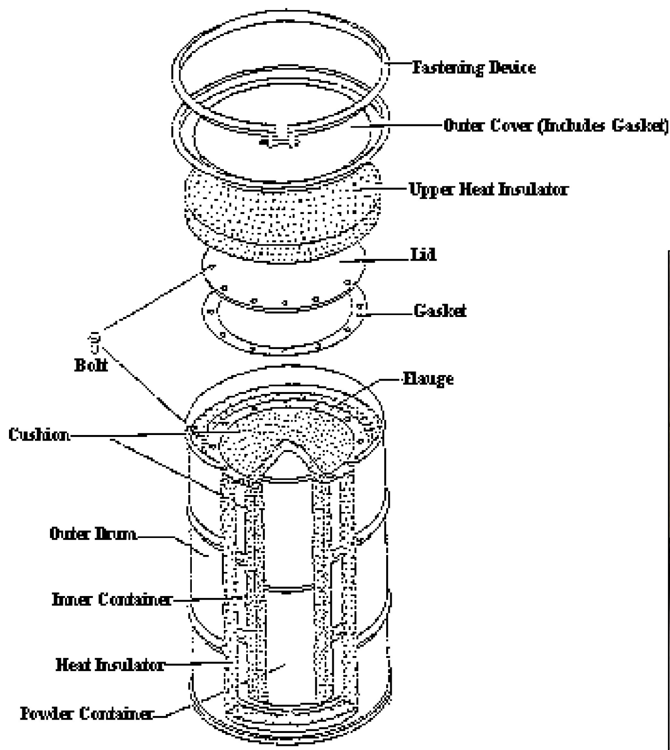


Figure A - Type A Drum for UO_2

Figure B - Power Reactor Spent Fuel

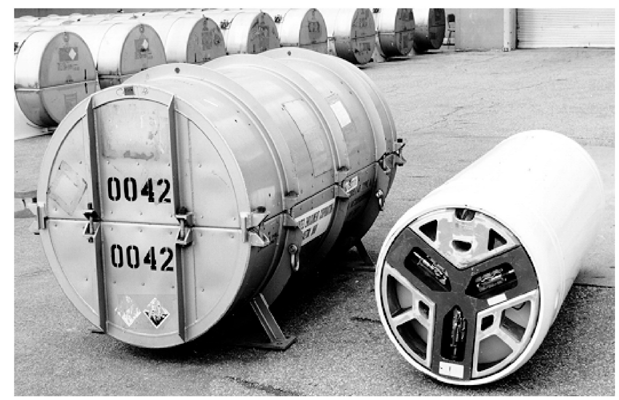


Figure C - Uranium Hexafluoride (UF_6) Overpack and Bare 30” Cylinder

G. Packages Containing Uranium Hexafluoride

Uranium hexafluoride (UF_6) is a radioactive material having a significant chemical hazard. During transportation, UF_6 exists as a crystalline solid and is shipped in metal cylinders at slightly reduced atmospheric pressure. The material presents hazards due to its radioactivity, as well as its corrosivity; breach of a cylinder of solid UF_6 would result in a reaction product of the material with the moisture in the air to produce highly corrosive hydrogen fluoride gas along with moderately radioactive uranyl fluoride solid particulates. Under the HMR, the radioactive nature of the material takes precedence, and the chemical hazard is treated as a subsidiary risk.

Depending on the degree of enrichment and the amount of fissile U present, UF_6 may be transported in excepted, industrial, Type A, or fissile packaging. The packaging requirements for UF_6, both fissile and LSA, are in § 173.420. This section contains references to American National Standards Institute (ANSI) Standard N14.1, *Nuclear Materials - Uranium Hexafluoride - Packaging for Transport*, and to ASME Code. All UF_6 cylinders with greater than 100g of UF_6 must comply with the provisions in § 173.420 that require each UF_6 package be designed to withstand:

- A hydraulic test at internal pressure of 200 lb per square inch without leakage.
- The free drop test in § 173.465(c) without loss or dispersal of the UF_6.
- The thermal test in 10 CFR § 71.73(c)(4) without rupture of the containment.

These tests do not have to be conducted sequentially or on the same package.

In addition to the provisions in § 173.420, UF_6 shipments are subject to the provisions in either § 173.427 or § 173.417. UF_6 that is enriched to not more than 1% is considered non-fissile, since it will meet the fissile exemption in § 173.453(d); as such, it can be shipped using the LSA shipping provisions in § 173.427. UF_6 that is enriched to more than 1% must be shipped in the authorized Type A or Type B fissile packages that are referenced in § 173.417(a)(2) and (3) and in § 173.417(b)(3).

The quantity limits for shipment of enriched (fissile) UF_6 in the form of residual "heels" of material in "empty" cylinders are provided in § 173.417(a)(2).

The quantity limits for fissile UF_6 in metal cylinders overpacked in DOT Specification 20PF and 21PF protective overpacks are contained in § 173.417(b)(3) or in the certificates for NRC-certified UF_6 packages. The specifications for the DOT overpacks are provided in

§ 178.356 (Specification 20PF) and § 178.358 (Specification 21PF). Handling procedures and packaging criteria for the overpacks must be in accordance with the United States Enrichment Corporation (USEC) Report USEC-651, *Good Handling Practices for Uranium Hexafluoride*.

VI. TRANSPORT CONTROLS

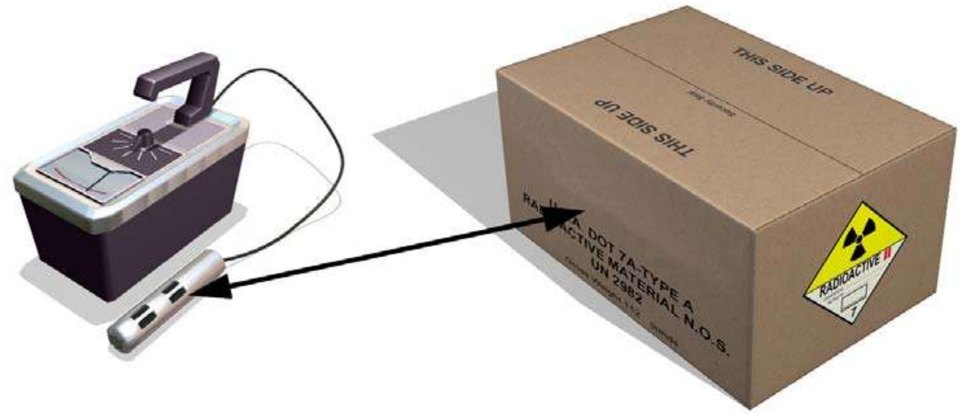
While proper packaging is the primary means of providing safety, transport controls provide additional levels of safety in the transport of radioactive materials. These controls include use of a transport index (TI), a criticality safety index (CSI) for fissile materials, dose rate limits, contamination limits, exclusive use provisions, and use of closed transport vehicles.

Exclusive use means sole use by a single consignor of a conveyance for which all initial, intermediate, and final loading and unloading are carried out in accordance with the direction of the consignor or consignee. The consignor and the carrier must ensure that any loading or unloading is performed by personnel having radiological training and resources appropriate for safe handling of the consignment. The consignor must provide to the initial carrier specific written instructions for maintenance of exclusive use shipment controls, including the vehicle survey requirement of § 173.443 (c) as applicable, and include these instructions with the shipping paper information provided to the carrier by the consignor.

A. Transport Index (TI)

The dose rates associated with radioactive material shipments are controlled, in part, by the transport index, often called the TI. The TI is a dimensionless number that restricts the number of radioactive material packages that can be safely accumulated on a conveyance or in a storage area. By definition, the transport index is determined by multiplying the maximum radiation level in millisieverts (mSv) per hour at 1 m (3.3 ft) from the external surface of the package by 100 (equivalent to the maximum radiation level in millirem per hour at 1 m (3.3 ft)). The TI is rounded up to the nearest tenth (except a TI between 0.0 and 0.05 may be taken as zero) and is shown, without units, as the TI on shipping papers and radioactive material labels. Figure 13 illustrates the measurement of a package TI.

Figure 13 - Transport Index



For non-exclusive use shipments, the TI from a single package can not exceed 10.

Conveyance limits on the sum of package transport indices are given in § 173.441(d) and are as follows:

1. Except for shipments by cargo aircraft only or by seagoing vessel, the sum of TIs for a non-exclusive use shipment may not exceed 50.
2. Where a consignment is transported under exclusive use, there is no limit on the sum of the TIs aboard a single conveyance.
3. Provisions for shipments of radioactive materials by air are described in §§ 175.700 - 175.705 and include:
    a. On a passenger-carrying aircraft—
        i. Each single package on the aircraft has a TI no greater than 3.0;
        ii. The combined TI of all the packages on the aircraft must be no greater than 50.
    b. On a cargo aircraft—
        i. Each single package on the aircraft has a TI no greater than 10.0.
        ii. The combined TI of all the packages on the aircraft is no greater than 200.
4. Provisions for shipment of radioactive materials by vessel are described in §§ 176.700 - 176.720 and include the requirement that the sum of the TIs for all packages on board a vessel may not exceed the limits specified in Table 4 (this table does not apply to consignments of LSA-I material).

Packages must be stowed at prescribed distances from areas occupied by persons, based on tables of cumulative TI versus separation distance found in DOT carrier regulations as follows:

- Rail § 174.700
- Air §§ 175.701 – 175.702
- Water § 176.708
- Highway § 177.842

There is a limit of a total TI of 50 for each group of packages in a single spot in storage incident to transportation (with each group of packages at least 6 m (20 ft) from other groups of radioactive packages).

The TI limits for freight containers and conveyances on vessels are listed in Table 4.

Table 4 - TI Limits for Freight Containers and Conveyances on Vessels

Type of freight container or conveyance	Limit on total sum of transport indices in a single freight container or aboard a conveyance	
	Not under exclusive use	Under exclusive use
I. Freight container - small	50	N/A
II. Freight container - large	50	No limit
III. Vessel: [a,b] 1. Hold, compartment or defined deck area: i. Packages, overpacks, small freight containers. ii. Large freight containers.	 50 200	 No limit No limit
2. Total vessel: i. Packages, overpacks, small freight containers. ii. Large freight containers.	 200 No limit	 No limit No limit

NOTES:
[a] *For vessels, the requirements in both 1 and 2 must be fulfilled.*
[b] *Packages or overpacks transported in or on a vehicle which are offered for transport in accordance with the provisions of § 173.441(b) (exclusive use) may be transported by vessels provided that they are not removed from the vehicle at any time while on board the vessel.*

B. Criticality Safety Index (CSI)

In addition to a transport index, packages containing fissile material (those not excepted under § 173.453) must be assigned a criticality safety index (CSI). Like the TI, the CSI is a dimensionless number, rounded up to the next tenth, which is used to provide control over the accumulation of packages, overpacks or freight containers. The CSI for packages containing fissile material is determined in accordance with the instructions provided in 10 CFR §§ 71.22, 71.23, and 71.59; it is determined from the grams of fissile material (plutonium-239, plutonium-241, uranium-233, uranium-235) present in the package. The CSI for an overpack, freight container, or consignment containing fissile material packages is the arithmetic sum of the criticality safety indices of all the fissile material packages contained within the overpack, freight container, or consignment.

Except for consignments under exclusive use, the CSI of any package or overpack may not exceed 50; a fissile material package with CSI greater than 50 must be transported by exclusive use. For non-exclusive use shipments of fissile material packages, except on vessels, the total sum of CSIs in a freight container or on a conveyance may not exceed 50, for exclusive use shipments the total sum of CSIs may not exceed 100. In temporary storage during transportation, the total CSI in any storage location must not exceed 50. Groups of such packages must be spaced at least 6 m (20 ft) apart.

Mixing of fissile material packages with other types of Class 7 (radioactive) materials in any conveyance or storage location is authorized only if the TI of any single package does not exceed 10, the CSI of any single package does not exceed 50, and the radiation level restrictions of § 173.441 and the specific requirements for the transportation of fissile material packages in § 173.457 are satisfied.

Provisions for shipment of radioactive materials by vessel are described in §§ 176.700 – 176.720 and include the requirement that the sum of the CSIs for all packages radioactive materials on board a vessel may not exceed the limits specified in Table 5 (this table does not apply to consignments of LSA-I material).

Table 5 - CSI Limits for Freight Containers and Conveyances on Vessels

Type of freight container or conveyance	Limit on total sum of criticality safety indices in a single freight container or aboard a conveyance	
	Not under exclusive use	**Under exclusive use**
I. Freight container - small	50	N/A
II. Freight container - large	50	100
III. Vessel: [a,b]		
1. Hold, compartment or defined deck area:		
i. Packages, overpacks, small freight containers.	50	100
ii. Large freight containers.	50	100
2. Total vessel:		
i. Packages, overpacks, small freight containers.	200	200
ii. Large freight containers.	No limit[c]	No limit[d]

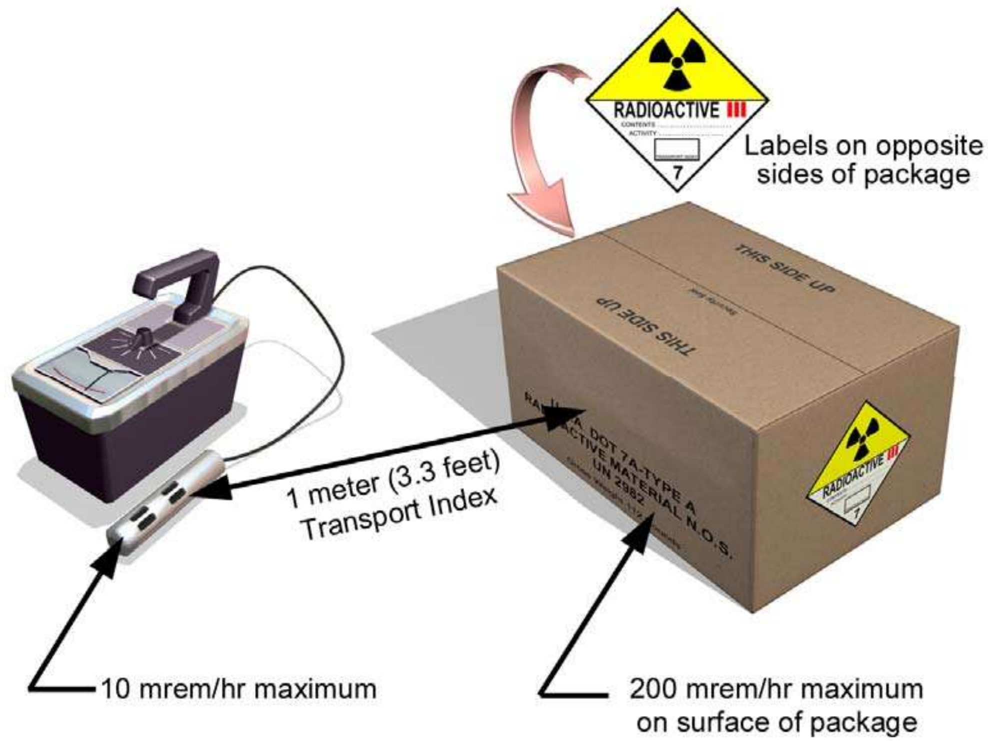
NOTES:
[a] *For vessels, the requirements in both 1 and 2 must be fulfilled.*
[b] *Packages or overpacks transported in or on a vehicle which are offered for transport in accordance with the provisions of § 173.441(b) (exclusive use) may be transported by vessels provided that they are not removed from the vehicle at any time while on board the vessel. In that case, the entries under the heading "under exclusive use" apply.*
[c] *The consignment must be handled and stowed such that the total sum of CSIs in any group does not exceed 50, and such that each group is handled and stowed so that the groups are separated from each other by at least 6 m (20 ft).*
[d] *The consignment must be handled and stowed such that the total sum of CSIs in any group does not exceed 100, and such that each group is handled and stowed so that the groups are separated from each other by at least 6 m (20 ft). The intervening space between groups may be occupied by other cargo.*

C. Package Radiation Limits

The limits on radiation levels of a package offered for transportation are found in § 173.441. (The dose limits for excepted packages are located in §§ 173.421, 424, 426, and 428; at 0.005 mSv/h (0.5 mrem/h) these limits are significantly lower than what is allowed for other radioactive material packages.)

For non-excepted packaging, packages are restricted to surface readings not exceeding 2 mSv/h (200 mrem/h) and a transport index (TI) that does not exceed 10 as shown in Figure 14. These limits apply for non-exclusive use shipments and help to ensure that transport personnel do not receive significant doses, even when frequently handling a large number of packages.

Figure 14- Package Radiation Limits for Non-Exclusive Use Shipments



Packages may be shipped with higher dose rates if they are placed under additional controls. For packages with surface readings under 2 mSv/h (200 mrem/h), but with a TI exceeding 10, the shipment may be placed under exclusive use. Packages having a surface reading over 2 mSv/h (200 mrem/h), up to as high as 10 mSv/h (1,000 mrem/h), must not only be placed under exclusive use but also must be shipped in a closed transport vehicle with the package secured in place with no loading or unloading operations between the beginning and end of the transportation. (A “closed transport vehicle” includes not only closed trailers and vans, but also arrangements where personnel barriers to limit access are placed around large packages carried on flat bed trailers.)

For exclusive use shipments, the vehicle radiation levels must not exceed the following during transportation:

- 2 mSv/h (200 mrem/h) at any point on the outer surfaces of the vehicle;
- 0.1 mSv/h (10 mrem/h) at any point 2 m (6.6 feet) from the outer lateral surfaces of the vehicle (excluding the top and underside of the vehicle);
- 0.02 mSv/h (2 mrem/h) in any normally occupied space, (this does not apply to carriers if they operate under the provisions of a State or federally-regulated radiation protection program and if personnel under their control who are in such an occupied space wear radiation dosimetry devices).

Figures 15 and 16 illustrate the allowable dose rates for exclusive use shipments.

Figure 15 - Allowable Dose Rates for an Exclusive Use Shipment

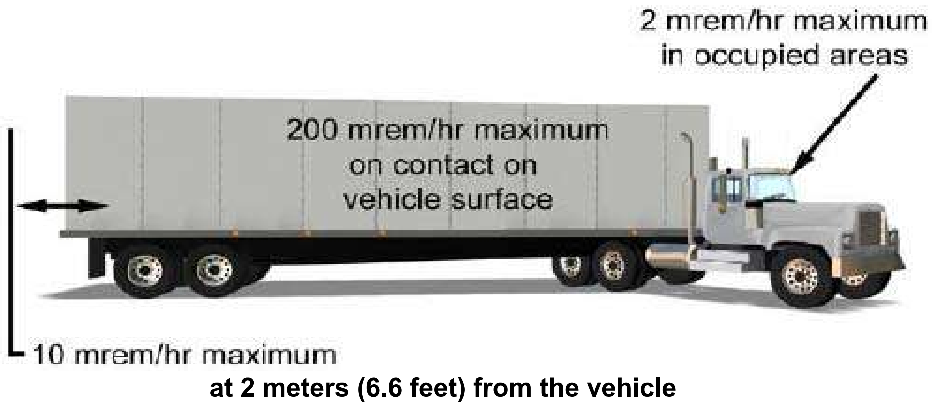


Figure 16- Allowable Dose Rates for an Exclusive Use Shipment in a Closed Transport Vehicle

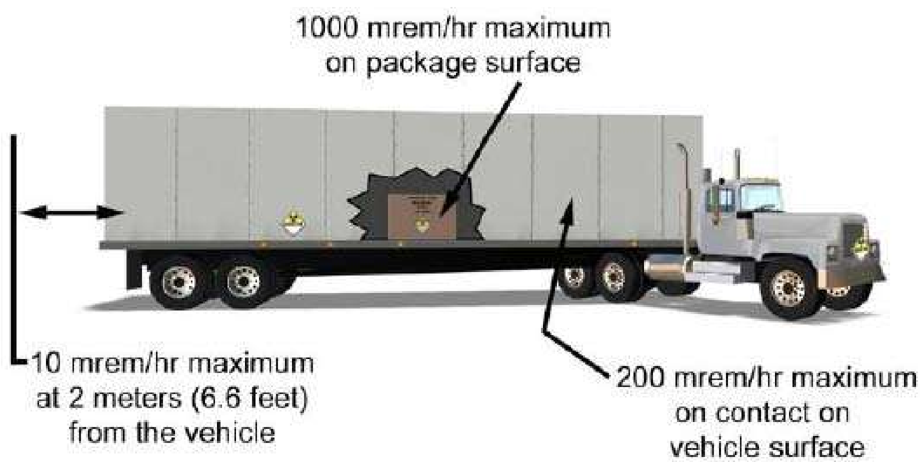


Table 6 summarizes the radiation level limits packages and transport vehicles in various configurations.

Table 6 - Radiation Level Limitations

Package and Vehicle Radiation Level Limits (§ 173.441)[1]				
		Nonexclusive Use Shipment	**Exclusive Use Shipment**	
		Open or Closed Transport Vehicle	Open (flat-bed)	Closed Transport Vehicle
Package Limits:	External Surface	2 mSv/h (200 mrem/h)	2 mSv/h (200 mrem/h)	10 mSv/h (1000 mrem/h)
	Transport Index (TI)[2]	10	No limit	
	Criticality Safety Index (CSI)[5]	50	No limit	
Transport Vehicle Limits (highway and rail):	Any point on the outer surface	N/A	N/A	2 mSv/h (200 mrem/h)
	Vertical planes projected from outer edges		2 mSv/h (200 mrem/h)	N/A
	Top of		Load: 2 mSv/h (200 mrem/h)	Vehicle: 2 mSv/h (200 mrem/h)
	2 meters from		Vertical Planes: 0.1 mSv/h (10 mrem/h)	Outer Lateral Surfaces: 0.1 mSv/h (10 mrem/h)
	Underside		2 mSv/h (200 mrem/h)	
	Occupied position	N/A[3]	0.02 mSv/h (2 mrem/h)[4]	
	Sum of package TIs	50	No limit	
	Sum of package CSIs[5,6]	50	100	

[1] *The limits in this table do not apply to excepted packages. [§§ 173.421, 173.424, 173.426, and 173.428]*
[2] *The dimensionless number equivalent to maximum radiation level at 1 meter (3.3 feet) from the exterior package surface is in mrem/h rounded up to the next tenth. [§ 173.403]*
[3] *No dose limit is specified, but separation distances apply to packages with RADIOACTIVE YELLOW-II, RADIOACTIVE YELLOW-III, or CSI labels. (§ 177.842)*
[4] *Does not apply to carriers if operating under a state or federally-regulated radiation protection program and if personnel wear radiation dosimetry devices. [§ 173.441(b)(4)]*
[5] *These provisions do not apply to shipment by vessel. See § 176.700–720 for the vessel requirements.*
[6] *The number of packages containing fissile material stored in transit in any one storage area must be limited so that the total sum of the CSIs is ≤50 and such groups of packages must be spaced at least 6 meters (20 feet) from other such groups. [§§ 173.457 and 173.459]*

D. Contamination Limits and Contamination Surveys

Removable, or non-fixed, contamination on the surface of radioactive material packages must be kept as low as reasonably achievable. The maximum removable surface contamination limits are stated in § 173.443 and are shown in Table 7.

Table 7 - Non-Fixed External Radioactive Contamination Limits for Packages

Contaminant	Maximum permissible limits		
	Bq/cm^2	µCi/cm^2	dpm/cm^2
Beta and gamma emitters and low toxicity alpha emitters	4	10^{-4}	220
All other alpha emitting radionuclides	0.4	10^{-5}	22

These levels are the surface limits for removable contamination. Usually, smears are used to assess the removable contamination levels. It is assumed that the smear technique has 10% efficiency. Therefore, shippers should multiply the smear data by 10 before comparing it to the limits. Taking account of this factor, the limits based on wipe data are as shown in Table 8.

Table 8 - Non-Fixed External Radioactive Contamination *Wipe* Limits for Packages

Contaminant	Maximum permissible *wipe* limits		
	Bq/cm^2	µCi/cm^2	dpm/cm^2
Beta and gamma emitters and low toxicity alpha emitters	0.4	10^{-5}	22
All other alpha emitting radionuclides	0.04	10^{-6}	2.2

* Assuming 10% smear efficiency

In addition, since smears are to be done over 300 cm^2, shippers should be careful to ensure that they convert to $/cm^2$ before making comparisons between the smear data and the values in the table. Techniques other than smears may be used to assess the removable contamination if they have equal or greater efficiency.

The contamination limits cited above apply to all non-exclusive use shipments of radioactive material packages. For packages shipped as exclusive use shipments by rail or highway, the contamination levels must not exceed the Table 7 limits at the beginning of transport, but may increase up to 10 times the limits during transport. This provision allows for the phenomenon of weeping (or leaching) whereby under certain conditions, packages will have fixed contamination that will migrate, or weep, to the outer surface and become removable.

If non-fixed surface contamination levels on packages in an exclusive use vehicle have risen during transportation above the Table 7 limits, the transport vehicle must be surveyed with appropriate radiation detection instruments after each use. It shall not be returned to service until the external radiation on the surface is below 0.005 mSv per hour (0.5 mrem per hour) and the removable surface contamination is below the limits of Table 7 (see §§ 177.843 and 174.715). These requirements do not apply to any vehicle used solely for transporting Class 7 (radioactive) material if a survey of the interior surface shows that the radiation dose rate does not exceed 0.1 mSv per hour (10 mrem per hour) at the interior surface or 0.02 mSv per hour (2 mrem per hour) at 1 meter (3.3 feet) from any interior surface. These vehicles must be stenciled with the words “For Radioactive Materials Use Only” in lettering at least 7.6 cm (3 inches) high in a conspicuous place, on both sides of the exterior of the vehicle. These vehicles must be kept closed at all times other than loading and unloading. The vehicles do not have to be decontaminated to the Table 7 limits until they are released back to general service.

VII. SHIPMENTS OF LOW SPECIFIC ACTIVITY (LSA) MATERIALS AND SURFACE CONTAMINATED OBJECTS (SCO)

As described in Section IV, low specific activity (LSA) material is radioactive material that has a low activity per unit mass (specific activity) and surface contaminated objects (SCO) are solid objects which are not themselves radioactive but which have radioactive material distributed on their surfaces. LSA implies *activity within* a material, while SCO implies *activity on* a material.

Low Specific Activity (LSA) material and Surface Contaminated Objects (SCO) are extremely important radioactive material classifications with respect to shipments of low-to-medium level radioactive waste materials. The majority of shipments of such wastes originating from the nuclear fuel cycle facilities, and from all kinds of industrial, medical, research and academic communities are in the form of varying types of LSA materials. The SCO category addresses solid wastes generated in the form of non-radioactive contaminated materials originating from cleanup, remediation and decontamination activities.

A. Transport Requirements for LSA Materials and SCO

Transport requirements specific to LSA materials and SCO may be found in § 173.427.

The quantity of LSA material or SCO in a single package must be restricted so that the external radiation level from the unshielded material does not exceed 10 mSv/h (1 rem/h) at 3 meters from the unshielded material. Compliance with this requirement does not allow taking credit for shielding provided by the packaging; the inherent property of the material must be limited so that even without any shielding, the dose rate would not exceed the limit. If the external radiation level from the unshielded material exceeds 10 mSv/h at 3 meters, the material may not be considered LSA or SCO, and it will require Type B packaging.

There are restrictions on the total activity of all SCO and some LSA transported in a conveyance. An activity restriction of 100 A_2 per conveyance applies to all SCOs and to LSA-II and LSA-III materials that are combustible solids or are in liquid or gaseous form.

LSA materials and SCO must be either non-fissile or fissile-excepted under § 173.453.

Packages of SCO and LSA materials must meet the contamination control limits in § 173.443 and the dose limits in § 173.441 discussed in Section VI.C and VI.D above.

Domestic shipments containing less than an A_2 quantity that are conducted as exclusive use are excepted from the marking and labeling requirements in 49 CFR Part 172. However, packages and unpackaged materials must be marked with "RADIOACTIVE—LSA" or "RADIOACTIVE—SCO", as appropriate and with "RQ" if the materials contain a hazardous substance. Unless the material is unconcentrated uranium or thorium ores, placards are required for exclusive use shipments of LSA and SCO shipped in excepted packaging under § 173.427(b)(4); liquid LSA-I material; or unpackaged LSA material or SCO.

B. Packages for LSA Materials and SCO

LSA materials and SCO may be shipped in a variety of package types, depending on their characteristics and the method of shipment.

1. Unpackaged LSA Material and SCO

LSA material and SCO in groups LSA-I and SCO-I may be transported "unpackaged", that is, the material may be shipped without packaging within a freight container, tank, intermediate bulk container or closed conveyance, under the following conditions (see § 173.427(c)):

- The material must be transported in a manner that ensures no release of contents from the conveyance and no loss of shielding under normal conditions of transport.
- Except for SCO-I material with specified low contamination levels, the shipment must be exclusive use. The conveyance must be surveyed and decontaminated, if necessary, in accordance with § 173.443(c), prior to unrestricted release of the conveyance.
- For SCO-I material with removable contamination above specified limits, measures must be taken to ensure that the radioactive material is not released inside the conveyance or to the environment.

2. Excepted Packages of LSA Material and SCO

For domestic transportation only, excepted packaging is authorized when the LSA material or SCO is transported in an exclusive use vehicle and does not exceed an A_2 quantity in each package. The packaging must meet the "General Design Requirements" of §§ 173.410, 173.24 and 173.24a.

3. Industrial Packages of LSA Material and SCO

Various industrial packages may be used for LSA materials or SCO based on the potential radiological hazard of the material to be transported. LSA-I materials can be shipped in IP-1 packagings, LSA-II and LSA-III materials require more durable IP-2 and IP-3 packagings. LSA material in liquid form requires more durable IP packaging than solid LSA material. Similarly, non-exclusive use shipments do not have the controls during transport that may exist for exclusive use shipments; thus non-exclusive use LSA requires packagings of a greater integrity than are required for exclusive use shipments. The categories of IP packages required for different LSA and SCO materials shipped under different transportation conditions are illustrated in Table 9.

Table 9 - Industrial Package Integrity Requirements for LSA Material and SCO

Contents	Industrial Packaging Type	
	Exclusive Use Shipment	**Non-Exclusive Use Shipment**
1. LSA-I:		
Solid	IP-1	IP-1
Liquid	IP-1	IP-2
2. LSA-II:		
Solid	IP-2	IP-2
Liquid	IP-2	IP-3
3. LSA-III	IP-2	IP-3
4. SCO-I	IP-1	IP-1
5. SCO-II	IP-2	IP-2

4. Type A Packages for LSA Material and SCO

For domestic transportation only, DOT-7A Type A packaging may be used.

5. Type B Packages for LSA and SCO

Type B packages are usually used for materials other than LSA and SCO. However, they may be used if the radioactivity and physical form of the LSA or SCO to be shipped are such that it can be considered one of the authorized contents for a particular Type B package.

6. Packages for Exclusive Use Transport of Liquid LSA-I

Exclusive use transport of liquid LSA-I must be done, in either:

- Specification 103CW, 111A60W7 tank cars. Bottom openings in tanks are prohibited; or
- Specification MC 310, MC 311, MC 312, MC 331 or DOT 412 cargo tank motor vehicles. Bottom outlets are not authorized. Trailer-on-flat-car service is not authorized.

7. Typical Packages for Radioactive Waste Shipped as LSA or SCO

Figure 17 shows typical packaging and shipping configurations for materials classified as LSA materials or SCO.

Figure 17 - Typical Packages for LSA Materials and SCO

Figure A - Intermodal Container
Depending on the contents or other packaging, it may be a conveyance, bulk packaging, excepted, or IP packaging.

Figure B - Steel Drum Depending on content and inner packaging, it may be a Type A, IP-1, -2, or -3.

Figure C - Shielded LSA Cask
Type A, IP-2 and IP-3.

Figure D - Metal Box
Type A or IP

VIII. HAZMAT COMMUNICATIONS AND RELATED REQUIREMENTS

Shippers have the greatest responsibility for compliance with the communication requirements of Part 172 of 49 CFR, but carriers are also subject to some of the requirements. Safe transportation of radioactive material requires correct communication of the specific hazards of the materials. Generally, an essential part of the total system for providing safety in transport of radioactive material is the requirement for communication of information on the specific hazards of the materials. The communication requirements of 49 CFR Part 172 are designed to complement the basic safety requirements for package activity limitation and package integrity. Historically, Part 172 has addressed the conventional communication requirements, such as, proper shipping papers, package marking, package labeling, and vehicle placarding. In recent years, additional subparts have been added to Part 172 to address emergency response information, hazmat employee training, and security plans.

A. Hazardous Materials Table

Subpart A of Part 172 describes the applicability of the regulations to shippers and carriers. Subpart B contains the hazardous materials table. The Hazardous Materials Table (HMT) in § 172.101 classifies those materials which DOT has designated as hazardous materials for purposes of transportation. The HMT prescribes the requirements for shipping papers, marking, and labeling applicable to the shipment and transportation of those hazardous materials. For each listed material, the table identifies the hazard class, the UN identification number, and gives the proper shipping name or directs the user to the proper shipping name. In addition, the HMT specifies or references other regulatory requirements pertaining to labeling, packaging, and quantity limits aboard aircraft and stowage of hazardous materials aboard vessels.

Before using the HMT, shippers should be familiar with the ground rules which explain the information in the ten columns of the table, and the explanatory symbols (see §§ 172.101(a)-(l) that precede the HMT). The information in the paragraphs preceding the HMT provides extensive information related to the proper use of the table and the information in the table.

B. Proper Shipping Names for Radioactive Materials

The list of proper shipping names for radioactive material, along with their UN identification numbers as shown in the HMT, is given in Table 10.

Table 10 - Radioactive Material Proper Shipping Names and Identification Numbers

Hazardous materials description and proper shipping names	**Identification Numbers**
Radioactive material, excepted package-articles manufactured from natural uranium *or* depleted uranium *or* natural thorium.	UN2909
Radioactive material, excepted package-empty packaging.	UN2908
Radioactive material, excepted package-instruments *or* articles.	UN2911
Radioactive material, excepted package-limited quantity of material.	UN2910
Radioactive material, low specific activity (LSA-I) *non fissile or fissile-excepted*.	UN2912
Radioactive material, low specific activity (LSA-II) *non fissile or fissile-excepted*.	UN3321
Radioactive material, low specific activity (LSA-III) *non fissile or fissile excepted*.	UN3322
Radioactive material, surface contaminated objects (SCO-I *or* SCO-II) *non fissile or fissile-excepted*.	UN2913
Radioactive material, transported under special arrangement *non fissile or fissile excepted*.	UN2919
Radioactive material, transported under special arrangement, fissile.	UN3331
Radioactive material, Type A package, fissile *non-special form*.	UN3327
Radioactive material, Type A package *non-special form non fissile or fissile-excepted*.	UN2915
Radioactive material, Type A package, special form *non fissile or fissile-excepted*.	UN3332
Radioactive material, Type A package, special form, fissile.	UN3333
Radioactive material, Type B(M) package, fissile.	UN3329
Radioactive material, Type B(M) package *non fissile or fissile- excepted*.	UN2917
Radioactive material, Type B(U) package, fissile.	UN3328
Radioactive material, Type B(U) package *non fissile or fissile-excepted*.	UN2916
Radioactive material, uranium hexafluoride *non fissile or fissile-excepted*.	UN2978
Radioactive material, uranium hexafluoride, fissile.	UN2977

These proper shipping names have been harmonized with those used internationally; there are no longer any generic proper shipping names for radioactive material with the phrase “not otherwise specified (n.o.s).” Most of the proper shipping names are based on the type of package used for the shipment. If the packaging type matches the contents, this is straightforward. However, if the shipper uses a higher-rated package than required for the contents, then either the package markings may be left as is and the proper shipping name consistent with that *packaging* is used, or the proper shipping name based on the *contents* is used, in which case the packaging markings are altered to be consistent.

C. <u>Shipping Paper Requirements</u>

As with other hazardous materials shipments, certain essential elements of information <u>must</u> be included on shipping papers. The availability of a complete and correct shipping paper description for a hazardous material shipment is vital not only to the carrier and the consignee, but also to emergency response personnel in the event of an incident.

1. <u>Basic Shipping Paper Requirements</u>

The shipping paper description must basically include the following:

- The basic shipping description, which consists of;
  - The UN Identification number from Column (4) of the § 172.101 table;
  - The proper shipping name from Column (2) of the § 172.101 table;
  - The UN hazard class or division - radioactive material is hazard class 7;
- The net quantity of material by mass, volume, or for Class 7 materials, activity. *NOTE: For <u>most</u> radioactive material, it is not required to list the weight or volume, since the additional requirements of § 172.203(d) provide better information, i.e., the radioactivity content in becquerels (curies). A listing of weight or volume is usually needed only with respect to establishing freight charges*;
- The letters “RQ”, if the shipment is a “hazardous substance”, either before or after, the basic description [see § 172.101, Appendix A, Table 2 for RQ values of radionuclides].
- Emergency response telephone number as prescribed in Subpart G, Part 172.

A shipping paper may contain additional information concerning the material, provided it is not inconsistent with, and does not cause confusion with, the basic description. Unless otherwise specified, the additional information must be placed after the required basic description.

2. Additional Shipping Paper Description for Radioactive Material

Section 172.203(d) details the additional shipping paper description for radioactive material, and this information, as appropriate, follows the basic description:

- The name of each radionuclide in the material as listed in § 173.435. Abbreviations, e.g., "^{99}Mo," are authorized;
- For mixtures of radionuclides, only the radionuclides that constitute 95% of the hazard of the mixture as described in § 173.433(g) need be listed on shipping papers and package labels (see Section VIII.C.4 of this document).
- A description of the physical and chemical form of the material, if the material is not in special form (generic chemical description is acceptable for chemical form).
- The activity contained in each package of the shipment in terms of the appropriate SI units (e.g., Becquerels (Bq), Terabecquerels (TBq), etc.). The activity may also be stated in appropriate customary units (curies (Ci), millicuries (mCi), microcuries (uCi), etc.) in parentheses following the SI units. Abbreviations are authorized. (The weight in grams or kilograms of fissile radionuclides may be inserted *instead* of activity units, except for plutonium-239 and plutonium-241. For plutonium-239 and plutonium-241, the weight in grams of fissile radionuclides may be inserted in *addition* to the activity units.)
- The category of label applied to each package in the shipment. For example: "RADIOACTIVE WHITE-I."
- The transport index assigned to each package in the shipment bearing RADIOACTIVE YELLOW-II or RADIOACTIVE YELLOW-III labels.
- For a package containing fissile material:
    - The words "Fissile Excepted" if the package is excepted pursuant to § 173.453; or otherwise
    - The criticality safety index for that package.
- For a package approved by the U.S. Department of Energy (DOE) or U.S. Nuclear Regulatory Commission (NRC), a notation of the package identification marking as prescribed in the applicable DOE or NRC approval (see § 173.471).
- For an export shipment or a shipment in a foreign-made package, a notation of the package identification marking as prescribed in the applicable International Atomic Energy Agency (IAEA) Certificate of Competent Authority which has been issued for the package (see § 173.473).

- For a shipment required to be consigned as exclusive use:
  - An indication that the shipment is consigned as exclusive use; or
  - If all the descriptions on the shipping paper are consigned as exclusive use, then the statement “Exclusive Use Shipment” may be entered only once on the shipping paper in a clearly visible location.
- For the shipment of a package containing a highway route controlled quantity of Class 7 (radioactive) materials the words “Highway route controlled quantity” or “HRCQ” must be entered in association with the basic description.

3. <u>Other Information and Examples of Shipping Papers Entries</u>

As indicated above, a great deal of specific information is required on shipping papers for radioactive material. While there is no precise prescription for the shipping paper format, the first three entries of the basic description must be in a specific order. In a final rule published under Docket HM-215I on December 29, 2006, DOT established new requirements for shipping descriptions on shipping papers. Previously, the basic description of a hazardous material consisted of the proper shipping name, hazard class, ID number and packing group (packing group is not applicable to Class 7), in that order. The HMR had also authorized an alternative description sequence, which lists the identification number first, followed by the proper shipping name, hazard class, and packing group (not applicable to Class 7). Beginning January 1, 2007, the alternative shipping description sequence became mandatory on shipping documents prepared in accordance with the ICAO Technical Instructions and the IMDG Code. The older sequence can be used until January 1, 2013 on other shipments; thereafter all shipping descriptions of a hazardous material must be indicated on a shipping paper in the following manner (as described earlier):

- Identification (ID) number listed first, followed by
- the proper shipping name,
- hazard class, and
- packing group (not applicable to Class 7).

Other descriptive information is allowed, such as the functional description of the product or the applicable regulatory citation under which the shipment is offered. This additional description must not confuse or detract from the required description. The following are some example entries of different ways shipments can be described on shipping papers:

Example 1:

One (1) box — UN 2916, Radioactive material Type B(U) package, 7, RQ,
22.7 kg Gross, Iridium - 192, Special Form, 2.2 TBq
Radioactive Yellow-II, Transport Index 0.6
USA/9033/B(U), In emergency, contact: 1-800-000-0000.

Example 2:

One (1) box — UN 2915, Radioactive material Type A package, Class 7(8),
7.8 kg gross, ^{60}Cobalt, 0.01 GBq, liquid, cobalt in 50 ml 5% hydrochloric acid solution, Radioactive Yellow-III and Corrosive labels applied, TI= 1.8, Emergency contact: 1-800-000-0000.

Example 3:

One (1) box — UN2915, Radioactive material Type A package, 7(5.1),
10 kg net, Thorium natural, as powdered solid thorium nitrate
48 MBq (1.3 mCi), Radioactive Yellow-II and 5.1 labels, TI 0.1 DOT Spec. 7A, Cargo aircraft only, In emergency contact: 1-800-000-0000.
NOTE: Although this material is LSA-I, as an oxidizer, it must be packaged and shown on the shipping papers in accordance with the specific packaging requirements of Section 173.419, with air shipment limited to not more than 11.3 kg.

Example 4:

Three (3) drums — UN 3321, Radioactive material low specific activity (LSA-II), 7, 363kg ea., ^{137}Cs, ^{60}Co and ^{90}Sr, Solid, elemental and inorganic salts in non-compacted solid debris and waste

Drum No.	Activity (MBq)
731	1.5
680	0.57
541	0.18

See attached Radwaste Manifest XZ 00052, Exclusive-use shipment. In emergency, contact (24-hour) 1-800-000-0000.
NOTE: This is an example of a shipment under § 173.427(b)(4).

Example 5:

(3) boxes UN 2915, Radioactive material Type A package, 7,
Box No.1, catalytic specimen, ^{35}S, 2.6 GBq
solid, powdered metal oxide matrix,
Radioactive White-I label, 60 lb

Box No.2, Tagged solvent, ^{30}Cl, 0.11 GBq
liquid, nonflammable organic
Radioactive White-I label, 50 lb

Box No. 3, converter element, ^{59}Fe and ^{55}Fe
1.1 GBq and 0.74 GBq, solid, steel part
Radioactive Yellow-III label, TI 1.6, 80 lb
NOTE: This is an example of how one basic entry can be used along with three different packages. Detailed information is given on the content, labels, and TI of each package.

Example 6:

4 cyl. UN 2977, Radioactive material uranium hexafluoride fissile, 7(8),
Total Gross Wt. 18,795 kg
Solid Uranium Hexafluoride (UF_6) contained in four Model 30B steel cylinders, each enclosed in a Model UX-30 protective overpack, Each cylinder contains 2,277 kg of UF6, 63 kg ^{235}U (629 MBq) 5.0 % ^{235}U enrichment
NRC Certificate USA/9196/AF, Type A
Radioactive Yellow-III labels, TI=5.0/package, CSI=5.0/package.
Radioactive and Corrosive placards and orange 2977 UN panel applied.
24-hour Emergency Telephone No.: contact 1-888-888-8888.

4. 95% Rule for Mixtures

The “95% Rule” for listing mixtures of radionuclides on shipping papers and labels is given in § 173.435(g), which states, “For mixtures of radionuclides, the radionuclides (*n*) that must be shown on shipping papers and labels in accordance with §§ 172.203 and 172.403 of this subchapter, respectively, must be determined on the basis of the following formula:

$$\sum_{i=1}^{n} \frac{a_{(i)}}{A_{(i)}} \geq 0.95 \sum_{i=1}^{n+m} \frac{a_{(i)}}{A_{(i)}},$$

Where:

$n+m$ represents all the radionuclides in the mixture
m are the radionuclides that do not need to be considered
$a_{(i)}$ is the activity of radionuclide i in the mixture; and
$A_{(i)}$ is the A_1 or A_2 value as appropriate for radionuclide i.

For example, consider a shipment of radionuclides in normal form where the contents of the package are as follows: 0.3 TBq of Co-60, 0.0002 TBq of Sr-90, 0.018 TBq of Cs-137, 0.016 TBq of I-131, and 0.011 TBq of Sr-89. The summation terms are as follows:

Isotope	Activity [TBq]	A_2 [TBq]	Contribution $= \frac{a_{(i)}}{A_{(i)}}$
Co-60	0.3	0.4	$= \frac{0.3}{0.4} = 0.75$
Sr-90	0.0002	0.3	$= \frac{0.0002}{0.3} = 6.7E-4$
Cs-137	0.018	0.6	$= \frac{0.018}{0.6} = 0.03$
I-131	0.016	0.7	$= \frac{0.016}{0.7} = 0.023$
Sr-89	0.011	0.6	$= \frac{0.011}{0.6} = 0.183$

The summation of each contribution is 0.987 and 95% of this value is 0.937; so it is necessary to list the largest radionuclide quantities until a contribution level of 0.937 is reached. Co-60 and Sr-89 are the 2 largest contributors, and the summation of their contributions is 0.933, so the next largest contributor is needed to reach the 95% value of 0.937, and that radionuclide is Cs-137.

Thus, the radionuclides that will need to be listed as “contents” on the shipping paper and label are: Co-60, Sr-89 and Cs-137. Note that the 95% Rule does not always list the radionuclides with the highest activity values, as the rule is dependent on the relative ratio of activity to A_1/A_2 values for each radionuclide.

5. Documentation for Excepted Packages

As noted in Section V.B, packages shipped according to the exceptions provided in §§ 173.421, 173.424, 173.426 and 173.428 (for limited quantity, instruments or articles, articles manufactured from natural or depleted U or natural Th, and empty radioactive material packaging) are excepted from the detailed shipping paper description requirements. With the addition of the requirement to mark these excepted packages, certification statements are no longer required. (However, a shipping paper is required if the radioactive material in the excepted package meets the definition of a hazardous substance or hazardous waste (as defined in § 171.8)).

Although shipping papers are not required for these excepted packages (with UN identification numbers 2908, 2909, 2910, and 2911), they are not forbidden. In addition, when shipping excepted packages by air, a prescribed statement on an airbill is required by ICAO and IATA regulations.

6. Shipper's Certification

Unless excepted, a shipping paper must include a certification statement, signed by the person offering the package for transport. The certification must appear on the paper that lists the required shipping description.

The following statement listed in § 172.204(a)(1) (or an alternate statement listed in §172.204(a)(2)) must be used for all hazardous materials shipments except for those by air:

> “This is to certify that the above-named materials are properly classified, described, packaged, marked, and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.”

For air transportation, the following language may be included on shipping papers in place of the above statement:

> “I hereby certify that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and in proper condition for carriage by air according to applicable national governmental regulations.”

The requirements and limitations for carriage of radioactive materials aboard aircraft are prescribed in §§ 175.75(a)(3) and 175.700 through § 175.705. The following statement, with deletion marking, is required for all hazardous material (including radioactive material) shipments by air:

> "This shipment is within the limitations for passenger carrying/cargo aircraft only (delete non-applicable)."

D. Marking Requirements

General marking requirements for all hazardous materials are provided in §§ 172.301 and 172.302. Specific requirements for Class 7 materials are located in § 172.310.

1. Basic Marking Requirements

Marking for non-bulk hazardous material packaging includes the following (some exceptions apply):

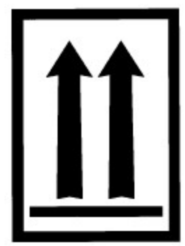
- Proper shipping name
- UN ID number (required on ALL packages, including excepted and empty)
- Name and address of the consignee or consignor
- RQ, if a "hazardous substance"
- DOT-SP Number, if shipped under a DOT Special Permit.

All required markings must be durable, in English, and displayed in a manner so as to not obscure them or reduce their effectiveness. Markings may either be printed on the surface of the package itself or on a label, tag, or sign (see § 172.304).

2. Marking Requirement for Liquids

Each non-bulk combination package with inner packaging containing liquid hazardous materials must be marked with arrows on two opposite sides to indicate the upward position of the inside packaging (see Figure 18). Such marking must be on two opposite sides, with the double arrows in the symbol pointing in the correct upright direction. Arrows for any other purpose may not be displayed on a package containing a liquid hazardous material. There are some exceptions to this rule (see § 172.312(c)). These exceptions include Class 7 radioactive material in Type A, IP–2, IP–3, Type B(U), or Type B(M) packages and non-bulk packages with hermetically sealed inner packagings.

Figure 18 - Package Orientation Marking for Liquid Packages



Package orientation

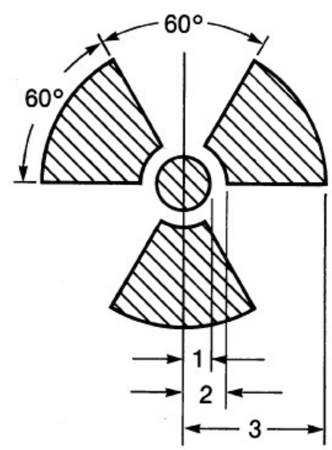
3. Marking Requirements for Radioactive Materials

In addition to the above markings, radioactive materials are subject to the following package marking requirements (see §§ 172.310, 173.471(b), 173.472(c), 173.473(b), and 178.350):

- Gross weight if > 50 kg (110 lb)
- "TYPE IP-1", "TYPE IP-2", "TYPE IP-3", "TYPE A" "TYPE B(U)" , or "TYPE B(M)," as appropriate to the package
- For each IP-1, IP-2, IP-3, or Type A package, the code for the country of origin of design (e.g., "USA")
- For each DOT 7A Type A packaging:
    - "USA DOT 7A Type A"
    - Name of packaging manufacturer (the person certifying that the package meets all requirements for a Type A package)

- For Type B packages, the trefoil radiation symbol (see Figure 19) - resistant to the effects of fire and water, plainly marked by embossing, stamping or other means resistant to the effects of fire and water (not on a sticky label)
- For Type B and fissile material packages, the applicable DOT, NRC or DOE package certificate ID number, as specified in the relevant certificate, e.g., USA/9166/B(U)-85
- Exclusive use domestic transportation of LSA materials and SCO is excepted from other marking requirements but must be stenciled or marked as “RADIOACTIVE – LSA” or “RADIOACTIVE – SCO,” as appropriate
- Excepted packages are excepted from other marking requirements but must be marked with the UN identification number for the material.

Figure 19- Trefoil Symbol



{1=Radius of Circle (Minimum dimensions 4 mm (0.16 inch) for markings and labels, 12.5 mm (0.5 inch) for placards), 2=1.5* Radius, 3= 5* Radius for markings and labels,= 4.5*Radius for placards.}

4. Marking of Bulk Radioactive Material Packages

Bulk packaging for a hazardous material is defined in § 171.8. The concept of bulk packaging reflected in that definition is that the packaging may involve the vehicle itself, such as a freight container or other large closed receptacle in which the hazardous material is loaded with no intermediate form of containment. Traditionally, the DOT has viewed Type A and Type B radioactive material packaging as non-bulk packaging.

Bulk radioactive material packaging is, therefore, most likely to involve conveyances such as the following:

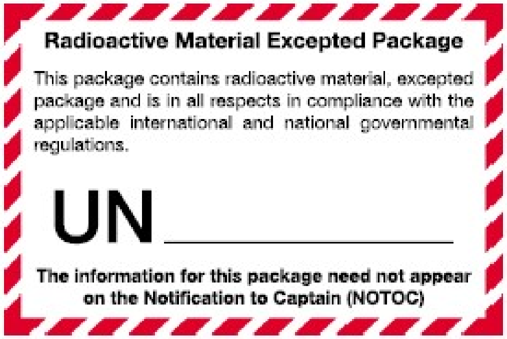
- Tightly closed trucks/vans or railcars containing contaminated soils and debris
- Large bins or freight containers for solids
- Tanks containing slurries or other liquid waste.

For such shipments, the bulk packaging must be marked on its exterior with the applicable UN hazard ID number (see § 172.302). When required for radioactive material, this ID number must be placed on either an orange rectangular panel adjacent to the required radioactive placard (see § 172.332.) or on a plain white square-on-point display configuration having the same outside dimensions as a placard (see § 172.336(b)). According to § 172.334(a), the ID number may not be placed on the radioactive placard in lieu of the word *Radioactive* for domestic shipments; however, this prohibition does not exist in the international (IAEA and IMO) regulations.

E. Labeling Requirements

Each package of Class 7 (radioactive material), unless excepted, must be labeled on two opposite sides, with a distinctive warning label. Excepted packages, and domestic shipments of LSA materials and SCO that are conducted as exclusive use are excepted from the labeling requirements. However, while not a DOT requirement, the ICAO Technical Instructions require excepted packages that are to be shipped by air to have a "Radioactive materials, Excepted Package" label as shown in Figure 19 .

Figure 20 - ICAO Excepted Package Label



Each of the three label categories, i.e., "RADIOACTIVE WHITE-I", "RADIOACTIVE YELLOW-II", or "RADIOACTIVE YELLOW-III, bears the trefoil symbol. Radioactive material labeling is based on the maximum package surface dose rate and the transport index (TI), as shown in Table 11 (taken from § 172.403).

Table 11 - Label Category Based on TI and Surface Radiation Level

Transport Index (TI)	Maximum radiation level at any point on the external surface	Label Category [1]
0 [2]	Less than or equal to 0.005 mSv/h (0.5 mrem/h)	WHITE-I
More than 0 but not more than 1	Greater than 0.005 mSv/h (0.5 mrem/h) but less than or equal to 0.5 mSv/h (50 mrem/h)	YELLOW-II
More than 1 but not more than 10	Greater than 0.5 mSv/h (50 mrem/h) but less than or equal to 2 mSv/h (200 mrem/h)	YELLOW-III
More than 10	Greater than 2 mSv/h (200 mrem/h) but less than or equal to 10 mSv/h (1,000 mrem/h)	YELLOW-III (Must be shipped under exclusive use provisions; see 173.441(b))

[1]Any package containing a "highway route controlled quantity" (§173.403) must be labeled as RADIOACTIVE YELLOW-III.
[2]If the measured TI is not greater than 0.05, the value may be considered to be zero.

The three radioactive labels are prescribed in **§§** 172.436 - 440 and are shown in Figure 21.

Figure 21 - Radioactive Material Labels

WHITE-I Label YELLOW-II Label YELLOW-III Label

For each of these labels, the vertical bars following RADIOACTIVE are in red. Each label is diamond-shaped, at least 100 mm (3.9 inches) on each side. The background color of the upper half (within the black line) is white for the "I" label. It is yellow for the "II" and "III" labels. Other label specifications are given in § 172.407.

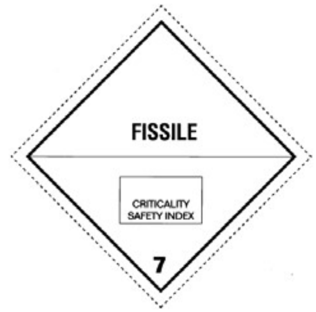
The following applicable items of information must be entered on the blank spaces of each radioactive label by legible printing (manual or mechanical) using a durable, weather-resistant means of marking:

- Contents – Except for LSA-I material, the names of the radionuclides. For mixtures of radionuclides, the radionuclides that represent 95% of the hazard present as determined in accordance with § 173.433(g) are listed. For LSA-I material, the term "LSA-I" may be used in place of the names of the radionuclides.
- Activity – Activity must be expressed in appropriate SI units (e.g., becquerels (Bq), terabecquerels (TBq), etc.). Except for plutonium-239 and plutonium-241, the weight in grams or kilograms of fissile radionuclides may be inserted instead of activity units. For plutonium-239 and plutonium-241, the weight in grams of fissile radionuclides may be inserted in addition to the activity units.
- Transport Index (TI) on Yellow-II and Yellow-III labels (not on White-I)

For radioactive materials with subsidiary hazards, the required subsidiary labels must also be applied.

For fissile material packages, a FISSILE label with the CSI indicated is required. Two fissile labels must be placed adjacent to the two radioactive material labels on the package. The fissile label is specified in § 172.441 and shown in Figure 22.

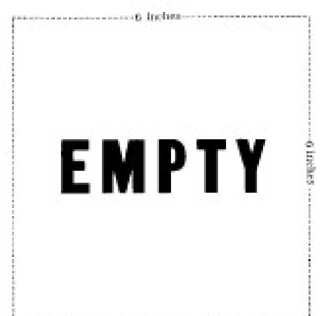
Figure 22 - Fissile Label



Each such FISSILE label must be completed with the criticality safety index (CSI) assigned in the NRC or DOE package design approval, or in the certificate of approval for special arrangement or the certificate of approval for the package design issued by the Competent Authority for import and export shipments. (For overpacks and freight containers required in § 172.402 to bear a FISSILE label, the CSI on the label must be the sum of the CSIs for all of the packages contained in the overpack or freight container.)

Empty radioactive material packages shipped under § 173.428 must be labeled with the “Empty” label specified in § 172.450 (shown in Figure 23) and have any other affixed labels removed or obliterated.

Figure 23 - Empty Label



The radioactive labels alert persons, particularly cargo handlers, that the package contains radioactive material and that the package may require special handling and stowage distance/separation control. A WHITE-I label indicates that the external radiation level is low and no special stowage controls or handling are required. The YELLOW-II and YELLOW-III labels indicate that the package will have an external radiation level which requires consideration of stowage distance/separation control in transportation. If the package bears the fissile label, the material has properties relating to nuclear criticality safety and may also require stowage controls in transportation. If the package bears a YELLOW-III label, the transport vehicle must be placarded RADIOACTIVE by the carrier when the packages are accepted from a shipper.

F. Placarding Requirements

Section 172.504 requires a placard for a transport vehicle (rail or highway) if any radioactive material package bears the "RADIOACTIVE YELLOW-III" label. Placards are also required for domestic transportation of exclusive use shipments of LSA material (unless the material is unconcentrated U or Th ores) and SCO shipped in excepted packaging under § 173.427(b)(4); liquid LSA-I material; or unpackaged LSA material or SCO. Section 172.506 requires the shipper to provide the required placards to the motor carrier, unless the carrier's motor vehicle is already placarded as required. Section 172.508 requires shippers to affix placards to rail cars.

The RADIOACTIVE placard is specified in § 172.556 and is illustrated in Figure 24.

Figure 24 - Vehicle Radioactive Placard

The background color for the black trefoil symbol in the upper half of this 12” by 12” placard is yellow.
NOTE: In the case of foreign shipments coming into the U.S., the placard may take the format of an enlarged RADIOACTIVE label or may look slightly different with the yellow background extending to the middle of the placard, ending at a black line. Foreign placards may also have the UN identification number in place of the word RADIOACTIVE.

For highway shipments of highway route controlled quantity shipments, the placard must be presented with a white square background and a black border as shown in Figure 25.

Figure 25 - HRCQ Placard

Section 172.505(b) requires that UF_6 shipments containing 454 kg (1,001 lb) or more of UF_6 must display the CORROSIVE placard in addition to any required radioactive placarding.

G. Emergency Response Information Requirements

Section 172.600 requires shippers to provide emergency response information on hazardous materials shipments. The regulation applies to any shipment of a hazardous material which is required to have shipping papers. Shipments of excepted radioactive material packages (packages containing limited quantities, instruments or articles, or “Empty” packagings) are excepted from shipping paper requirements, and, therefore, are not subject to the emergency response information requirements unless they contain a hazardous substance.

1. Required Information

At a minimum, the emergency response information must provide: the basic description and technical name of the hazardous material, immediate hazards to health, immediate precautions to be taken in the event of an accident or incident, immediate methods for handling fires, immediate methods for handling spills or leaks in the absence of fire, and preliminary first aid measures.

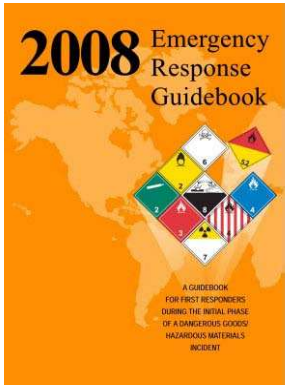
This information must be on a shipping paper or an associated document and kept on the vehicle and maintained at all locations where the shipment is handled. This required information is very similar to the information in the guide pages of the Emergency Response Guidebook (ERG) (see Section 3 below). In many cases, shippers satisfy this requirement by attaching to their shipping papers an appropriate guide page from the ERG.

There is a wide range of potential hazards for the many types of radioactive material that can be shipped under a given shipping name and guide number. If the product being shipped has properties that are either less hazardous or more hazardous than the description in the applicable guide in the ERG, then the emergency actions could be more specific than those in the guide. In such cases, the shipper may wish to satisfy the technical information requirements from § 172.602 (a)(1-7) by preparing statements that are appropriate to the product being shipped.

2. Emergency Response Telephone Number

Shippers are required to provide an emergency response telephone number which must be monitored on a 24-hour basis while the shipment is in transportation. The number must be of a person or entity who is knowledgeable of mitigation information or has immediate access to such a person. If the number of the agency hired to provide the information is listed, the person offering the shipment must ensure the agency has received the most current information on the material and that it accepts responsibility for providing this information in an emergency.

3. Emergency Response Guidebook



The Emergency Response Guidebook (ERG2008) was developed jointly by the US Department of Transportation, Transport Canada, and the Secretariat of Communications and Transportation of Mexico (SCT) for use by firefighters, police, and other emergency services personnel who may be the first to arrive at the scene of a transportation incident involving a hazardous material. It is primarily a guide to aid first responders in (1) quickly identifying the specific or generic classification of the material(s) involved in the incident, and (2) protecting themselves and the general public during this initial response phase of the incident. DOT's goal is to place one ERG2008 in each emergency service vehicle, nationwide, through distribution to state and local public safety authorities. The ERG may be found online at: http://hazmat.dot.gov/pubs/erg/guidebook.htm and at http://www.tc.gc.ca/canutec/en/guide/guide.htm.

The Guidebook is divided into color-coded sections: white, yellow, blue, orange and green. Information on how to use the Emergency Response Guidebook and other supporting information can be found in the white pages. The yellow-bordered pages index the list of dangerous goods in numerical order of 4-digit ID number. The blue bordered pages index the list of dangerous goods in alphabetical order by material name. The green-bordered pages suggest initial isolation distances and protective action distances for hazardous material spills that are Toxic by Inhalation (TIH). A list of gases produced when spilled in water is also provided. Both the yellow and blue pages lead you to a guide number located in the orange bordered pages. The orange-bordered pages (orange guides) are most important as this is where all the safety recommendations reside. The orange pages comprise a total of 62 individual guides, each providing safety recommendations and emergency response information to protect first responders and the public. Recommendations include potential hazards, public safety, and emergency response actions.

The orange guides 161- 166 provide information on radioactive material incidents. These guides are titled as follows:

- Guide 161 - Radioactive Materials (Low Level Radiation)
- Guide 162 - Radioactive Materials (Low to Moderate Level Radiation)
- Guide 163 - Radioactive Materials (Low to High Level Radiation)
- Guide 164 - Radioactive Materials (Special Form/Low to High Level External Radiation)
- Guide 165 - Radioactive Materials (Fissile/Low to High Level Radiation)
- Guide 166 - Radioactive Materials – Corrosive (Uranium Hexafluoride/Water-Sensitive).

H. Training Requirements

Training requirements are found in several sections of the HMR as follows:

- General - § 173.1
- Specific - § 172.704
- Modal:
  - Air - § 175.20
  - Vessel - § 176.13
  - Highway - §§ 177.800, 177.816

DOT has information and reference materials for training requirements at: http://hazmat.dot.gov/training/training.htm.

Section 172.704 requires that each *hazmat employer* must ensure that each *hazmat employee*, as defined in § 171.8, receives the required training and testing in the following subjects:

- General awareness/familiarization with the 49 CFR hazardous materials transportation requirements
- Function-specific training
- Safety training
- Security awareness training
- In-depth security training, if a security plan is required.

Initial training is required within 90 days of employment on a specific job. The hazmat employee must have **recurrent training** every three years or within 90 days after assignment to a new job for which training has not already been provided.

1. General Awareness/Familiarization Training

General awareness/familiarization training is directed toward the hazmat employee being able to recognize and identify hazardous materials in a manner consistent with the hazard communication standards of 49 CFR 172. Training in this area should include a basic orientation on DOT shipping papers, package marking, package labeling, emergency response information and vehicle placarding requirements. Testing should focus on awareness, recognition and identification. DOT has prepared training modules that meet the requirements for general awareness training which may be found at http://hazmat.dot.gov/training/mods/mod.htm.

2. Function-Specific Training

Function-specific training is intended to focus on those hazardous material activities (functions) which actually involve the hazmat employee. If the employee does not perform certain hazmat activities, then neither training nor testing in those activities is required.

3. Safety Training

Safety training must cover the following:

- Required emergency response information
- Measures to protect the employee from hazards
- Methods and procedures for avoiding accidents, such as proper handling procedures

OSHA Safety training may be used to satisfy this requirement.

4. Security Awareness Training

Security awareness training is to provide an awareness of security risks associated with hazardous materials transportation and methods designed to enhance transportation security. This training must also include a component covering how to recognize and respond to possible security threats.

5. In-Depth Security Training

Each hazmat employee of a company required to have a security plan in accordance with § 172.800 (see Section I below) must be trained concerning the security plan and its implementation. Security training must include company security objectives, specific security procedures, employee responsibilities, actions to take in the event of a security breach, and the organizational security structure.

6. Testing and Record Keeping

Each hazmat employee must be trained and tested to determine the effectiveness of the training received. The hazmat employer must certify that each hazmat employee has been properly trained, and the employer must maintain the training records for hazmat employees. Training Records must include:

- Hazmat employee's name;
- Completion date of most recent training;
- Training Materials (Copy, description, or location);
- Name and address of hazmat trainer; and
- Certification that the hazmat employee has been trained and tested

I. Security Requirements

Title 49 CFR Part 172, Sections 800-804, establishes the requirements for the development and implementation of security plans for shippers and carriers of specified high-risk hazardous materials. Security plans are required for those who offer for transportation the following types and quantities of hazardous materials:

- A hazardous material in an amount that must be placarded in accordance with Subpart F of Part 172 of the HMR;
- A hazardous material in a bulk packaging having a capacity equal to or greater than 13,248 L (3,500 gallons) for liquids or gases or more than 13.24 cubic meters (468 cubic feet) for solids; or
- A select agent or toxin regulated by the Centers for Disease Control and Prevention under 42 CFR Part 73.
- OSHA safety training may be used to satisfy this requirement.

A security plan must include an assessment of possible transportation security risks for shipments of the hazardous materials covered by the plan and appropriate measures to address the assessed risks. At a minimum, a security plan must include the following elements:

- Personnel security. Measures to confirm information provided by job applicants hired for positions that involve access to and handling of the hazardous materials covered by the security plan.
- Unauthorized access. Measures to address the possibility that unauthorized persons may gain access to the hazardous materials covered by the security plan or to transport conveyances being prepared for transportation of the hazardous materials covered by the security plan.
- En route security. Measures to address the security risks of shipments of hazardous materials covered by the security plan en route from origin to destination, including shipments stored incidental to movement.

Additional information and resources for hazardous materials security can be found at the DOT website: http://hazmat.dot.gov/riskmgmt/hmt/hmt_security.htm

J. Incident Reporting Requirements

Incident reporting requirements are given in §§ 171.15 and 171.16. Two phases of incident reporting are required in the regulations; § 171.15 covers immediate telephone notification following an incident and § 171.16 outlines written reporting procedures within 30 days.

Section 171.15 requires notification, as soon as practical, but no later than 12 hours after the occurrence, of any reportable incident that occurs during the course of transportation in commerce (including loading, unloading, and temporary storage). Any reporting delay beyond what is necessary to safely secure the incident scene is not permitted. Notification must be made by telephone to the National Response Center on 800-424-8802 (toll free) or 202-267-2675 (toll call). Included in the list of reportable incidents is the following:

- Fire, breakage, spillage, or suspected radioactive contamination occurs involving a radioactive material.

For reportable incidents that require immediate notification, and for some other occurrences, such as the discovery of undeclared hazardous material, § 171.16 requires submittal of a Hazardous Materials Incident Report on DOT Form F 5800.1 (01/2004) within 30 days of discovery of the incident. Reports must be provided to the Information Systems Manager, PHH-63, Pipeline and Hazardous Materials Safety Administration, Department of Transportation, Washington, DC 20590- 0001, or an electronic Hazardous Material Incident Report may be filed online at https://hazmatonline.phmsa.dot.gov/incident/. For an incident involving transportation by aircraft, a written or electronic copy of the Hazardous Materials Incident Report must be sent to the FAA Security Field Office nearest the location of the incident.

A copy of the Hazardous Materials Incident Report must be retained for a period of two years. In addition, a Hazardous Materials Incident Report must be updated within one year of the date of occurrence of the incident in certain instances.

Further information on incident reporting requirements may be found at http://hazmat.dot.gov/enforce/spills/spills.htm.

IX. QUALITY ASSURANCE

DOT requirements for quality control are located in §§ 173.474 and 173.475. These are titled "Quality control for construction of packaging" and "Quality control requirements prior to each shipment of Class 7 (radioactive) materials", respectively. (The NRC regulations in 10 CFR Part 71 contain similar requirements in paragraphs §§71.85 and 71.87, entitled "Preliminary Determinations" and "Routine Determinations", respectively).

A. Prior to First Use

Section 173.474 requires that prior to the first use of any packaging for the shipment of Class 7 (radioactive) material, the offeror shall determine that:

- The packaging meets the quality of design and construction requirements as specified in the HMR; and
- The effectiveness of the shielding, containment and, when required, the heat transfer characteristics of the package, are within the limits specified for the package design.

B. Prior to Each Use

Section 173.475 requires that prior to each shipment of Class 7 (radioactive) materials, the offeror must ensure, by examination or appropriate tests, that:

- The packaging is proper for the contents to be shipped;
- The packaging is in unimpaired physical condition, except for superficial marks;
- Each closure device of the packaging, including any required gasket, is properly installed, secured, and free of defects;
- For fissile material, each moderator and neutron absorber, if required, is present and in proper condition;
- Each special instruction for filling, closing, and preparation of the packaging for shipment has been followed;

- Each closure, valve, or other opening of the containment system through which the radioactive content might escape is properly closed and sealed;
- Each packaging containing liquid in excess of an A_2 quantity and intended for air shipment has been tested to show that it will not leak under an ambient atmospheric pressure of not more than 25 kPa, absolute (3.6 psia). The test must be conducted on the entire containment system, or on any receptacle or vessel within the containment system, to determine compliance with this requirement;
- The internal pressure of the containment system will not exceed the design pressure during transportation; and
- External radiation and contamination levels are within the allowable limits specified in this subchapter.

This last requirement to ensure compliance with radiation and contamination limits of §§ 173.441 and 173.443 does **not** require that surveys or direct measurement be made. Both sections give shippers latitude in their methods of ensuring compliance with the radiation and contamination limits; procedures other than measurements, such as quality assurance and quality control, are acceptable means of ensuring compliance. However, if a compliance inspection during transportation determines that radiation or contamination levels exceed the limit, the shipper is subject to a citation.

C. NRC QA Requirements

In addition to the above-mentioned generic quality control requirements of 10 CFR 71.85 and 71.87, 10 CFR 71, Subpart H, contains specific quality assurance (QA) requirements associated with the use of NRC-certified Type B and fissile material packages used under the general licenses of §§ 71.17, 71.20, and 71.21. A major condition applying to the use of such NRC-certified packages is the requirement that each registered user of such a package must have their quality assurance program, associated with use of the package, approved by the NRC as having met applicable requirements of Subpart H, §§ 71.101-71.137. Section 71.37(a) requires that applicants requesting package design approval by the NRC must describe, with respect to Subpart H of 10 CFR Part 71, the QA programs that they will apply in designing, fabricating, assembling, testing, maintaining, repairing, modifying, and using the proposed packaging.

NRC's Regulatory Guide 7.10, "Establishing Quality Assurance Programs for Packaging Used in Transport of Radioactive Material" provides guidance on developing quality assurance programs and guidance for preparing and submitting QA program descriptions for review by the NRC.

X. OVERVIEW OF NRC'S 10 CFR TRANSPORT-RELATED REQUIREMENTS

Transportation requirements of NRC which apply to transport of NRC-licensed radioactive material are located in 10 CFR 71. Since 10 CFR part 71 is a matter of "compatibility" for regulatory programs of the NRC "Agreement States," effectively it is also applicable to activities of Agreement State licensees. Several other transport-related requirements are in 10 CFR Part 20. A brief overview of these follows.

NOTE: NRC and Agreement States regulate licensed shippers and receivers of radioactive material packages, not carriers. DOT's authority applies to shippers and carriers, not to receivers.

A. 10 CFR PART 71

In accordance with 10 CFR 71.5, each NRC licensee who transports licensed radioactive material outside the site of usage, as specified in the NRC license, or where transport is on a public highway, or who delivers licensed material to a carrier for transport, must comply with the applicable requirements of the DOT hazardous materials transport regulations. NRC inspects the radioactive material shipping practices of its licensees, and enforces licensee compliance with the DOT regulations.

With the exception of packages approved by the U.S. Department of Energy (DOE), all packages used for domestic shipments of fissile material (in excess of fissile exempt quantity) and for quantities of other licensed material in excess of Type A quantities must be certified for use by the NRC. The user must register with the NRC and make all shipments in compliance with the terms of the package approval. The package approval standards and performance requirements are set out in 10 CFR 71.

NRC has published Regulatory Guide 7.9, "Standard Format and Content of Part 71 Applications for Approval of Packages for Radioactive Material" to assist applicants in preparing applications that thoroughly and completely demonstrate the ability of the given packages to meet the regulations. NRC's "Standard Review Plan for Transportation Packages for Radioactive Material" (NUREG-1609) provides guidance for the review and approval of applications for packages used to transport radioactive material (other than irradiated nuclear fuel) under 10 CFR Part 71. The "Standard Review Plan for Transportation Packages for Spent Nuclear Fuel" (NUREG -1617) provides guidance for the review and approval of applications for packages used to transport spent nuclear fuel under 10 CFR Part 71.

B. <u>10 CFR PART 20</u>

This Part has transportation-related requirements in 10 CFR §§ 20.1906 and 10 CFR 20.1601(e), and in Appendix G.

1. <u>Procedures for Receiving and Opening Packages</u>

10 CFR § 20.1906 covers procedures for receiving and opening packages. Each licensee who expects to receive a package containing quantities of radioactive material in excess of a Type A quantity shall make arrangements to receive:

- The package when the carrier offers it for delivery; or
- Notification of the arrival of the package at the carrier's terminal and to take possession of the package expeditiously.

This section also requires that an NRC licensee who <u>receives</u> a radioactive package perform certain monitoring of the package, as follows:

- Except for packages containing gaseous or special form radioactive material, any package bearing any of the three categories of RADIOACTIVE labels must be monitored for **external surface contamination**;
- The external surface of any package containing greater than a Type A quantity, (i.e., a Type B quantity) must be monitored upon receipt for **external radiation levels**;
- Monitoring for <u>both</u> surface contamination and external radiation levels must be performed on <u>any</u> package known to contain radioactive material, **if there is evidence of degradation of package integrity (**such as packages that are crushed, wet, or damaged);

The licensee shall perform the required monitoring as soon as practical after receipt of the package, but not later than 3 hours after the package is received at the licensee's facility (if it is received during the licensee's normal working hours, or not later than 3 hours from the beginning of the next working day if it is received after working hours).

Instances of surface contamination and/or external radiation levels exceeding the applicable limits **must be reported immediately to the appropriate NRC regional office**.

Each licensee must:

- Establish, maintain, and retain written procedures for safely opening packages in which radioactive material is received; and
- Ensure that the procedures are followed and that due consideration is given to special instructions for the type of package being opened.

2. Control Of Access To High Radiation Areas Containing Radioactive Material Packages

10 CFR 20.1601 "Control of access to high radiation areas" paragraph (e) reads as follows:

"Control is not required for each entrance or access point to a room or other area that is a high radiation area solely because of the presence of radioactive material prepared for transport and labeled in accordance with the regulations of the Department of Transportation provided that:

(1) The packages do not remain in the area longer than 3 days; and
(2) The dose rate at one meter from the external surface of any package does not exceed 0.01 rem (0.1 mSv) per hour."

In implementing the provisions of Section 20.1601(e), it is apparent that time is of the essence for package storage (not more than 3 days) and no package may have a TI greater than ten.

3. Requirements for Transfers of Low-Level Radioactive Waste

10 CFR 20, Appendix G, covers requirements for transfers of low-level radioactive waste intended for disposal at licensed land disposal facilities and for low-level waste manifests. It requires a waste generator, collector, or processor who transports, or offers for transportation, low-level radioactive waste intended for ultimate disposal at a licensed low-level radioactive waste land disposal facility to prepare a Manifest (OMB Control Numbers 3150-0164, -0165, and -0166) reflecting information requested on applicable NRC forms including Form 540 (Uniform Low-Level Radioactive Waste Manifest (Shipping Paper)). NRC Form 540 contains information needed to satisfy DOT shipping paper requirements in 49 CFR Part 172 and the waste tracking requirements of 10 CFR Part 20. The current revision of Form 540 can be found at http://www.nrc.gov/reading-rm/doc-collections/forms/. The instructions for completing Form 540 are contained in NRC document NUREG/BR-0204 available at the NRC web site at: http://www.nrc.gov/reading-rm/doc-collections/nuregs/brochures/br0204/

C. Notification Requirements

The NRC regulations in 10 CFR 71.97 and 10 CFR 73.72 require that licensees shipping HRCQ of nuclear waste in Type B packages, spent nuclear fuel, and special nuclear materials provide advance notification to state governors or their designated representative.

D. NRC Requirements for Radioactive Materials in Quantities of Concern

As part of the NRC's efforts to improve radioactive material security after the events of September 11, 2001, the NRC requires additional security measures when an individual and/or company is engaged in certain NRC-licensed activities. These additional security measures include advance notification to the NRC and state governors or their designated representatives about certain radioactive material shipments. The individuals and/or companies engaged in NRC-licensed activities were issued these security measures through a modification of their NRC license and they are cognizant of its specific requirements.

XI. OTHER REQUIREMENTS

A. Carrier Requirements

There are two types of motor carriers, private carriers and for-hire carriers. A private carrier is a company that provides truck transportation of its own cargo, usually as a part of a business that produces, uses, sells and/or buys the cargo being hauled. A for-hire carrier is a company that provides truck transportation of cargo belonging to others and is paid for doing so. For radioactive material, for-hire carriers are exempt from the requirement to obtain a license from NRC or an Agreement State, to the extent that they transport licensed radioactive material for someone else (see 10 CFR §§ 30.13, 40.12 and 70.12). A private carrier generally owns the radioactive material which is being transported and transportation activities are incidental to their regular business activity. A private carrier is always licensed by the NRC or an agreement state to possess and transport the radioactive material.

All carriers are subject to the same safety requirements of the HMR. An exception from the requirement for **certification** of the shipping papers is provided to a private carrier (see §172.204(b)((1)(ii)).

The principal requirements which apply to all carriers are to:

- Assure that the transport vehicle is properly placarded;
- Assure that shipper has properly certified the shipment;
- Maintain radiation control based on package transport index/separation table and the other transport requirements;
- Report to DOT hazmat incidents involving fire, accident, breakage or suspected radioactive contamination (§§ 171.15, 171.16, 174.750, 175.705(e), 176.710(c), and 177.843(c));
- Provide training to "Hazmat Employees";
- Develop security plans as required by 49 CFR Part 172, §§ 800-804; and
- Register with DOT and submit an annual fee when transporting certain radioactive material.

The sections specifically applicable to radioactive material in the modal parts of the HMR begin at the following sections:

- Rail § 174.700;
- Air § 175.700 (also see §§ 175.33 and 175.75);
- Water § 176.700; and
- Highway §§ 177.842, 177.843, and 177.870(g).

Some of the requirements in these areas have been described above in the sections on Transport Controls and Hazmat Communications and Related Requirements.

B. Registration Requirements

DOT has a national registration program for certain persons engaged in offering for transport and transporting of certain hazardous materials in foreign, interstate or intrastate commerce. The registration requirement (found in §§ 107.601 - 107.620) applies to radioactive material **shippers or carriers** who **offer or transport**:

- Shipments of a "Highway Route Controlled Quantity";
- Shipments of radioactive material in bulk packaging with a capacity equal to or greater than 13,248 L (3,500 gallons) for liquids or gases, or more than 13.24 cubic meters (468 cubic feet) for solids; or
- Shipments of radioactive material for which vehicle placarding is required, which includes:
  - Domestic transportation of exclusive use shipments of less than an A_2 quantity of LSA material (unless the material is unconcentrated U or Th ores) and SCO shipped in excepted packaging under § 173.427(b)(4); liquid LSA-I material; or unpackaged LSA material or SCO.
  - Shipments of packages bearing RADIOACTIVE-YELLOW III labels, whether in an exclusive or non-exclusive use vehicle.

The registration fee is $1000 annually ($275 for small businesses and not-for-profit organizations) (§ 107.612). The fee provides funds for grants distributed to States and Indian tribes for hazardous materials emergency response planning and training. This program began in 1992 and is administered by the Associate Administrator for Hazardous Materials Safety, Pipeline and Hazardous Materials Safety Administration (PHMSA).

Information on the registration program may be found online at http://hazmat.dot.gov/regs/register/register.htm.

C. Motor Carrier Safety Requirements

Besides the transportation controls in §§ 177.842, 177.843, and 177.870(g), highway shipments may be subject to the Federal Motor Carrier Safety Regulations (FMCSR) which are located in 49 CFR Parts 350-399. The FMCSR apply if the vehicle has a gross vehicle weight rating of 10,001 pounds or more, or if the radioactive material is being transported in a quantity requiring placarding. For intrastate commerce, a state may impose some requirements different than the FMCSR.

Some of the FMCSR requirements of particular relevance to radioactive materials shipments are those for commercial driver's license with hazardous materials endorsement, Hazardous Materials Safety Permits, and routing requirements.

1. Commercial Driver's License

A "Commercial Driver's License" (CDL) means a license issued to an individual by a state or other jurisdiction, in accordance with the standards in 49 CFR Part 383, which authorizes that individual to operate a "commercial motor vehicle". For radioactive material shipments the driver of a vehicle that requires placarding must have a CDL with a "hazardous materials endorsement" (§ 383.93).

In order to obtain a hazardous materials endorsement, each applicant must pass a test demonstrating knowledge of the following (see § 383.121):

- Hazardous materials regulations,
- Hazardous materials handling,
- Operation of emergency equipment, and
- Emergency response procedures.

A State may not issue, renew, upgrade, or transfer a hazardous materials endorsement for a CDL to any individual authorizing that individual to operate a commercial motor vehicle transporting a hazardous material in commerce unless the Transportation Security Administration (TSA) has determined that the individual does not pose a security risk warranting denial of the endorsement.

2. Hazardous Materials Safety Permits

The Federal Motor Carrier Safety Administration (FMCSA) requires motor carriers to obtain a Hazardous Materials Safety Permit (HMSP) prior to transporting certain highly hazardous materials, including a highway route controlled quantity of a Class 7 (radioactive) material. All motor carriers, including interstate, intrastate and foreign carriers must comply with this regulation. In order to maintain an HMSP, motor carriers are required to:

- Maintain a "satisfactory" safety rating in order to obtain and hold a safety permit.
- Maintain their crash rating, and their driver, vehicle, hazardous materials or out-of service rating so they are not in the worse 30 percent of the national average as indicated in FMCSA's Motor Carrier Management Information System (MCMIS).
- Have a satisfactory security program (and associated training) according to § 172.800 in place.
- Maintain registration (see above) with PHMSA.
- Develop a system of communication that will enable the vehicle operator to contact the motor carrier during the course of transportation and maintain records of these communications.
- Have a written route plan required for radioactive materials set forth in § 397.101 and for explosives in Part 397.19.
- Perform a pre-trip inspection (North American Standard (NAS) Level VI Inspection Program for Radioactive Shipments) for shipments containing highway route controlled Class 7 (radioactive) materials.

The pre-trip inspection required in 49 CFR § 385.415 for HRCQ shipments must be performed by a Federal, State, or local government inspector, or an inspector under contract with a Federal, State, or local government. The inspector must have completed an appropriate training program of at least 104 hours, including at least 24 hours of training in conducting radiological surveys on inspecting vehicles transporting highway route controlled quantity (HRCQ) radioactive materials.

The inspection must cover all applicable requirements in the HMR and the FMCSR--including 49 CFR Parts 383 (commercial driver's license), 391 (driver qualifications), 395 (hours of service), 393 and 396 (vehicle condition)--or compatible State regulations; and provisions in the HMR on the transportation of radioactive materials (49 CFR Parts 171, 172, 173 and 178) and registration (49 CFR Part 107, Subpart G).

The requirements for the HMSP may be found in 49 CFR §§ 385.401- 423 and online at www.fmcsa.dot.gov/safetyprogs/hm.htm.

3. Highway Routing Requirements

The requirements for the routing of radioactive material shipments by highway are in 49 CFR § 397.101 – 397.103.

A carrier or any person operating a motor vehicle that contains a class 7 (radioactive) material as defined in 49 CFR § 173.403 for which placarding is required under 49 CFR Part 172 shall ensure that the motor vehicle is operated on routes that minimize radiological risk and shall tell the driver which route to take and that the motor vehicle contains radioactive materials (49 CFR § 397.101(a)).

If the contents of a package being shipped are a highway route controlled quantity, the package must be transported under specific routing controls as given in 49 CFR § 397.101(b):

- The carrier must operate on "preferred routes".

  (A preferred route is an Interstate System highway for which an alternative route is not designated by a State routing agency, a State-designated route selected by a State routing agency pursuant to §397.103, or both. The "Guidelines for Selecting Preferred Highway Route Controlled Quantity Shipments of Radioactive Materials" describe the guidelines for States to use in designating routes; it may be found online at http://hazmat.fmcsa.dot.gov/nhmrr/PDFs/ramguide.pdf. The State-designated routes may be found at: http://hazmat.fmcsa.dot.gov/nhmrr/index.asp.)
- The carrier shall select routes to reduce time in transit over the preferred route segment of the trip.
- Interstate System bypass beltway around a city, when available, shall be used in place of a preferred route through a city.
- Deviations from preferred routes are allowed only:
  - As necessary to pick up or deliver HRCQ
  - To make necessary rest, fuel or motor vehicle repair stops, or
  - Under emergency conditions.
- Pickup and delivery segments of the route are to follow:
  - Shortest-distance route from the pickup/delivery location to the nearest preferred route entry/exit location
  - Deviation from the shortest-distance pickup or delivery route is authorized if such deviation:
    - Minimizes the radiological risk;
    - Does not exceed the shortest-distance route by more than 25 miles and
    - Does not exceed five times the length of the shortest-distance route.

- The carrier is required to prepare a written route plan and furnish a copy to the driver and the shipper (before departure for exclusive use shipments and within 15 days following departure for all other shipments).
- Carriers of highway route controlled quantities must also file detailed reports to the Office of Enforcement and Compliance (MC-PSDECH), Federal Motor Carrier Safety Administration, within 90 days of accepting the packages for shipment. The report must include the route plans, shipping papers, names of shippers, carriers and consignees, etc. (Reference 49 CFR § 397.101(g).) *NOTE: Shipments made in compliance with the physical security requirements of 10 CFR Part 73 of the NRC are excepted from this requirement.*
- The driver of a shipment with highway route controlled quantities must be provided with certain training every two years and must have in his possession a certificate of such training.

D. <u>Radioactive Material Shipments By Air</u>

As noted in Section III above, the HMR authorizes air transport of radioactive material in accordance with the ICAO Technical Instructions provided all of the conditions of § 171.22 are met.

Section 175.700 limits Class 7 materials aboard a passenger-carrying aircraft to excepted packages, unless the material is intended for use in, or incident to research, medical diagnosis or treatment. Regardless of its intended use, no person may carry a Type B(M) package aboard a passenger-carrying aircraft, a vented Type B(M) package aboard any aircraft, or a liquid pyrophoric Class 7 material aboard any aircraft.

NRC requirements in 10 CFR § 71.88 limit the air transport of plutonium.

XII. DOT AND NRC ENFORCEMENT POLICIES

Under the DOT/NRC MOU, each agency conducts an inspection and enforcement program within its jurisdiction to assure compliance with its requirements. The NRC will normally carry out enforcement actions for violations of the requirements of 10 CFR Part 71 and 49 CFR (except 49 CFR Parts 390-397) by NRC licensee-shippers and licensee-shipper-private carriers. The DOT will carry out enforcement actions for violations of 49 CFR (including Parts 390-397) by carriers of radioactive materials and shippers of radioactive materials from agreement states, DOE contractors, or any other shippers otherwise not subject to NRC requirements.

Violations of the regulations in 49 CFR and 10 CFR Part 71 may result in civil or criminal penalties, cease/desist orders, suspension orders, etc. DOT's enforcement powers under the HMR are explained in 49 CFR Subpart D. Further information on enforcement of the HMR may be found at http://hazmat.dot.gov/enforce/hmenforce.htm. NRC's "Enforcement Policy" may be found on the NRC public web site and the NRC Agency-wide Document Access and Management System (ADAMS) (see http://www.nrc.gov/about-nrc/regulatory/enforcement.html).

Import and export shipments must be made in accordance with the international regulations that are cited in §§ 171.12 and 171.22. When import shipments are found to be in violation of the international air and sea transport regulations (which are essentially the same as the IAEA regulations) enforcement action against the foreign shipper or carrier can be taken by DOT by citing the applicable requirements in the ICAO or IMO regulations. If violations are found in radioactive material shipments being exported under the IMO or ICAO, the shipper or carrier may be charged with violating both the domestic and the international regulations.

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APPENDIX A INTERNATIONAL SYSTEM OF UNITS (SI) FOR RADIOACTIVE MATERIALS IN TRANSPORTATION

The information contained in this appendix is intended to aid persons in understanding the relationships between the International System of Units (SI) and the customary units for radiological measurements. It is designed to help in converting values shown in one system to values in the other system.

To ensure compatibility with international transportation standards, units of measure in the HMR are expressed using SI units. U.S. standard or customary units, which appear in parentheses following the SI units, are for information only and are not intended to be the regulatory standard.

The labels on packages and descriptive information on shipping documents show the measure of the radioactive content or the activity. The SI unit used to measure activity is the becquerel (Bq); the customary unit is the curie (Ci). The maximum radiation level at 1 meter from a package determines the transport index (Tl), which is shown on labels and shipping papers. The SI unit of measurement for radiation levels is the sievert (Sv) per hour; traditionally, it has been the rem (or a fraction of the rem) per hour.

It is often necessary to use numerical abbreviations to write the measured values in a practical way. The following pages provide definitions and abbreviations for numerical factors and for the customary and SI units. Additionally, examples of conversions from customary units to SI radiological and SI to customary units are detailed.

DEFINITIONS AND ABBREVIATIONS

NUMERICAL

Multiplication Factors		Prefix	Symbol
1 000 000 000 000 000 000 =	10^{18}	exa	E
1 000 000 000 000 000 =	10^{15}	peta	P
1 000 000 000 000 =	10^{12}	tera	T
1 000 000 000 =	10^{9}	giga	G
1 000 000 =	10^{6}	mega	M
1 000 =	10^{3}	kilo	k
100 =	10^{2}	hecto	h
10 =	10^{1}	deka	da
0.1 =	10^{-1}	deci	d
0.01 =	10^{-2}	centi	c
0.001 =	10^{-3}	milli	m
0.000 001 =	10^{-6}	micro	u (or µ)
0.000 000 001 =	10^{-9}	nano	n
0.000 000 000 001 =	10^{-12}	pico	p
0.000 000 000 000 001 =	10^{-15}	femto	f
0.000 000 000 000 000 001 =	10^{-18}	atto	a

RADIOLOGICAL

The curie and becquerel are units of measure of the quantity or activity of radioactive material which indicate the rate that atoms in the material are giving off radiation or disintegrating. The curie (Ci) is equal to 37 billion disintegrations per second, while the becquerel (Bq) is equal to only one disintegration per second. Thus, one curie is equal to 37 gigabecquerels or 0.037 terabecquerels; in symbols, 1 Ci = 37 GBq = 0.037 TBq.

The sievert (Sv) and the rem are units of radiation dose (technically, of dose equivalent) absorbed by the body. A sievert is equal to 100 rem, or 1 Sv = 100 rem.

Another unit for activity is disintegrations per minute (dpm), which can be obtained from radiation detection instrumentation readouts in counts per minute (cpm) divided by the detector's system efficiency. Since curies are a measure of disintegrations per second (dps), they are related to dpm as follows:

1 curie (Ci) = 3.7×10^{10} dps = 2.22×10^{12} dpm
1 millicurie(mCi) = 3.7×10^{7} dps = 2.22×10^{9} dpm
1 microcurie (μCi) = 3.7×10^{4} dps = 2.22×10^{6} dpm

EQUIVALENTS FOR CONVERSIONS

Quantity (activity)

1 TBq = 27 Ci = 27,000 mCi

1 GBq = 0.027 Ci = 27 mCi = 27,000 μCi

1 MBq = 0.000027 Ci = 0.027 mCi = 27 μCi

1 Ci = 0.037 TBq = 37 GBq = 37,000 MBq

1 mCi = 0.000037 TBq = 37 MBq

1 μCi = 0.037 MBq = 37,000 Bq

1 nCi = 0.000037 MBq = 37 Bq

1 pCi = 0.037 Bq = 37 mB

Radiation Level (dose equivalent rate)

1 Sv/h = 100 rem/h = 100,000 mrem/h

1 mSv/h = 0.1 rem/h = 100 mrem/h

1 μSv/h = 0.0001 rem/h = 0.1 mrem/h

1 rem/h = 0.01 Sv/h = 10 mSv/h = 10,000 μSv/h

1 mrem/h = 0.00001 Sv/h = 0.01 mSv/h = 10 μSv/h

USE OF CONVERSION FACTORS

To convert a value from one system of units to the other:

- First, in the left column above, find the unit you wish to convert from.
- Second, find the factor in that line for the unit you wish to convert to.
- Third, multiply the original value by the factor; the result will be the measure in the desired units.

Examples:

1 A radioactive material label shows 14 TBq. How many curies is that?

14 TBq x 27 Ci per TBq = 378 Ci

2. There is 50 MBq of a radioactive material in a package. How many millicuries is it?

50 MBq x 0.027 mCi per MBq = 1.35 mCi

3. How many TBq are equal to 500 curies?

500 curies x 0.037 TBq per Ci = 18.5 TBq

4. The EPA standards require that public drinking water systems limit the natural radium concentration to less than 5 pCi per liter. What is this upper limit in becquerels?

5 pCi per liter x 0.037 Bq per pCi = 0.185 Bq/liter

5. The Transport Index (Tl) of a package is the number equal to the maximum radiation level in millirem per hour at a distance of 1 meter from the package. A Tl of 1.0 corresponds to a radiation level of 1 mrem/h at 1 meter. What is the radiation level in microsieverts per hour which corresponds to a Tl of 2.5?

2.5 Tl x 1.0 mrem/h per Tl x 10 μSv per mrem = 25 μSv/h

6. The maximum surface radiation level for a package with a Radioactive Yellow-II label is 0.5 mSv per hour. Would a measured radiation level of 38 mrem per hour be acceptable for a Radioactive Yellow II label?

38 mrem/h x .01 mSv/h per mrem/h = 0.38 mSv/h

Yes, since 0.38 mSv/h is less than 0.5 mSv per hour.

Appendix H

Noise and Vibration Calculations

Project **Diablo Canyon Power Plant**
Project No.
Date

Type	FTA Database Substitute
Spike Driver	Large Bulldozer
Truck	Loaded Truck
Forklift	Loaded Truck
Generator	Small Bulldozer

Veh. #	Index	Equipment	PPV_{ref}	L_v at 25ft (VdB)	Distance to Nearest Receptor (ft)	PPV_{equip}	L_v (VdB)	PPV Damage Criteria	L_v Damage Criteria	Annoyance Criteria	Damage Assessment	Annoyance Assessment
1	10	Large Bulldozer	0.089	87	25	0.089000	87.0	0.5	90	72	**No Impact**	**Impact**
2	12	Loaded trucks	0.076	86	25	0.076000	86.0	0.5	90	72	**No Impact**	**Impact**
3	12	Loaded trucks	0.076	86	25	0.076000	86.0	0.5	90	72	**No Impact**	**Impact**
4	14	Small bulldozer	0.003	58	25	0.003000	58.0	0.5	90	72	**No Impact**	**No Impact**
TOTAL (All equipment simultaneously)						0.244000	**91.1**	0.5	90	72	**Impact**	**Impact**

Project **Diablo Canyon Power Plant**
Date

Type	FTA Database Substitute
Spike Driver	Large Bulldozer
Truck	Loaded Truck
Forklift	Loaded Truck
Generator	Small Bulldozer

Veh. #	Index	Equipment	PPVref	Lv at 25ft (VdB)	Distance to Nearest Receptor (ft)	PPVequip	Lv (VdB)	PPV Damage Criteria	Lv Damage Criteria	Annoyance Criteria	Damage Assessment	Annoyance Assessment
1	10	Large Bulldozer	0.089	87	625	0.000712	45.1	0.5	90	72	**No Impact**	**No Impact**
2	12	Loaded trucks	0.076	86	625	0.000608	44.1	0.5	90	72	**No Impact**	**No Impact**
3	12	Loaded trucks	0.076	86	625	0.000608	44.1	0.5	90	72	**No Impact**	**No Impact**
4	14	Small bulldozer	0.003	58	625	0.000024	16.1	0.5	90	72	**No Impact**	**No Impact**
TOTAL (All equipment simultaneously)						0.00195	**49.2**	0.5	90	72	**No Impact**	**No Impact**

Ground-borne noise = Lv - 30 = 19.2 dBA

Project **Diablo Canyon Power Plant Decommissioning Project**
Date **8/29/2022**

Type	
Loaded Trucks	

Veh. #	Index	Equipment	PPV_{ref}	L_v at 25ft (VdB)	Distance to Nearest Receptor (ft)	PPV_{equip}	L_v (VdB)	PPV Damage Criteria	L_v Damage Criteria	Annoyance Criteria	Damage Assessment	Annoyance Assessment
1	12	Loaded trucks	0.076	86	50	**0.026870**	77.0	0.12	90	72	**No Impact**	**Impact**
TOTAL (All equipment simultaneously)						0.026870	**77.0**	0.12	90	72	**No Impact**	**Impact**

Ground-borne noise = Lv - 30 = 47.0 dBA

Project **Diablo Canyon Power Plant Decommissioning Project**
Date **8/29/2022**

Type	FTA Database Substitute
Gantry Crane	Large Bulldozer
Truck-mounted crane	Loaded Truck
Truck-mounted crane	Loaded Truck
Sissor Lift	Small Bulldozer
Sissor Lift	Small Bulldozer
Reach Lift	Small Bulldozer
Reach Lift	Small Bulldozer
Forklift	Small Bulldozer
Forklift	Small Bulldozer
Generator	Small Bulldozer

Veh. #	Index	Equipment	PPV_{ref}	L_v at 25ft (VdB)	Distance to Nearest Receptor (ft)	PPV_{equip}	L_v (VdB)	PPV Damage Criteria	L_v Damage Criteria	Annoyance Criteria	Damage Assessment	Annoyance Assessment
1	10	Large Bulldozer	0.089	87	625	0.000712	45.1	0.5	90	72	**No Impact**	**No Impact**
2	12	Loaded trucks	0.076	86	625	0.000608	44.1	0.5	90	72	**No Impact**	**No Impact**
3	12	Loaded trucks	0.076	86	625	0.000608	44.1	0.5	90	72	**No Impact**	**No Impact**
4	14	Small bulldozer	0.003	58	626	0.000024	16.0	0.5	90	72	**No Impact**	**No Impact**
5	14	Small bulldozer	0.003	58	627	0.000024	16.0	0.5	90	72	**No Impact**	**No Impact**
6	14	Small bulldozer	0.003	58	628	0.000024	16.0	0.5	90	72	**No Impact**	**No Impact**
7	14	Small bulldozer	0.003	58	629	0.000024	16.0	0.5	90	72	**No Impact**	**No Impact**
8	14	Small bulldozer	0.003	58	625	0.000024	16.1	0.5	90	72	**No Impact**	**No Impact**
9	14	Small bulldozer	0.003	58	625	0.000024	16.1	0.5	90	72	**No Impact**	**No Impact**
10	14	Small bulldozer	0.003	58	625	0.000024	16.1	0.5	90	72	**No Impact**	**No Impact**
TOTAL (All equipment simultaneously)			0.262			0.002095	**49.2**	0.5	90	72	**No Impact**	**No Impact**

Ground-borne noise = Lv - 30 = 19.2 dBA

Project Diablo Canyon Power Plant Decommissioning Project
Date 8/26/2022

Project Description says "no changes to the existing grade are expected"

Equipment List

Equipment Number	Equipment Type	Subcontractor	Number	Horsepower	Load Factor
1	Truck				
2	Forklift				
3	Spike Driver				

Calculation of sound pressure levels

Equipment Number	Equipment Index Number	Equipment	Reference Sound Pressure Level @ 50 ft (dBA re: 20µPa)					Reference Utilization (%)		Distance to Nearest Noise-Sensitive Receptor (ft)	Sound Pressure Level @ Receptor (dBA re: 20µPa)
			FTA	FHWA (Predicted)	FHWA (Measured)	VA	Used	FHWA	Used		
1	65	Truck	88	N/A	N/A	88	88	N/A	20%	700	58
2	37	Forklift	N/A	85	75	N/A	85	20%	20%	700	55
3	60	Spike Driver	77	N/A	N/A	N/A	77	N/A	40%	700	50
TOTAL SOUND PRESSURE LEVEL (dBA re: 20µPa)											**60**

COMPARISON TO CITY OF PISMO BEACH NOISE ORDINANCE:

	Distance	L50 dBA	Barrier & Berm Losses	Total L50 dBA	L50 Ambient	L50 Total Noise Level	Delta	Pismo Beach Limits, L50
Price Canyon home	700	58.3	-7.5	50.8	52.4	54.7	2.3	55.0
Dell Court	900	56.1		56.1	49.4	56.9	7.5	55.0
Dell Court with Mitigation	900	56.1	-4.5	51.6	49.4	53.7	4.3	55.0
Judkins School	1150	54.0	-18	36.0	49.4	49.6	0.2	55.0
Reef Court/Coral Court*	1400	52.3	0	52.3	56.4	57.8	1.4	60.0
Vincente Ct.	1250	53.3	0	53.3	49.4	54.8	5.4	55.0

* - Residences on Coral Court are closer to the noise source.
** - L50 noise level is approximately 2 decibels lower than the Leq noise level.

CHANGE IN AMBIENT NOISE CALCULATION

	Distance	dBA	Barrier & Berm Losses	Total dBA	Ambient al	Noise Level	Delta
Price Canyon home	700	60.3	-7.5	52.8	53.8	56.3	2.5
Dell Court	900	58.1		58.1	50.8	58.8	8.0
Dell Court with Mitigation	900	58.1	-4.5	53.6	50.8	55.4	4.6
Judkins School	1150	56.0	-18	38.0	50.8	51.0	0.2
Reef Court/Coral Court*	1400	54.3	0	54.3	58.8	60.1	1.3
Vincente Ct.	1250	55.3	0	55.3	53.5	57.5	4.0

* - Residences on Coral Court are closer to the noise source.

Project Diablo Canyon Power Plant Decommissioning Project
Date 8/26/2022

Equipment List PBR Operational Noise

Equipment Number	Equipment Type	Subcontractor	Number	Horsepower	Load Factor
1	Sissor Lift				
2	Sissor Lift				
3	Reach Lift				
4	Reach Lift				
5	Forklift				
6	Forklift				

Calculation of sound pressure levels

Equipment Number	Equipment Index Number	Equipment	Reference Sound Pressure Level @ 50 ft (dBA re: 20µPa)					Reference Utilization (%)		Distance to Nearest Noise-Sensitive Receptor (ft)	Sound Pressure Level @ Receptor (dBA re: 20µPa)
			FTA	FHWA (Predicted)	FHWA (Measured)	VA	Used	FHWA	Used		
1	37	Sissor Lift	N/A	85	75	N/A	85	20%	20%	625	56
2	37	Sissor Lift	N/A	85	75	N/A	85	20%	20%	625	56
3	37	Reach Lift	N/A	85	75	N/A	85	20%	20%	625	56
5	37	Forklift	N/A	85	75	N/A	85	20%	20%	625	56
TOTAL SOUND PRESSURE LEVEL (dBA re: 20µPa)											62

COMPARISON TO CITY OF PISMO BEACH NOISE ORDINANCE:

	Distance	L50 dBA**	Barrier & Berm Losses	Total L50 dBA	PBR L50 Ambient	L50 Total	L50 Delta	Pismo Limits, L50
Price Canyon home	625	60.1	-7.8	52.3	52.4	55.4	3.0	55.0
Dell Court	850	57.4		57.4	49.4	58.1	8.7	55.0
Dell Court with Mitigation	850	57.4	-7.5	49.9	49.4	52.7	3.3	55.0
Judkins School	1100	55.2	-19.5	35.7	49.4	49.6	0.2	55.0
Reef Court/Coral Court*	1500	52.5	0	52.5	56.4	57.9	1.5	60.0
Vincente Ct.	1420	53.0	0	53.0	49.4	54.5	5.1	55.0

* - Residences on Coral Court are closer to the noise source.
** - L50 noise level is approximately 2 decibels lower than the Leq noise level.

CHANGE IN AMBIENT NOISE CALCULATION

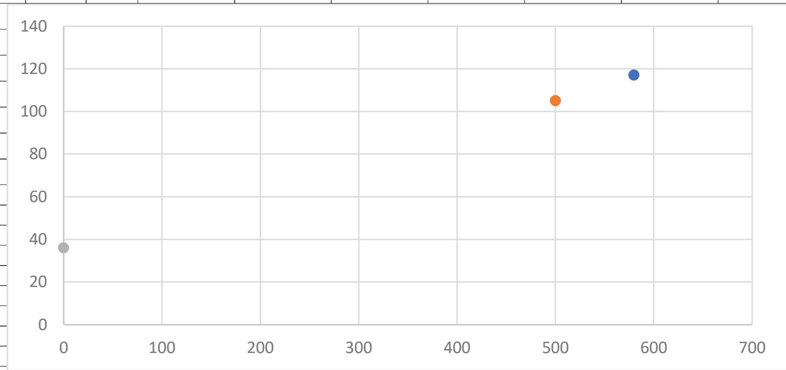
	Distance	Leq dBA	Barrier & Berm Losses	Total Leq dBA	PBR Ambient	Leq Total	Leq Delta
Price Canyon home	625	62.1	-7.8	54.3	53.8	57.1	3.3
Dell Court	850	59.4		59.4	50.8	60.0	9.2
Dell Court with Mitigation	850	59.4	-7.5	51.9	50.8	54.4	3.6
Judkins School	1100	57.2	-19.5	37.7	50.8	51.0	0.2
Reef Court/Coral Court*	1500	54.5	0	54.5	58.8	60.2	1.4
Vincente Ct.	1420	55.0	0	55.0	53.5	57.3	3.8

* - Residences on Coral Court are closer to the noise source.

Barrier Insertion Loss for Point Source

(Use same units as sound speed in cell M4)									
Source to barrier distance	500		**A**	504.74					
Source height	36		**B**	80.895					
Observer to barrier distance	80		**C**	585.63					
Observer height	117								
Barrier height	105								
		Using Price Canyon Road as a berm							
Barrier: 0, Berm: 1	1								
Zone	Bright								
Distance from Source	580								
Octave band (Hz)	**63**	**125**	**250**	**500**	**1000**	**2000**	**4000**	**8000**	**dBA**
PWL at source	100	100	100	100	100	100	100	100	107.0
Directivity (10log(Q)) OR									
Directivity (Q)	2	2	2	2	2	2	2	2	
SPL at receiver (distance loss only)	47	47	47	47	47	47	47	47	53.7
Attenuation due to barrier (dB)	8	8	8	8	8	8	7	7	7.5
SPL at receiver with barrier	39	39	39	39	39	39	39	40	46.2
Fresnel Number	-5E-04	-0.001	-0.002	-0.004	-0.009	-0.017	-0.034	-0.068	

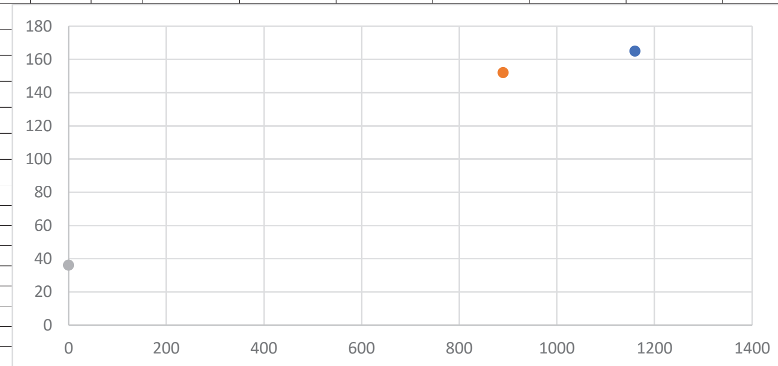
Speed of Sound	1126	ft/s



Barrier Insertion Loss for Point Source

(Use same units as sound speed in cell M4)									
Source to barrier distance	890		**A**	897.53					
Source height	36		**B**	270.31					
Observer to barrier distance	270		**C**	1167.2					
Observer height	165								
Barrier height	152	18.3 dBA loss from PBR construction to Judknis School							
Barrier: 0, Berm: 1	1								
Zone	Shadow								
Distance from Source	1160								
Octave band (Hz)	**63**	**125**	**250**	**500**	**1000**	**2000**	**4000**	**8000**	**dBA**
PWL at source	100	100	100	100	100	100	100	100	107.0
Directivity (10log(Q)) OR									
Directivity (Q)	2	2	2	2	2	2	2	2	
SPL at receiver (distance loss only)	41	41	41	41	41	41	41	41	47.7
Attenuation due to barrier (dB)	9	10	12	14	17	20	23	23	18.3
SPL at receiver with barrier	31	30	29	26	24	21	18	18	29.4
Fresnel Number	0.0772	0.1531	0.3063	0.6125	1.225	2.4501	4.9001	9.8003	
Source to barrier distance	780		19.5 dBA loss from PBR operations to Judkins Shool						
Source height	36								
Observer to barrier distance	270								
Observer height	165								
Barrier height	152								
Barrier: 0, Berm: 1	1								
Attenuation due to barrier (dB)	10	11	13	16	18	21	23	23	19.5

Speed of Sound	1126	ft/s

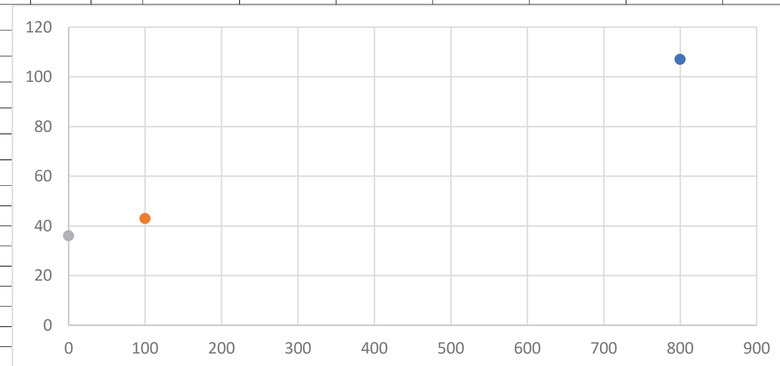


Barrier Insertion Loss for Point Source

(Use same units as sound speed in cell M4)

Source to barrier distance	100	A	100.24
Source height	36	B	702.92
Observer to barrier distance	700	C	803.14
Observer height	107		
Barrier height	43		
	12' barrier for PBR Construction noise at Dell Court		
Barrier: 0, Berm: 1	1		
Zone	Bright		
Distance from Source	800		

Speed of Sound 1126 ft/s



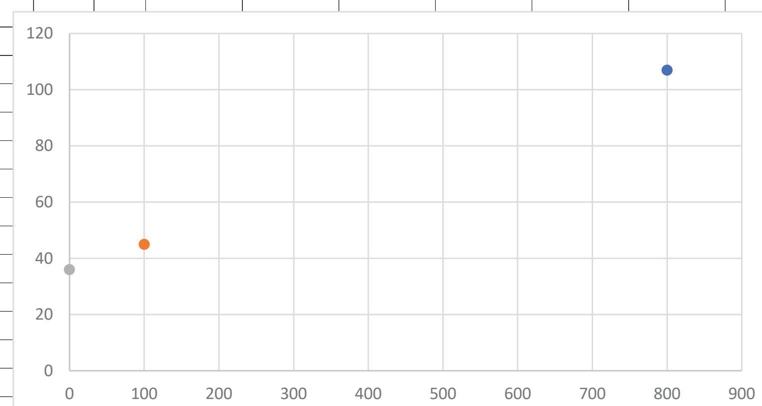
Octave band (Hz)	63	125	250	500	1000	2000	4000	8000	dBA
PWL at source	100	100	100	100	100	100	100	100	107.0
Directivity (10log(Q)) OR									
Directivity (Q)	2	2	2	2	2	2	2	2	
SPL at receiver (distance loss only)	44	44	44	44	44	44	44	44	50.9
Attenuation due to barrier (dB)	8	8	8	8	7	7	5	0	4.5
SPL at receiver with barrier	36	36	36	36	37	37	39	44	46.4
Fresnel Number	-0.002	-0.004	-0.009	-0.018	-0.035	-0.071	-0.141	-0.282	

Barrier Insertion Loss for Point Source

(Use same units as sound speed in cell M4)

Source to barrier distance	100	A	100.4
Source height	36	B	702.7
Observer to barrier distance	700	C	803.1
Observer height	107		
Barrier height	45		
	12' barrier for PBR Operations noise at Dell Court		
Barrier: 0, Berm: 1	1		
Zone	Shadow		
Distance from Source	800		

Speed of Sound 1126 ft/s



Octave band (Hz)	63	125	250	500	1000	2000	4000	8000	dBA
PWL at source	100	100	100	100	100	100	100	100	107.0
Directivity (10log(Q)) OR									
Directivity (Q)	2	2	2	2	2	2	2	2	
SPL at receiver (distance loss only)	44	44	44	44	44	44	44	44	50.9
Attenuation due to barrier (dB)	8	8	8	8	8	8	8	8	8.0

SPL at receiver with barrier	36	36	36	36	36	36	36	36	42.9											
Fresnel Number	1E-05	2E-05	4E-05	8E-05	2E-04	3E-04	6E-04	0.001												

Project **Diablo Canyon Power Plant Decommissioning Project**
Date **8/25/2022 SMVR Construction Noise**

Enter list of equipment provided by client/contractor for record

Equipment List

Equipment Nu	Equipment Type	Subcontractor	Number	Horsepower	Load Factor
1	Spike Driver				
2	Truck				
3	Forklift				
4	Generator				

Calculation of sound pressure levels

Equipment Number	Equipment Index Number	Equipment	Reference Sound Pressure Level @ 50 ft (dBA re: 20µPa)					Reference Utilization (%)		Distance to Nearest Noise-Sensitive Receptor (ft)	Sound Pressure Level @ Receptor (dBA re: 20µPa)
			FTA	FHWA (Predicted)	FHWA (Measured)	VA	Used	FHWA	Used		
1	60	Spike Driver	77	N/A	N/A	N/A	77	N/A	40%	700	50
2	65	Truck	88	N/A	N/A	88	88	N/A	20%	700	58
3	37	Forklift	N/A	85	75	N/A	85	20%	20%	700	55
4	29	Generator (<25KVA, VMS Signs)	N/A	70	73	N/A	73	50%	50%	700	47
TOTAL SOUND PRESSURE LEVEL (dBA re: 20µPa)											**60**

		Distance	dBA	Ambient	Total	Delta
Daytime	SMVR-SM	700	60	65.9	67.0	1.1
	SMRV-SB	6800	41	69.6	69.6	0.0

No nighttime construction

Project **Diablo Canyon Power Plant Decommissioning Project**
Date **8/25/2022 SMVR Operations**

Equipment List

Equipment N	Equipment Type	Subcontractor	Number	Horsepower	Load Factor
1	Gantry Crane				
2	Truck-mounted crane				
3	Truck-mounted crane				
4	Sissor Lift				
5	Sissor Lift				
6	Reach Lift				
7	Reach Lift				
8	Forklift				
9	Forklift				
10	Generator				

Calculation of sound pressure levels

Equipment Number	Equipment Index Number	Equipment	Reference Sound Pressure Level @ 50 ft (dBA re: 20µPa)					Reference Utilization (%)		Distance to Nearest Noise-Sensitive Receptor (ft)	Sound Pressure Level @ Receptor (dBA re: 20µPa)
			FTA	FHWA (Predicted)	FHWA (Measured)	VA	Used	FHWA	Used		
1	**19**	Crane, Derrick	88	85	81	88	**88**	16%	**16%**	**700**	**57**
2	**20**	Crane, Mobile	83	85	85	82	**85**	16%	**16%**	**700**	**54**
4	**37**	Sissor Lift	N/A	85	75	N/A	**85**	20%	**20%**	**700**	**55**
5	**37**	Sissor Lift	N/A	85	75	N/A	**85**	20%	**20%**	**700**	**55**
6	**37**	Reach Lift	N/A	85	75	N/A	**85**	20%	**20%**	**700**	**55**
7	**37**	Forklift	N/A	85	75	N/A	**85**	20%	**20%**	**700**	**55**
8	**29**	Generator (<25KVA, VMS Signs)	N/A	70	73	N/A	**73**	50%	**50%**	**700**	**47**
TOTAL SOUND PRESSURE LEVEL (dBA re: 20µPa)											**63**

		Distance	dBA	Barrier	Total dBA	Ambient	Total	Delta
Daytime	SMVR-SM	700	63.3		**63.3**	**65.9**	67.8	1.9
	SMVR-SM with Mitigation	700	63.3	-14.0	49.3	65.9	66.0	0.1
	SMRV-SB	6800	41.0		**43.5**	**69.6**	69.6	0.0
Nighttime	SMVR-SM	700	63.3		63.3	50.0	63.5	13.5
	SMVR-SM with Mitigation	700	63.3	-14.0	**49.3**	**50.0**	52.7	2.7
	SMRV-SB	9504	41.0		**41.0**	**60.7**	60.7	0.0

Bold numbers indicate SMVR-SM operational noise does not exceed ambient noise level as stated in City of Santa Maria Municipal Code

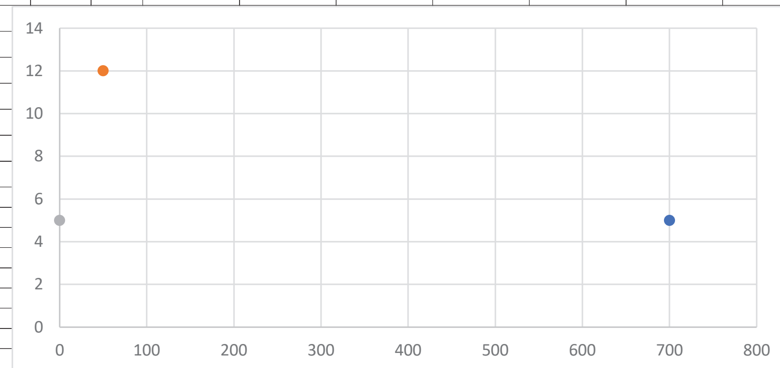
Barrier Insertion Loss for Point Source

(Use same units as sound speed in cell M4)

Source to barrier distance	50	**A**	50.488	
Source height	5	**B**	650.04	
Observer to barrier distance	650	**C**	700	
Observer height	5			
Barrier height	12			
Barrier: 0, Berm: 1	0			
Zone	Shadow			
Distance from Source	700			

Speed of Sound	1126	ft/s

Octave band (Hz)	**63**	**125**	**250**	**500**	**1000**	**2000**	**4000**	**8000**	**dBA**
PWL at source	100	100	100	100	100	100	100	100	107.0
Directivity (10log(Q)) OR									
Directivity (Q)	2	2	2	2	2	2	2	2	
SPL at receiver (distance loss only)	45	45	45	45	45	45	45	45	52.1
Attenuation due to barrier (dB)	6	7	8	10	13	16	19	20	14.3
SPL at receiver with barrier	39	38	37	35	32	29	26	25	37.8
Fresnel Number	0.0588	0.1166	0.2333	0.4665	0.9331	1.8661	3.7322	7.4645	



DIABLO CANYON DECOMMISSIONING PROJECT CUMULATIVE AND ALTERNATIVES NOISE CALCULATIONS

Diablo Canyon Truck Route Calcs

Location	Trucks	Ambient	Total	DCPP Cumulative Projects
1	**37.9**	**61.8**	**61.8**	**Cumulative Project 4**
2	**44.5**	**62.2**	**62.3**	**Cumulative Project 6 is close -**
3	53.9	66.4	66.6	
4	46.3	52.2	53.2	
5	53.2	58.5	59.6	
6	**53.4**	**59.4**	**60.4**	**Cumulative Project 3**
7	45.4	60.5	60.6	
8	46.2	58.6	58.8	
9	46.6	60.0	60.2	
10	46.7	64.3	64.4	
11	47.5	65.6	65.7	
12	45.5	52.0	52.9	
13	35.9	64.6	64.6	
14	25.3	53.5	53.5	
15	19.0	58.8	58.8	
16	37.3	50.8	51.0	
17	29.9	50.8	50.8	
18	42.2	53.8	54.1	

CUMULATIVE PROJECT #6

3 is 230' from Avila Beach Road

6 is 730' from Avila Beach Road

10 log (230/730) =	-5.016	line source loss
20 log (230/730) =	-10.03	point source loss

ALTERNATIVES ANALYSIS FOR ALTERNATIVE 7

DCPP to PBR Truck Route Calcs

Location	Trucks	Ambient	Total	Delta	Doubled Trucks	Ambient	Total	Non-Alternative Delta
1	37.9	61.8	61.8	0.0	40.9	61.8	61.8	0.0
2	44.5	62.2	62.3	0.1	47.5	62.2	62.3	0.1
3	53.9	66.4	66.6	0.2	56.9	66.4	66.9	0.2
4	46.3	52.2	53.2	1.0	49.3	52.2	54.0	**0.8**
5	53.2	58.5	59.6	1.1	56.2	58.5	60.5	**0.9**
6	53.4	59.4	60.4	1.0	56.4	59.4	61.2	**0.8**
7	45.4	60.5	60.6	0.1	48.4	60.5	60.8	0.1
8	46.2	58.6	58.8	0.2	49.2	58.6	59.1	0.2
9	46.6	60.0	60.2	0.2	49.6	60.0	60.4	0.2
10	46.7	64.3	64.4	0.1	49.7	64.3	64.4	0.1
11	47.5	65.6	65.7	0.1	50.5	65.6	65.7	0.1
12	45.5	52.0	52.9	0.9	48.5	52.0	53.6	0.7
13	35.9	64.6	64.6	0.0	38.9	64.6	64.6	0.0
14	25.3	53.5	53.5	0.0	28.3	53.5	53.5	0.0
15	19.0	58.8	58.8	0.0	22.0	58.8	58.8	0.0
16	37.3	50.8	51.0	0.2	40.3	50.8	51.2	0.2
17	29.9	50.8	50.8	0.0	32.9	50.8	50.9	0.0
18	42.2	53.8	54.1	0.3	45.2	53.8	54.4	0.3

ALTERNATIVES ANALYSIS FOR ALTERNATIVE 7

SMVR Truck Route Calcs

Locatior	Trucks	Ambient	Total	Delta	Doubled Trucks	Ambien	Total	Non-Alternative Delta
1	40.9	67.5	67.5	0.0	43.9	67.5	67.5	0.0
2	36.5	54.9	54.9	0.0	39.5	54.9	55.0	0.1
3	31.8	59.9	59.9	0.0	34.8	59.9	59.9	0.0
4	46.7	65.4	65.5	0.1	49.7	65.4	65.5	0.0
5	42.6	67.9	67.8	-0.1	45.6	67.9	67.9	0.1
6	42.4	66.8	66.8	0.0	45.4	66.8	66.8	0.0
7	39.5	68.3	68.3	0.0	42.5	68.3	68.3	0.0
8	54.7	74.3	74.3	0.0	57.7	74.3	74.4	0.1
9	38.1	59.9	60	0.1	41.1	59.9	60.0	0.0
10	37.8	61.4	61.4	0.0	40.8	61.4	61.4	0.0
11	36.9	55.6	55.7	0.1	39.9	55.6	55.7	0.0
12	35.8	64.8	64.8	0.0	38.8	64.8	64.8	0.0
13	36.9	66.8	66.8	0.0	39.9	66.8	66.8	0.0
14	43.8	62	62.1	0.1	46.8	62.0	62.1	0.0
15	46.3	70.1	70.1	0.0	49.3	70.1	70.1	0.0
16	50.5	67.7	67.8	0.1	53.5	67.7	67.9	0.1
17	40.1	58.4	58.5	0.1	43.1	58.4	58.5	0.0
18	53.7	71.9	72	0.1	56.7	71.9	72.0	0.0
19	54.7	70.1	70.2	0.1	57.7	70.1	70.3	0.1
20	58.8	72.3	72.5	0.2	61.8	72.3	72.7	0.2
21	52.7	65.9	66.1	0.2	55.7	65.9	66.3	0.2
22	63.2	73.1	73.5	0.4	66.2	73.1	73.9	0.4
23	58.8	69.6	70	0.4	61.8	69.6	70.3	0.3

Appendix I

Vehicle Miles Traveled Calculations

DCPP Employee Commute Calculations

Zipcode	Distance to DCPP Gate (miles)	Existing Employees	Percent of Existing Employees in Zipcode	Phase 1 Employee Distribution	Phase 2 Employee Distribution	Employees per Vehicle (All Phases)	Existing Employee Vehicles (carpool adjusted)	Phase 1 Employee Vehicles (carpool adjusted)	Phase 2 Employee Vehicles (carpool adjusted)
93401	11.9	134	11.6%	100	31	1.4	93	69	21
93405	12.8	62	5.4%	46	14	1.4	43	32	10
93420	35.8	176	15.2%	131	41	1.4	122	91	28
93422	30.5	161	13.9%	120	37	1.4	111	83	26
93424	2.9	10	0.9%	7	2	1.4	7	5	1
93426	60.2	2	0.2%	1	0	1.4	1	1	0
93428	43.9	1	0.1%	1	0	1.4	1	1	0
93430	31.9	3	0.3%	2	1	1.4	2	1	1
93432	41.0	7	0.6%	5	2	1.4	5	3	1
93433	13.4	60	5.2%	45	14	1.4	42	31	10
93434	25.4	4	0.3%	3	1	1.4	3	2	1
93436	52.1	4	0.3%	3	1	1.4	3	2	1
93440	45.1	1	0.1%	1	0	1.4	1	1	0
93442	25.6	20	1.7%	15	5	1.4	14	10	3
93444	31.1	107	9.2%	80	25	1.4	74	55	17
93445	12.4	24	2.1%	18	6	1.4	17	12	4
93446	41.8	109	9.4%	81	25	1.4	75	56	17
93449	6.4	47	4.1%	35	11	1.4	33	24	8
93451	53.8	3	0.3%	2	1	1.4	2	1	1
93453	53.0	8	0.7%	6	2	1.4	6	4	1
93454	37.2	27	2.3%	20	6	1.4	19	14	4
93455	34.7	85	7.3%	63	20	1.4	59	44	14
93458	27.5	17	1.5%	13	4	1.4	12	9	3
93461	55.0	1	0.1%	1	0	1.4	1	1	0
93465	43.7	52	4.5%	39	12	1.4	36	27	8
93402	18.8	32	2.8%	24	7	1.4	22	17	5
TOTAL		**1157**		**862**	**268**		**804**	**596**	**185**

Zipcode	Existing Employee Round-Trip VMT (To DCPP Gate)	Existing Employee Round-Trip VMT (To DCPP)	Phase 1 Employee Round-Trip VMT (To DCPP Gate)	Phase 1 Employee Round-Trip VMT (To DCPP)	Phase 2 Employee Round-Trip VMT (To DCPP Gate)	Phase 2 Employee Round-Trip VMT (To DCPP)
93401	2213.4	3515.4	1642.2	2608.2	499.8	793.8
93405	1100.8	1702.8	819.2	1267.2	256	396
93420	8735.2	10443.2	6515.6	7789.6	2004.8	2396.8
93422	6771	8325	5063	6225	1586	1950
93424	40.6	138.6	29	99	5.8	19.8
93426	120.4	134.4	120.4	134.4	0	0
93428	87.8	101.8	87.8	101.8	0	0
93430	127.6	155.6	63.8	77.8	63.8	77.8
93432	410	480	246	288	82	96
93433	1125.6	1713.6	830.8	1264.8	268	408
93434	152.4	194.4	101.6	129.6	50.8	64.8
93436	312.6	354.6	208.4	236.4	104.2	118.2
93440	90.2	104.2	90.2	104.2	0	0
93442	716.8	912.8	512	652	153.6	195.6
93444	4602.8	5638.8	3421	4191	1057.4	1295.4
93445	421.6	659.6	297.6	465.6	99.2	155.2
93446	6270	7320	4681.6	5465.6	1421.2	1659.2
93449	422.4	884.4	307.2	643.2	102.4	214.4
93451	215.2	243.2	107.6	121.6	107.6	121.6
93453	636	720	424	480	106	120
93454	1413.6	1679.6	1041.6	1237.6	297.6	353.6
93455	4094.6	4920.6	3053.6	3669.6	971.6	1167.6
93458	660	828	495	621	165	207
93461	110	124	110	124	0	0
93465	3146.4	3650.4	2359.8	2737.8	699.2	811.2
93402	827.2	1135.2	639.2	877.2	188	258
TOTAL	**44824.2**	**56080.2**	**33268.2**	**41612.2**	**10290**	**12880**
Per Employee	38.7	48.5	38.6	48.3	38.4	48.1

Truck VMT Calculations

Mode	Destination	Miles per Trip	Round Trip Miles	Phase 1 VMT	Phase 2 VMT
Direct Truck	Nevada (US Ecology)	500	1000	257000	20000
Direct Truck	Texas (Andrews)	1229	2458	24580	0
Direct Truck	Port of Long Beach or Utah (Salt Lake City)	886	1772	0	74424
Direct Truck	Utah (Clive)	881	1762	7048	0
Direct Truck	Arizona (La Paz)	471	942	0	56520
Direct Truck or Truck to Rail	Utah (Clive) or Texas (Andrews)	1229	2458	49160	0
Direct Transport Vehicle or Truck to Rail	Utah (Clive) or Texas (Andrews)	1229	2458	103236	0
Direct Truck	Utah (Clive) or Texas (Andrews)	1229	2458	142564	0
Truck to Rail	Santa Maria Valley Railyards	39	77	2864	0
Direct Truck	Topsoil Trucks to DCPP Site	84	168	0	296032

DIRECT TRUCK

Phase	Years	Weeks	Working Days	Phase VMT	Phase VMT per Working Day	Number of Truck Trips	Daily Truck Round Trips
Phase 1	7	364	1456	586452	402.78	391	0.27
Phase 2	7	364	1456	446976	306.99	1,882	1.29

TRUCK TO RAIL

Phase	Years	Weeks	Working Days	Phase VMT	Phase VMT per Working Day	Number of Truck Trips	Daily Truck Round Trips
Phase 1	7	364	1456	2864	1.97	37	0.03
Phase 2	7	364	1456	0	0.00	0	0

Alternative 7 DCPP Employee Commute Calculations

Zipcode	Distance to DCPP Gate (miles)	Existing Employees	Percent of Existing Employees in Zipcode	Phase 1 Employee Distribution	Alternative 7 (including Phase 2) Employee Distribution	Employees per Vehicle (All Phases)	Existing Employee Vehicles (carpool adjusted)	Phase 1 Employee Vehicles (carpool adjusted)	Alternative 7 (Including Phase 2) Employee Vehicles (carpool adjusted)
93401	11.9	134	11.6%	100	65	1.4	93	69	45
93405	12.8	62	5.4%	46	30	1.4	43	32	21
93420	35.8	176	15.2%	131	85	1.4	122	91	59
93422	30.5	161	13.9%	120	78	1.4	111	83	54
93424	2.9	10	0.9%	7	5	1.4	7	5	3
93426	60.2	2	0.2%	1	1	1.4	1	1	1
93428	43.9	1	0.1%	1	0	1.4	1	1	0
93430	31.9	3	0.3%	2	1	1.4	2	1	1
93432	41.0	7	0.6%	5	3	1.4	5	3	2
93433	13.4	60	5.2%	45	29	1.4	42	31	20
93434	25.4	4	0.3%	3	2	1.4	3	2	1
93436	52.1	4	0.3%	3	2	1.4	3	2	1
93440	45.1	1	0.1%	1	0	1.4	1	1	0
93442	25.6	20	1.7%	15	10	1.4	14	10	7
93444	31.1	107	9.2%	80	52	1.4	74	55	36
93445	12.4	24	2.1%	18	12	1.4	17	12	8
93446	41.8	109	9.4%	81	53	1.4	75	56	37
93449	6.4	47	4.1%	35	23	1.4	33	24	16
93451	53.8	3	0.3%	2	1	1.4	2	1	1
93453	53.0	8	0.7%	6	4	1.4	6	4	3
93454	37.2	27	2.3%	20	13	1.4	19	14	9
93455	34.7	85	7.3%	63	41	1.4	59	44	28
93458	27.5	17	1.5%	13	8	1.4	12	9	6
93461	55.0	1	0.1%	1	1	1.4	1	1	1
93465	43.7	52	4.5%	39	26	1.4	36	27	18
93402	18.8	32	2.8%	24	15	1.4	22	17	10
TOTAL		**1157**		**862**	**560**		**804**	**596**	**388**

Zipcode	Existing Employee Round-Trip VMT (To DCPP Gate)	Existing Employee Round-Trip VMT (To DCPP)	Phase 1 Employee Round-Trip VMT (To DCPP Gate)	Phase 1 Employee Round-Trip VMT (To DCPP)	Alternative 7 (Including Phase 2) Round Trip VMT (To DCPP Gate)	Alternative 7 (Including Phase 2) Round Trip VMT (To DCPP)
93401	2213.4	3515.4	1642.2	2608.2	1071	1701
93405	1100.8	1702.8	819.2	1267.2	537.6	831.6
93420	8735.2	10443.2	6515.6	7789.6	4224.4	5050.4
93422	6771	8325	5063	6225	3294	4050
93424	40.6	138.6	29	99	17.4	59.4
93426	120.4	134.4	120.4	134.4	120.4	134.4
93428	87.8	101.8	87.8	101.8	0	0
93430	127.6	155.6	63.8	77.8	63.8	77.8
93432	410	480	246	288	164	192
93433	1125.6	1713.6	830.8	1264.8	536	816
93434	152.4	194.4	101.6	129.6	50.8	64.8
93436	312.6	354.6	208.4	236.4	104.2	118.2
93440	90.2	104.2	90.2	104.2	0	0
93442	716.8	912.8	512	652	358.4	456.4
93444	4602.8	5638.8	3421	4191	2239.2	2743.2
93445	421.6	659.6	297.6	465.6	198.4	310.4
93446	6270	7320	4681.6	5465.6	3093.2	3611.2
93449	422.4	884.4	307.2	643.2	204.8	428.8
93451	215.2	243.2	107.6	121.6	107.6	121.6
93453	636	720	424	480	318	360
93454	1413.6	1679.6	1041.6	1237.6	669.6	795.6
93455	4094.6	4920.6	3053.6	3669.6	1943.2	2335.2
93458	660	828	495	621	330	414
93461	110	124	110	124	110	124
93465	3146.4	3650.4	2359.8	2737.8	1573.2	1825.2
93402	827.2	1135.2	639.2	877.2	376	516
TOTAL	**44824.2**	**56080.2**	**33268.2**	**41612.2**	**21705.2**	**27137.2**
Per Employee	38.7	48.5	38.6	48.3	38.8	48.5

Alternative 7 Truck VMT Calculations

Mode	Destination	Miles per Trip	Round Trip Miles	Phase 1 VMT	Phase 2 VMT	Alternative 7 Phase 1 VMT	Alternative 2 Phase 1 VMT
Direct Truck	Nevada (US Ecology)	500	1,000	257,000	20,000	-	-
Direct Truck	Texas (Andrews)	1,229	2,458	24,580	-	-	-
Direct Truck	Port of Long Beach or Utah (Salt Lake City)	886	1,772	-	74,424	-	-
Direct Truck	Utah (Clive)	881	1,762	7,048	-	-	-
Direct Truck	Arizona (La Paz)	471	942	-	56,520	-	-
Direct Truck or Truck to Rail	Utah (Clive) or Texas (Andrews)	1,229	2,458	49,160	-	-	-
Direct Transport Vehicle or Truck to Rail	Utah (Clive) or Texas (Andrews)	1,229	2,458	103,236	-	-	-
Direct Truck	Utah (Clive) or Texas (Andrews)	1,229	2,458	142,564	-	-	-
Truck to Rail	Santa Maria Valley Railyards	39	77	2,864	-	-	-
Direct Truck	Topsoil Trucks to DCPP Site	84	168	-	296,032	-	-
Direct Truck	Las Vegas, NV	440	880	-	-	3,534,080	10,043,440
Direct Truck	LaPaz, AZ	463	926	-	-	610,234	13,553,862
Direct Truck	Beatty, NV	426	851	-	-	851	-
Direct Truck	Los Angeles, CA	200	400	-	-	75,799	-
Direct Truck	Concrete Cap Movement	50	100	-	-	29,171	-
Direct Truck	Fill Material Movement	0.002	0.005	-	-	20	-

DIRECT TRUCK

Phase	Years	Weeks	Working Days	Phase VMT	Phase VMT per Working Day	Number of Truck Trips	Daily Truck Round Trips
Phase 1	7	364	1456	586,452	402.78	391	0.27
Phase 2	7	364	1456	446,976	306.99	1,882	1.29
Phase 1 (with Alternative 7)	4	208	832	3,044,958	5,743.54	9,839	11.83
Phase 2 (with Alternative 7)	5	260	1040	13,808,605	23,119.50	27,932	26.86

TRUCK TO RAIL

Phase	Years	Weeks	Working Days	Phase VMT	Phase VMT per Working Day	Number of Truck Trips	Daily Truck Round Trips
Phase 1	7	364	1456	2864	1.97	37	0.03
Phase 2	7	364	1456	0	0.00	0	0
Phase 1 (with Alternative 7)	4	208	832	0	0.00	0	0
Phase 2 (with Alternative 7)	5	260	1040	0	0.00	0	0