Chapter 7
Response to Comments

SCH# 2022030180

Volume 3

CARBON TERRAVAULT I (KERN COUNTY)

by California Resources Corporation *(PP22405)*

Kern County
Planning and Natural Resources Department
Bakersfield, California

August 2024

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PLANNING AND NATURAL RESOURCES DEPARTMENT

Planning
Community Development
Administrative Operations

August 30, 2024

FILE: ZCC No. 5, Map 119; ZCC No. 4, Map 120;
CUP No. 13, Map 118; CUP No. 14, Map 118;
CUP No. 5, Map 119; CUP No. 6, Map 119;
CUP No. 3, Map 120; CUP No. 2, Map 138
S.D.: #4 - Couch

Addressee List (See Distribution List)

Response to Comments for the Draft Recirculated Environmental Impact Report (DREIR) to the Carbon TerraVault I (Kern County) Project by California Resources Corporation (CRC) (PP22405)(SCH#2022030180)

Dear Interested Party,

This is to advise that the Kern County Planning and Natural Resources Department has prepared a document entitled Volume 3 – Chapter 7 – Response to Comments, for the above referenced proposed project. Section 15088 of the California Environmental Quality Act (CEQA) Guidelines requires the Lead Agency to evaluate comments on environmental issues received from persons who reviewed the DREIR and prepared written responses addressing each comment. This document has been posted with the Kern County Clerk and provided to commenting agencies and interested parties by mail at least 10 days prior to the scheduled Planning Commission Hearing.

This document is Chapter 7 of the Final Recirculated Environmental Impact Report (FREIR) and is available for review at the Planning and Natural Resources Department, which is located at 2700 "M" Street, Suite 100, Bakersfield, CA 93301 or on the Department website at: https://kernplanning.com/environmental-doc/carbon-terravault-1-kerncounty

A public hearing has been scheduled with the Kern County Planning Commission to consider this request on September 12, 2024 at 7:00 p.m., or soon thereafter, at the Chambers of the Board of Supervisors, First Floor, Kern County Administrative Center, 1115 Truxtun Avenue, Bakersfield, California.

Thank you for your participation in the environmental process for this proposed project. If you have any questions, please do not hesitate to contact me at (661) 862-5015 or via email at AlvidrezK@kerncounty.com.

Sincerely,

Keith Alvidrez

Keith Alvidrez, Planner II
Planning and Natural Resources Department

Commenting Agencies and Interested Persons: California Department of Fish and Wildlife; Kern County Fire Department; Earthjustice; Center of Biological Diversity; PG&E; San Manuel Nation; Twenty-Nine Palms Band of Mission Indians; Alissa Reed: Diane Marks: Emmanuel V. Campos; Erika Sanchez; George Harmer; International Brotherhood of Electrical Workers; Ironworker Local 433; Jason Hodgson; John Neumann; Les Clark; Samantha Harp; Teena Crabtree; Southern California Gas Company; Friends of the Earth; Last Chance Alliance

Carbon TerraVault I (Kern County)
RTC Notification List

CA Department of Fish & Wildlife
1234 East Shaw Avenue
Fresno, CA, 93710

Kern County Fire Department
2820 M Street
Bakersfield, CA 93301

Earthjustice
50 California Street, Suite 500,
San Francisco, CA, 94111

Center of Biological Diversity
1212 Broadway, Suite 800
Oakland CA 94612

Pacific Gas and Electric Company
850 Stillwater Road
West Sacramento, CA 95605

San Manuel Nation
26569 Community Center Drive
Highland, CA, 92346

Twenty-Nine Palms Band of Mission Indians
46-200 Harrison Place
Coachella, CA 92236

Building and Construction Trades Council
Attn: Alissa Reed
1730 18th Street, Box 1197
Bakersfield, CA 93302

Diane Marks
728 Caroline Street
Port Angeles, WA 98362-3502

Emmanuel V. Campos
513 Hilltop Court
Taft, CA 93268

Erika Sanchez

George Harmer
422 Palm Street
Taft, CA 93268

International Brotherhood Electrical Workers
Attn: Brian Hold
3921 Sillect Avenue
Bakersfield, CA 93308

Ironworkers Local 433
Attn: Rene Palacios
17495 Hurley Street East
City of Industry, CA 91744

Jason Hodgson
701 Wildcat Way
Taft, CA 93268

Accelerated Environmental Services
Attn: John Neuman
814 Center Street
Taft, CA 93268-3129

West Side Recreation & Park District
Attn: Les Clark
500 Cascade Place
Taft, CA 93268

Samantha Harp

West Side Recreation & Park District
Attn: Teena Crabtree
500 Cascade Place
Taft, CA 93268

Southern California Gas Co.
9400 Oakdale Ave
Chatsworth, CA 91311

Friends of the Earth
PO Box 7010
Merrifield, VA 22116-7010

Last Change Alliance
Attn: Woody Little
5600 Picardy Dr N
Oakland, CA 94605

Notice of Completion & Environmental Document Transmittal

Mail to: State Clearinghouse, P. O. Box 3044, Sacramento, CA 95812-3044 (916) 445-0613
For Hand Delivery/Street Address: 1400 Tenth Street, Sacramento, CA 95814

SCH # 2022030180

Project Title: Recirculated EIR Carbon TerraVault I (Kern County) by California Resources Corporation (CRC)

Lead Agency: Kern County Planning and Natural Resources Department — Contact Person: Keith Alvidrez

Mailing Address: 2700 "M" Street Suite 100 — Phone: (661) 862-5015

City: Bakersfield — Zip: 93301 — County: Kern

Project Location: County: Kern — City/Nearest Community: City of Taft, Community of Buttonwillow

Cross Streets: Skyline Road and Elk Hills Road — Zip Code: 93251

Lat. / Long.: 35° 19.51567' N, 119° 31.11937' W — Total Acres: 9,104

Assessor's Parcel No.: Multi — Section: Multi — Twp.: Multi — Range: Multi — Base: MDB&M

Within 2 Miles: State Hwy #: 58 W — Waterways: California Aqueduct

Airports: Elk Hills – Buttonwillow Airport — Railways: N/A — Schools: N/A

Document Type:

CEQA: ☐ NOP ☐ Early Cons ☐ Neg Dec ☐ Mit Neg Dec ☐ Draft EIR ☐ Supplement/Subsequent EIR (Prior SCH No.) ☐ Other Response to Comments / FREIR

NEPA: ☐ NOI ☐ EA ☐ Draft EIS ☐ FONSI

Other: ☐ Joint Document ☐ Final Document ☐ Other

Local Action Type:

☐ General Plan Update ☐ General Plan Amendment ☐ General Plan Element ☐ Community Plan
☐ Specific Plan ☐ Master Plan ☐ Planned Unit Development ☐ Site Plan
☒ Rezone ☐ Prezone ☒ Use Permit ☐ Land Division (Subdivision, etc.)
☐ Annexation ☐ Redevelopment ☐ Coastal Permit ☐ Other:

Development Type:

☐ Residential: Units ____ Acres ____
☐ Office: Sq.ft. ____ Acres ____ Employees ____
☐ Commercial: Sq.ft. ____ Acres ____ Employees ____
☐ Industrial: Sq.ft. ____ Acres ____ Employees ____
☐ Educational ____
☐ Recreational ____
☐ Water Facilities: Type ____ MGD ____
☐ Transportation: Type ____
☐ Mining: Mineral ____
☐ Power: Type ____ MW ____
☐ Waste Treatment: Type ____ MGD ____
☐ Hazardous Waste: Type ____
☒ Other: Carbon Capture and Storage and initial source

Project Issues Discussed in Document:

☒ Aesthetic/Visual
☒ Agricultural Land
☒ Air Quality
☒ Archeological/Historical
☒ Biological Resources
☐ Coastal Zone
☒ Drainage/Absorption
☒ Economic/Jobs
☐ Fiscal
☒ Flood Plain/Flooding
☒ Forest Land/Fire Hazard
☒ Geologic/Seismic
☒ Minerals
☒ Noise
☒ Population/Housing Balance
☒ Public Services/Facilities
☒ Recreation/Parks
☒ Schools/Universities
☒ Septic Systems
☒ Sewer Capacity
☒ Soil Erosion/Compaction/Grading
☒ Solid Waste
☒ Toxic/Hazardous
☒ Traffic/Circulation
☒ Vegetation
☒ Water Quality
☒ Water Supply/Groundwater
☒ Wetland/Riparian
☒ Wildlife
☒ Growth Inducing
☒ Land Use
☒ Cumulative Effects
☒ Other GHG, Wildfire, Tribal Cultural Resources, Energy

Present Land Use/Zoning/General Plan Designation: Oil and Gas Exploration and Production/*Zoning:* A (Exclusive Agriculture); A-1 (Limited Agriculture)/*General Plan:* 8.3 (Extensive Agriculture); 8.3/2.1 (Extensive Agriculture & Seismic Hazard Overlay); 8.4 (Mineral and Petroleum); and 8.4/2.4 (Mineral and Petroleum & Steep Slope).

Project Description: A proposed CCS facility for permanent underground storage of up to 48 million tons of CO_2 in two reservoir formations on approximately 9,104 surface acres in the Elk Hills Oilfield in unincorporated Kern County and the related initial source for the capture of CO_2. The land acreages of the CCS Land Surface Area, which comprises the Conditional Use Permit being considered, has been reduced from the original 9,130 acres to 9, 104 acres through changes in the location of the facility onsite pipeline. The initial source of CO_2 is the pre-combustion oilfield gas from infield locations, including uses associated with the existing Elk Hills Power Plant. Maximum injection per year from future sources would be up to 2, 210,000 tons per year divided between the two formations (R-26 and A1-A-2). The facility consists of an underground pore space, approved by the EPA as the "area of review" where CO_2 will become permanently mineralized into rock, the CCS Surface Land Area over the underground storage area where limited uses will be permitted, approval of six (6) EPA Class VI UIC wells, conversion and creation of wells for CO_2 leak monitoring and seismic activity, approximately 11 miles of facility and injection underground pipeline for capture of pre-combustion gas, and the related infrastructure improvements for the capture, transfer, and permanent storage of CO_2.

Reviewing Agencies Checklist

Lead Agencies may recommend State Clearinghouse distribution by marking agencies below with and "**X**".
If you have already sent your document to the agency, please denote that with an "**S**".

_____ Air Resources Board	_____ Office of Emergency Services
_____ Boating & Waterways, Department of	_____ Office of Historic Preservation
_____ California Highway Patrol	_____ Office of Public School Construction
_____ CalFire	_____ Parks & Recreation
_____ Caltrans District # _____	_____ Pesticide Regulation, Department of
_____ Caltrans Division of Aeronautics	_____ Public Utilities Commission
_____ Caltrans Planning (Headquarters)	_____ Regional WQCB # _____
_____ Central Valley Flood Protection Board	_____ Resources Agency
_____ Coachella Valley Mountains Conservancy	_____ S.F. Bay Conservation & Development Commission
_____ Coastal Commission	_____ San Gabriel & Lower L.A. Rivers and Mtns Conservancy
_____ Colorado River Board	_____ San Joaquin River Conservancy
_____ Conservation, Department of	_____ Santa Monica Mountains Conservancy
_____ Corrections, Department of	_____ State Lands Commission
_____ Delta Protection Commission	_____ SWRCB: Clean Water Grants
_____ Education, Department of	_____ SWRCB: Water Quality
_____ Energy Commission	_____ SWRCB: Water Rights
S Fish & Game Region # Fresno	_____ Tahoe Regional Planning Agency
_____ Food & Agriculture, Department of	_____ Toxic Substances Control, Department of
_____ General Services, Department of	_____ Water Resources, Department of
_____ Health Services, Department of	
_____ Housing & Community Development	_____ Other _____
_____ Integrated Waste Management Board	_____ Other _____
_____ Native American Heritage Commission	

Local Public Review Period (to be filled in by lead agency)

Starting Date August 30, 2024 Ending Date September 30, 2024

Lead Agency (Complete if applicable):

Consulting Firm: _____	Applicant: _____
Address: _____	Address: _____
City/State/Zip: _____	City/State/Zip: _____
Contact: _____	Phone _____
Phone: _____	

Signature of Lead Agency Representative: _____**/s/**_____ **Date:** 8/30/2024

Keith Alvidrez, Planner II

Authority cited: Section 21083, Public Resources Code. Reference: Section 21161, Public Resources Code.

Chapter 7
Response to Comments

SCH# 2022030180

Volume 3

CARBON TERRAVAULT I (KERN COUNTY)

by California Resources Corporation *(PP22405)*

Kern County Planning and Natural Resources Department
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August 2024

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Appendix D Earthjustice References

Acronyms and Abbreviations

ACS	American Community Survey
AEWSD	Arvin-Edison Water Storage District
AFY	acre-feet per year
ANT Report	*ANT Proposal: Emissions Validation and Mitigation Menu*
ASF	age sensitivity factor
Bbl	barrel
Brown Act	Ralph M. Brown Act
BTEX	benzene, toluene, ethylbenzene, and xylene
CA	California
CAAQS	California Ambient Air Quality Standards
CalGEM	California Geologic Energy Management Division
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CCST	California Council on Science and Technology
CEQA	California Environmental Quality Act
CNEL	community noise equivalent level
County	Kern County Planning and Natural Resources Department
CRC	California Resources Corporation
CSU	California State
CUP	Conditional Use Permit
CVRWQCB	Central Valley Regional Water Quality Control Board
CWD	Cawelo Water District
dB	decibels
Department	Kern County Planning and Natural Resources Department
DNL	day-night average level; *also* L_{dn}
DOF	California Department of Finance
DOGGR	California Division of Oil, Gas, and Geothermal Resources (now CalGEM)
DPM	diesel particulate matter
EIR	Environmental Impact Report
EO	Executive Order
EOR	enhanced oil recovery

EPA	U.S. Environmental Protection Agency
ERA	Emission Reduction Agreement
ERC	Emission Reduction Credit
EWMA	Eastside Water Management Area
FS	feasibility study
FTA	FracTracker Alliance
GAMAQI	*Final Draft Guidance for Assessing and Mitigating Air Quality Impacts* (Feb. 19, 2015)
General Plan	Kern County General Plan
GR	Global Response
GSA	Groundwater Sustainability Agency
GSP	Groundwater Sustainability Plan
HAP	hazardous air pollutant
HARP2	Hotspots Analysis and Reporting Program, Version 2
HP	horsepower
HRA	Health Risk Assessment
ISR	Indirect Source Rule
K	Kelvins
km	kilometer
KTWD	Kern-Tulare Water District
lbs/hr	pounds per hour
lbs/yr	pounds per year
L_{dn}	day-night average sound level; *also*
L_{eq}	equivalent continuous sound pressure level
m^3	cubic meters
M&I	Municipal and Industrial
MM	Mitigation Measure
MMBtu/hr	million British thermal units per hour
MMRP	Mitigation, Monitoring, and Reporting Program
MRP	Monitoring and Reporting Program
NAAQS	National Ambient Air Quality Standards
NKWD	North Kern Water District
NO_X	oxides of nitrogen

NSR	New Source Review
OEHHA	Office of Environmental Health Hazards Agency
OGD	oil and gas development
OG-ERA	Oil and Gas Emission Reduction Agreement
OPNGAS	City of Los Angeles, Department of Public Works, Office of Petroleum and Natural Gas Administration and Safety
OPR	Office of Planning and Research
Ordinance	Kern County Zoning Ordinance
PAH	polycyclic aromatic hydrocarbon
PHMSA	Pipeline and Hazardous Materials Safety Administration
PM	particulate matter
PM_{10}	particulate matter up to 10 microns in diameter
$PM_{2.5}$	particulate matter up to 2.5 microns in diameter
POWER	*Protecting Our Water and Environmental Resources v. County of Stanislaus* (2020) Case No. S251709, 10 Cal.5th 479
Project	Amendment to Chapter 19.98 (Oil and Gas Production) of the Kern County Zoning Ordinance
REL	Reference Exposure Level
ROG	reactive organic gases
SB	Senate Bill
SEIR	Supplemental Environmental Impact Report
SEL	sound exposure level
SCAQMD	South Coast Air Quality Management District
SGMA	Sustainable Groundwater Management Act
SJVAB	San Joaquin Valley Air Basin
SJVAPCD	San Joaquin Valley Air Pollution Control District
SPAL	Small Project Analysis Level
SREIR	Supplemental Recirculated Environmental Impact Report
SWID	Shafter-Wasco Irrigation District
SWRCB	State Water Resources Control Board
TAC	toxic air contaminant
TDS	total dissolved solids
TEOR	thermally enhanced oil recovery equipment
tpy	tons per year

UIC	Underground Injection Control
VERA	Voluntary Emission Reduction Agreement
VOC	volatile organic compound
WDR	Waste Discharge Requirement
WDWA	Westside District Water Authority
WST	well stimulation treatment

Chapter 7

Response to Comments

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Chapter 7

Response to Comments

7.1 Introduction

7.1.1 Purpose

As defined by Section 15050 of the California Environmental Quality Act (CEQA) Guidelines, the Kern County Planning and Natural Resources Department is serving as "Lead Agency" for preparation of the Final Recirculated Environmental Impact Report (REIR) for the Carbon TerraVault I (Kern County) Project (CTV I) proposed by California Resources Corporation (CRC, or project proponent). The Final REIR presents the environmental information and analyses that have been prepared for the Project, including comments received addressing the adequacy of the Draft REIR, and responses to those comments. The Draft REIR was circulated for a 45-day public review period. All comments have been included and responses provided for the circulation. In addition to the responses to comments, clarifications, corrections, or revisions have been made to the Draft REIR and are included in this Chapter 7, Response to Comments. The Final REIR, which includes the responses to comments, the Draft REIR, and the Mitigation Monitoring Program, will be used by the Planning Commission and Board of Supervisors in the decision making process for the Project.

7.1.2 Public Process

Kern County prepared and circulated an Initial Study (IS)/Notice of Preparation (NOP) to the responsible agencies, trustee agencies, and local agencies as well as other interested parties for review and comment beginning on March 4, 2022, and ending on April 4, 2022. In conjunction with this public notice, Kern County hosted a scoping meeting on March 18, 2022, at the KCPNR, located at 2700 "M" Street, Suite 100, Bakersfield, California. The purpose of the meeting was to introduce the Project and to solicit input from agencies, organizations, and other interested parties regarding the proposed Project, alternatives, mitigation measures, and environmental impacts to be analyzed in the EIR. Comments received during the 30-day review period were used in the preparation of the Draft EIR. During the March 18, 2022, scoping meeting, no members of the public were present, and no testimony was given. The IS/NOP, scoping meeting, and community workshop materials, comment letters received, and a complete summary of all scoping comments are included as Appendix A of the Draft EIR.

A Draft EIR was prepared, incorporating public and agency responses to the IS/NOP and the scoping process. The Draft EIR was circulated for review and comment to appropriate agencies and additional individuals and interest groups who have requested to be notified of EIR projects. Per Section 15105 of the *CEQA Guidelines*, Kern County provided for a 45-day public review period on the Draft EIR. With mutual agreement between the local agency and project applicant,

the circulation period for public review of the EIR was extended to a 72-day period, beginning December 19, 2023, and ending March 1, 2024. Within this timeframe, both in-person and online informational workshops were made available to surrounding communities. Meeting materials were made available in both English and Spanish. One in-person workshop was held in the City of Taft, and two in-person workshops were held in the unincorporated community of Buttonwillow. One virtual workshop was provided for community members with internet access.

A total of 17 verbal comments were received during the public workshops described above. Additionally, the County received 24 letters with substantive comments in response to the Draft EIR. A summary of all comments and copies of all comment letters received during the Draft EIR circulation are included in Appendix A of the Draft REIR.

County staff has determined, following a review of the written comments and release of the EPA Class VI Permit for Reservoir 26R, that changes should be made in the previously circulated Draft EIR. CEQA Guidelines Section 15088.5 (f)(1) provide that when an EIR is revised and the entire EIR is circulated, Kern County, as the lead agency, may require reviewers to submit new comments, and the lead agency need not respond to comments received during an earlier circulation period. Per Section 15105 of the *CEQA Guidelines*, Kern County provided for a 45-day public review period on the Draft REIR, which began on June 4, 2024 and ended July 18, 2024.

7.1.3 Revised Summary of Impacts, Mitigation Measures, and Significance Conclusions and Errata

The following section includes a listing of all errata/revisions made to the text of the Draft Recirculated Environmental Impact Report (DREIR). Amended text is identified by page number. Additions to the DREIR test are shown with <u>underline</u> and text removed from the DREIR is shown with ~~strikethrough~~. The errata/revisions as outlined below, fall within the scope of the original project analysis included in the DREIR and do not result in an increase to any identified impacts or produce any new impacts. No new significant environmental impacts would result from the changes. Therefore, no significant revisions have been made which would require recirculation of the DREIR pursuant to CEQA Guideline 15088.5 (Recirculation of an EIR Prior to Certification).

Chapter 1 Executive Summary, Page 1-1

The DREIR is revised to implement the following revision in Chapter 1, Executive Summary and all other applicable locations throughout the DREIR.

Corporation (CRC, or project proponent) would request the approval of multiple Conditional Use Permits (CUPs) (CUP No. 13 Map No. 118, CUP No. 14 Map No. 118, CUP No. 5 Map 119, CUP No. 6 Map 119, CUP No. 3, Map 120, and CUP No. 2 Map No. 138) for the construction and operation of an approximately 9,104-acre carbon capture and storage (CCS) facility with related capture facilities and pipeline for the initial source and request associated Zone Change Case (ZCC) No. 5, Map 119 and ZCC No. 4, Map 120 from A-1 (Limited Agriculture) to A (Exclusive Agriculture) on approximately ~~6,160~~ 6,132 acres.

Chapter 2 Introduction, Page 2-2

The CO_2 would be injected into the identified geographically confined reservoirs for storage~~, becoming part of the rock through mineralization in perpetuity~~.

Chapter 2 Introduction, Page 2-3

The RDEIR incorporates the following primary substantive changes to the original DEIR released on December 19, 2023, as follows:

Volume 1

- Section 1.0, Executive Summary – description of recirculation, clarification of project objectives
- Section 2.0, Introduction – description of recirculation and previous circulation
- Section 3.0, Project Description – clarification of project objectives, addition of "Future Sources – Identification", projects added to Table 3-8, Cumulative Projects list
- Section 4.3, Air Quality – addition of Mitigation Measure 4.3-5, renumbering subsequent mitigation measures
- Section 4.4, Biological Resources – addition of Mitigation Measures 4.4-14 and 4.4-15, renumbering subsequent mitigation measures
- Section 4.7, Geology and Soils – additional discussion in Impact 4.7-1
- Section 4.13, Noise – correction of Impact 4.13-4 level of significance after mitigation to significant and unavoidable

Volume 2

- Appendix B – 4 Co_2 Dispersion Modeling
- Appendix E – US Environmental Protection Agency Class VI Underground Injection Storage Project and the A1A2 Storage Project (applications available at the time of recirculation)
- Appendix K – addition of Appendix K-4, "Source Identification Memo"

Chapter 3 Project Description, Page 3-10

The applicant for the CarbonFrontier CCS Project is Aera Energy, LLC. On February 7, 2024, California Resources Corporation (CRC) announced the signing of a definitive merger agreement with Aera Energy, LLC. CRC is the applicant for the Carbon TerraVault 1 (Kern County) CCS Project in the Elk Hills oilfield, which is approximately 9 miles southeast from the CarbonFrontier CCS Surface Land use boundary, also in unincorporated Kern County. The Carbon TerraVault 1 (Kern County) CCS Project is in process of consideration for various land use permits, EPA permits, and a Draft Recirculated EIR (SCH # 2022030180) Carbon TerraVault I (Kern County) CCS Project by California Resources Corporation - Kern County Planning & Natural Resources Department. Both projects are being processed separately, have no shared facilities and are not dependent on the other for operations. They are both included in the respective cumulative impact list in each individual EIR. Common ownership of the projects, if the merger is finalized, is not sufficient evidence under the California Environmental Quality Act (CEQA) for a determination the projects are connected. There is no evidence or permitting on record that changes either project based on the announced tentative merger.

Chapter 3 Project Description, Page 3-38

It is anticipated that ~~diesel heavy heavy-duty trucks~~ the operation and maintenance phase of the CO_2 Compression and Pumping Facility will generate approximately ~~would make 40~~ 20 trips per day following the access routes designated for travel.

Chapter 3 Project Description, Page 3-42

The injection and monitoring well for the underground storage are in the EPA Class VI UIC permit would have specific requirements for decommissioning as well as continued monitoring and bonding for the long-term oversight of the ~~mineralized~~ CO_2 storage space.

Chapter 4 Environmental Setting, Impacts, and Mitigation Measures, Page 4.1-27-4.20-9

The RDEIR is revised to insert the following text in each "Cumulative Setting" section immediately following the paragraph beginning either "The documents provide…" or "The aforementioned documents provide…":

Other potential future CO_2 source projects are insufficiently definite for a detailed assessment of their contribution to potentially significant cumulative impacts. In addition, it is not certain what other sources are likely to contribute CO_2 for storage at the Project and there are no currently

operational CCS projects in California on which to base a more concrete analysis of CO_2 source impacts. The extent of contributions to cumulative impacts from these projects are dependent on many variables and are not knowable at this time. However, any such project in the County would be accompanied by a separate CUP and associated environmental review process. It is reasonably anticipated that these future projects would be sited consistent with zoning and land use controls, would comply with all applicable federal, state, and local regulations, and would implement mitigation measures to minimize or avoid environmental impacts. As a result, these source projects are anticipated to result in impacts typical of similar scale development projects.

Section 4.1 Aesthetics and Visual Resources, Page 4.1-27

As discussed above, there is uncertainty regarding potential future CO_2 source projects, including the exact location and nature of any such facilities and whether they would be new facilities or utilize existing facilities requiring modification. It is generally anticipated that these facilities would be located within areas of consistent zoning for similarly scaled land uses, thus limiting impacts to aesthetic resources. However, construction and operation of these facilities nonetheless has the potential to introduce or increase features such as heavy equipment or buildings that could degrade the visual character of their surroundings. The extent of contribution to the visual impacts from potential future CO_2 source projects would depend on many variables that are not knowable at this time. Such CO_2 source projects will be subject to their own permitting and environmental review.

Section 4.2 Agricultural and Forest Resources, Page 4.2-17

As discussed above, there is uncertainty regarding potential future CO_2 source projects, including the exact location and nature of any such facilities and whether they would be new facilities or utilize existing facilities requiring modification. Depending on siting, these facilities have the potential to result in conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, Williamson Act conservation contracts, or forest land or timberland, resulting in impacts to these resources. The extent of contribution to these impacts from potential future CO_2 source projects would depend on many variables that are not knowable at this time. Such CO_2 source projects will be subject to their own permitting and environmental review.

Section 4.3 Air Quality, Page 4.3-77

Regarding impacts to air quality, the project has the potential to contribute to cumulative impacts within the region. A complete analysis and evidence for the record of the cumulative impacts on air quality of the various activities from oil and gas are provided 4.3, *Air Quality*, of the Oil and Gas EIR.

As discussed above, there is uncertainty regarding potential future CO_2 source projects, including the exact location and nature of any such facilities and whether they would be new facilities or utilize existing facilities requiring modification. It is generally anticipated that these facilities would be located within areas of consistent zoning for similarly scaled land uses, thus limiting impacts to sensitive receptors. However, construction and operation of these facilities nonetheless has the potential to result in increases in criteria air pollutants and toxic air contaminants in the vicinity of such operations, as well as potentially offensive odors near sensitive receptors. The extent of contribution to these impacts from potential future CO_2 source projects would depend on many

variables that are not knowable at this time. Such CO_2 source projects will be subject to their own permitting and environmental review.

Section 4.4 Biological Resources, Page 4.4-53

MM 4.4-6 Any potential San Joaquin kit fox dens (as defined in United States Fish and Wildlife Service 2011) detected during reconnaissance or focused/protocol surveys shall be reevaluated by the qualified biologist for species activity no more than 30 days prior to the commencement of ground disturbance in the required preconstruction survey. Potential kit fox dens shall be marked, and a 50-foot avoidance buffer shall be delineated using brightly colored stakes and flagging or similar materials to prevent inadvertent damage to the potential den. If the qualified biologist determines that an unoccupied potential den cannot be avoided, the den may be hand excavated in accordance with the United States Fish and Wildlife Service Standardized Recommendations for Protection of the Endangered San Joaquin Kit Fox Prior to or During Ground Disturbance (United States Fish and Wildlife Service 2011). If species activity is detected, the location shall be identified as a "known" kit fox den in accordance with the U.S. Fish and Wildlife Service species guidelines (United States Fish and Wildlife Service 2011). A minimum 100-foot buffer from any disturbance area shall be maintained for known dens and a minimum 500-foot buffer from any disturbance area shall be maintained for natal dens. No excavation of a known or natal den shall occur without prior authorization from the United States Fish and Wildlife Service and the California Department of Fish and Wildlife. For activities occurring on land covered under an approved federal and/or State incidental take authorization, the requirements set forth in those documents shall be implemented. Other standard measures to protect San Joaquin kit fox, including capping pipes, covering trenches, adding exit ramps to excavated areas, shall be implemented in accordance with MM ~~4.4-15~~ 4.4-13.

Section 4.4 Biological Resource, Page 4.4-46

Focused/protocol level surveys for Burrowing Owl will be conducted in accordance with all currently applicable presence and absence survey and/or species protocols established by the United States Fish and Wildlife Service and the California Department of Fish and Wildlife ("Species Protocols") (MM 4.4-1(b)). Such surveys would be consistent with guidelines stablished in the CDFW Staff Report on Burrowing Owl Mitigation (Staff Report) (2012). Appendix D of the Staff Report describes species survey guidance, which states a minimum of three or more survey visits, at least three weeks apart between April 15 and July 15.

Section 4.4 Biological Resources, Page 4.4-52

Table 4.4-5: Disturbance Buffers for Sensitive Resources

Sensitive Resource	Buffer Zone from Disturbance (feet)
Potential San Joaquin kit fox den	50
Known San Joaquin kit fox den	100
Natal San Joaquin kit fox den	500
Atypical San Joaquin kit fox den	50
Rodent burrows, small mammal burrows	50
Listed bird species active nests	0.5 miles
NON-Listed bird active nests NON-Listed Raptor	250 feet 500 feet
Burrowing owl burrow (breeding and non-breeding season)	Pursuant to California Department of Fish and Wildlife guideline
San Joaquin coachwhip, all legless lizards, coast horned lizard	30
American badger: Non-maternity dens Maternity dens	 50 200
Crotch's bumble bee	50
Special-status plants	50

Section 4.4 Biological Resources, Page 4.4-66

Regarding impacts to biological resources, the project has the potential to contribute to cumulative impacts within the region. A complete analysis and evidence for the record of the cumulative impacts on biological resources of the various ground-disturbing activities from oil and gas are provided 4.4, *Biological Resources*, of the Oil and Gas EIR.

As discussed above, there is uncertainty regarding potential future CO_2 source projects, including the exact location and nature of any such facilities and whether they would be new facilities or utilize existing facilities requiring modification. It is generally anticipated that these facilities would be located within areas of consistent zoning for similarly scaled land uses, thus limiting impacts to biological resources. However, construction and operation of these facilities nonetheless has the potential to result in disturbance of undeveloped areas or developed areas suitable for certain species, which may adversely affect biological resources potentially present in those areas. The extent of contribution to these impacts from potential future CO_2 source projects would depend on many variables that are not knowable at this time. Such CO_2 source projects will be subject to their own permitting and environmental review.

Section 4.4 Biological Resources, Page 4.4-21

"The project area is outside of the known geographic range (east of the California aqueduct) of the species and has no potential to occur."

Section 4.5 Cultural Resources, Page 4.5-29

As discussed above, there is uncertainty regarding potential future CO_2 source projects, including the exact location and nature of any such facilities and whether they would be new facilities or utilize existing facilities requiring modification. It is generally anticipated that these facilities would be located within areas of consistent zoning for similarly scaled land uses, thus limiting impacts to cultural resources. However, construction and operation of these facilities nonetheless has the potential to result in ground disturbing activities that could adversely impact prehistoric and historical archaeological sites, paleontological resources, historic buildings and structures. The extent of contribution to these impacts from potential future CO_2 source projects would depend on many variables that are not knowable at this time. Such CO_2 source projects will be subject to their own permitting and environmental review.

Section 4.6 Energy, Page 4.6-12

The project would involve electricity ~~and natural gas~~ demands for the operation of stationary sources, for ~~including of all~~ capture equipment, compression and pumping equipment.

Section 4.6 Energy, Page 4.6-17

As discussed above, there is uncertainty regarding potential future CO_2 source projects, including the exact location and nature of any such facilities and whether they would be new facilities or utilize existing facilities requiring modification. Construction and operation of these facilities nonetheless has the potential to result in temporary increases in energy demand associated with construction as well as operational demands for gas and electricity. The extent of contribution to these impacts from potential future CO_2 source projects would depend on many variables that are not knowable at this time. Such CO_2 source projects will be subject to their own permitting and environmental review.

Section 4.7 Geology and Soils, Page 4.7-18

MM 4.7-1 The owner/operator shall prepare a comprehensive seismic activity monitoring plan that includes, but is not limited, connection to the statewide seismic monitoring program of California Seismic Network (CISN). This draft plan shall be submitted concurrently to all of the following agencies: U.S. Environmental Protection Agency, Region 9, California Seismic Network, California Air Resources Board and Kern County Public Works and Kern County Planning and Natural Resources. The final plan shall be approved by the California Air Resource Board and included all requirements of State law including but not limited to: Appropriate subsurface monitoring to ensure geologic sequestration of injected carbon dioxide; Identification of hazards and conditions that may require the suspension of carbon dioxide injections; notification protocols for all applicable agencies and emergency procedures. All requirements for seismic monitoring

adopted by the California Air Resources Board - "Carbon Capture, Removal, Utilization and Storage Program" shall be implemented.

In addition, implement MMs 4.3-6, 4.3-8, 4.7-2 through 4.7-4, 4.8-1, 4.9-4, 4.9-9, 4.9-10, 4.9-12, 4.9-14, 4.9-18, 4.10-4, 4.11-1 through 6, and 4.15-4.

Section 4.7 Geology and Soils, Page 4.7-19

Implement MM 4.7-1, as described above~~.~~, and MMs 4.3-6, 4.3-8, 4.7-2 through 4.7-4, 4.8-1, 4.9-4, 4.9-9, 4.9-10, 4.9-12, 4.9-14, 4.9-18, 4.10-4, 4.11-1 through 6, and 4.15-4.

Section 4.7 Geology and Soils, Page 4.7-27

Implement MM 4.7-1 through MM 4.-7-6, as described above~~.~~, and MMs 4.3-6, 4.3-8, 4.8-1, 4.9-4, 4.9-9, 4.9-10, 4.9-12, 4.9-14, 4.9-18, 4.10-4, 4.11-1 through 6, and 4.15-4.

Section 4.7 Geology and Soils, Page 4.7-25

Regarding impacts associated with geology and soil, the project has the potential to contribute to cumulative impacts within the region. A complete analysis and evidence for the record of the cumulative impacts on air quality of the various activities from oil and gas are provided 4.6, *Geology and Soils* of the Oil and Gas EIR.

As discussed above, there is uncertainty regarding potential future CO_2 source projects, including the exact location and nature of any such facilities and whether they would be new facilities or utilize existing facilities requiring modification. It is generally anticipated that these facilities would be located within areas of consistent zoning for similarly scaled land uses. Construction and operation of these facilities nonetheless has the potential to be located in areas of potentially hazardous geological or soil conditions. The specific design, location, slope, geologic and soil conditions for every CO_2 source project are not known at this time and would be analyzed on a site-specific basis at the project level. Thus, the extent of these impacts from potential source projects are not knowable at this time. Such CO_2 source projects will be subject to their own permitting and environmental review.

Section 4.8 Greenhouse Gas Emissions, Page 4.8-22

As shown in Table 4.8-3, the project's total construction GHG emissions would be 4,456 MT CO_2e. Table 4.8-4 shows the project's operational GHG emissions of 85 MT CO_2e per year, or 1,700 MT CO_2e over the 20-year operational lifetime of the project. Additionally, Table 4.8-4 shows total GHG reductions of 31,217,430 MT CO_2e over 20 years from implementation of the project, resulting in a net reduction in emissions from the existing sources associated with Elk Hills oilfield gas operations baseline.

Section 4.8 Greenhouse Gas Emissions, Page 4.8-25

Additional sources will need to be identified by the applicant and permitted ~~by the applicant and~~ project proponents for those sources and must be legally permitted and disclosed as required by Mitigation Measure (MM) 4.9-11 (Section 4.9, *Hazards and Hazardous Materials*).

Section 4.8 Greenhouse Gas Emissions, Page 4.8-32

As discussed above, there is uncertainty regarding potential future CO_2 source projects, including the exact location and nature of any such facilities and whether they would be new facilities or utilize existing facilities requiring modification. Construction and operation of these facilities has the potential to result in increases in GHG emissions. The extent of these impacts from potential CO_2 source projects would depend on many variables that are not knowable at this time. Such CO_2 source projects will be subject to their own permitting and environmental review.

Section 4.9 Hazards and Hazardous Materials, Page 4.9-56

MM 4.9-1 ~~Prior to~~ The Owner/operator shall provide a comprehensive Worker Environmental Awareness Program to the County with its first CCS project-related permit application in each calendar year. The program shall include all training requirements identified in Owner/operator Best Management Practices and mitigation measures and include training for all field personnel (including Owner/operator employees, agents and contractors). The Worker Environmental Awareness Program shall include protocols and training for responding to and handling of hazardous materials and hazardous waste management, and emergency preparedness, release reporting, and response requirements. The Worker Environmental Awareness Program shall be provided to the surface owner at the time of the application pathway process so the surface owner may educate employees as well.

Section 4.9 Hazards and Hazardous Materials, Page 4.9-73

A complete analysis and evidence for the record of the cumulative impacts on air quality of the various activities from oil and gas are provided 4.8, *Hazards and Hazardous Materials/Public Health Risks*, of the Oil and Gas EIR.

As discussed above, there is uncertainty regarding potential future CO_2 source projects, including the exact location and nature of any such facilities and whether they would be new facilities or utilize existing facilities requiring modification. It is generally anticipated that these facilities would be located within areas of consistent zoning for similarly scaled land uses, thus limiting impacts to sensitive receptors. However, construction and operation of these facilities nonetheless has the potential to require the transport or use of hazardous materials. The extent of contribution to these impacts from potential future CO_2 source projects would depend on many variables that are not knowable at this time. Such CO_2 source projects will be subject to their own permitting and environmental review. The handling of hazardous materials is required to comply with all applicable federal, state, and local laws. Additionally, potential CO_2 source projects are anticipated to be subject to siting controls applicable to similar scale industrial uses that will limit exposure hazards.

Section 4.10 Hydrology and Water Quality, Page 4.10-42

As discussed above, there is uncertainty regarding potential future CO_2 source projects, including the exact location and nature of any such facilities and whether they would be new facilities or

utilize existing facilities requiring modification. It is generally anticipated that these facilities would be located within areas of consistent zoning for similarly scaled land uses, thus limiting impacts to hydrologic resources. However, construction and operation of these facilities nonetheless has the potential to be located in varying drainage and other hydrological conditions, potentially resulting in hydrologic resource impacts. The specific design, location, drainage, and other conditions for potential future CO_2 source projects are not known at this time and would be analyzed on a site-specific basis at the project level. Such CO_2 source projects will be subject to their own permitting and environmental review.

Section 4.11 Land Use and Planning, Page 4.11-55

As discussed above, there is uncertainty regarding potential future CO_2 source projects, including the exact location and nature of any such facilities and whether they would be new facilities or utilize existing facilities requiring modification. It is generally anticipated that these facilities would be located within areas of consistent zoning for similarly scaled land uses, but the specific design and location for potential future CO_2 source projects are not known at this time and would be analyzed on a site-specific basis at the project level. Such CO_2 source projects will be subject to their own permitting and environmental review.

Section 4.12 Mineral Resources, Page 4.12-9

As discussed above, there is uncertainty regarding potential future CO_2 source projects, including the exact location and nature of any such facilities and whether they would be new facilities or utilize existing facilities requiring modification. Depending on siting, these facilities have the potential to adversely impact mineral resources. The extent of contribution to these impacts from potential future CO_2 source projects would depend on many variables that are not knowable at this time. Such CO_2 source projects will be subject to their own permitting and environmental review.

Section 4.13 Noise, Page 4.13-31

As discussed above, there is uncertainty regarding potential future CO_2 source projects, including the exact location and nature of any such facilities and whether they would be new facilities or utilize existing facilities requiring modification. It is generally anticipated that these facilities would be located within areas of consistent zoning for similarly scaled land uses, thus limiting noise impacts. However, these projects have the potential to result in increases in noise typical of construction and operation associated with similarly scaled land uses. The extent of contribution to these impacts from potential future CO_2 source projects would depend on many variables that are not knowable at this time. Such CO_2 source projects will be subject to their own permitting and environmental review. Both construction and operation would be required to comply with applicable noise regulations.

Section 4.14 Population and Housing, Page 4.14-10

As discussed above, there is uncertainty regarding potential future CO_2 source projects, including the exact location and nature of any such facilities and whether they would be new facilities or utilize existing facilities requiring modification. It is generally anticipated that these facilities would be located within areas of consistent zoning for similarly scaled land uses. Construction typically

generates short-term demand for a relatively small workforces that is unlikely to require additional housing or generate changes in land uses. Operations of similarly scaled land uses typically do not generate large scale workforces. However, the extent of contribution to these impacts from potential future CO_2 source projects would depend on many variables that are not knowable at this time. Such CO_2 source projects will be subject to their own permitting and environmental review.

Section 4.15 Public Services, Page 4.15-21

Impact 4.15-4: Contribute to Cumulative Public Services Impacts

A complete analysis and evidence for the record of the cumulative impacts on public services of the various activities from oil and gas are provided 4.14, *Public Services*, of the Oil and Gas EIR.

As discussed above, there is uncertainty regarding potential future CO_2 source projects, including the exact location and nature of any such facilities and whether they would be new facilities or utilize existing facilities requiring modification. It is generally anticipated that these facilities would be located within areas of consistent zoning for similarly scaled land uses. Construction typically generates short-term demand for a relatively small workforces that is unlikely to require additional public services. Operations of similarly scaled industrial uses typically do not generate large scale workforces. The extent of contribution to these impacts from potential future CO_2 source projects would depend on many variables that are not knowable at this time. Such CO_2 source projects will be subject to their own permitting and environmental review.

Section 4.16 Recreation, Page 4.16-7

A complete analysis and evidence for the record of the cumulative impacts on public services of the various activities from oil and gas are provided 4.15, *Recreation*, of the Oil and Gas EIR.

As discussed above, there is uncertainty regarding potential future CO_2 source projects, including the exact location and nature of any such facilities and whether they would be new facilities or utilize existing facilities requiring modification. It is generally anticipated that these facilities would be located within areas of consistent zoning for similarly scaled land uses, thus limiting impacts to recreational activities. Construction typically generates short-term demand for a relatively small workforces that is unlikely to generate additional demand for or use of existing parks and recreational facilities such that these resources would become deteriorated. Similarly, operations of similarly scaled industrial uses typically do not generate large scale workforces. The extent of contribution to these impacts from potential future CO_2 source projects would depend on many variables that are not knowable at this time. Such CO_2 source projects will be subject to their own permitting and environmental review.

Section 4.17 Transportation and Traffic, Page 4.17-20

As discussed above, there is uncertainty regarding potential future CO_2 source projects, including the exact location and nature of any such facilities and whether they would be new facilities or utilize existing facilities requiring modification. It is generally anticipated that these facilities would be located within areas of consistent zoning for similarly scaled land uses, thus limiting impacts to transportation. Construction could result in short term increases in commuter and truck trips that

would depend on the particular construction activity. Operations would also involve vehicle trips typical of similarly scaled industrial uses. The extent of contribution to these impacts from potential future CO_2 source projects would depend on many variables that are not knowable at this time. Such CO_2 source projects will be subject to their own permitting and environmental review.

Section 4.18 Tribal Cultural Resources, Page 4.18-10

As discussed above, there is uncertainty regarding potential future CO_2 source projects, including the exact location and nature of any such facilities and whether they would be new facilities or utilize existing facilities requiring modification. It is generally anticipated that these facilities would be located within areas of consistent zoning for similarly scaled land uses, thus limiting impacts to tribal cultural resources. However, construction and operation of these facilities nonetheless has the potential to result in ground disturbing activities that could adversely impact properties important to tribal communities. The extent of contribution to these impacts from potential future CO_2 source projects would depend on many variables that are not knowable at this time. Such CO_2 source projects will be subject to their own permitting and environmental review.

Section 4.19 Utilities and Service Systems, Page 4.19-2-28

The header for Utilities and Service Systems was revised as follows:

~~4.17~~4.19 Utilities and Service Systems

Section 4.19 Utilities and Service Systems, Page 4.19-26

As discussed above, there is uncertainty regarding potential future CO_2 source projects, including the exact location and nature of any such facilities and whether they would be new facilities or utilize existing facilities requiring modification. It is generally anticipated that these facilities would be located within areas of consistent zoning for similarly scaled land uses. New or modified facilities could generate increases in demand for public utilities such as water supply, wastewater treatment, or solid waste disposal consistent with similarly scaled industrial uses. The extent of contribution to these impacts from potential future CO_2 source projects would depend on many variables that are not knowable at this time. Such CO_2 source projects will be subject to their own permitting and environmental review.

Section 4.20 Wildfire, Page 4.20-9

As discussed above, there is uncertainty regarding potential future CO_2 source projects, including the exact location and nature of any such facilities and whether they would be new facilities or utilize existing facilities requiring modification. It is generally anticipated that these facilities would be located within areas of consistent zoning for similarly scaled land uses, thus limiting cumulative wildfire impacts. The extent of contribution to these impacts from potential future CO_2 source projects would depend on many variables that are not knowable at this time. Such CO_2 source projects will be subject to their own permitting and environmental review.

7.2 Response to Comments

7.2.1 Global Responses

1: Source Identification

GR-1a, Potential Future CO_2 Sources and Piecemealing

Commenters assert that potential projects that may contribute CO_2 for storage in the proposed project reservoirs at a future date (see RDEIR, Vol. 1, pp. 13-15 and RDEIR, Vol. 2, Appendix K-4) are part of the "whole of the action" which must be included in the RDEIR Project Description and in analysis of impacts, mitigation measures and alternatives. This Global Response 1 responds to such issues, generally referred to as "piecemealing." In addition, commenters claim that the RDEIR fails to provide essential information on potential future CO_2 sources, including the industrial processes emitting CO_2, CO_2 properties, capture technology and transportation by pipeline or truck to the proposed project reservoirs, and that the RDEIR's analysis of impacts mitigation and alternatives fails due to these omissions. These comments are derivative of the assertion that such analysis is required to avoid piecemealing, which is incorrect for the reasons discussed below. RDEIR, Vol. 1, pp. 3-13 – 15 and Vol. 2, Appendix K-4 provide general information on the characteristics of the potential future CO_2 source categories.

The applicant has submitted an economic feasibility analysis from WZI Inc. (See Appendix A-1, Economic Feasibility Analysis), prepared by project development specialist J.D. Frederick, which among other things addresses issues raised by these comments. Where relevant, this Global Response incorporates information from the WZI Report, which provides additional supporting facts and expert opinion regarding the relationship of the proposed project and potential future CO_2 sources.

An EIR project description must be accurate, stable and finite, as the basis for analysis of environmental impacts. *Southwest Regional Council of Carpenters v. City of Los Angeles* (2022) 76 Cal.App.5th 1154. A project consists of the "the whole of an action." CEQA Guidelines § 15378. A proposed project's full environmental effects must not evade CEQA review by splitting the whole of the action into smaller "piecemeal" projects, each with minimal environmental impacts. *Planning & Conservation League v. Castaic Lake Water Agency* [2009] 180 Cal.App.4th 210. In general, illegal piecemealing occurs when the proposed project is the first step in planned development, a future project constitutes a "crucial element" or "integral part" of the first project, or completion of one project "legally compels" or "practically presumes" completing the other. See *Laurel Heights Improvement Association of San Francisco, Inc. v. Regents of the University of California* (1988) 47 Cal.3d 376 ("first step" of school relocation to part of an existing building improperly piecemealed from future expansion to the rest of the building, when future expansion was reasonably foreseeable and would change the scale of the initial project and impacts); *San Joaquin Raptor/Wildlife Rescue Center v. County of Stanislaus (*1994) 27 Cal.App.4th 713 (EIR improperly excluded sewer expansion that was a "crucial element" of residential development project);*Tuolumne County Citizens for Responsible Growth, Inc. v. City of Sonora* (2007) 155

Cal.App.4th 1214 (improper piecemealing of shopping center and road realignment, when shopping center could not be legally completed without road realignment).

On the other hand, as discussed in *Banning Ranch Conservancy v. City of Newport Beach* (2012) 211 Cal.App.4th 1209, 1223-1224, even in cases where the *Laurel Heights* "reasonably foreseeable" test is met, courts have found no piecemealing when an EIR project description is limited to a proposed project that has "independent utility" whether or not another project proceeds, and the two projects have different proponents and serve different purposes. In *Banning Ranch*, the court rejected piecemealing claims when a development project and adjacent park project had different proponents, served different purposes and were "independently justified." Even though in that case there were specific, non-speculative pending plans for both projects, the city planned to build the park to provide recreation for existing residents, regardless of whether or not the private project to provide new residential and commercial development went forward. Similarly, in *Communities for a Better Environment v. City of Richmond* (2010) 184 Cal.App.4th 70, 99-100, the court rejected arguments that the EIR for a refinery upgrade project should have included another company's proposed hydrogen pipeline, concluding that these were "independently justified separate projects with different project proponents—not 'piecemealed' components of the same project", with "entirely different, unrelated functions." The upgrade project would improve oil processing within the refinery, while the hydrogen pipeline would separately provide a connection for transporting excess hydrogen to other consumers. The refinery upgrade did not depend on the hydrogen pipeline and would serve its function with or without the latter. See also *Paulek v. Department of Water Resources* (2014) 231 Cal.App.4th 35, 47: separate CEQA review of dam improvements and emergency outlet extension was not piecemealing, because the projects served distinct purposes, respectively, improving seismic resilience of the dam itself and transporting water downstream from the dam in the event of emergency. The outlet extension was not a "consequence" of the dam improvement project, which did not "legally or practically compel" the extension. In addition, there is no piecemealing when potential future projects are too speculative and indefinitely defined for meaningful environmental review. See, e.g., *Berkeley Keep Jets Over the Bay v. Board of Port Commissioners* (2001) 91 Cal. App. 4th 1344, 1361 (no piecemealing when potential future "runway projects existed only as concepts in long-range plans that were subject to constant revision" and the proposed project "would be built whether or not runway capacity is ever expanded.")

The initial source of CO_2 for storage at the proposed project reservoirs is the precombustion natural gas stream from production wells in the Elk Hills oilfield. The proposed project facilities are designed and sized to accommodate only the initial CO_2 source. No additional sources of CO_2 or new development are proposed as part of the proposed project, and no additional infrastructure (such as larger CO_2 pipelines) has been included in the proposed project to accommodate any potential future sources.

Due to the large size of the existing 26R and A1A2 reservoirs which the proposed project will utilize, CO_2 captured from oilfield operations would not fill the maximum available storage capacity. The RDEIR section on "Future Sources-Identification" (RDEIR Vol. 1, pp. 13-15) and the technical memorandum in RDEIR Vol. 1, Appendix K-4, discuss categories of potential future projects that may be developed and approved at a later date, which could take advantage of the

proposed project's available CO_2 storage capacity. Mitigation Measure 4.11-7 limits potential future CO_2 sources to projects in the same categories, within Kern County: hydrogen (green and blue), biomass carbon removal and storage, cement production, green steel production, oilfield field gas streams, power plants, direct air capture and alternative fuel production. In addition, RDEIR, Vol. 1, p. 3-15 identifies six projects in Kern County that are currently in the process of exploratory planning and preliminary development by companies that have publicly indicated their interest in sending CO_2 to the proposed project for storage. Because some potential future CO_2 source projects are reasonably foreseeable, they are included in the RDEIR's cumulative impact analysis. RDEIR, Vol. 1, Table 3-8, Cumulative Projects, pp. 3-45 – 47; see also Global Response 10, Cumulative Impacts. Instead of being included in cumulative impact analysis, commenters assert that potential future CO_2 sources must be included as part of the proposed project itself. On the contrary, as the *Banning Ranch* case explains, even reasonably foreseeable future projects need not be included in the same EIR if the proposed project has independent utility whether or not the other projects proceed.

Commenters' central claim is that the proposed project depends on utilizing the full capacity of its reservoirs, which necessarily includes potential future CO_2 sources since the initial CO_2 source would not fill them. Moreover, as the RDEIR (Vol. 1, p. 4.8-24) acknowledges, state policy phasing out fossil fuels could result in unavailability of the initial CO_2 source by 2045 or sooner. Therefore, commenters assert, the project lacks independent utility and its completion practically presumes, if not legally compels, approval and implementation of additional CO_2 source projects. As evidence, commenters assert that the GHG impact analysis in RDEIR Vol. 1, Section 4.8, which projects CO_2 injection to utilize the maximum storage capacity, demonstrates that that the County plans to issue entitlements for the maximum storage capacity of the reservoirs. Commenters also point to the identification of two potential future CO_2 sources (discussed in detail below) in the draft EPA Class VI Underground Injection Control (UIC) permit. The comments are not correct. The County is not obligated to approve any CO_2 source projects, no applications are pending before the County, and there is insufficient information available to allow for meaningful environmental review of such projects. If and when any future CO_2 sources projects are proposed, a separate CEQA review and Conditional Use Permit (CUP) would be required for each project, including consideration of its transportation of CO_2 by pipeline or truck to the proposed project for storage. EPA's review and issuance of a Class VI UIC permit is a separate procedure under the federal Safe Drinking Water Act, independent of the County's review under CEQA, which does not legally or practically compel the County to take any action. EPA's permitting process under its Safe Drinking Water Act authority over underground injection and confinement of stored CO_2 is distinct from the County's broader land use authority.

The proposed project does include the full capacity of the R26 and A1A2 reservoirs, and therefore the RDEIR analyzed maximum storage in Section 4.8 evaluating potentially significant GHG impacts. Nevertheless, as the RDEIR explains, the applicant is responsible for obtaining CO_2 sources for injection. Since projects to fill the reservoirs to capacity have not been reviewed or permitted, the amount of GHG emissions they would produce, capture, store or release is unknown. RDEIR Vol. 1, p. 4.8-25. While the RDEIR appropriately disclosed this information, the realization of any potential future projects that have indicated interest in pursuing the opportunity for CO_2 storage is speculative and uncertain. The County is not responsible for ensuring that future

CO_2 sources sufficient to fill the reservoir capacity are developed and approved. The applicant bears the risk if this does not occur.

Commenters assert that the project is financially dependent on additional CO_2 sources beyond the Elk Hills Oil Field gas stream, and that the RDEIR downplays this dependency. This claim is incorrect. Although the size of the project reservoirs provides a large-scale opportunity for storage that would be wasted if additional CO_2 sources never come online, the project has independent utility because it is economically feasible without them. The WZI Report provides an expert analysis of project economic feasibility based on publicly available information and concludes that the proposed project "which consists solely of capturing Elk Hills' CO_2 and injecting it in the existing Elk Hills pore space, would be viewed as a stand-alone project worth pursuing with little economic risk" independent of whether or not additional CO_2 sources are developed. Based on all-in fixed project costs, and assuming for purposes of providing a highly conservative economic analysis that the Project will store only approximately 101,743 tpy using the single, existing amine unit, the economic feasibility analysis determined that project returns exceed the cost of the project by year four of operation without any additional sources of CO_2. This cost estimate is based on only the improvements which are needed to capture CO_2 from Elk Hills. The WZI Report concludes that the proposed project "is economically viable and would proceed based on current economic assumptions without any expectation or reliance on other sources of CO_2." Accordingly, the proposed project has "independent utility" and the potential future CO_2 sources are not "crucial elements" or "integral parts" of the project, without which it cannot proceed.

Incorporating potential future CO_2 sources into the proposed project description is also inappropriate and infeasible because most or all of the potential future CO_2 source projects are speculative. There is both a high level of uncertainty as to whether any of the potential source projects will ever be implemented, and a lack of information to support CEQA analysis of potential projects that have not yet been planned, designed and developed to the point of concrete proposals. See *Berkeley Keep Jets Over the Bay,* 91 Cal. App. 4th at 1361 (no piecemealing when potential future projects "existed only as concepts"). At this time, the categories of potential source projects described in RDEIR Vol. 1, p. 3-13 and Vol. 2, Appendix K-4, as well as the prospect of a future carbon management business park in which co-located industries could utilize CO_2 storage capacity (RDEIR Vol. 2, Appendix K-2), exist only as concepts, not specific proposed projects. Were the RDEIR revised as commenters request, to incorporate the speculative and indefinite future potential for additional CO_2 source projects into the Project Description as components of the proposed project, the RDEIR would fail to satisfy the CEQA requirement for an accurate, stable and finite project description.

RDEIR Vol. 1, p. 3-15, also identifies six specific potential future CO_2 source projects that are currently in the process of exploratory planning and development, five of which have entered into Carbon Dioxide Management Agreements (CDMAs) with the proposed project applicant. As with the general categories of projects, implementation of any of the six projects is speculative and uncertain. None of them has completed CEQA review or obtained conditional use permits, and there is no commitment by the County to approve these projects. Commenters assert that the CDMAs demonstrate that the future CO_2 source projects are non-speculative because the applicant has committed to integrating them with the proposed project and point to media announcements of

CDMAs as evidence of such commitment. These comments are incorrect. CDMAs are preliminary agreements allowing other parties to explore the potential opportunity to utilize the proposed project for CO2 storage, enabling them to perform front-end engineering and design and feasibility evaluation. See RDEIR, Vol. 1, p. 3-14. The WZI Report further explains that the CDMAs are used in initial stages of future planning, diligence and research when the parties are still determining whether or not to enter into a binding agreement. The completion of a project explored pursuant to a CDMA requires much more extensive project development before and execution of final binding agreements. As the WZI Report states, public statements and press releases announcing CDMAs represent marketing efforts and none of the speculative potential projects that have entered into CDMAs with the applicant are relied on in WZI's analysis of project economic feasibility.

In addition, in most cases the purposes and proponents of potential future CO_2 source projects are different those of the proposed project; see RDEIR pp. 3-15 and 3-45 - 47. All but one of the potential future CO_2 source projects have independent production purposes which generate CO_2 as a byproduct, such as hydrogen production, oilfield production, alternative fuel production, biomass conversion, energy generation, cement and steel production. Although these projects may (and for "blue hydrogen" production, must) utilize underground CO_2 storage, the projects do not themselves have a carbon capture and storage (CCS) purpose. (The exception is the Avnos Direct Air Capture Project, which does have a CCS purpose.) Moreover, all but one of the potential future CO_2 source projects are under development by companies other than the proposed project applicant. (The exception is the applicant's CalCapture project, exploring the prospect of capturing CO_2 emissions from the Elk Hills power plant for sequestration in one of the proposed project reservoirs.) Commenters note that the applicant or affiliates may be financially participating in some potential future CO_2 source projects. Commenters also point to an applicant affiliate participating in a direct air capture consortium which includes one of the potential future project source proponents (Avnos). But that consortium has 43 members, including Avnos and other industry members, and also the City of Bakersfield, the Tejon Indian Tribe, colleges and research institutions, labor unions and community organizations. See https://www.crc.com/news/news-details/2023/Carbon-TerraVaults-California-DAC-HubConsortium-Selected-for-U.S.-DOE-Funding-to-Bring-Direct-Air-Captureand-Storage-to-the-Golden-State/default.aspx. These collaborations and funding relationships do not alter the fact that, except for the potential CalCapture project, the proponents of the proposed project and potential future CO_2 source projects are different.

For clarification, the following text on RDEIR p. 4.8-25 is revised to read:

> Additional sources will need to be identified by the applicant and permitted by the ~~applicant and~~ project proponents for those sources, and must be legally permitted and disclosed as required by Mitigation Measure (MM) 4.9-11 (Hazards and Hazardous Materials).

For the above reasons, the proposed project satisfies the "independent utility" and related criteria of the piecemealing cases; i.e., the potential future CO_2 sources are not "crucial elements" or "integral parts" of the proposed project, completion of which would be "legally compelled" or "practically presumed" by completion of the proposed project. If future projects eventually advance to non-speculative proposals, undergo CEQA review, are permitted and constructed, they could then contribute to CO_2 storage in the proposed project reservoirs. However, as detailed in

the WZI Report, the uncertain and contingent possibility of CO_2 contributions from future projects does not deprive the proposed project of independent utility.

Commenters assert that the proposed project will attract and incentivize future CO_2 source projects that will generate new impacts not studied in the RDEIR. Excluding such projects from the RDEIR Project Description for the reasons discussed above does not mean they evade CEQA review. Mitigation Measure 4.11-7 provides for CEQA review and mitigation of impacts for any future project permitted to contribute CO_2 to the proposed project reservoirs:

> Each CO_2 source project located in unincorporated Kern County requires a zoning evaluation, its own EIR and its own Conditional Use Permit (CUP) from the County.
>
> Each CO_2 source project located in an incorporated city in Kern County requires preparation of a CEQA document with the County as a responsible agency. Mitigation Measure 4.11-7 prohibits reliance on a CEQA exemption by source projects as a condition of injecting into the proposed project's reservoirs.
>
> CO_2 pipelines from offsite sources that traverse unincorporated Kern County land require an EIR and CUP from the County.
>
> CO_2 pipelines permitted by the California Public Utilities Commission (CPUC) require either an EIR and CUP from the County or the County's participation in the CPUC process, which must provide reasonable and feasible mitigation to protect Kern County communities.

All CO_2 source projects must be located in Kern County and are limited to specified industry categories: hydrogen (green and blue), biomass carbon removal and storage, cement production, green steel production, oilfield field gas streams, power plants, direct air capture and alternative fuel production. See also Mitigation Measure 4.8-6, which requires all sources of CO_2 for injection into the proposed project reservoirs must certify to the County, prior to injection, that any additional CO_2 generated from the source facility has been mitigated to "no net increase"; and Mitigation Measure 4.9-11 which requires all sources that provide CO_2 for injection to the proposed project to be disclosed to the Kern County Planning and Natural Resources Department and EPA in writing and be legally permitted to operate by the county or city where they are located.

Commenters object to limiting Mitigation Measure 4.11-7 to future CO_2 sources within Kern County, but this limitation helps the County to oversee compliance with the mitigation requirements.

The commentors raise issues regarding a CTV I Carbon Hub proposed to the Federal government for funding. Kern County Planning and Natural Resources has no application for the permitting of a CTV I Carbon Hub for any sources or as named in the Department of Energy funding, Direct Air Capture Hub. With no details submitted to the department and no application, staff is not clear how much land such a "Hub" entails. However, the proposed CTV I Carbon Hub appears to propose multiple sources co-located on land in close proximity to the proposed CTV I CCS project under review and consideration in this RDEIR. Any such facility, under the current Kern County Zoning and General Plan, would require a discretionary permit and would be subject to CEQA.

Such CEQA analysis by Kern County will impose all feasible and reasonable mitigation to reduce impacts from criteria pollutants. Such feasible and reasonable mitigation includes a Developer Mitigation Agreement (DMA) that results in no net increase to the baseline air impacts. The statement referenced in the Appendix K-4 Source Identification Tech Memo only references county practice and policy and is not an approval or conditions for applicant designed source as the source is hypothetical. MM 4. 11-7 includes standards for the consideration and processing of additional sources that will use the CTV I CCS project. Those sources are not characterized as a "Carbon Hub" as staff has no details or information, outside a hypothetical Carbon Management Park postulated by the county with no location and not the applicant , to determine the location, size or content of the such a facility. MM 4.11-7 is clear that any of the listed sources in the geographic area identified in a Carbon Hub or as standalone projects will be subject to the requirements of the mitigation measure with full enforceability by Kern County.

Commenters assert that the proposed project should be limited to sequestering CO_2 from existing known facilities and preclude future CO_2 sources. If, as commenters claim, a CCS project must incorporate all CO_2 sources it will ever utilize into its Project Description, in order to avoid piecemealing, each CCS project would be required to wait to commence CEQA review until it could assemble enough CO_2 source projects, sufficiently developed for review in the same EIR, to fill its maximum storage capacity. This would severely limit the ability of lead agencies to approve CCS projects utilizing large reservoirs that can efficiently store CO_2 from many sources, including future unknown sources, contributing for many years. Instead, to achieve the same statewide storage capacity, a larger number of short-term, small-reservoir projects would be required, each with maximum capacity limited to match CO_2 from existing sources plus a few future sources that may be ready for immediate CEQA review. Such a piecemeal approach to developing CCS projects in California would be logistically inefficient at best, and economically unworkable at worst, and would hinder the state's CCS goals as incorporated in the California Air Resources Board (CARB) 2022 Scoping Plan for Achieving Carbon Neutrality.

GR-1b, Lone Cypress Energy Services Hydrogen Project and Avnos Direct Air Capture Project

Commenters assert that, at the least, the RDEIR Project Description is improperly piecemealed by excluding Lone Cypress Energy Services' blue hydrogen project and the Avnos Direct Air Capture (DAC) projects. The Lone Cypress project previously submitted an application to the County for a CUP, and both projects were previously identified as CO_2 sources in the proposed project's draft EPA Class VI UIC permits. Commenters also note the inclusion of hydrogen plant and DAC sources in the project documentation under the CARB Low Carbon Fuel Standard (LCFS) CCS Protocol. For these reasons, commenters claim, it is not speculative that these projects will be CO_2 sources for the proposed project, and additional information is available to enable their meaningful environmental review. While one aspect of piecemealing analysis is whether projects are sufficiently developed to enable CEQA review or are mere "concepts", the key question is whether the proposed project has independent utility. See *Banning Ranch* and other cases discussed above.

The Lone Cypress project proponent has withdrawn its CUP application, stating that "Lone Cypress presently intends to reassess the nature, timing, and technical elements of the project." May 10, 2024 letter from Greg Brooks, president of Lone Cypress Energy, to Jamal Ferguson, Kern County Planning and Natural Resources Department (Appendix B-1, Lone Cypress Withdrawal Letter). There is no pending application before the County either for Lone Cypress or for the Avnos DAC project, which never submitted one and so has not provided sufficiently detailed project designs and plans to support an application. Even if Lone Cypress had not withdrawn its CUP application, the County is not obligated to approve these projects and it remains uncertain whether or not either of them will move forward.

The applicant also notified EPA that it does not expect to source CO_2 from the Lone Cypress or Avnos projects, due to Lone Cypress' reassessment and CUP application withdrawal, and the fact that the applicant has yet to enter into any commercial agreement with Avnos. June 17, 2024, letter from Travis Hurst, CTV I project manager, to David Albright, EPA (Appendix B-2, EPA Public Notice). In response, EPA initiated a process to remove references to the Lone Cypress and Avnos facilities from its proposed permits. U.S. EPA, July 17, 2024, Reopening of Public Notice: Intent to Issue Class VI Underground Injection Control Permits for Carbon TerraVault JV Storage Company Sub 1, LLC, Elk Hills, California. As discussed above, EPA's permitting process under its Safe Drinking Water Act authority over underground injection and confinement of stored CO_2 is distinct from the County's broader land use authority. Regardless of the Lone Cypress and Avnos projects being included in or removed from the draft EPA Class VI UIC permits and/or included in the LCFS documentation, the County has independent authority to approve or reject those projects, as it does for any other future proposed CO_2 source projects, and it remains uncertain whether or not either of them will move forward.

In addition, commenters assert that information on the Lone Cypress and Avnos projects submitted to EPA for the proposed project's Class VI UIC permit applications can provide the basis for CEQA review. The information on CO_2 sources required to be submitted to EPA, focused on ensuring secure CO_2 transport and geological storage under the Safe Drinking water Act, is more limited than information the County must consider in evaluating potentially significant impacts in all environmental categories under CEQA. Even if the information submitted to EPA regarding Lone Cypress and Avnos projects when they were previously included as CO_2 sources was adequate to inform CEQA review, that is not determinative under piecemealing caselaw. See *Banning Ranch* at 603, where the court found that a development project and adjacent park project both had "specific, pending plans [which] distinguish cases rejecting piecemealing claims on the ground the future actions were too speculative." In that case, the EIR Notice of Preparation (NOP) for the park project was issued (by the same lead agency) two months after the NOP for the development project, and the EIRs were concurrently prepared using the same consultant. Nevertheless, the court concluded, there was no piecemealing because the development and park projects had independent utility and "the City can and will build the park regardless of any development on Banning Ranch." For the reasons discussed above, the same conclusion applies to the proposed project.

Commenters point to public statements and press releases regarding the Lone Cypress and Avnos projects. As discussed above for public statements and press releases regarding CDMAs, such statements generally represent marketing efforts, and no potential future CO_2 source projects are relied on in the WZI Report's analysis of project economic feasibility.

Regarding the inclusion of the Lone Cypress and Avnos projects in analysis of cumulative impacts, please see Global Response 10, Cumulative Impacts.

GR-1c, "Hard to Decarbonize" Industries

Comments criticize the RDEIR's characterization of certain potential future CO_2 sources as belonging to industries that are "essential but hard to decarbonize, such as concrete and hydrogen transportation fuels." RDEIR, Vol. 1, p. 4.8-26. Commenters assert that "hard to decarbonize industries" do not include to oil and gas production or gas-fired power plants.

The RDEIR does not state that oil and gas production or gas-fired power plants are "hard to decarbonize." Rather "hard to decarbonize" refers to production of certain materials included in the list of potential future CO_2 sources, including steel and cement production. RDEIR, Vol. 1, p. 3-13, RDEIR Appendix K-4; see also CARB Scoping Plan, p. 209. These industries are difficult to decarbonize without carbon capture and storage, because the manufacturing processes require fossil fuel combustion to provide high temperatures that cannot easily be achieved by electrification. In addition, "blue hydrogen", which represents 95% of current U.S. hydrogen production, depends on carbon capture and storage to receive CO_2 generated in the production process, which converts natural gas to hydrogen and CO_2.

Commenters also assert that hydrogen and alternative fuels cannot be "hard to decarbonize industries" because they are not "industries," as they do not produce an "end product or service." The "end product or service" terminology comes from the definition of Scope 3 emissions in GHG inventory protocols, although its relevance in the comment is unclear. Hydrogen and alternative fuels are marketable products manufactured in industrial process and are commonly referred to as "industries." See, e.g., RDEIR Appendix K-2, Envisioning a Carbon Management Business Park, p. 147 (referring to "research and discussions about the hydrogen industry"); International Energy Agency, The Future of Hydrogen (referring to regulations that affect "the development of a clean hydrogen industry"); available at https://www.iea.org/reports/the-future-of-hydrogen; U.S. Energy Information Administration, Developments in U.S. Alternative Fuels Markets, p. 1 (referring to market changes in "the alternative fueled vehicle (AFV)/alternative fuels industry"); available at https://www.eia.gov/renewable/alternativefuels/issues_trends/altfuelmarkets.html.

2: Extending the Life of Fossil Fuel Facilities

Commenters claim that availability of CO_2 storage at the proposed project will serve to extend the duration of Elk Hills oilfield activities and Elk Hills power plant operation, resulting in additional impacts from those sources that would not have occurred but for the project. For this reason, commenters assert, the allegedly extended operating life of Elk Hills and other facilities should be incorporated into the RDEIR's Project Description, and associated impacts should be analyzed and

mitigated as impacts of the proposed project. In effect, commenters argue that the RDEIR improperly piecemealed CEQA review of the proposed project from review of the "project" of continuing operation of existing facilities for a longer period; and/or failed to consider such continuing operation as a "probable future project" for purposes of cumulative impact analysis. Please see Global Response 1, Source Identification, regarding piecemealing, and Global Response 10, Cumulative Impacts. Commenters also assert that, by extending the operational life of fossil fuel facilities, the proposed project will conflict with state carbon neutrality goals.

The applicant has submitted an economic feasibility analysis from WZI Inc. (WZI Report), prepared by J.D. Frederick, which among other things addresses issues raised by these comments. Where relevant, this Global Response incorporates information from the WZI Report, which provides additional supporting facts and expert opinion regarding the relationship of the proposed project to the operating life of CO_2 sources.

Under CEQA, the environmental impacts of a proposed project are determined by comparing pre-existing baseline conditions to post-project conditions. Existing conditions constitute the environmental baseline in the absence of the proposed project. CEQA Guidelines § 15125. In the absence of physical changes or expanded operations, ongoing operation of existing facilities is a continuation of existing baseline conditions, not a part of the proposed project or a probable future project. As such, operation and maintenance of existing facilities with negligible or no expansion of the existing use is categorically exempt from CEQA. CEQA Guidelines § 15301. See World Business Academy v. California State Lands Commission (2018) 24 Cal.App.5th 476, in which the court held that extending the duration of the Diablo Canyon nuclear power plant's lease qualified for the categorical exemption for existing facilities and rejected the claim that "impacts that could arise from an additional seven years of plant operations" were not properly part of the baseline. Ongoing operation with no physical or functional changes to the existing facility, the court found, constituted continuation of baseline conditions. "[A]ll of the purported environmental effects to which appellant points are incident to and part of the plant's current baseline operations." World Business Academy at 501; see also Citizens for East Shore Parks v. State Lands Commission (2011) 202 Cal.App.4th 549 (EIR for wharf lease extension properly treated continuance of existing wharf operations as baseline conditions; rejecting plaintiff's argument that ongoing operations must be excluded from the baseline because they would cease without the lease extension).

In addition, the commenters' assumption that the duration of ongoing oil and gas activities at the Elk Hills oil field would be altered by the proposed project is unsupported by evidence. The Elk Hills oil field has 4,048 wells under CRC management, including 2,387 active wells, and is expected to remain in operation for a minimum of at least 20 years (refer to Appendix A-1, Economic Feasibility Analysis) The proposed project cannot extend the lifetime of the oilfield by enabling enhanced oil recovery (EOR), because injection of CO_2 captured by CCS facilities for purposes of EOR is prohibited by state law. Public Resources Code § 3132(b) (SB 905). California has also adopted a number of number of policies, programs and targets to address climate change and greenhouse gases by, among other things, reducing reliance on fossil fuels, as discussed in RDEIR Vo. 1, pp. 4.8-9 – 15. However, no current or pending proposed regulatory requirements would mandate that the Elk Hills oilfield be shut down in the absence of the proposed project. Although oil extraction in California has declined since 1986 from 402 million barrels per year to

6 million barrels per year in 2020, there is still demand for finished fossil fuels (gasoline diesel, and jet fuel), primarily for transportation. The California Air Resources Board's (CARB) 2022 Scoping Plan recognizes that California is a net exporter of finished fossil fuels and further provides that a phasedown of fossil fuel extraction should be managed with consideration of exports. If in-state extraction were to be phased out fully, the future petroleum demand by in-state refineries would be met through increased crude imports. This could lead to "leakage" as defined by AB 32: "a reduction in emissions in GHGs within the state that is offset by an increase in emissions of GHGs outside the state." See RDEIR, Vol. 2, Appendix K-4.

Regarding the Elk Hills Power Plant, the WZI Report explains that CRC has invested the necessary capital to operate the Elk Hills facility through 2045 (and possibly beyond), without regard to whether the Project is approved. California Energy Commission licensing for the power plant is current and expected to remain in effect for the next 20 years, at a minimum. The Elk Hills Power Plant currently provides about one-third of its power to serve the Elk Hills oil field, and the remaining two-thirds goes to the California power grid. Thus, the Elk Hills Power Plant will remain in operation as long as the Elk Hills oil field is in operation. In addition, even after the oil field ceases operation, as long as power pricing is sufficient, the Elk Hills Power Plant will provide any remaining capacity to the California power grid as directed by the California Independent System Operator (CAISO). To meet this existing need, CRC has already expended approximately $26 million in 2023 and 2024 on planned major plant maintenance at the Elk Hills Power Plant to conform to reliability requirements. This work is entirely independent of the proposed CCS project and will not alter or affect the infrastructure and construction associated with the proposed project.

Similarly, the commenters assert that the proposed project will serve to extend the operational lifetime of future sources of CO_2 that may contribute to the project including other oilfields and power plants. For the same reasons, there is no evidence that the operational lifetime of facilities other than the Elk Hills oilfield and power plant will be extended by the existence of the proposed project.

3: Environmental Justice and Public Participation

Commenters noted that roughly 20% of Kern County households are Spanish speaking with limited English proficiency and requested that the County provide Spanish translations of CEQA notices, documents or parts of documents, and public meeting presentations.

Neither CEQA nor the CEQA Guidelines contain a requirement for California lead agencies to translate notices or all or part of environmental review documents into non-English languages. However, despite not being required to do so under CEQA, the County and the U.S. Environmental Protection Agency (EPA) provided Spanish interpretation and translated materials at joint live public workshops held on January 30, 2024, in Taft and January 31 and February 28, 2024 in Buttonwillow, as well as an online virtual workshop on January 17, 2024. Public hearings at both the Planning Commission and Board of Supervisors are required for consideration of the Project and will provide opportunities for public comment. Spanish translation services will be available for the presentations at the Planning Commission and Board of Supervisors hearings, as well as for Spanish-speakers who request to provide public comment. The County provides these

services beyond what is required by law in order to facilitate participation by the County's Spanish-speaking residents in the public workshops and hearings on the EIR.

There is no express requirement in CEQA for interpreters or translation of CEQA notices and documents, and a mandatory requirement cannot be implied, because CEQA cannot be interpreted "in a manner which imposes procedural or substantive requirements beyond those explicitly stated" therein. CEQA § 21083.1. The California Legislature has recognized that statutory changes would be necessary to add a translation mandate to CEQA, as reflected in several unsuccessful bills that would have required translation of CEQA documents. The Governor vetoed Assembly Bill 543 (2013-2014 Reg. Sess.), which would have required the Office of Planning and Research (OPR) to develop guidelines for determining when a lead agency must translate CEQA notices into non-English languages, and Assembly Bill 2447 (2017-2018 Reg. Sess.), which would have required translation of certain CEQA notices into languages prevalent in the area in which a project is located. Senate Bill 950 (2019-2020 Reg. Sess.), which would have required OPR to develop requirements for translation of certain CEQA "notices and other documents" into non-English languages spoken by a "substantial number of people" served by the lead agency, failed passage in the Senate Environmental Quality Committee in May 2020.

A senate committee report discussed the problems with adding a translation requirement as proposed in SB 950. Senate Committee on Environmental Quality, Committee Report re: "California Environmental Quality Act: housing and land use" (May 27, 2020) (included in Oil and Gas SREIR AR 264089-264112). The committee report raised multiple concerns including the risk of inaccurately translating terms of art and technical scientific terms in factual statements and analysis; the cost to public agencies of up to $300 per page translated; logistic issues including the need to hire or contract with translators proficient both in the relevant languages and in CEQA and the environmental factors analyzed under CEQA; and the risk of creating new civil liabilities against lead agencies for inaccurately translated documents. These concerns are applicable here, where a $300 per page cost would be exorbitant for the 988-page RDEIR Volume 1, with or without the 5,712 pages of appendices in RDEIR Volume 2, and where the RDEIR contains highly technical discussions of carbon capture and storage technology and environmental impacts, raising the risk of (and potential liability for) mistranslation.

In addition, in two rulings on the EIR for the Kern County Oil and Gas Ordinance, the Court of Appeal confirmed that the County was not required to translate public notices or all or part of an EIR into Spanish, or to provide Spanish-language interpreters at public meetings related to an EIR. *King & Gardiner Farms, LLC v. County of Kern* (2020) Case No. F077656, Slip Opinion at 122-126 (Cal. Ct. App. 5th Dist. Feb. 25, 2020), and *V Lions Farming LLC v. County of Kern* (2024) Case Nos. F084763, F085102, F085220, Slip Opinion at 97-105 (Cal. Ct. App. 5th Dist. March 7, 2024). In the latter ruling, the Court of Appeal reiterated that translation was not legally mandatory and also determined that the evidence discussed above was sufficient to determine that the County's decision to provide translation services at meetings and workshops, but not to translate notices or portions of the EIR, was not an abuse of discretion.

Recently, the Little Hoover Commission on CEQA reform discussed the problems with proposals to add a translation requirement to CEQA. Little Hoover Commission Report #279, "CEQA: Targeted Reforms for California's Core Environmental Law" (May 2024) (available at https://lhc.ca.gov/wp-content/uploads/Report279.pdf). As the Commission Report explained (p. 19):

Currently there is no requirement for the translation of CEQA documents. . . . [W]e recognize the substantial financial cost of translating CEQA documents, some of which stretch for hundreds or even thousands of pages, often with dense scientific language and concepts. Indeed, translation of entire documents may in some cases serve little purpose in achieving broader public awareness, since the complexity of CEQA cases can render the documents indecipherable to even the most educated lay reader, regardless of language. Additionally, opponents of past proposals for translation requirements have expressed a concern that claims of inaccurate translation would raise a new avenue of legal action against a project. Last, any requirement for translation would have to address detailed questions such as how many languages a document should be translated into, and what standard of translation is acceptable.

While the Little Hoover Commission recommended further study of the issue, to date there remains no requirement for translation. The concerns identified by the senate committee report and the Little Hoover Commission also support the County's reasonable determination not to voluntarily adopt a policy of translating CEQA notices and documents or parts of documents.

GR – 3b, Other Public Participation Comments

Commenters who participated in the joint County and EPA public workshops indicated confusion as to whether comments on the EIR should be submitted to the County or to EPA. Although the two agencies held joint public workshops for convenience, EPA's consideration of the proposed UIC permit is a separate proceeding from the County's CEQA review of the proposed project. As clearly stated in the notices of availability for the DEIR and RDEIR, and in the County's workshop presentations (RDEIR Vo. 2, Appendix A-5) in both the PowerPoint and the verbal presentation, comments on the DEIR were to be submitted in writing to the County, and persons submitting comments to EPA should send copies to the County if they wished their comments to EPA to be included in the record for the County's CEQA process. Comments on EPA's draft UIC permit were to be submitted to EPA, as stated in EPA's UIC permit notices and EPA's presentations at the joint workshops (RDEIR Vol., 2, Appendix A-5). The County is not required to incorporate comments made to EPA, that were not provided to the County, into the CEQA review process.

Commenters requested that the County provide additional time for review before the scheduled Planning Commission and Board of Supervisors hearings. The County's CEQA process is in full compliance with all applicable CEQA requirements for public review and participation. As comments will be accepted on the Project and the CEQA document up until the Board of Supervisors takes action at the noticed public hearing, no delay is warranted.

In addition, commenters requested that the County provide a draft of the RDEIR with italics or other markings to show each text change together with a detailed summary of changes. The redlined RDEIR with detailed summary of changes requested by commenters is not required by CEQA. As stated in the RDEIR, the County's Notice of Availability for the RDEIR solicited (and commenters provided) new comments on the entire RDEIR.

For clarification, the RDEIR Vol. 1, p. 2-3, is revised by adding following text at the end of Section 2.2.2, Reason for Recirculation:

The RDEIR incorporates the following primary substantive changes to the original DEIR released on December 19, 2023, as follows:

Volume 1

- Section 1.0, Executive Summary – description of recirculation, clarification of project objectives
- Section 2.0, Introduction – description of recirculation and previous circulation
- Section 3.0, Project Description – clarification of project objectives, addition of "Future Sources – Identification", projects added to Table 3-8, Cumulative Projects list
- Section 4.3, Air Quality – addition of Mitigation Measure 4.3-5, renumbering subsequent mitigation measures
- Section 4.4, Biological Resources – addition of Mitigation Measures 4.4-14 and 4.4-15, renumbering subsequent mitigation measures
- Section 4.7, Geology and Soils – additional discussion in Impact 4.7-1
- Section 4.13, Noise – correction of Impact 4.13-4 level of significance after mitigation to significant and unavoidable

Volume 2

- Appendix B – 4 CO_2 Dispersion Modeling
- Appendix E – US Environmental Protection Agency Class VI Underground Injection Storage Project and the A1A2 Storage Project (applications available at the time of recirculation)
- Appendix K – addition of Appendix K-4, "Source Identification Memo"

GR – 3c, Environmental Justice

Commenters assert that project impacts contribute to cumulative impacts disproportionately affecting already burdened environmental justice communities. Commenters note that Kern County as a whole has an elevated percentage of Hispanic, linguistically isolated and pollution burdened populations; and that the project is located within a census tract with high pollution burdens and levels of unemployment, poverty and linguistic isolation as reported by the CalEnviroScreen 4.0 screening tool, developed by the Office of Environmental Health Hazard

Assessment (OEHHA). In addition, commenters assert that mitigation and alternatives analyses should specifically address ways to reduce or eliminate impacts to burdened communities.

Environmental Justice is a land use policy issue not an issue for analysis under CEQA. A specific analysis of environmental justice is not required by CEQA. See *Friends of Davis v. City of Davis* (2000) 83 Cal.App.4th at 1004, 1019 (under CEQA, the question is not whether a project will affect particular persons, but whether it will affect the environment of persons in general), CEQA Guidelines § 15064(e) (economic and social changes resulting from a project shall not be treated as significant effects on the environment). Economic or social factors may contribute to the environmental impacts of a project or may contribute to determinations of the significance of impacts; however, they do not constitute impacts in themselves. CEQA Guidelines §§ 15064(e), 15131(b), 15382. Although a specific environmental justice analysis is not required under CEQA, many issues commonly associated with environmental justice generally are addressed in the CEQA analysis of impacts to sensitive and vulnerable populations in all communities, of all races, cultures, and income levels. Accordingly, the RDEIR evaluated impacts on the physical environment, including project and cumulative impacts affecting human beings and human health for all communities – for example, evaluating air quality impacts to sensitive receptors such as residences and schools. Where relevant, consideration of mitigation measures and alternatives took into account potential impacts to sensitive and vulnerable populations, e.g. MM 4.3-6 which provides: "No Class VI or Class II injection well for use in this CCS project shall be located within 4000 feet of any sensitive receptor."

The project site, within the Elk Hills oilfield, is located in census tract 33.04, with a total population of 2,683 spread over 618 square miles. The population in census tract 33.04 is 57% white and 36% Hispanic (compared to 30% white and 57% Hispanic for Kern County as a whole), with a mean household income of $70,357 (compared to $63,883 for Kern County as a whole). See https://censusreporter.org/profiles/14000US06029003304-census-tract-3304-kern-ca/. The project site is not within one of the disadvantaged communities identified in the Kern County General Plan Housing Element 2024-2031 (Fig. 99), submitted to the California Department of Housing and Community Development on June 28, 2024. Accordingly, the project is unlikely to disproportionately focus potential environmental impacts on disadvantaged, Hispanic or low-income populations.

As OEHHA and CalEPA have previously indicated, the information provided by the CalEnviroScreen tool is not a substitute for CEQA analysis. See OEHHA and CalEPA, California Communities Environmental Health Screening Tool, Version 2.0 (CalEnviroScreen 2.0) – Guidance and Screening Tool (October 2014), pp. iii-iv:

[T]he CalEnviroScreen scoring results are not directly applicable to the cumulative impacts analysis required under the California Environmental Quality Act (CEQA). The statutory definition of "cumulative impacts" contained in CEQA is substantially different than the working definition of "cumulative impacts" used to guide the development of CalEnviroScreen. Therefore, the information provided by this tool cannot substitute for analyzing a specific project's cumulative impacts as required in a CEQA environmental review.

Moreover, CalEnviroScreen assesses environmental factors and effects on a regional or community-wide basis and cannot be used in lieu of performing an analysis of the potentially significant impacts of any specific project. Accordingly, a lead agency must determine independently whether a proposed project's impacts may be significant under CEQA based on the evidence before it, using its own discretion and judgment. The tool's results are not a substitute for this required analysis. Also, this tool considers some social, health and economic factors that may not be relevant when doing an analysis under CEQA.

Thus, the overall CalEnviroScreen scores, combining pollution burden scores with population characteristics and socioeconomic factors, do not correspond to impacts on the physical environment under CEQA. In addition, the pollution burden score cited by commenters is a composite score that includes disparate factors such as children's exposure to lead risk from housing, pesticide use, traffic volumes, and presence of cleanup sites (including those already remediated and posing no ongoing risk), as well as exposure to pollutants such as ozone and $PM_{2.5}$. Each of these datasets includes existing conditions which, under CEQA, are considered part of the environmental baseline or setting, not potential environmental impacts. As a result, census tracts may receive high pollution burden scores based on factors that would not constitute project or cumulative impacts under CEQA. Please see also Global Responses GR-6, Air Quality, GR-8, Mitigation Effectiveness, and GR-10, Cumulative Impacts.

4: CO_2 Pipelines

GR – 4a, CO_2 Pipeline Information

Commenters assert that the RDEIR fails to adequately disclose, analyze and mitigate CO_2 pipeline safety hazards, and claim that less than significant project-level and cumulative impact determinations, as related to CO_2 pipelines, are not supported by substantial evidence. The comments rely on a technical report from Accufacts, Inc., prepared for the commenters by Richard Kuprewicz (Accufacts Report). This information does not indicate any new or substantially more severe impacts than those described in the RDEIR.

The applicant has submitted a technical report from Cornerstone Engineering, Inc., prepared by Christine Halley, Karine Hochstatter and Allen Luthi (Cornerstone Report), which addresses technical issues raised by the Accufacts report. Where relevant, the responses below incorporate certain information contained in the Cornerstone Report, which provides additional supporting facts and expert opinion regarding CO_2 pipelines and related impact analysis. This information does not indicate any new or substantially more severe impacts than those described in the RDEIR.

Commenters claim that the RDEIR omits important information the following parameters, as discussed in the Accufacts Report:

- CO_2 purity – Commenters request clarification on the RDEIR's reference to "high purity" CO_2, and control of impurities such as water that can cause corrosion and risk pipeline rupture. As stated in RDEIR Vol. 2, Appendix E-2, U.S. Environmental Protection Agency Class VI Underground Injection Control (UIC) Permit Application Narratives for the Elk

Hills 26R Storage Project and the A1A2 Storage Project, the CO_2 stream concentration will [be a minimum of 95% CO_2. This concentration meets the Pipeline and Hazardous Materials Safety Administration (PHMSA) standard for "high purity" CO_2, i.e., CO_2 at a higher concentration than 90%, which establishes federal regulatory jurisdiction. RDEIR Appendix E-2, pp. 35-36, explains that injectate specifications of <50 ppmv for water (to ensure that entrained water remains in solution with the CO_2) and < 50 ppm O2 will keep CO_2 stream corrosiveness low. Pipelines will be covered in cathodic protection to prevent corrosion, and the testing and monitoring plan requires monitoring of CO_2 stream chemistry (including water content) and corrosion to confirm that performance parameters are maintained. RDEIR Vol. 2, p. 3-20 and Attachment C to RDEIR Vol. 2, Appendix E-2 (Testing and Monitoring Plan), pp. 2-3, 6-7.

- Pipeline design parameters – Commenters request additional information on pipe grade, thickness, diameter, operating temperature and maximum operating pressure, pipeline routes, and locations of valves and compressors stations. The details of final design for the project are not known as the applicant has not yet developed the final design. The terms "facility pipeline" and " injection pipeline" are interchangeable for purposes of a required Conditional Use Permit before operation. All pipelines, however termed, are subject to MM 4.9-4 which requires safety features that exceed PHMSA requirements. Such requirements, under the jurisdiction of Kern County Fire Department and the State Fire Marshall mandate the inclusion of appropriate spacing of automatice shut off valves, infra-red cameras for monitoring for leaks, appropriate review for construction details and coatings as well as all other State and Federal regulations. RDEIR Vol. 1, Chapter 3, Project Description, pp. 3-19 - 20, presents sufficient information on project pipelines to provide the basis for environmental impact analysis, including pipeline diameters, routes and pressure ranges. RDEIR Vol. 2, Appendix B-4, CO_2 Dispersion Modeling, states that the dispersion models assume an operating temperature of 80 °F. RDEIR Vol. 1 Section 3.4.1 describes the CO_2 compression and pumping facilities at the proposed capture facilities at each point of emission, sized to pressurize the CO_2 to approximately 1,700 to 2,100 pounds per square inch gauge for dense phase transport. There are no additional compressors or pumps proposed along the piping system. As shown in RDEIR Vol. 2, Appendix B-4, modeling of pipeline valve spacing determined that, for full-bore pipeline rupture scenarios at high pressure, isolation valves located at approximately one mile upstream and downstream would reduce the release duration for both gas and dense phase releases and would reduce the maximum distance traveled by dense phase releases.

- Operating pressure and CO_2 phase – As described in the RDEIR, p. 3-19, CO_2 will be compressed to approximately 1,700 to 2,100 pounds per square inch gauge for dense phase transport. The commenter asserts that "dense phase" CO_2 may include liquid or supercritical phase, depending on pressure, which is relevant to pipeline safety. ("Supercritical fluid" refers to a phase which occurs at high pressure and/or temperature and has physical properties intermediate between gas and liquid.) Table 5 in RDEIR Vol. 2, Appendix B-4 presents the results of small hole and full-bore pipeline rupture scenarios modeled over varying pressure ranges, CO_2 composition and phase, including both supercritical and liquid phases. However, all pipelines will be operated with the CO_2 in

supercritical phase due to size of quantities anticipated to be injected. As discussed in the RDEIR, Vol. 1, pp. 4.9-51 – 52, the effect of CO_2 leakage from a pipeline would depend on its location and the type and quantity of materials released. Based on the modeling analysis in Appendix B-4, the RDEIR disclosed that the worst-case event for a catastrophic failure would result in CO_2 dispersion for a range of 867 feet even with high winds. This distance remains within the 9,104 acres of the project's CCS Surface Land Area (RDEIR Vol. 1, p. 3-1). The nearest populated community (Buttonwillow) that could be affected by a release is 4 miles from the project site, and the nearest school (Mc Kittrick Elementary) is 4.45 miles away. See RDEIR, Vol. 1, pp. 4.9-51 – 52.

- Potential future CO_2 sources – Commenters assert that the RDEIR fails to provide necessary information on future CO_2 pipelines associated with potential future CO_2 sources, including the phase in which CO_2 will be transported which is relevant to pipeline safety. Commenters also raise concerns that SB 905 (2021-2022 Reg. Sess.) provides (among other things) that intrastate pipelines shall only be utilized to transport CO_2 to or from a carbon capture project once the federal Pipeline and Hazardous Materials Safety Administration (PHMSA) has concluded a rulemaking on new pipeline safety standards. Please see Global Response 1, Initial and Future CO_2 Sources. Potential future CO_2 sources are not components of the proposed project. The future effect of SB 905 on pipelines transporting CO_2 from potential future sources will depend on the status of PHMSA's rulemaking at that time. SB 905 does not apply to CO_2 captured and transported within a facility or property, which is the case for the CTV I proposed project; see RDEIR, Vol. 1, p. 3-12.

GR – 4b, CO_2 Pipeline Safety History

Commenters claim that the RDEIR understates the risk and impacts of pipeline rupture as indicated by past pipeline-related incidents, including oil pipeline incidents and the CO_2 pipeline rupture that occurred in Satartia, Mississippi in February 2020. The RDEIR acknowledges that "[t]there have been a number of industrial and natural releases of CO_2 where injuries and fatalities due to CO_2 inhalation have occurred" and provides detailed discussion of past incidents involving CO_2 releases, as well as an analysis of CO_2 releases associated with PHMSA-regulated pipelines. RDEIR, Vol. 1, Section 4.9-2, pp. 4.9-8 – 14.

Regarding the Satartia incident, RDEIR Vol. 1, Section 4.9-2, pp. 4.8-8 – 4.9-9, discusses key points from the findings of the Failure Investigation Report – Denbury Gulf Coast Pipelines LLC (Denbury Failure Report) prepared by PHMSA's Office of Pipeline Safety. The full report is included in the RDEIR as Appendix B-2 Failure Investigation Report – Denbury Gulf Coast Pipelines, LLC (Denbury Failure Report. The Denbury Failure Report states that there were no injuries or fatalities; see also RDEIR Vol. 1, p. 4.9-14 (noting that the Satartia pipeline rupture resulted in a total of 200 residents being evacuated and 45 residents taken to the hospital, with no residents admitted due to hazardous material exposure). As explained in the Denbury Failure Report, the rupture was caused by excessive strain on the pipeline due to a landslide following heavy rains. Commenters assert that the RDEIR discussion "tries to downplay" the Satartia

incident as a "unique situation", but that is PHMSA's characterization; see Denbury Failure Report, pp. 1 - 3:

> The weather conditions and unique topography of the accident site prevented the CO_2 vapor from rapidly dispersing and allowing a plume to form that migrated toward Satartia. . . . When CO_2 in a super-critical phase (which is common for CO_2 pipelines) releases into open air, it naturally vaporizes into a heavier than air gas and dissipates. During the February 22 event, atmospheric conditions and unique topographical features of the accident site significantly delayed dissipation of the heavier-than-air vapor cloud. . . . Local emergency responders were not informed by Denbury of the rupture and the nature of the unique safety risks of the CO_2 pipeline. . . .

The Denbury Failure Report found several risk factors attributed to the operator: failure to adequately address the risk of geohazards, underestimating the affected area in its dispersion model, and not notifying local responders of the incident. For the CTV I project, these issues have been addressed: landslide risk, along with other geohazards, was evaluated in the geological risk assessment and found to be "low to moderate"; see RDEIR Vol. 2, Appendix E-1, Preliminary Soil & Geologic Evaluation Report, Terra Vault 1 Carbon Collection Project, Elk Hills, Kern County, CA, pp. 30-32, p. 30, and RDEIR Vol. 1, pp. 4.7-7 - 8 and 4.7-19 - 22. Geotechnical studies conducted during final siting of project infrastructure will further evaluate site-specific geologic conditions, to be considered in infrastructure siting. To mitigate potentially significant impacts from the low-to-moderate risk associated with landslides (Impacts 4.7-4 and 4.7-6), Mitigation Measure 4.7-2 prohibits wells or accessory equipment and facilities on slopes greater than 30%, and Mitigation Measure 4.7-3 requires the owner/operator to implement all requirements of a site-specific geotechnical report. In addition, Mitigation Measure 4.9-18 ensures that local responders as well as appropriate agencies are notified to advise them of a potential failure.

Commenters also claim that the RDEIR fails to take into account the risk assessment for a previous CO_2 injection proposal in the Elk Hills oil field, or potential health risks of a CO_2 release that are described in a risk assessment for a hydrogen energy center near Bakersfield. The proposed CO_2 injection cited by the commenter was for the purposes of enhanced oil recovery, not carbon capture and storage, and is not relevant to the CTV I project. Regarding health risks associated with CO_2 releases, please see Global Response 5, Greenhouse Gas Impacts.

See also Global Response 7, Geological and Induced Seismicity Risk, discussing the risk and impacts of stored CO_2 releases.

GR – 4c, Federal and State Pipeline Safety Jurisdiction and Regulations

Commenters assert that federal and state pipeline jurisdiction are unclear and regulatory requirements are inadequate. As described in RDEIR Vol. 1, Section 4.9.3, PHMSA has regulatory authority and expertise over hazardous material pipelines, including CO_2 pipelines. PHMSA develops safety regulations and provides guidance to ensure safety in pipeline design, construction, testing, operation, maintenance, and emergency response. Many of these regulations are written as performance standards, which set the level of safety to be attained and allow the pipeline operator

to use various technologies to achieve safety. Regulations at 49 CFR Part 195 include detailed requirements on safety and environmental protection and incorporate many of the applicable national safety standards of the American Petroleum Institute (API), American Society of Mechanical Engineers, American National Standards Institute, and American Society for Testing and Materials. In California, the Office of the State Fire Marshal (OSFM) has delegated authority from PHMSA over intrastate pipelines, including oversight and enforcement of 49 CFR Part 195 requirements and further is a resource for the Kern County Fire Department on infield oil and gas CO_2 pipelines. These pipelines have been used in the oil field for enhanced oil recovery in the past The RDEIR mitigation measure provides more requirements and authority for the Kern County Fire Department in consultation with the State Fire Marshall to regulate any pipeline or other conveyance carrying CO_2. As the RDEIR notes, OSFM does not currently regulate pipelines transporting CO_2 as a gas or liquid under the federal program. See RDEIR Vol. 1, pp. 4.9-25-26, 36-37, 4.15-2.

Commenters assert that OSFM jurisdiction is unclear because "dense phase" CO_2 may vary with pressure between liquid and supercritical phase, but the federal pipeline regulations enforced by OSFM only cover CO_2 "consisting of more than 90 percent carbon dioxide molecules compressed to a supercritical state." 49 CFR §195.3. However, since the federal requirements do apply to pipelines that will transport supercritical phase CO_2, the CTV I facility pipelines must be designed to meet 49 CFR Part 195 specifications for the given operating temperature and pressure conditions.

Mitigation Measure 4.9-4 provides that, prior to construction of all CCS related facility pipelines, the operator must submit a construction permit site plan for review and approval by the County Planning and Natural Resources Department, the County Fire Marshall and OSFM. The site plan must provide details of the full location of the facility pipeline, width of easement for the pipeline, location and spacing of automatic shut off valves, location of monitoring cameras, pipeline construction and coatings, and all other requirements of federal and state regulations, including all details and features to show compliance with 49 CFR Part 195 requirements. The measure states that "General reference to 'compliance with regulations' will not be considered sufficient." As a conservative measure, Mitigation Measure 4.9-4 requires that all CCS-related CO_2 facility pipelines must be designed, constructed, and pressure tested in accordance with PHMSA regulations as well as oversight and additional conditions from the Kern County Fire Department and State Fire Marshall. That includes all gathering lines that transport CO_2.

The Accufacts Report comments that the labeling of pipelines in RDEIR Vol. 1, Figures 1-1 and 3-3 do not clarify the jurisdiction of PHMSA and OSFM. The figures depict proposed pipeline routes and were not intended to distinguish jurisdictional boundaries.

The Accufacts Report notes that additional federal and state regulations or legislation may be adopted in the future with stricter requirements. Pipeline construction and operation for proposed projects must conform to currently existing regulatory requirements, which agencies with jurisdiction and expertise have determined to be adequate. If future regulatory changes adopted by PHMSA or OSFM are applicable to project operations, compliance will be required those agencies.

GR – 4d, Pipeline Safety Mitigation Measures

Commenters assert generally that the RDEIR fails to include all feasible mitigation for pipeline-related impacts, because mitigation measures incorporate compliance with allegedly inadequate federal and state regulations. However, commenters have not proposed additional feasible or necessary mitigation measures. "[R]equiring compliance with regulations is a common and reasonable mitigation measure" for CEQA purposes. *Oakland Heritage Alliance v. City of Oakland* (2011) 195 Cal.App.4th 884, 906. Please see also Global Response GR-8, Mitigation Effectiveness.

Commenters assert that pipeline setbacks and limits on encroachment by future development should be required as mitigation. Mitigation Measure 4.9-4 requires compliance with setback requirements specified in 49 CFR Part 195. As discussed above, M 4.9-4 provides for County review and approval of a site plan that must include all details and features necessary to demonstrate compliance with 49 CFR Part 195 regulations. Those regulations include 49 CFR § 195.210(b) which provides: "No pipeline may be located within 50 feet (15 meters) of any private dwelling, or any industrial building or place of public assembly in which persons work, congregate, or assemble, unless it is provided with at least 12 inches (305 millimeters) of cover in addition to that prescribed in § 195.248." Pipelines associated with the proposed project lie wholly within the Elk Hills Oil Field administrative boundary, with no pipeline routes proposed along populated corridors. RDEIR, Vol. 1, Figure 3-3: Site Plan. The closest sensitive receptor is four miles from the project site, and the worst-case pipeline failure would result in CO_2 dispersion for a range of 867 feet. RDEIR, Vol. 1, pp. 4.9-51 – 52 and Appendix B-4. Encroachment by future development is limited by Mitigation Measure 4.11-2, which restricts use of the CCS Surface Land Area to agricultural cultivation, solar and energy storage, conservation, and permitted oil and gas exploration and production, and related provisions in Mitigation Measures 4.11-3, 4 and 5 regarding procedures for building permits, lot line adjustments and deed restrictions in the CCS Surface Land Area. No additional mitigation measures imposing setbacks or limiting encroachments are needed.

The Accufacts Report, p. 1, offers suggestions directed to federal regulators as recommendations for improving pipeline safety regulations, which is beyond the County's jurisdiction and the scope of this project. If these regulatory suggestions are reframed as mitigation measures for the CTV I project, they are inapplicable to project-specific conditions and circumstances: Adding an odorant to the pipelines would be unnecessary and ineffective, given the worst-case extent of impact is 867 feet as demonstrated by dispersion modeling (RDEIR Vol. 2, Appendix B-4) and the distance to the nearest sensitive receptors is four miles (RDEIR Vol. 1, p. 3-1). The nearest community that could be affected by a release is 4 miles from the project site, and the nearest school is 4.45 miles away. See RDEIR, Vol. 1, pp. 4.9-51 – 52. As discussed above, Mitigation Measure 4.9-18 requires coordination with local responders, and water and other contaminants in the project's CO_2 stream are controlled. The CTV I project will construct new pipelines to compressed CO_2 to injection wells; no existing pipelines will be converted into service for CO_2 transport.

Regarding injection well blowout prevention, please see Global Response 7, Geological and Induced Seismicity Risk.

5: Greenhouse Gas Impacts

Commenters contend that the RDEIR analysis of greenhouse gas (GHG) impacts is inadequate and fails to address numerous issues, including issues related to future sources of CO_2 for storage in the proposed project reservoirs, risk of CO_2 releases from storage and pipelines, and treatment of GHG in alternatives analysis, mitigation measures and cumulative impacts analysis. This Global Response 5 addresses comments specifically related to GHG. Please also see Global Responses 1, 2, 4, and 7 through 10 regarding GHG-related aspects of other topics.

The applicant has submitted a technical report from Ramboll Americas Engineering Solutions, Inc., San Francisco, California (See Appendix A-3, Ramboll Technical Memorandum), and a report by Ramboll entitled "Regulatory Framework and GHG Reporting for Carbon Capture and Sequestration in California" (See Appendix A-2, Ramboll Regulatory Framework and GHG Reporting for CCS Projects in California), as well as a technical report from Cornerstone Engineering, Inc., prepared by Christine Halley, Karine Hochstatter and Allen Luthi (Cornerstone Report), which address technical issues raised by the Sahu and DiGiulio Reports submitted as part of the comments submitted by Center for Biological Diversity, Center on Race Poverty & the Environment, Central California Environmental Justice Network, Central Valley Air Quality Coalition, and the Sierra Club. Where relevant, the responses below incorporate information from the Ramboll Report, which provides additional supporting facts and expert opinion regarding greenhouse gas issues. This information does not indicate any new or substantially more severe impacts than those described in the RDEIR.

GR – 5a, Consistency of GHG Significance Findings

Commenters contend that the RDEIR conclusions and findings regarding the significance of GHG impacts are incoherent and internally inconsistent. Commenters also contend that the RDEIR appears to deny that the significant impacts exist alongside disclosure of the impact. The RDEIR is neither incoherent nor inconsistent, nor does the RDEIR deny significant impacts exist. The proposed project would capture GHG emissions through the operation of a carbon capture and sequestration (CCS) facility. While 31,217,430 MT of CO_2 is anticipated to be captured from operating facilities and/or from a direct air capture technology that captures atmospheric CO_2, (RDEIR, p. 4.8-26) the capture technology itself creates CO_2 emissions during operation. Based on use of amine technology, this is estimated to result in creation of 26,222 MT of additional CO_2 (RDEIR, Table 4.8-6, p. 4.8-26). MM 4.8-6 requires that both the capture process and any outside sources that will send the CO_2 for injection must mitigate the CO_2 produced to a level of "no net increase" (RDEIR, pp. 4.8-27 – 4.8-28). As stated in the RDEIR, taking into account the emission reductions from CCS, the project's impacts related to GHG emissions would be less than significant (RDEIR, p. 4.8-26), but this conclusion is contingent on injected CO_2 remaining in the geographically confined reservoirs in perpetuity without leakage from injection and capture activities (RDEIR, p. 4.8-26). If, however, any of the injected CO_2 leaked, or additional unmitigated CO_2 was created in the capture facility operations, then GHG emissions from the project would be potentially significant in the context of existing background GHG levels on a state-wide basis. (RDEIR, p. 4.8-26). Although MM 4.8-1 through MM 4.8-6 would greatly reduce the likelihood of CO_2 escaping from the reservoirs, the possibility of a release from unforeseen circumstances and

equipment failures or stops to injection from monitoring failures remains (RDEIR, p. 4.8-26). Although the possibility of an escape of CO_2 is extremely unlikely, such a release could potentially result in contributions to GHG emissions that the RDEIR conservatively characterizes to remain significant and unavoidable (RDEIR, p. 4.8-26). The RDEIR clearly explains the assumptions leading to the ultimate conclusion that the potential contribution to GHG emissions of the project is significant and unavoidable. There is no incoherence or inconsistency in this explanation.

Commenters similarly claim that the RDEIR is inconsistent in determining that, although the project will have significant and unavoidable impacts on GHG emissions, the No Project Alternative will have less-than-significant impacts on GHG emissions, and the No Project Alternative will have greater GHG impacts than the proposed project. There is no inconsistency. The proposed project would capture GHG emissions through the operation of a CCS facility and mitigate its own operational GHG emissions to net zero. The No Project Alternative would not capture and store any GHG emissions (RDEIR, pp. 6-17, 6-22), resulting in no change to the existing GHG emissions baseline, a less than significant impact. While the GHG impact analysis concluded that the ”contribution to greenhouse emission due to unknown release of emissions or stops to injection for monitoring failures remains significant and unavoidable” (RDEIR, p. 4.8-26), the No Project Alternative analysis compares the unchanged GHG baseline with no project to the expected “environmental effects which would occur if the project is approved” (CEQA Guidelines §15126.6(e)(3)(B)), where the project is operating to capture and store CO_2. In that comparison, where the RDEIR states “impacts to GHGs would be greater” under the No Project Alternative (RDEIR, p. 6-17), the statement is intended to convey that the No Project Alternative will have a poorer GHG outcome (with no change from baseline conditions) than the proposed project operating a carbon capture and storage facility. Please see also Global Responses GR-9, Alternatives and GR-7, Geological and Induced Seismicity Risk.

As part of this response, for clarity, the following edits are made to the existing text in Table 1-1, Summary of Significant and Unavoidable Impacts of the Project, RDEIR, p. 1-13, for the Greenhouse Gas resource, in the column for Project Impacts:

> The project has the potential to generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment and conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases. The objective of the project is that injected CO_2 remains in the geographically confined reservoirs in perpetuity without leakage from injection and capture activities. However, there is a very small possibility that some of the injected CO_2 could leak from storage for a variety of reasons. If any of the injected CO_2 leaked, or additional unmitigated CO_2 was created in the capture facility operations, then GHG emissions from the project would be potentially significant. Although MM 4.8-1 through MM 4.8-6 would greatly reduce the likelihood of CO_2 escaping from the reservoirs, the possibility of a release from unforeseen circumstances and equipment failures or stops to injection from monitoring failures remains. Thus, even with the implementation of MM 4.8-1 ~~and MM 4.8-2~~ through MM 4.8-6, the impact would remain **significant and unavoidable**.

As part of this response, for clarity, the following edits are made to the existing text in Table 5-1, Summary of Significant and Unavoidable Impacts of the Project, RDEIR, p. 5-4, for the Greenhouse Gas resource, in the column for Project Impacts:

> The project has the potential to generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment and conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases. The objective of the project is that injected CO_2 remains in the geographically confined reservoirs in perpetuity without leakage from injection and capture activities. However, there is a very small possibility that some of the injected CO_2 could leak from storage for a variety of reasons. If any of the injected CO_2 leaked, or additional unmitigated CO_2 was created in the capture facility operations, then GHG emissions from the project would be potentially significant. Although MM 4.8-1 through MM 4.8-6 would greatly reduce the likelihood of CO_2 escaping from the reservoirs, the possibility of a release from unforeseen circumstances and equipment failures or stops to injection from monitoring failures remains. Thus, even with the implementation of MM 4.8-1 ~~and MM 4.8-2~~ through MM 4.8-6, the impact would remain **significant and unavoidable**.

GR – 5b, Adequacy of Data and Analysis Supporting Finding of Significant Impact from GHG Emissions

Commenters claim that the finding of significant impact for GHG emissions is not accompanied by data or analysis regarding the nature or extent of the significant impact. This is not correct. RDEIR Section 4.8, Greenhouse Gas Emissions considers impacts associated with greenhouse gas emissions, including potential CO_2 releases from storage. Although implementation of Mitigation Measures 4.8-1 through 4.8-6 would reduce the likelihood of such releases, the RDEIR conservatively concludes that the impact would be significant and unavoidable. RDEIR, Vol. 1, pp. 4.8-22 – 26 and 4.8-32 – 33 (Impacts 4.8-1 and 4.8-3). Thus, the RDEIR acknowledges the unavoidable possibility of CO_2 releases from geological storage and unforeseen equipment failures. Though the likelihood is low, it is not zero, and the resulting impact would be significant in the context of background GHG concentrations on a state-wide level.

Evidence that injected CO_2 will remain in the Approved Storage Area is discussed in the RDEIR, Vol. 1, pp. 3-22 – 24, 4.7-3 – 4, 4.10 – 28 -29, supported by extensive geological evaluation, seismic history and analysis, geomechanical modeling and risk assessment contained in RDEIR Vol. 2, Appendix E-2, U.S. Environmental Protection Agency Class VI Underground Injection Control (UIC) Permit Application Narratives for the Elk Hills 26R Storage Project and the A1A2 Storage Project, and Appendix F, Hazard and Hazardous Materials Technical Documentation. This response focuses on evidence supporting the RDEIR's conclusions with respect to potential releases from equipment failure and maintenance activities. Please see Global Response 7 for a discussion of evidence supporting the RDEIR's conclusion regarding risk of release due to geological and seismicity factors.

RDEIR Vol. 2, Appendix F contains an evaluation of the risk that damage to or failure of pipelines and surface equipment can result in CO_2 leakage. The Appendix F evaluation points out that the applicant's use of prevailing industry design and construction practices and compliance with applicable regulatory and monitoring requirements will reduce to the maximum extent practicable the risk of leakage from surface facilities due to equipment failure. In addition, as Appendix F recognizes, project facilities and pipelines will utilize proven construction materials and control processes common to new CO_2 projects. Operations and maintenance will follow established industry practices and standards demonstrated to be effective. Facilities will also be designed to follow the elements of process safety management specified in OSHA's Occupational Safety and Health Standard 29 CFR 1910.119. Pipelines will comply with California's Code of Regulations, Title 8. The evaluation in Appendix F also recognizes that the unique and centralized automation and control system currently in use at the Elk Hills Oil Field will facilitate real-time operational control over the project and ensure the safety and reliability of the facilities. The evaluation recognizes that there is a possibility of fugitive emissions from surface equipment in the event of equipment failure and that CO_2 will occasionally need to be vented from surface equipment for operational maintenance. Based on all of the available information, the Appendix F evaluation concludes that the severity of any impacts from equipment related CO_2 releases is insubstantial and there is a very low, but not zero, possibility of occurrence of such releases.

As the Appendix F evaluation further notes, the applicant will monitor and report any CO_2 released through equipment failure and maintenance events as part of its facility-wide reporting requirements under 40 CFR Part 98 Subpart W and the analogous state provisions at Division 3, Chapter 1, Subchapter 10 of Title 17 of the California Code of Regulations. The amount of CO_2 emissions attributed to surface equipment associated with the project will be included in the mass balance information reported to CARB.

GR – 5c, Project Objective of CO_2 Sequestration and GHG Significant Impact Finding

Commenters assert that because it cannot be guaranteed that no CO_2 will ever leak from the storage reservoirs, the project should not be approved by the County because if such leakage occurs, the project would not fulfill its fundamental objective to capture and permanently store CO_2 emissions underground. As explained above, it is highly unlikely that any CO_2 will be released from the storage reservoirs. Moreover, CEQA case law establishes that CEQA documents are generally not required to prove that a proposed project will achieve its objectives. Lead agencies are generally entitled to assume that proposed projects will work as described. Lead agencies can make reasonable assumptions about how the project will work in the future without guaranteeing these assumptions will remain true. See, *Village Laguna of Laguna Beach Inc. v. Board of Supervisors* (1982) 134 Cal App. 3d 1022; *Environmental Council of Sacramento v. City of Sacramento* (2008) 142 Cal. App. 4th 1018.

GR – 5d, Consistency with GHG Plans and Policies

Commenters assert that the analysis of GHG emissions and impacts does not properly assess consistency with plans and policies relating to GHGs, with a particular emphasis on the California Air Resources Board's (CARB) 2022 Scoping Plan for Achieving Carbon Neutrality (2022 Scoping Plan). The RDEIR identifies the 2022 Scoping Plan as part of the regulatory setting for the project in Section 4.8.3 (RDEIR Vol. 1, pp. 4.8-7 – 4.8-18) and discusses consistency with plans, policies and regulations adopted for the purpose of reducing emissions of greenhouse gases, including the California Air Resources Board's 2022 Scoping Plan, as part of the discussion of Impact 4.8-2 (Conflict with any Applicable Plan, Policy, or Regulation Adopted for the Purpose of Reducing the Emissions of Green House Gases) (RDEIR, Vol. 1, pp. 4.8-28 – 4.8-31). As the RDEIR notes,

> "[t]he CARB 2022 Scoping Plan … lays out a path to achieve targets for carbon neutrality and reduce anthropogenic GHG emissions by 85 percent below 1990 levels no later than 2045, as directed by AB 1279 (CARB 2022b). The CARB 2022 Scoping Plan acknowledges the need deploy all viable tools to address the existential threat that climate change presents, including carbon capture and sequestration. Modeling completed in support of the 2022 Scoping Plan clearly shows there is no path to carbon neutrality without carbon removal and sequestration, making it an essential tool to achieve carbon neutrality. Governor Newsom also recognized the importance of CO_2 removal strategies and directed CARB to establish CO_2 removal and carbon capture targets of 20 MMT CO_2 and 100 MMT CO_2 by 2030 and 2045, respectively, as well as signing 2022 legislation on carbon removal and sequestration, including: AB 1279, SB 905, SB 1137, and AB 1757 (CARB 2022b)." RDEIR, Vol. 1, pp. 4.8-13 – 4.8-14; see also, RDEIR, Vol. 1, pg. 4.8-28.

The RDEIR further explains that CCS is identified as one of the strategies for carbon removal and sequestration in the 2022 Scoping Plan and that although no CCS projects are currently operational in California, it is not a new technology and has been proven to be a safe and reliable technology. RDEIR, Val. 1, pg. 4.8-28. The RDEIR recounts the "Strategies for Success" identified in the 2022 Scoping Plan for the Carbon Dioxide Removal and Capture Sector. RDEIR, Vol. 1, pg. 4.8-29. The RDEIR states that as a CCS project, the project is essential to meeting California's targets for climate neutrality, GHG emission reductions, CO_2 capture and carbon removal and is reasonably expected to reduce region wide and statewide GHG emissions over the expected life of the project, and thus would support the 2022 Scoping Plan strategies for success. RDEIR, Vol. 1, pg. 4.8-30. The RDEIR also states that the project would comply with any new regulations developed as a result of implementation of the Strategies for Success in the 2022 Scoping Plan. On the basis of these facts, the RDEIR concludes that the project would be consistent with the 2022 Scoping Plan. RDEIR Vol. 1, pg. 4.8-30.

Commenters do not dispute any of the facts set forth in the RDEIR regarding Scoping Plan consistency but assert merely that the RDEIR's discussion of the project's consistency with the 2022 Scoping Plan fails to provide sufficient information to enable decision-makers to make a reasoned decision and fails to provide substantial evidence to justify its conclusions. The CEQA Guidelines define "substantial evidence" to mean "enough relevant information and reasonable inferences from this information that a fair argument can be made to support a conclusion, even

though other conclusions might also be reached" (14 CCR § 15064.7(a)) and "facts, reasonable assumptions predicated on facts, and expert opinion supported by facts." 14 CCR § 15064.7(b). As noted above, the RDEIR sets forth facts, reasonable assumptions and expert opinion supported by facts establishing that the project is consistent with the 2022 Scoping Plan. Commenters identify two elements of the 2022 Scoping Plan strategies for success they contend are inapplicable to the project – "Evaluate and streamline permitting barriers to project implementation while protecting public health and the environment" and "update the CARB Carbon Capture and Sequestration Protocol with the best available science and implementation experience." As an initial matter, the RDEIR does not state that the project support each of the elements of the "Strategies for Success" – only that the project is broadly consistent with the 2022 Scoping Plan. Nevertheless, even in those cases, commenters are mistaken. Implementation of the project will provide valuable information, input and experience with respect to both permitting processes and science and implementation experience, thus supporting both of these elements.

Commenters assert that the analysis of consistency with the 2022 Scoping Plan fails to address consistency of the project's initial and potential future CO_2 sources with the 2022 Scoping Plan. Commenters assume that a CCS project can be consistent with the 2022 Scoping Plan only if it is related to one of the industries specifically noted in the 2022 Scoping Plan – electricity generation, cement production and refineries – and that because the initial source for the project is oil field gas, the project cannot be consistent with the 2022 Scoping Plan. Commenters are mistaken. Nothing in the 2022 Scoping Plan purports to forbid deployment of CCS to capture CO_2 from industry sectors other than the ones mentioned in the 2022 Scoping Plan. Indeed, such a limitation is belied by the 2022 Scoping Plan's recognition that there is a need deploy all viable tools to address the existential threat that climate change presents, including carbon capture and sequestration, as well as the 2022 Scoping Plan's recognition that there is no path to carbon neutrality without carbon removal and sequestration, making it an essential tool to achieve carbon neutrality. As the Ramboll Report points out, the Scoping Plan states that the deployment of CCS and direct air capture must happen towards the end of this decade to be on track to achieve the greenhouse gas reduction goals of AB 1279. Ramboll Report, pg. 11.

The Ramboll Report also explains that the transportation sector, the State's leading source of GHG emissions, is a focus for significant GHG reductions in the Scoping Plan. The Scoping Plan acknowledges that "the transition to complete ZEV technology will not happen overnight. Conventional ICE vehicles from legacy fleets will remain on the road for some time, even after all new vehicle sales have transitioned to ZEV technology." 2022 Scoping Plan, pg. 190. The transition from fossil fuels to zero-emission transportation is anticipated to be a multi-decade process. This transition process will retain a corresponding continuing, though declining, demand for fossil fuels for legacy vehicles in on-road applications, and in aviation, marine, and rail applications. Ramboll Report, pg. 11. Accordingly, there will be continuing need for oil and gas production to support those vehicles. Nothing in the 2022 Scoping Plan suggests that CCS is prohibited from deployment in the oil and gas production sector.

As described in Ramboll's CCS Whitepaper attached to the Ramboll Report, the scoping Plan has identified the Low Carbon Fuel Standard (LCFS) to be the primary mechanism for transforming California's transportation fuel pool with low-carbon fuels to supplement the ZEV mandates and

decarbonize the transportation sector. Specifically, there is a CCS protocol under the LCFS which includes detailed GHG quantification and verification methods to ensure the validity of GHG reductions from CCS projects under the LCFS program. Moreover, the 2022 Scoping Plan scenario also projects that major petroleum operations in California will install CCS beginning in 2028 to support the reduction of transportation fuel carbon intensity. Therefore, CARB has determined that actions to invest and implement CCS technologies to reduce the carbon intensity of transportation fuels is consistent with the 2022 Scoping Plan to reduce GHG emissions from the hard-to-decarbonize transportation sectors, especially in the interim years. CCS Whitepaper, pg. 5.

Commenters claim that the project cannot be consistent with the 2022 Scoping Plan, because proposed mitigation measures discussed in the RDEIR that provide for purchase of credits do not follow the "hierarchy" of mitigation commenters contend is required by the 2022 Scoping Plan. According to commenters, the lead agency must first impose all on site mitigation, then prioritize local off-site mitigation, and only then consider non-local offsite mitigation and voluntary offsets. Commenters further contend that only voluntary offsets issued by a recognized and reputable voluntary carbon registry are permissible. Commenters offer no suggestions on mitigation measures that were overlooked in the RDEIR analysis. In addition, commenters misstate CARB's position. With respect to CEQA mitigation, CARB characterizes its statements in the 2022 Scoping Plan as "suggestions" and "recommendations." 2022 Scoping Plan, pp. 270-271; see also 2022 Scoping Plan Appendix D, pp. 28-29. Nevertheless, the RDEIR reflects that all feasible mitigation is included.

GR – 5e, Support for GHG Impacts Analysis

Commenters claim that the RDEIR's analysis of GHG impacts is flawed because "it purports to present data that it admits does not exist." In particular, commenters contend that the projection in Table 4.8-6 that a total of 31,217,430 MT CO_2e will be injected from 2026-2045 and the estimate for annual injection volume are flawed because some of the sources that will contribute to annual injection volume and total projected injection have not yet been permitted.

Commenters fundamentally misunderstand the nature of the data presented. As set forth in Chapter 3 of the RDEIR, the project reviewed in the RDEIR comprises six proposed Class VI Underground Injection Control (UIC) wells, approximately 11 miles of underground facility and injection pipeline for capture from the precombustion Elk Hills field gas, and related infrastructure improvements. Additionally, 10 existing wells would be converted to monitoring wells, and six existing wells would be converted into seismic monitoring wells. The proposed new facilities are designed to accommodate the CO_2 from the pre-combustion Elk Hills field gas, but are not designed, sized, or constructed to accommodate any future sources of CO_2.

At the same time, the RDEIR recognizes that the Elk Hills field gas streams will not provide enough captured CO_2 to produce the maximum injection capacity of 2,150,000 tons per year for which the project is being permitted in two EPA permits for the oil and gas reservoirs (26R and/or A1A2) for permanent sequestration. In other words, the naturally occurring geologic reservoir where the project is located has the capacity to accommodate a greater amount of CO_2 than would be provided by the Elk Hills gas streams alone. The RDEIR thus identifies a range of industries, as well as six

projects currently in exploratory stages of planning and development, that could potentially provide CO_2 streams for injection. RDEIR, Vol. 1, pp. 3-13 – 3-15. At the same time, the RDEIR makes clear that none of those industries or projects have been approved and that each will require an additional conditional use permit (CUP) and associated environmental review from the county before they can provide CO_2 streams for injection in the reservoirs.

Accordingly, estimated GHG emissions in Tables 4.8-4 through 4.8-6 are not intended as exact projections. Rather, the GHG emissions and sequestration figures are good-faith estimates based on maximum reservoir capacity that account for (1) the only known CO_2 source for the project and its operational details, whose uncertainties have been acknowledged by the RDEIR, and (2) the possibility that other sources of CO_2 might, at unknown points in the future, be permitted through separate approval and environmental review processes to sequester CO_2 within the existing natural reservoir underlying the project site. Consistent with the importance that the state has placed on the sequestration of CO_2, this potential is not permanently prohibited by the County or by the proposed project. However, as stated in the RDEIR, any such future source would be required to be permitted with a separate CUP and associated environmental review under CEQA, and no such application is pending. RDEIR Vol. 1, pp. 3-13 – 3-15, 4.8-19.

GR – 5f, Adequacy of GHG Emissions Data

Commenters contend that the RDEIR fails to disclose the operational GHG emissions from the capture facility stationary sources. Commenters are incorrect. As described in the RDEIR, capture facility stationary sources include two amine capture plants and CO_2 compression and pumping facilities (compressors, pumps, chiller system and heat exchanger). RDEIR pp. 3-15 – 3-20. These stationary sources will solely be powered by electricity. The RDEIR presents operational GHG emissions data for stationary sources, as detailed in Table 4.8-4: Estimated Operational Greenhouse Gas Emissions, in the column labeled "Total Emissions from Existing Plants." Because the stationary sources will all be powered by electricity, the indirect GHG emissions from the proposed capture, compression and pumping facilities are included in the total emissions from existing plants as shown in Table 4.8-4.

For clarification, the following text on RDEIR, Vol. 1, p. 4.6-12, is revised to read:

> The project would involve electricity ~~and natural gas~~ demands for the operation of stationary sources, <u>for</u> ~~including of all~~ capture equipment, compression and pumping equipment.

GR – 5g, Project Lifespan and GHG Analysis

Commenters assert that the RDEIR fails to explain why its analysis only goes to the year 2045 and up to 31 MMT of CO_2, when the RDEIR is for approval of the entire storage capacity of 49.21 MMT of CO_2 and the project lifespan is currently estimated to be 30 years or roughly to 2054. RDEIR Tables 4.8-4 through 4.8-6 (RDEIR, Vol. 1, pp. 4.8-23 – 4.8-26) assume that the Project would operate over a 20-year operational lifetime (2026-2045). At the maximum injection rate assumed in Table 4.8-4 (2,150,000 MT CO_2), the project could operate beyond 2045 for approximately 8 more years until injection reached the maximum capacity in both the 26R and

A1A2 reservoirs. However, 2045 was selected by the RDEIR as a conservative, reasonable projection because 2045 is the year by which the State aims to ban fossil fuel production, and the Elk Hills power plant may be forced to close, although the RDEIR recognizes state policies may ban fossil fuel production and force plant closure earlier. RDEIR Vol. 1, pg. 4.8-24. The RDEIR also indicates that 2045 is the projected lifespan capacity of reservoir A1A2 and recognizes that it is the goal date of the EO B-55-18 mandate to achieve carbon neutrality. RDEIR, Vol. 1, pg. 4.8-25. On the basis of this information, the Ramboll Report concludes that using 2045 is appropriate in this context and is consistent with the 2022 Scoping Plan and climate goals. Ramboll Report, pg. 11. However, as the Ramboll Report also notes, using 2045 as the projected lifespan of the project does not indicate that the project could not potentially operate and continue to sequester CO_2 beyond 2045 without electricity generated from the Elk Hills power plant. The electricity demand of the project can be met in the absence of the Elk Hills power plant by supply from the existing electricity grid. By the same logic, implementation of the project would not affect when the Elk Hills power plant would be shut down, because the electricity necessary to operate the project does not need to come from the Elk Hills power plant, and the Elk Hills power plan is independently used by the existing (and ongoing) oil field operations that are unaffected by the proposed project. The RDEIR also acknowledges that although the project is economically viable with only the Elk Hills field gas as its source, the ultimate lifespan of the project is dependent on the sources permitted for injection into the storage, and the ability of the project to obtain CO_2 source(s) and inject CO_2 at the upper limit of 2,210,000 million tons per year, until the permitted storage capacity is reached. RDEIR, Vol 1, pg. 4.8-25. Please see also Global Response 1, Source Identification, and Global Response 2, Extending the Life of Fossil Fuel Facilities.

GR – 5h, Offset Credits for CCS Operations

Commenters contend that the RDEIR must disclose and analyze the issue of whether the project will or should generate offset credits in the Cap-and-Trade market. According to commenters, if such credits could be generated, the GHG impacts of the project could be materially different than those discussed in the RDEIR because such credits might allow continued emissions elsewhere. As noted in the RDEIR, the GHG captured and injected as presented in Tables 4.8-4 through Table 4.8-6, is based on the project's maximum annual injection rate and the existing natural storage capacity of the geologic reservoirs. The actual GHG captured and injected may represent CO_2 emissions from a combination of existing known sources as well as possible future sources that could, at an unknown future date, be developed and permitted. The general possibility of these future sources is described in more detail in Appendix K-4 of the RDEIR. Some of these sources could be eligible for Low Carbon Fuel Standard (LCFS) credits, and some could be large GHG emitting facilities subject to cap-and-trade regulations. As described in more detail in Ramboll's CCS Whitepaper, future applications for fuels to be qualified under the LCFS program must undergo a project-based crediting mechanism and be verified by CARB-accredited verifiers. The Cap-and-Trade program presently does not have any mechanisms to account for GHG reductions from CCS technologies. CCS Whitepaper, pg. 7. CARB provides oversight on the LCFS program, the Statewide GHG inventory, and the Cap-and-Trade program, among other regulatory frameworks for GHG reductions. The Ramboll Report concludes that these rigorous GHG reporting and verification requirements with CARB's oversight ensure the completeness and consistency of

GHG emissions data reported by covered entities under these programs to prevent potential double-counting and maintain the integrity of the emissions reduction framework. Ramboll Report at 13.

GR – 5i, GHG Cumulative Impacts Analysis

Commenters raise several issues regarding the RDEIR's cumulative impacts analysis for GHG. This response addresses comments specific to the GHG cumulative impacts analysis set forth in RDEIR Section 4.8.5 (RDEIR, Vol 1, pp. 4.8-31 – 4.8-33). For additional responses to comments regarding the cumulative impacts analyses in the RDEIR, including the GHG cumulative impacts analysis, please see Global Response 10 – Cumulative Impacts.

As noted above, the GHG cumulative impacts analysis is set forth in RDEIR section 4.8.5. As the RDEIR states:

> "Accounting for permanent CCS and the resulting GHG emissions reductions, the project's cumulative impacts would be less than significant. However, this is contingent upon injected CO_2 remaining in the identified geographically confined reservoirs for storage in perpetuity. Should the injected CO_2 fail to remain in the reservoirs in perpetuity, GHG emissions from the project would be potentially significant and the project would have the potential to conflict with GHG reduction plans. Implementation of MM 4.8-1 and MM 4.8-2 would greatly reduce the likelihood of CO_2 escaping from the reservoirs, but the possibility of a release due to unforeseen circumstances or equipment failure remains. As a result, the project's individual and cumulative impacts would remain significant and unavoidable." RDEIR, Vol. 1, pg. 4.8-32.

Commenters raise several issues with this analysis. First, commenters contend that the RDEIR frames the cumulative impacts analysis in fundamentally misleading ways and take exception to the statement in the RDEIR that "[s]ince the project individually results in a net reduction in GHG emissions, the project would also contribute to reductions in cumulative GHG reductions." RDEIR, Vol. 1, pg. 4.8-32. First, according to commenters, this statement contradicts the finding of the RDEIR that the project will contribute to cumulatively considerable impacts. Commenters are mistaken. As set forth above, because there is a small possibility that GHG might not remain confined in the geologic storage reservoirs in perpetuity, the RDEIR very conservatively concludes that the project may have individual, and cumulatively considerable, significant and unavoidable impacts. There is no contradiction in these concepts. Second, commenters contend that the statement misses the point of cumulative impact analysis and contend that if one could infer cumulative impacts from individual impacts, there would be no need for cumulative impacts analyses under CEQA. Commenters confuse a statement regarding *emissions* with a conclusion regarding *impacts*. The statement with which commenters take issue is correct – because as an individual project the project will result in net reductions of *emissions* of GHG, it will also result in a cumulative reduction of *emissions* of GHG. That statement alone does not, however, say anything about individual or cumulative *impacts* of the project.

Commenters claim that the RDEIR's cumulative analysis must include analysis of impacts from projects in the RDEIR's potential future CO_2 source projects list as well as any other future project that may plan on sending CO_2 for sequestration in the proposed project reservoirs. The scope of a cumulative analysis is guided by standards of practicality and reasonableness. CEQA Guidelines § 15130(b); *City of Long Beach v. Los Angeles Unified Sch. Dist.* (2009) 176 Cal.App.4th 889. Mere awareness of proposed expansion plans or other proposed development does not necessarily require the inclusion of those proposed projects in the EIR. Rather, these projects must become "probable future projects" in order to require considered in cumulative impact analysis. CEQA Guidelines § 15130(b); *Gray v. County of Madera* (2008) 167 Cal.App.4th 1099, 1127. Projects actively undergoing environmental review or in which an applicant has devoted significant time and financial resources in anticipation of such review are considered sufficiently "probable." *Gray*, 167 Cal.App.4th at 1127-28.

The RDEIR identifies the initial source of CO_2 for the project storage as pre-combustion Elk Hills field gas, which is evaluated as part of the proposed project. RDEIR, Vol. 1, p. 3-12. In addition, the RDEIR identifies categories of potential future sources of CO_2 that could contribute to CO_2 stored in the proposed project reservoirs together with CO_2 from the existing Elk Hills field gas streams. RDEIR, Vol. 1, p. 3-13 and Vol. 2, Appendix K-4. These include other oil and gas operations, power plants, hydrogen production, direct air capture of CO_2, biomass carbon removal and storage, alternative fuels production, and cement and steel production.

Where environmental review or investment of time and financial resources in anticipation of such review has progressed to the point that a project is considered a "reasonably probable" future project, that project was included in the cumulative projects list in RDEIR Vol. 1, Table 3-8. Oilfield field gas streams are identified as a potential future CO_2 source (RDEIR Vol. 1, p. 3-13) and Table 3-8 includes oil and gas development under the Kern County Oil and Gas Development Zoning Ordinance. While no other potential future CO_2 source project is currently undergoing environmental review, Lone Cypress Energy Services' hydrogen project, which commenced environmental review but was withdrawn for reassessment by the applicant, is considered a "reasonably probable" future project and is included in Table 3-8. In addition, Table 3-8 includes potential future CO_2 source projects without pending applications or environmental review that have been announced in the media, including projects listed in RDEIR Vol. 1, p. 3-15 which have entered into preliminary agreements or discussions with the proposed project applicant to explore the possibility of future CO_2 storage. The County does not have information from the proponents of these projects and It is uncertain whether any of them will be approved and constructed. See Global Response 1, Source Identification. Nevertheless, on the conservative assumption that these projects are under development, with investment of time and financial resources by the project proponents in anticipation of submittal for environmental review, they were added to the RDEIR's cumulative projects list.

The RDEIR provides a good faith disclosure of the general nature of potential future CO_2 source projects; see RDEIR Vol. 2, Appendix K-4. There are no currently operational CCS projects in California, and therefore no CCS-dependent CO_2 sources such as blue hydrogen or direct air capture facilities, or other CO_2 source categories operating in conjunction with CCS, on which to

base a more definitive analysis. It is not possible to identify potential future sources of CO_2 more specifically or provide more detailed analysis of such projects without engaging in speculation.

Commenters question why the RDEIR focuses on the contribution of cumulative impacts from oil and gas development. RDEIR Vol. 1, Table 3-8 and the cumulative impact analyses in the GHG impact section includes oil and gas development under the Kern County Oil and Gas Development Zoning Ordinance, as analyzed in the Final Environmental Impact Report - Revisions to the Kern County Zoning Ordinance - 2015(C) Focused on Oil and Gas Local Permitting, certified on November 9, 2015; supplemented by a Supplemental EIR certified on December 11, 2018; a Supplemental Recirculated EIR (SREIR) certified on March 8, 2021; and an Addendum adopted on August 23, 2022 (collectively referred to as the "Oil and Gas EIR"), which is incorporated by reference in the RDEIR. Oilfield gas streams beyond the initial CO_2 source are the only identified potential future CO_2 source category for the proposed project (RDEIR Vol. 1, p. 3-13) as to which detailed information developed from prior CEQA reviews is available. In addition, given the location of the proposed project within the Elk Hills oilfield, continued development of oil and gas resources is the most likely to contribute to cumulative impacts in the project area, specifically the criteria pollutants and related GHG emissions associated with the employee vehicles for routine maintenance, reworks and emergency reworks and abandonments. Such activities will occur outside the CUP boundary of the CCS project but within the regional locational area for cumulative projects. Moreover, the cumulative impact analysis in the Oil and Gas EIR covers cumulative impacts from oil and gas development together with other planned development based on the Kern County General Plan and the regional growth plan and projections included in the Kern Council of Governments Regional Transportation Plan/Sustainable Communities Strategy. See the Oil and Gas EIR (2015), Vol. 1, p. 3-79. As stated in the RDEIR, Vol. 1, p. 2-16, the Oil and Gas EIR is incorporated by reference as a source of information, pursuant to CEQA (Pub. Res. Code) § 21061 and CEQA Guidelines § 15150. The RDEIR provides CEQA review of the Carbon TerraVault I project, not subsequent or supplemental site-specific review of the project in the Oil and Gas EIR, i.e., the Kern County Zoning Ordinance amendments and associated oil and gas development.

GR – 5j, Adequacy of GHG Mitigation Measures

Commenters question the adequacy and enforceability of the RDEIR mitigation measures related to GHG impacts. Under CEQA, an EIR must provide mitigation measures that are effective to reduce potentially significant impacts to less than significant levels or, for significant and unavoidable impacts, all feasible mitigation. Commenters assert that the RDEIR's mitigation measures requiring compliance with other agencies' regulations – such as EPA Class VI permit regulations, CARB CCS standards, and CalGEM well integrity requirements – provide inadequate mitigation for purposes of CEQA. However, "requiring compliance with regulations is a common and reasonable mitigation measure" for CEQA purposes. *Oakland Heritage Alliance v. City of Oakland* (2011) 195 Cal.App.4th 884, 906. Lead agencies may presume that impacts mitigated by compliance with regulatory agency requirements "normally will be determined to be less than significant." *Protect the Historic Amador Waterways v. Amador Water Agency* (2004) 116 Cal.App.4th 1099. Commenters objecting to reliance on regulatory requirements of expert agencies such as EPA, CARB and CalGEM must present substantial evidence that, notwithstanding compliance with the regulations, the impact will be significant. *See, e.g., Berkeley Keep Jets Over*

the Bay Committee v. Board of Port Commissioners of the City of Oakland (2001) 91 Cal. App. 4th 1344 (notwithstanding compliance with federal aviation noise requirements, commenters provided substantial evidence of significant noise impacts from nighttime airplane flights). This Global Response addresses commenters' specific objections to RDEIR mitigation measures and recommendations for other mitigation measures that, commenters assert, would constitute effective and feasible mitigation for GHG impacts. Please see also Global Response 8, Mitigation Effectiveness and regarding mitigation for geological and seismic impacts Global Response 7, Geological and Induced Seismicity Risk.

Commenters assert that MM 4.8-1 constitutes inadequate and unlawfully deferred mitigation under CEQA. Mitigation Measure 4.8-1 provides as follows:

> Prior to any injection of CO_2 the owner/operator shall submit a monitoring plan that complies with all requirements of the EPA UIC permit issued for the project to demonstrate the retention of CO_2 in the injection/hydrocarbon reservoir zone. The plan shall be submitted to the Kern County Planning and Natural Resources Department concurrent with submittal to the EPA for review. A copy of the final approved plan from the EPA shall be provided to the Kern County Planning and Natural Resources Department.

The applicant has already submitted proposed testing and monitoring plans to EPA. As explained in the Cornerstone Report:

> Pursuant to 40 C.F.R. § 146.90, [the applicant] submitted proposed testing and monitoring plans with the 26R and A1-A2 Class VI UIC permit applications. As the U.S. EPA has explained, monitoring plans should be "site-specific" and the monitoring data is used to ". . . verify that the injectate is safely confined in the target formation . . ." 75 Fed. Reg. 77,230, 77,259 (Dec. 10, 2010). Based on [the applicant]'s application, on December 20, 2023, the U.S. EPA public noticed the 26R Class VI UIC permits, including monitoring permit conditions in Section M (Testing and Monitoring), and Attachment C, which is the proposed testing and monitoring plan for the 26R storage site (i.e., the Monterey Formation). Cornerstone Report, pg. 24.

Commenters make several criticisms of MM 4.8-1. First, relying on the opinion of Dr. DiGiulio, commenters claim that MM 4.8-1 does not provide sufficient monitoring for leakage from well penetrations, which according to Dr. DiGiulio, are the most likely source of the loss of CO_2. As documented in the Cornerstone Report, the monitoring required for the UIC permit will adequately monitor for CO_2 migration through artificial penetrations (wells) in the confining zone. Cornerstone Report, pp. 24-25. Second, Dr. Giulio asserts that the UIC permit monitoring will not provide sufficient monitoring in the Etchegoin Formation above the confining zone to detect CO_2 migration from containment because there will be only one monitoring well per CO_2 reservoir. The Cornerstone Report concludes that the proposed monitoring wells are sufficient and notes that EPA has explained that the prosed monitoring will detect any movement of CO_2 from containment. Cornerstone Report, pg.24-25. Third, Dr. Giulio asserts that MM 4.8-1 and the monitoring plan contain vague terms that lack definitions and are unenforceable. The Cornerstone Report demonstrates that the set of monitoring activities specified in the monitoring plan for the UIC

permit in conjunction with the required periodic update and history matching of the reservoir model using the monitoring data complies with US EPA requirements for verification of plume and pressure stabilization, and containment, and that the Testing and Monitoring Plan as a whole is sufficient to mitigate any potential impacts from CO_2 release from containment. Cornerstone Report, pg. 25. Fourth, commenters contend that the requirement in MM 4.8-1 that the monitoring plan be submitted "prior to any injection of CO_2" is vague and unenforceable. The requirement that the plan be submitted before injection occurs should reasonably be understood to mean before the first injection activities take place, a clear, easily determined, and enforceable point in time. Fifth, commenters contend that a monitoring plan alone will not fully mitigate the risk of leakage and that there must be an action plan to mandate what must happen if leakage of CO_2 occurs. As described in the Cornerstone Report, Section R of the publicly noticed 26R Class VI UIC permits for the project require an Emergency and Remedial Response Plan that "describes actions [CTV] must take to address movement of the injection or formation fluids, including surface leaks of carbon dioxide or other contaminants, that may cause an endangerment to a USDW or public health during construction, operation, and post-injection site care periods."

Commenters contend that MM 4.8-6 is an ineffective, unenforceable, and impermissibly deferred mitigation measure. MM 4.8-6 provides as follows:

> The project shall offset all greenhouse gas emissions associated with the capture facility, and construction equipment not covered by the Cap-and-Trade program or other mandatory greenhouse gas emission reduction measures through owner/operator reductions of greenhouse gas emissions as verified by the San Joaquin Valley Air Pollution Control District, through acquisition of offset credits from the California Air Pollution Control Officers Association Exchange Register or other third party greenhouse gas reductions as verified by the San Joaquin Valley Air Pollution Control District, or through inclusion in an Emission Reduction Agreement, to offset Project-related greenhouse gas emissions that are not included in the Cap-and-Trade program to assure that no net increase in greenhouse gas emissions from the Project construction or operation occur. All sources providing CO_2 for injection must certify that any additional CO_2 generated from the source capture facility has been mitigated to "no net increase" before injection at Carbon TerraVault I (Kern County).

Commenters assert that this mitigation measure is inappropriate and unlawful as mitigation and reveals a fundamental failure in the project's ability to meet its objectives. Commenters are incorrect on each point.

Commenters first assert that MM 4.8-6 could lead to potentially unlimited releases of CO_2 into the atmosphere as long as those emissions were purportedly offset with emissions credits, negating the rationale of a CCS project. The comment's assumption on the scope of such offsets is too broad. Mitigation Measure 4.8-6 is a mitigation measure to reduce GHG impacts to the extent feasible as required by CEQA, not an alternative means of operating the project. If releases were offset with emission credits pursuant to MM 4.8-6, the release to the atmosphere will net to zero emissions under this mitigation measure. More importantly, however, MM 4.8-6 applies by its terms only to GHG emissions in two categories: (a) those that fall outside the Cap-and-Trade program or other mandatory greenhouse gas emission reduction requirement and (b) additional emissions generated

from sources providing CO_2 for injection. Thus, contrary to the assertions of commenters, the universe of emissions to which MM 4.8-6 can be applied is not potentially unlimited, but instead is limited by the terms of the mitigation measure itself. For the initial source for the project, the capture, compression and pumping facilities are comprised entirely of electrically operated equipment powered by electric generating units subject to the cap-and-trade program. In the likely event the project relies on fossil fuel powered construction equipment, the fuel supplied to that equipment is also subject to cap-and-trade. (If the construction equipment is electrically powered, the grid power used to charge the equipment will be subject to the cap-and-trade program.) Thus, it is unlikely that any substantial amount of emissions would fall within this mitigation measure. But if emissions associated with the capture facility and construction equipment not covered by the Cap-and-Trade program or other mandatory greenhouse gas emission reduction measures do occur, this mitigation measure is intended as a backstop to ensure that amount is not released to the atmosphere unmitigated. In addition, for potential future CO_2 sources, as a condition of allowing such injections into the project reservoirs, MM 4.8-6 requires mitigation to no net increase for any CO_2 emissions generated by the source that are in addition to the CO_2 injected and sequestered by the proposed project. Contrary to commenters' claim, this mitigation measure could not be used to offset the emissions of the CO_2 that will be sequestered by the project. MM 4.8-6 thus does not reveal a fundamental failure in the project's ability to meet its objective of providing a permanent underground storage facility for CO_2.

Commenters' policy objections to the use of CO_2 offsets for any purposes are noted. Nevertheless, provided that emission offset credits satisfy the requirements discussed below, they generally are a permissible form of CEQA mitigation, See, e.g., the San Joaquin Valley Air Pollution Control District's Guidance for Assessing and Mitigating Air Quality Impacts (pp. 8-9), which states: "Offsets: Emission reductions recognized by the District in the form of Emission Reduction Credits that are used in accordance with the provisions of District Rule 2301 (Emission Reduction Credit Banking), or other actual emission reductions that may be used to mitigate an emission increase." One of the stated purposes of San Joaquin Valley Air Pollution Control District Rule 2301 is "to provide an administrative mechanism for sources to transfer banked greenhouse gas emission reductions to others for any use."

Commenters identify the general requirements for emission offset credits – that they be real, permanent, additional, verifiable and enforceable, but focus their comment primarily on the issue of "additionality." In the context of offset credits, "additional" generally means a reduction not otherwise required by law and that would not otherwise occur. Commenters contend that MM 4.8-6 is fatally flawed because it does not explicitly require that offset credits applied through the mitigation measure meet these requirements. Commenters miss the inherent limits in this mitigation measure. By specifying that any offsets be obtained through the California Air Pollution Control Officers Association Exchange Registry or other third party reductions verified by the San Joaquin Valley Air Pollution Control District or through an Emission Reduction Agreement with the San Joaquin Valley Air Pollution Control District, MM 4.8-6 assures that that any offsets used with be real, permanent, additional, verifiable and enforceable. Commenters assert that MM 4.8-6 is does not specify the timing by which offsets would need to be provided nor to whom certification for new sources would need to be made. Although there might be some lag time during which the offset project is being carried out while injection is occurring at the project, given the small amount

of offsets potentially subject to MM 4.8-6, this is unlikely to be a significant issue. Commenters further contend that no provision is made for trucks that might transport CO_2 to the project from some potential future CO_2 source projects. As noted above, such trucks would likely fall outside the scope of MM 4.8-6 because if fossil fueled (or electrically operated, but charged with grid power including fossil fueled generation) the fuel and/or electricity would be covered by the cap-and-trade program. For the same reasons that the DMA for criteria pollutants is permissible and effective mitigation as explained in response to commenters' contentions regarding the DMA, in Global Response 8 – Mitigation Effectiveness, the Emission Reduction Agreement for GHGs included in MM 4.8-6 can form the basis for permissible and effective GHG mitigation.

Commenters question which agency will receive and enforce the certification that additional CO_2 generated from a future CO_2 source capture facility has been mitigated to "no net increase" prior to injection into the proposed project reservoirs. This certification must be provided to the County prior to injection and is enforceable by the County through inclusion of MM 4.8-6 in the Mitigation Monitoring and Reporting Program for the proposed project. Please see also Global Response 8, Mitigation Effectiveness.

Commenters also broadly contend that MM 4.8-1 through 4.8-6 constitute impermissibly deferred mitigation under CEQA. CEQA allows deferred mitigation when "practical considerations prohibit devising such measures early in the planning process" so long as the agency commits itself to meeting an achievable performance standard. *Communities for a Better Environment v. City of Richmond* (2010) 184 Cal.App.4th 70, 94. The lead agency must commit to the mitigation, adopt specific performance standards, and identify the project actions to achieve the standards. CEQA Guidelines § 15126.4(a)(1)(B). "Compliance with a regulatory permit or other similar process may be identified as mitigation if compliance would result in implementation of measures that would be reasonably expected, based on substantial evidence in the record, to reduce the significant impact to the specified performance standards." *Id.* Deferral may be appropriate "where another regulatory agency will issue a permit for the project and is expected to impose mitigation requirements independent of the CEQA process so long as the EIR included performance criteria and the lead agency committed itself to mitigation." *Clover Valley Foundation v. City of Rocklin* (2011) 197 Cal.App.4th 200, 237; *see also Oakland Heritage Alliance*, 195 Cal.App.4th 884. Mitigation is not deferred because performance standards and commitments are contained in the EPA appendices and regulatory requirements, which must be complied with as provided in the mitigation measures. The mitigation measures meet these requirements.

6: Air Quality Impacts

The applicant has submitted a technical report from Ramboll Americas Engineering Solutions, Inc., San Francisco, California (Ramboll Report), and a report by Ramboll entitled "Regulatory Framework and GHG Reporting for Carbon Capture and Sequestration in California" (CCS Whitepaper) which address technical issues raised by the Sahu Report submitted as part of the comments submitted by Center for Biological Diversity, Center on Race Poverty & the Environment, Central California Environmental Justice Network, Central Valley Air Quality Coalition, and the Sierra Club. Where relevant, the responses below incorporate information from the Ramboll Report, which provides additional supporting facts and expert opinion regarding air

quality issues. This information does not indicate any new or substantially more severe impacts than those described in the RDEIR.

GR – 6a, Revised $PM_{2.5}$ National Ambient Air Quality Standard

Commenters state that the United States Environmental Protection Agency (EPA) recently revised the annual National Ambient Air Quality Standard (NAAQS) for fine particulate matter (also known as $PM_{2.5}$) downward from 12 micrograms per cubic meter to 9 micrograms per cubic meter. Commenters state that the San Joaquin Valley currently does not meet the new standard and is not expected to meet it by 2032. Commenters assert that the implications of the new standard should be addressed in the RDEIR and claim that the San Joaquin Valley Air Pollution Control District will have to institute further restrictions on pollution sources, including in Kern County.

The RDEIR summarizes the national and State ambient air quality standards in Table 4.3-1 in the Environmental Setting section of Section 4.3, Air Quality. RDEIR, Vol 1, pp. 4.3-6 – 4.3-7. Effective May 6, 2024, the EPA has revised the primary annual $PM_{2.5}$ standard from 12.0 µg/m3 to 9.0 µg/m3, while other $PM_{2.5}$ standards remain the same. The future $PM_{2.5}$ attainment status of Kern County will be determined through EPA's Clean Air Act regulatory process using the revised $PM_{2.5}$ standard. Only after the attainment designation process has played out and the regulatory agencies have had an opportunity to assess what actions may be necessary will it be possible to know what further regulatory actions, if any may follow. However, as discussed more fully below, the change in the annual $PM_{2.5}$ standard does not alter the conclusions in the RDEIR regarding $PM_{2.5}$.

As part of this response for clarification, RDEIR Table 4.3-1 is revised to incorporate the revised annual $PM_{2.5}$ NAAQS as follows:

> Delete the number "12.0 µg/m3" in the row for "Fine Particulate Matter" and the column for "National Standards – Primary", and replace with the number "9.0 µg/m3".

Commenters point to a sentence from the regulatory Federal Register document "Reconsideration of the National Ambient Air Quality Standards for Particulate Matter" promulgating the revised annual $PM_{2.5}$ NAAQS to the effect that the currently available evidence does not establish a level below which it can be concluded with confidence that no health effect from $PM_{2.5}$ exposure will occur. 19 Fed. Reg. 16249. On the basis of this sentence, commenters insist the RDEIR discussion on the health effects of $PM_{2.5}$ must be revised. In context, this sentence has a different meaning than that ascribed to it by commenters. The sentence occurs in the section entitled "Uncertainties in the Health Effects Evidence" (89 Fed. Reg. 16248) and in context is intended to identify uncertainty in interpreting evidence from epidemiological studies, rather than a stating conclusion on health effects. In any event, the Ramboll Report provides an expert opinion that the statement cited by commenters does not warrant a revision to the discussion of $PM_{2.5}$ health effects contained in the RDEIR.

Commenters note that the RDEIR discusses the health effects of particulate matter (PM_{10} and $PM_{2.5}$) separately from the discussion of the health effects of diesel particulate matter (DPM) and suggest a cross reference from the $PM_{2.5}$ discussion to the DPM discussion.

Commenters also identify a sentence in the particulate matter health effects discussion that refers to a section of the RDEIR that does not exist.

As part of this response, for clarity, the following sentence is inserted after the reference to DPM on RDEIR page 4.3-15:

For a discussion of the health effects of DPM, please refer to the discussion of Diesel Particulate Matter in the section on Health Effects and Risks of Toxic Air Contaminants on page 4.3-25.

As part of this response, for clarity, the following sentence is deleted from RDEIR page 4.3-15:

~~The section below entitled "Oil and Gas Operations and Health Effects" further discusses potential health effects of $PM_{2.5}$ emissions, among other things.~~

GR – 6b, Data and Assumptions Underlying the Air Quality Impacts Analysis

Based on the Sahu Report, commenters claim the RDEIR assessment of impacts and formulation of mitigation measures is inadequate because it is premised on unexplained or faulty assumptions.

First, commenters assert that the data on "Existing Air Quality" presented in the RDEIR covering 2019-2021 is dated and may not be representative of current air quality in Kern County. Additional years of air quality data, through 2023, are available. The Ramboll Report contains expert opinion that there are no substantial differences between the 2019-2021 air pollutant concentrations measured in Kern County and the measured concentrations in 2022-2023, even though the COVID-19 pandemic may have affected local air pollutant-emitting activities for some periods in 2019-2021. The data establishes that the number of days exceeding NAAQS is generally lower in the 2022-2023 period compared to the 2019-2021 period. The Ramboll Report thus contains the expert opinion that the three-year period of 2019-2021 presented in Table 4.3-3 of the RDEIR continues to be representative of the current air quality status in the project's vicinity and the analysis contained in the RDEIR continues to represent a conservative (i.e., worst case) analysis of air quality impacts.

Second, commenters assert that the RDEIR and its Appendix describing air quality emissions and impacts do not explain the assumptions and emission factors underlying the analysis and whether those assumptions and emission factors are representative of expected activities and equipment for CTV I. Information regarding the methodology for the air quality analysis in the RDEIR is presented in the RDEIR section entitled "Methodology." As summarized in the RDEIR:

> The construction and operational emissions were estimated from several emissions models and associated spreadsheet calculations, depending on the source type and data availability. The primary emissions models used included CARB's on-road vehicle emission factor model (EMFAC) version 2021 and the California Emissions Estimator Model (CalEEMod) version 2021.1.13. Construction and operational emissions were estimated using project-specific data and schedules within the models. RDEIR, Vol. 1, pp. 4.3-52 – 4.3-53.

The air quality impacts analysis is presented in Appendix B-1 – Air Quality Impacts Analysis which contains a report prepared by Trinity Consultants (Trinity Report). RDEIR, Vol. 2, pp. 181, et seq. As set forth in the Trinity Report:

> Project construction and operational activities would also generate greenhouse gas (GHG) emissions. Criteria and GHG emissions were estimated using the California Emissions Estimator Model (CalEEMod) Version 2022.1.1.13 (California Air Pollution Control Officers Association (CAPCOA) 2022), which is the most current version of the model approved for use by the San Joaquin Valley Air Pollution Control District (SJVAPCD). Trinity Report, pg. 1-1, RDEIR, Vol. 2, pg. 189.

Appendix B to the Trinity Report contains the project emission data and calculations. RDEIR, Vol. 2, pp. 261, et seq. The Ramboll Report contains expert opinion demonstrating that the project-specific information used in the Trinity Report analysis are conservative and realistic for the purpose of estimating criteria air pollutant (CAP) and GHG emissions. As the Ramboll Report explains,

> The Trinity Report assumes an average duration of 18 days per well for well pad construction and 12 days per well for well drilling construction for all 18 wells. These activities are highly conservative estimates of construction activities needed for this project, since some of the existing wells would only need to be converted from an oil and gas producing well to a Class VI injector, which would be associated with less intense construction activities than what were assumed in the Trinity report. Furthermore, the Trinity Report conservatively assumes all on-road trip lengths to be 40 miles per one-way trip, which is more conservative than CalEEMod default trip length of 17 miles for worker trips and 11 miles for vendor trips for this project location, which already account for the project's rural setting. Other construction inputs for the purpose of estimating CAP and GHG emissions are also conservative in nature, such as total construction hours and number of trips, as stated in the Trinity [Report].
>
> Furthermore, the RDEIR conservatively assumes all emissions would occur in one year to compare with the applicable thresholds of significance. Therefore, input parameters for CAP and GHG emissions are generally well documented, reasonable, and conservative. In addition, CalEEMod provides estimates for both exhaust and fugitive particulate matter (PM) emissions, which were summed to compare with the applicable thresholds of significance in the RDEIR.
>
> CalEEMod is a statewide program designed to calculate both CAP and GHG emissions for development projects in California, and utilizes widely accepted methodologies for estimating emissions with default data that can be used when site-specific information is not available. CalEEMod provides a simple platform to calculate both construction emissions and operational emissions from a given set of inputs, such as construction schedule and land use sizes. CalEEMod is recommended by SJVAPCD in the agency's public comment letter on the project's Notice of Preparation. Ramboll Report, pp. 5-6

Third, commenters claim that the RDEIR suggests false precision by failing to disclose quantitative error ranges and/or to qualitatively explain the uncertainty inherent in the emissions calculations. The Ramboll Report contains expert opinion that although there are uncertainties in emissions

estimates, the assumptions and data used in the RDEIR are conservative and appropriate for the analysis presented. As the Ramboll Report explains:

> There are uncertainties associated with the estimation of emissions from each of the source categories considered that may affect the subsequent estimation of exposure concentrations and risk characterization.
>
> CalEEMod default emission factors were used to estimate emissions of all off-road equipment for the construction of the project components. This assumes that emissions from all equipment will be equal to the fleet wide average emissions when some emissions may vary from this rate. Emission factors used in the RDEIR analysis are generally conservative, because the analysis assumes the earliest possible commencement of construction and operations, and equipment emission standards are expected to become more stringent over time in order to meet fuel efficiency standards and other regulatory requirements.
>
> In addition, there are uncertainties associated with the estimation of emissions from construction and operational equipment. The hours of operation for each piece of equipment were provided, however, the equipment may run less than expected. For example, when project-specific information is not available, construction equipment were assumed to operate continuously for up to 10 hours a day to estimate CAP emissions and health risk impacts, whereas, in reality, construction equipment are likely to operate intermittently throughout a workday. The construction and operational equipment activities assumed in the RDEIR analysis are conservative for the purpose of estimating air quality impacts.
>
> Construction assumptions also affect construction emissions. For example, it has been estimated that there is an average duration of 18 days per well construction. This average is based on the worst-case and deepest monitoring well proposed (namely, the depth of 8,904 feet). While the listed depth (for example, those listed in Table 4-12 of the RDEIR) is based on the best available engineering analysis developed as a component of CRC's prior work preparing detailed Class VI EPA permits, it is acknowledged that minor variations based on actual field conditions could occur. Nonetheless, because the emission estimates are based on worst-case monitoring well construction, and applied to each well, the uncertainty noted above does not change the overall conclusions or analysis, and represents a conservative estimate of project construction activity and construction emissions. Ramboll Report, pp. 6-7.

Fourth, commenters note that page 4-6 of the Trinity Report is completely blank and question whether that indicates missing information that should be provided to the public. The blank page in the Trinity Report is a formatting error. The table appearing on the top of page 4-7 is the next text that follows the text appearing on the bottom of page 4-5. There is no information missing from the Trinity Report.

GR – 6c, The RDEIR Adequately Addresses Cumulative Air Quality Impacts

Commenters assert that the RDEIR's analysis of cumulative air quality impacts is inadequate because it does not explain the connection between the potential project emissions and human health impacts as required by the decision in *Sierra Club v. County of Fresno* 6 Cal.5th 502. The RDEIR describes the potential adverse health effects related to exposure to NO_x, PM_{10}, and $PM_{2.5}$ in the section entitled "Criteria Air Pollutants and Health Effects." RDEIR Vol. 1, pp. 4.3-12 – 4.3-15. The RDEIR also describes the development and use of mass emissions thresholds in the section entitled "Guide for Assessing and Mitigating Air Quality Impacts/Air Quality Thresholds of Significance." RDEIR, Vol.1, pp. 4.3-45 – 4.3-46. The Ramboll Report contains an expert opinion that the RDEIR provides a meaningful and understandable narrative of ozone and secondary PM formation in the section entitled "Criteria Air Pollutants and Health Effects." RDEIR, Vol. 1, pp. 4.3-5 – 4.3-11; Ramboll Report, p. 10. In addition, the RDEIR discusses that it is not scientifically feasible to predict how the project criteria pollutant emissions would affect the number of days the region is in nonattainment or the impacts on public health and welfare in the section entitled "Air Basin Emissions Analysis" under Impact 4.3-5. RDEIR Vol. 1, pg. 4.3-79. The RDEIR clearly states that "SJVAPCD is the primary agency responsible for ensuring the health and welfare of sensitive individuals to elevated concentrations of air quality in the San Joaquin Valley Air Basin at the present time and it has not provided methodology to assess the specific correlation between mass emission generated and the effect on public health and welfare." RDEIR Vol. 1, pg. 4.3-79. The Ramboll Report contains expert opinion that it is not scientifically feasible to further connect air quality impacts of the project to effects on human health. Ramboll Report, pg. 10. Accordingly, the RDEIR contains the requisite analysis connecting air quality effects of the project to human health consequences as required by CEQA and the decision in *Sierra Club*, supra.

Commenters also contend that assessment of the human health impacts of cumulative air pollution is crucial because Kern County already experiences some of the worst air quality and the project will incentivize development of additional industrial sources that will be concentrated nearby and contribute to worsening air quality. The potential future CO_2 sources listed in RDEIR, Vol. 1, pp. 3-13 – 15, and the air quality and other impacts from those sources must be mitigated by MM 4.11-7. Because those additional CO_2 source projects are speculative at this point and will be developed in the future, ensuring that impacts are mitigated under CEQA and prohibiting reliance on CEQA exemptions for those projects is the appropriate mitigation. It should also be noted that while these sources may have air quality emissions and other impacts typical of industrial projects, they will be beneficial for greenhouse gas impacts, since they will sequester CO_2 for storage in the proposed project reservoirs. Mitigation Measure 4.11-7 provides for CEQA review and mitigation of impacts for any future project permitted to contribute CO_2 to the proposed project reservoirs:

> Each CO_2 source project located in unincorporated Kern County requires a zoning evaluation, its own EIR and its own Conditional Use Permit (CUP) from the County.
>
> Each CO_2 source project located in an incorporated city in Kern County requires preparation of a CEQA document with the County as a responsible agency. Mitigation Measure 4.11-7 prohibits reliance on a CEQA exemption by source projects as a condition of injecting into the proposed project's reservoirs.

> CO_2 pipelines from offsite sources that traverse unincorporated Kern County land require an EIR and CUP from the County.
>
> CO_2 pipelines permitted by the California Public Utilities Commission (CPUC) require either an EIR and CUP from the County or the County's participation in the CPUC process, which must provide reasonable and feasible mitigation to protect Kern County communities. RDEIR, Vol. 1, pp. 4.11-53 – 4.11-54.

Commenters further assert that the cumulative air quality impact of the project is particularly burdensome because the population near the projects has one of the highest pollution burdens in the state, as well as challenges posed by unemployment, poverty, and linguistic isolation. The project site, within the Elk Hills oilfield, is located in census tract 33.04, with a total population of 2,683 spread over 618 square miles. The population in census tract 33.04 is 57% white and 36% Hispanic (compared to 30% white and 57% Hispanic for Kern County as a whole), with a mean household income of $70,357 (compared to $63,883 for Kern County as a whole). See https://censusreporter.org/profiles/14000US06029003304-census-tract-3304-kern-ca/. The project site is not within one of the disadvantaged communities identified in the Kern County General Plan Housing Element 2024-2031 (Fig. 99), submitted to the California Department of Housing and Community Development on June 28, 2024. Accordingly, the project is unlikely to disproportionately focus potential environmental impacts on disadvantaged, Hispanic or low-income populations.

GR – 6d, The RDEIR Contains All Feasible Mitigation for Fugitive Dust Impacts

Commenters contend that MM 4.3-2 are inadequate and do not represent all feasible mitigation for fugitive dust at the project site. In particular, commenters contend that MM 4.3-2 is inadequate because it does not require all measures identified by the SJVAPCD in its GAMAQI and Regulation VIII and suggest a number of specific provisions be added. MM 4.3-2 provides as follows:

> The Owner/operator shall develop and implement a Fugitive Dust Control Plan in compliance with San Joaquin Valley Air Pollution Control District fugitive dust suppression regulations. The Fugitive Dust Control Plan shall include:
>
> a. Name(s), address(es), and phone number(s) of person(s) responsible for the preparation, submission, and implementation of the plan.
>
> b. Description and location of operation(s).
>
> c. Listing of all fugitive dust emissions sources included in the operation.
>
> d. The following dust control measures shall be implemented:
>
> 1. All on-site unpaved roads shall be effectively stabilized using water or chemical soil stabilizers that can be determined to be as efficient as or more efficient for fugitive dust control than California Air Resources Board approved soil stabilizers, and that shall not increase any other environmental impacts including loss of vegetation.

2. All material excavated or graded will be watered to prevent excessive dust. Watering will occur as needed with complete coverage of disturbed areas. The excavated soil piles will be watered as needed to limit dust emissions to less than 20% opacity or covered with temporary coverings.
3. Construction activities that occur on unpaved surfaces will be discontinued during windy conditions when winds exceed 25 miles per hour and those activities cause visible dust plumes that exceed the SJVAPCD 20% opacity standard.
4. Track-out debris onto public paved roads shall not extend 50 feet or more from an active operation and track-out shall be removed or isolated such as behind a locked gate at the conclusion of each workday, except on agricultural fields where speeds are limited to 15 mph.
5. All hauling materials should be moist while being loaded into dump trucks.
6. All haul trucks hauling soil, sand, and other loose materials on public roads shall be covered (e.g., with tarps or other enclosures that would reduce fugitive dust emissions).
7. Soil loads should be kept below 6 inches or the freeboard of the truck.
8. Drop heights when loaders dump soil into trucks shall not exceed 5 feet above the truck.
9. Gate seals should be tight on dump trucks.
10. Traffic speeds on unpaved roads shall be limited to 25 miles per hour.
11. All grading activities shall be suspended when visible dust emissions exceed 20%.
12. Other fugitive dust control measures as necessary to comply with San Joaquin Valley Air Pollution Control District Rules and Regulations.
13. Disturbed areas shall not exceed those shown on the Site Plan.
14. Disturbed areas should be re-vegetated as soon as possible after disturbance if area is no longer needed for oil and gas activities. RDEIR, Vol. 1, pp. 4.3-58 – 4.3-59.

Specific fugitive dust control measures are required to be included in any Fugitive Dust Control Plan approved by the SJVAPCD under its Regulation VIII. Paragraph 12 of MM 4.3-2 specifically requires "Other fugitive dust control measures as necessary to comply with San Joaquin Valley Air Pollution Control District Rules and Regulations" and will encompass all other control measures that are required for compliance with SJVAPCD regulations. In addition, as discussed in RDEIR section 3.8 entitled "Entitlements Required," the approval of the Fugitive Dust Control Plan from SJVAPCD is included as a requirement for the implementation of the project. RDEIR Vol. 1, pp. 3-43 – 3-44. Accordingly, MM 4.3-2 includes all feasible mitigation for fugitive dust.

GR – 6e, RDEIR MM 4.3-8 is Adequate Mitigation Under CEQA

Commenters contend that MM 4.3-8 is inadequate and unlawfully deferred mitigation. MM 4.3-8 provides as follows:

> Prior to issuance of any construction or grading permits, the Owner/operator shall consult with the San Joaquin Valley Air Pollution Control District and develop a draft Air Monitoring program for fence line monitoring of all air constituents generated by the CCS project including but not limited to: criteria pollutants, CO_2, and H2S. The plan shall be reviewed and approved by both the San Joaquin Valley Air District and the California Air Resources Board, with a draft copy to the EPA UIC Program and Kern County Planning and Natural Resources and implemented before any construction on the CCS facilities can occur. The final approved plan shall be provided to the EPA UIC Program and Kern County Planning and Natural Resources. RDEIR, Vol. 1, pg. 4.3-74.

As stated, Mitigation Measure 4.3-8 requires the applicant to develop in conjunction with the Air Resources Board and SJVAPCD a fenceline monitoring program. This is a requirement for any operator of a "carbon dioxide capture, removal, or sequestration project operator" pursuant to Public Resources Code § 74641, subdivision (c), which specified that the operator must "[c]reate an air monitoring and mitigation plan to measure, track, and minimize potential toxic air contaminants and criteria air pollutants from the site of the carbon dioxide capture, removal, or sequestration project and submit the plan to the state board." "[R]equiring compliance with regulations is a common and reasonable mitigation measure" for CEQA purposes. *Oakland Heritage Alliance v. City of Oakland* (2011) 195 Cal.App.4th 884, 906; *see also Rominger v. Colusa* (2014) 229 Cal. App. 4th 690, 728 (challengers offered "no evidence to suggest that it would be unreasonable to expect" compliance with statewide regulations); Cal. Evidence Code § 664 ("It is presumed that official duty has been regularly performed"). Lead agencies may thus presume that impacts mitigated by compliance with regulatory agency requirements "normally will be determined to be less than significant." *Protect the Historic Amador Waterways v. Amador Water Agency* (2004) 116 Cal.App.4th 1099. This is also consistent with the numerous provisions of the CEQA Guidelines that direct lead agencies to rely on the requirements of previously approved plans or programs to reduce project impacts. *See, e.g.,* CEQA Guidelines §§ 15064, 15130, 15152, 15183. Consistent with the Guidelines, the courts have repeated upheld reliance on existing plans and programs, as well as other regulatory programs that avoid or reduce significant environmental impacts.

Commenters objecting to reliance on regulatory requirements of expert agencies such as EPA, CARB and CalGEM must present substantial evidence that, notwithstanding compliance with the regulations, the impact will be significant. *See, e.g., Berkeley Keep Jets Over the Bay Committee v. Board of Port Commissioners of the City of Oakland* (2001) 91 Cal.App.4th 1344 (notwithstanding compliance with federal aviation noise requirements, commenters provided substantial evidence of significant noise impacts from nighttime airplane flights). *See also* CEQA Guidelines § 15064.7(d) (lead agencies may utilize environmental standards of regulatory agencies as CEQA thresholds of significance).

Commenters assert that Mitigation Measures 4.3-8, involving a monitoring plan that that will be prepared post-project approval constitutes improperly deferred mitigation. CEQA allows deferred mitigation when "practical considerations prohibit devising such measures early in the planning process" so long as the agency commits itself to meeting an achievable performance standard. *Communities for a Better Environment v. City of Richmond* (2010) 184 Cal.App.4th 70, 94. The lead agency must commit to the mitigation, adopt specific performance standards, and identify the project actions to achieve the standards. CEQA Guidelines § 15126.4(a)(1)(B). "Compliance with a regulatory permit or other similar process may be identified as mitigation if compliance would result in implementation of measures that would be reasonably expected, based on substantial evidence in the record, to reduce the significant impact to the specified performance standards." *Id*. Deferral may be appropriate "where another regulatory agency will issue a permit for the project and is expected to impose mitigation requirements independent of the CEQA process so long as the EIR included performance criteria and the lead agency committed itself to mitigation." *Clover Valley Foundation v. City of Rocklin* (2011) 197 Cal.App.4th 200, 237; *see also Oakland Heritage Alliance*, 195 Cal.App.4th 884. This is the scenario contemplated by Mitigation Measure 4.3-8 which requires the owner/operator to work with the SJVAPCD and CARB to develop a monitoring plan that meets specified regulatory standards for the UIC permit. Commenters cite to *Gray v. County of Madera* (2008) 167 Cal.App.4th 1099 to contend that a "goal" is not a performance standard. However, the error in *Gray* was a lack of specificity. The goal in *Gray* was to replace lost water, but the court in that case held that "this goal is not a specific performance standard such as the creation of a water supply mechanism that would place neighboring landowners in a situation substantially similar to their situation prior to the decline in the water levels of their private wells because of the mining operations, including allowing the landowners to use water in a substantially similar fashion to how they were previously using water." *Gray*, 167 Cal.App.4th at 1119. Unlike Mitigation Measure 4.3-8, the mitigation in *Gray* did not rely upon or incorporate existing specific regulatory or statutory requirements. In contrast to the unsubstantiated and nonspecific goal in *Gray*, mitigation is not deferred because performance standards and commitments are contained in the EPA appendices and regulatory requirements, which must be complied with as provided in the mitigation measures.

7: Geological and Induced Seismicity Risk

GR-7a, Geology and Soils Impacts and Greenhouse Gas Impacts

Commenters assert that the analysis of potential CO_2 leakage from geological storage, including but not limited to releases due to natural or induced seismic events, is flawed and not supported by substantial evidence. Commenters also assert that, due to site geological conditions and the presence of legacy wellbores from past oil and gas operations, there is a risk of geological storage failure and CO_2 release, including but not limited to natural and induced seismicity impacts. The comments rely on a technical report prepared by Dominic DiGiulio, consultant for the Environmental Integrity Project (DiGiulio Report). The applicant has submitted a technical report from Cornerstone Engineering, Inc., prepared by Christine Halley, Karine Hochstatter and Allen Luthi (Cornerstone Report), which addresses technical issues raised by the DiGiulio Report. Where relevant, the responses below incorporate information from the Cornerstone Report, which provides additional supporting facts and expert opinion regarding geological storage, seismic risk

and related impact analysis. This information does not indicate any new or substantially more severe impacts than those described in the RDEIR.

In evaluating Geology and Soils impacts including Impacts 4.7-1 (related to earthquake fault rupture) and 4.7-2 (related to strong seismic shaking, both natural and induced), the RDEIR considered the potential for CO_2 leakage from underground storage, and determined that these impacts would be less than significant with mitigation, including measure requiring compliance with federal and state requirements to suspend CO_2 injection if seismic damage occurs. RDEIR, Vol. 1, pp. 4.7-17 – 19. The RDEIR also determined that the cumulative impact of potential induced seismic activity associated with CO_2 injection from multiple regional CCS projects would be significant and unavoidable, though other cumulative Geology and Soils impacts were determined to be less than significant with mitigation. RDEIR, Vol. 1, pp. 4.7-25 – 29 (Impact 4.7-10). Comments relating to natural and induced seismicity impacts are addressed in this Global Response 7; see also additional information in the Cornerstone Report.

Commenters claim that the RDEIR's determination that Geological and Soils Impacts 4.7-1, 4.7-2 and 4.7-10 (other than cumulative induced seismicity) are less than significant with mitigation is inconsistent with the determination of significant and unavoidable climate impacts in RDEIR Section 4.8, Greenhouse Gas Emissions. Section 4.8 considers impacts associated with greenhouse gas emissions, including potential CO_2 releases from storage. Although implementation of Mitigation Measures 4.8-1 through 4.8-6 would reduce the likelihood of such releases, the impact would be significant and unavoidable. RDEIR, Vol. 1, pp. 4.8-22 – 26 and 4.8-32 – 33 (Impacts 4.8-1 and 4.8-3). Thus, the RDEIR acknowledges the unavoidable possibility of CO_2 releases from geological storage. Though the likelihood is low, it is not zero, and the resulting impact would be significant in the context of background GHG concentrations on a state-wide level. In addition, although this Global Response 7 also discusses the low likelihood of a CO_2 release from storage based on geological features of the reservoirs and surrounding formations, it is important to recognize that the less-than-significant Geology and Soils impacts that commenters question are specifically related to seismicity. There is no inconsistency in determining that these Geology and Soils Impacts are less than significant with mitigation, given the low likelihood of CO_2 releases from geological storage due to natural or induced seismic events; but if a release does occur, Greenhouse Gas Impacts would be significant and unavoidable based on the contribution of GHG to climate consequences. See also Global Response 5, Greenhouse Gas Impacts.

GR-7b, CO_2 Confinement in Geologic Storage

Commenters claim that the RDEIR fails to appropriately address the risk of CO_2 leakage from both releases to the air and lateral migration underground, and fails to support its conclusions with substantial evidence. Although responses to specific comment is being presented in this Chapter 7 – Response to comments, the project is the permitting of land use for the CCS project and the EIR is not required to provide evidence for determinations by CARB or the EPA. Neither of those permits are subject to CEQA and specific evidence for the issuance of their permits will or will not be provided by the applicant at the time of the issuance of their permits before construction begins.

Evidence that injected CO_2 will remain in the Approved Storage Area is discussed in the RDEIR, Vol. 1, pp. 3-22 – 24, 4.7-3 – 4, 4.10 – 28 -29, supported by extensive geological evaluation, seismic history and analysis, geomechanical modeling and risk assessment contained in RDEIR Vol. 2, Appendix E-2, U.S. Environmental Protection Agency Class VI Underground Injection Control (UIC) Permit Application Narratives for the Elk Hills 26R Storage Project and the A1A2 Storage Project, and Appendix F, Hazard and Hazardous Materials Technical Documentation, together with supplemental information in the Cornerstone Report.

The 26R and A1A2 storage reservoirs within the Monterey Formation are 6,000 to 8,000 feet below ground surface, with vertical confinement by the dense overlying Reef Ridge Shale and, below the reservoirs, the Lower Antelope Shale Member. These formations have been effective to confine oil and gas deposits for millions of years. In support of the EPA Class VI UIC permit application, the storage reservoir depositional framework, sand continuity and confinement were demonstrated using well logs, seismic and core data, as well as production, injection, and pressure data over 40 years of oil and gas operations. The data show that there are no faults through the lateral or vertical confinement of the reservoirs, and no seeps associated with leakage through the Reef Ridge Shale. See RDEIR, Vol. 2, Appendix E-2.

Commenters assert that evidence of reservoir isolation during geologic history and past oilfield operations does not demonstrate a low risk of leakage from new high-pressure storage of CO_2, given the regional risk of seismic activity and the many existing wellbores present from past oilfield operations. However, this historic information is relevant to project operating conditions, because the operator will maintain reservoir pressure at or below the discovery pressure, i.e., the original pressure in the reservoirs when discovered, prior to oil and gas extraction. RDEIR, pp. 3-24 - 26. As indicated in RDEIR Vol. 2, Appendix E-2, Area of Review and Corrective Action Plans for 26R Storage Project and A1A2 Storage Project, the initial discovery pressures were 3,250 psi for the 26R reservoir and 4,000 psi for the A1A2 reservoir. Maintenance of reservoir pressure at or below these levels will avoid excessive post-injection pressures that could risk CO_2 escaping geological confinement, and also minimizes the potential for induced seismicity. The EPA draft permit (R9U1c_CA6-FY22-1.4) contained in Appendix E-2 of the RDEIR includes conditions of approval. Section K – Operations conditions 1-10 address the pressure levels and related requirements. Under pre-extraction conditions, including natural seismicity, the reservoirs confined oil and gas deposits for millions of years at these pressures, which are far below the estimated failure pressure for the Reef Ridge Shale of 7,500 psi or more; see RDEIR, Appendix E-2, Class VI Permit Application Narrative, p. 27. Regarding the risk of leakage through legacy well bores, during oilfield operations 841 billion cubic feet of gas and 114 million barrels of water were injected into the 26R formation and 175 billion cubic feet of gas and five million barrels of water into the A1A2 formation for pressure maintenance and enhanced oil recovery (EOR) purposes, with no instances of leakage through existing well bores during injection. Moreover, the Elk Hills reservoirs and oil and gas infrastructure were unaffected by previous seismic events in the region, including the 1952 Kern County earthquake with estimated magnitude 7.5. RDEIR Vol. 2, Appendix E-2, Attachment B.

Commenters assert that the RDEIR fails to support the analysis of CO_2 confinement with monitoring well data from the Monterey Formation outside the 26R and A1A2 reservoir areas to evaluate migration of injected fluids, or monitoring data for leakage from oil and gas wells during EOR injection into the 26R and A1A2 reservoirs. There have been no recordable instances of uncontrolled releases above the Reef Ridge Shale associated with hydrocarbon extraction or EOR injection operations, nor are there documented seeps associated with leakage up through the Reef Ridge Shale. Further EOR is prohibited by State law and Kern County conditions from being utilized in conjunction with this project.

Commenters claim that the RDEIR does not adequately consider health and safety hazards from potential CO_2 releases from geological storage. RDEIR Vol. 1, pp. 4.9-8 -15, reviews past CO_2 release incidents and discusses localized impacts on human health and safety from large releases. Based on the project-specific dispersion modeling, the worst case event for a catastrophic CO_2 pipeline failure would result in CO_2 plume dispersion for a range of 867 feet even with high winds. This plume dispersal distance is contained within the 9,104 acres of the project's CCS Surface Land Area, while the nearest community that could be affected by a release is 4 miles from the project site. See RDEIR, pp. 4.9-8 – 15, 4.9-51 – 54, 4.9-62 - 66 and RDEIR Vol. 2, Appendix B-4, CO_2 Dispersion Modeling. Beyond the dispersal range, a CO_2 release does not pose a health and safety risk, although it does add to the cumulative load of greenhouse gases affecting global climate. Please see Global Response 5, Greenhouse Gases, regarding climate change impacts. Regarding the Satartia, Mississippi pipeline incident, please see Global Response 4, CO_2 Pipelines and full PSMA report of on the failure in Appendix B-2 Failure Investigation Report.

GR-7c, Lateral Confinement

Commenters assert that the analysis of CO_2 storage is not supported by substantial evidence that underground CO_2 will remain laterally confined to the Approved Storage Space. Lateral confinement is determined by the boundaries of the storage pore space and the distance a given volume of CO_2 will migrate from the injection well, as well as the presence of confining geological features such as an anticline (a downward facing fold of stratified rock) or sealing fault. Geomechanical modeling provides evidence of CO_2 confinement within the Approved Storage Space under the proposed project's operating conditions. See RDEIR, Vol. 1, p. 3-24 and Vol. 2, Appendix E-2, Attachment B (Area of Review and Corrective Action Plan) for each reservoir. A geo-cellular grid and reservoir simulation model was developed based on three-dimensional subsurface geology, static well data (bottom and surface hole location, well bore trajectory, porosity and permeability) and dynamic data (pressure and saturation), to determine the maximum extent of the CO_2 plume. The modeling results demonstrate confinement in the 26 R reservoir by up-dip pinch-out of the reservoir on the anticline structure and lateral confinement by reservoir edges, and confinement in the A1A1 reservoir by the anticline structure. As noted above, the operator will maintain reservoir pressure at or beneath the discovery pressure of the reservoir, ensuring that CO_2 does not migrate beyond the edges of the anticline structure or into the Reef Ridge shale.

The current low pressure in the depleted 26R and A1A2 reservoirs also demonstrates the lack of lateral connection to other reservoirs. If the storage reservoirs were connected to surrounding aquifers or oil and gas reservoirs, fluids would flow into the depleted reservoirs and reach high

pressure in equilibrium with the surrounding reservoirs. The DiGiulio Report cites an article by Zumberge et al. (2005) suggesting that oil may have spilled from the Northwest Stevens anticline reservoirs and reached the 26R reservoir through a hydraulic connection between reservoirs. As stated in the Cornerstone Report, Zumberge et al.'s opinion is not supported by the low depleted pressure in the 26R reservoir. Further the permitting protocols in the required EPA Permit will ensure sufficient monitoring and on-going review of monitoring data.

The DiGuilio Report claims that RDEIR Appendix E-2 refers to the Etchegoin formation that overlies the confining Reef Ridge Shale as a "dissipation interval", suggesting that CO_2 will migrate out of the storage reservoirs into that formation, but leakage into the Etchegoin Formation would constitute movement into an unauthorized zone. The identification of a 'dissipation interval' above the confining layer is a requirement per the US EPA Class VI regulations and was therefore identified in this application. The applicant will be monitoring both the overlying Etchegoin Formation and the Upper Tulare Formation, this is above and beyond what is required by regulation and a conservative measure which has been incorporated into the US EPA permit application.

Commenters suggest that the RDEIR's statement that the project area contains no groundwater used as drinking water that would be at risk from lateral CO_2 migration (RDEIR, p. 4.9-52), and EPA permit provisions prohibiting injection that could allow movement of fluid into an underground source of drinking water (USDW). The permit provision is a requirement of EPA regulations, 40 CFR § 144.12, and also prohibits endangerment of any future USDWs, as does Mitigation Measure 4.10-4 ("The Owner/operator shall not conduct any Class VI injection activity regulated by the UIC program that discharge into any underground source of current or future beneficial use groundwater, including drinking water. The Owner/operator must demonstrate compliance with U.S. EPA Class VI UIC permit conditions.")

GR-7d, Natural Seismicity Risk

Commenters claim that the RDEIR's description of the environmental setting for geology impacts and determination of low to medium seismic risk analysis of seismic risk is unsupported by evidence as it fails to properly account for all factors of seismic risk, including the level of seismic activity in the surrounding region and the risk of seismic damage to legacy wellbores from past oil and gas activity. Citing past earthquakes and consequences, including legacy wellbore and pipeline damage from seismic events outside the project area, commenters assert that the RDEIR should find natural seismicity impacts to be significant and unavoidable, due to the risk of releases from CO_2 storage through earthquake damage to legacy wellbores.

The RDEIR environmental setting and impact analysis for Geology and Soil Impact are based on a site-specific expert evaluation of regional and project area seismicity, presented in RDEIR, Vol. 2, Appendix E-1, Preliminary Soil and Geological Evaluation. The Cornerstone Report notes that the seismic risk factors referred to by the commenters generally apply to structures and other surface improvements and/or to populated areas, while the seismic hazard analysis in RDEIR Appendix E-1 considered appropriate risk factors for the proposed project. For legacy well bores, in particular, lateral forces are far less than at ground surface due to the stabilizing nature of

surrounding soils. Therefore, for legacy well bores, seismic risk is associated with the possibility for fault movement.

The RDEIR, Vol. 1, pp. 4.7-5 - 6, describes the geological setting of regional faults and seismic history, not limited to the project area or the Elk Hills oil field. The setting description notes that the San Joaquin Valley is seismically active outside the Elk Hills oil field, and identifies the nearest regional faults (San Andreas and White Wolf) and historic earthquakes including the 1952 Kern County earthquake, the largest on record in the region. There have been eight earthquakes with a magnitude of 5.0 or greater within a 30-mile radius of Elk Hills. The impact analyses (RDEIR pp. 4.7-17 - 19) discloses there are numerous faults in the vicinity and an earthquake could disturb project surface and/or subsurface facilities, potentially resulting in loss, injury or death and in CO_2 release from underground storage. By contrast, within the Elk Hills area, there have been no earthquakes recorded greater than magnitude 3.0. The site-specific expert evaluation, prepared by a licensed engineering geologist and a geotechnical engineer (RDEIR, Vol. 2, Appendix E-1) determined that there are no identified active faults in the Elk Hills area, which is not located in a State-designated Alquist-Priolo Earthquake Fault zone. Due to the thickness and high clay content of the regionally continuous confining Reef Ridge Shale, no regional events (including the 1952 Kern County earthquake) have impacted the Elk Hills reservoirs or oil and gas infrastructure. The closest major active faults are approximately 12- 15] miles west and 25 miles southeast of Elk Hills, and seismic activity associated with these faults is much deeper (6 miles below surface) than the proposed project's storage reservoirs. The closest minor active fault is approximately five miles away. The evaluation concluded that "it is unlikely that ground rupture could occur at this site since it is not located within 500 feet of a suspected active fault" and that "ground failure is highly unlikely at this site." In addition, the evaluation in Appendix E-1 found that: "Based on the predicted maximum horizontal accelerations at the site and the soil types identified in this investigation ground failure is highly unlikely at this site." The US Geological Survey has classified the shallow sediment at Elk Hills (less than 30 meters depth) as having a high VS30 (average seismic shear-wave velocity), demonstrating reduced risk to surface facilities, wells and infrastructure.

The magnitude 7.7 Kern County earthquake in 1952, on the White Wolf Fault approximately 25-30 miles from the project site, caused loss of life and severe damage for long distances from the epicenter, but did not cause impacts to Elk Hills reservoirs or oil and gas infrastructure. RDEIR, Vol. 1, pp. 4.7-5, 17, RDEIR Vol. 2, Appendix E-1. The DiGiulio Report claims that references to the 1952 earthquake are misleading because, although the 26R reservoir was discovered in the 1940s, it was not developed until the 1970s, and the A1A2 reservoir was not discovered until the 1970s, implying that there were no facilities present in 1952 to be affected. However, the shallow oil zone which overlays the 26R reservoir has been in production since 1910. A substantial number of delineation/development wells were drilled in the 26R reservoir prior to 1952, which were used to monitor the reservoir. The 1952 earthquake caused no reservoir containment issues or infrastructure impacts to the Elk Hills field development present at the time. As the Cornerstone Report details, after the 1952 earthquake, no damage was reported to any shallow or deep, producer or injector well at Elk Hills. Even in the Edison oilfield, closer to the White Wolf fault, there was no evidence of damage to subsurface installations.

The DiGuilio Report asserts that the project's seismic risk assessment should have followed guidelines proposed by Templeton et al. (2021, 2023), including evaluation of seismic activity history within a 200 km (rather than 100 km) radius of the project site and recommendations for stakeholder outreach. These recommendations apply to projects in populated areas vulnerable to social and economic impacts from damage to public infrastructure and business operations, with a baseline hazard of natural tectonic seismicity and vulnerability to induced seismicity. The site-specific risk assessments prepared for the proposed project (RDEIR, Vol. 2, Appendices E-1, E-2 and F) consider appropriate factors for the project setting and operating conditions. The 1952 earthquake is the largest in California and no larger has been recorded within 200 km or 125 miles.

The DiGuilio Report asserts that wellbore damage would reasonably be expected from a major seismic event originating within 100 km of the proposed project, based on expected peak ground acceleration. However, the DiGiulio Report also states that "it is unclear what magnitude seismic event would be sufficient to cause damage to wellbores" and suggests that "is reasonable" to follow the California Air Resources Board (CARB) Carbon Capture and Sequestration Protocol requirement to determine the integrity of any well, facility, or pipeline when an earthquake of magnitude 2.7 or more has been detected within a one mile radius of CO_2 injection operations. Mitigation Measure 4.7-1 requires implementation of all requirements of CARB's Carbon Capture, Removal, Utilization and Storage Program. In addition, the proposed project is required to follow the state's CCS protocol which includes this requirement for post-earthquake integrity testing.

The above evidence and additional evidence discussed in the Cornerstone Report support the conclusion that Impact 4.7-1 is less than significant with feasible mitigation by comprehensive seismic monitoring and effective response to detected incidents, and the risk of wellbore damage does not raise natural seismicity impacts to a significant and unavoidable level. See below for responses to comments on seismic monitoring and mitigation.

GR-7e, Induced Seismicity Risk

Commenters claim that the RDEIR's assessment of the risk of CO_2 injection inducing seismicity (Impact 4.7-2, RDEIR Vol. 1, p. 4.7-19) is unsupported by evidence and inconsistent with scientific literature linking injection of CO_2 and other fluids with induced earthquakes. Even where natural seismicity is low to moderate, commenters assert, injection can cause induced seismicity, which could damage infrastructure and result in CO2 leakage. Commenters also assert that EPA's Class VI permitting and regulatory requirements do not adequately address induced seismicity, as they are primarily concerned with leakage through faults in the confining layer, not transmission of pressure and induced seismicity below the storage formation.

Evidence supports the conclusion that there is no significant risk of seismicity from pressure transmission below the Monterey Formation. The project operating pressure is lower than the pressure necessary to fracture the Monterey Formation sequestration zone, or the Reef Ridge confining layer. As a result, the CO_2 would remain in the zone of injection and not transmit to the underlying formation. The Monterey Formation is approximately 4,000 feet thick, with more than 2,000 feet of rock below the base of the injection target with a documented tensile failure pressure that is 3,000 psi higher than the maximum final pressure of 3,250 psi for the 26R reservoir and

4,000 psi for the A1A2 reservoir. Below the base of the Monterey Formation are approximately 9,000 feet of sedimentary strata. At pressures much higher than 4,000 psi, these formations preclude any downward fluid migration or induced seismicity.

The site-specific evaluation in RDEIR Vol. 2, Appendix F, found no record of induced seismic events from extensive water and gas injection at the Elk Hills Oil Field. Based on geological conditions and the operational history of injection at Elk Hills, the evaluation concluded that probability of occurrence is less than 1% and the severity of the risk is insubstantial since, if induced seismicity were to occur, it would be at a low level based on the record of water injection operations. The Cornerstone Report explains that the project site selection was supported by the absence of features conducive to induced seismicity. The presence and orientation of existing faults are key components for inducing seismicity. The absence of active faults in the project Area of Review and the fact that injection pressure will not exceed the fracture gradient supports the conclusion that the likelihood of induced seismicity is remote.

The DiGiulio Report notes that increased pore pressure beyond initial conditions is one of the main causes of injection-induced seismic events, and the risk of induced seismicity in depleted oil and gas fields may be less than that associated with other storage configurations since such fields have decreased pore pressure compared to initial conditions. As discussed above, the project will maintain maximum final pressure at the initial reservoir conditions.

More generally, the DiGiulio Report cites injection-induced seismicity attributed to hydraulic fracturing and oilfield produced water disposal in other states, e.g., Colorado, Oklahoma and Texas. The circumstances associated with oilfield induced seismicity in other parts of the United States have been shown to be inapplicable in California. These issues were examined in two reports by the California Council for Science and Technology (CCST): "Advanced Well Stimulation Technologies in California" (2014) and "An Independent Scientific Assessment of Well Stimulation in California, Potential Environmental Impacts of Hydraulic Fracturing and Acid Stimulations" (2015). CCST found that the lack of seismicity for hydraulic fracturing in California is consistent with the relatively shallow injection depths and small injection volumes in California operations, compared to other parts of the United States where high volume fracturing uses much greater quantities of water at greater depths. Regarding wastewater injection, CCST found that the likelihood of such induced seismicity is low in California compared to other regions in the U.S; the zones at which the rocks are rigid enough to accumulate enough stress to cause significant earthquakes are relatively deep in California, and significantly deeper than the oil and gas development and wastewater disposal zones; oil and gas production in California occurs in sedimentary basins, which are less susceptible to induced seismicity from wastewater injection; typical wastewater volumes injected per well in California are generally less than those associated with well stimulation operations in other parts of the country where induced seismicity has occurred; and operation of injection wells has had little effect on seismicity rates in Kern County.

The DiGiulio Report identifies one potentially injection-induced seismic incident at the Tejon Oil Field, associated with the White Wolf Fault. However, in that case the White Wolf fault was intersected by a seismically active fault in proximity to the oil field, with an 11 km high permeability pathway along the seismically active part of the fault. Under such circumstances,

seismicity may be induced in a fault that is favorably oriented for slipping by injecting fluids at pressure differentials as low as 1.5 psi. However, the DiGiulio Report provides no evidence of induced seismicity at depths, pressures and geological conditions similar to the project site.

For Impact 4.7-10 (RDEIR, Vol. 1, pp. 4.7-25 – 29), the RDEIR determined that the cumulative impact of potential induced seismic activity from multiple regional CCS projects would be significant and unavoidable. Commenters assert that a significant and unavoidable finding does not excuse the need to adequately consider cumulative induced seismicity risk from multiple CCS projects and other sources. The RDEIR does consider cumulative induced seismicity and explains that, while there is considerable information on seismic events in California, the state has no experience yet with multiple CCS projects in the same county. Since validation from real world projects is unavailable, the cumulative impact from multiple foreseeable CCS projects (see the "cumulative projects" list, RDEIR Vol. 1, Table 3-8, pp. 3-45 - 47) was conservatively considered significant and unavoidable, due to uncertainty of the implementation of multiple projects and the ability of all projects to simultaneously cease injection during an event. The RDEIR also considers contributions to cumulative impacts from other sources; specifically, from oil and gas activity in a region with active oil fields. As discussed in the RDEIR, extensive information is available on cumulative impacts from oil and gas activity, but there is no evidence of contribution to cumulative induced seismicity for the reasons discussed above. Other types of cumulative development would not be expected to induce seismic events.

GR-7f, CO_2 Mineralization

The DiGiulio Report notes that the RDEIR removed a statement in the original DEIR that mineralization of stored CO_2 would occur within two to five years and that the CO_2 dispersion modeling analysis does not include mineralization. The comment claims that the security of non-mineralized high-pressure CO_2 storage is low. The comment is correct that mineralization – a natural process in which CO_2 reacts with certain minerals to form solid carbonates – is not expected to occur at appreciable levels within hundreds of years of CO_2 injection. However, as discussed above, maintenance of reservoir pressure at or below the discovery pressure will avoid excessive post-injection pressures that could cause non-mineralized CO_2 to escape geological confinement. For clarification, the following text is deleted from the RDEIR, Vol. 1, p. 2-2:

> The CO_2 would be injected into the identified geographically confined reservoirs for storage ~~becoming part of the rock through mineralization in perpetuity~~.

In addition, the following text is deleted from the RDEIR, Vol. 1, p. 3-42:

> The injection and monitoring well for the underground storage are in the EPA Class VI UIC permit would have specific requirements for decommissioning as well as continued monitoring and bonding for the long-term oversight of the ~~mineralized~~ CO_2 storage space.

GR-7g, Geological Storage Effectiveness Metric

Commenters assert that the RDEIR provides no metric or performance standard for determining the effectiveness of geological CO_2 storage. The DiGiulio Report recommends that storage "permanence" be determined by a two-part metric: a 95% probability that 99% of CO_2 will be retained in 26R and A1/A2 reservoirs for 100 years, and a 95% probability that 99% of CO_2 will be retained subsurface for 1,000 years. The report also notes that different metrics, of varying stringency, have been proposed in scientific publications.

For CEQA purposes, it is not necessary to demonstrate that the proposed project will achieve the applicant's effectiveness metric, or any other metric drawn from the scientific literature. As discussed above, the RDEIR identified the risk of CO_2 loss contributing to atmospheric GHG levels due to unforeseen circumstances or equipment failure, and determined that the resulting project and cumulative impacts remain significant and unavoidable. RDEIR, Vol. 1, pp. 4.8-22 – 26 and 4.8-32 – 33 (Impacts 4.8-1 and 4.8-3).

Nevertheless, the proposed project does have an effectiveness metric, and RDEIR Vol. 2, Appendix F provides substantial evidence indicating that it will be met. The applicant has selected the effectiveness metric from the California Air Resources Board (CARB) Low Carbon Fuel Standard (LCFS) Protocol, Section C.2.2(f): a 90% probability that 99% of injected CO_2 will remain stored within the 26R and A1A2 reservoirs for 100 years after the end of CO_2 injection. See RDEIR, Vol. 2, Appendix F, Hazards and Hazardous Materials Documentation, Low Carbon Fuel Standard (LCFS) Report #1 - Site Based Risk Assessment. As explained in the RDEIR Vol. 1, pp. 4.6-5 - 6 and 4.8-9 - 10, a Carbon Capture and Sequestration Protocol was added to the LCFS in 2016 for the purpose of enabling CCS projects to become certified to generate LCFS credits. The LCFS CCCS Protocol establishes methodology for quantifying geological CO_2 sequestration and permanence requirements related to site characteristics, plume extent evaluation, testing and monitoring, well operation, post-injection site care, and more. Although more stringent metrics have been proposed in the scientific literature, CARB has determined that its protocol is sufficient to qualify CCS projects for "Permanence Certification."

Commenters assert that the RDEIR does not provide substantial evidence that the criterion of 90% probability that 99% of injected CO_2 will remain stored for 100 years will be met. Since the outcome after 100 years cannot be directly demonstrated, the LCFS protocol requires a site-based risk assessment, including modeling analysis, to project long-term storage effectiveness. Applying the methodology required by CARB, the site-based risk assessment determined that reservoirs 26R and A1A2 can meet CARB's LCFS permanence certification criterion of 90% probability that 99% of the injected CO_2 remains in the reservoir for 100 years after end of CO_2 injection, even under conservative assumptions. RDEIR Vol. 2, Appendix F, pp. 1-2. In addition, in compliance with the risk management plan requirements of LCFS Protocol Section C.2.2, the analysis evaluated and ranked risk scenarios and identified steps to manage, monitor, avoid, or minimize the risks. All risk scenarios were found to be low or low/medium in the LCFS protocol's risk classification, based on the history of oil and gas geological confinement and oilfield operations, compliance with EPA regulatory requirements, continuous injection pressure monitoring, mechanical integrity testing,

monitoring well and CO_2 surface monitoring, and low probability of failure scenarios. See RDEIR Vol. 2, Appendix F, pp. 2-10.

The DiGiulio Report opines that it is not credible that the project will achieve the LCSF CCS Protocol criteria given presence of legacy wellbores, high pressure CO_2 storage and the probability of local seismic activity that could damage plugged wellbores. In addition, commenters dispute the determination that the project is at low or low/medium risk of a seismic natural disaster or induced seismic event. As described above, under pre-extraction conditions, including natural seismicity, the reservoirs confined oil and gas deposits for millions of years at pressures at or above the project's CO_2 storage pressure and, despite the presence of many wellbores, no wellbore leakage occurred during oilfield injection operations. (See below for more detail regarding evaluation of wellbore leakage risk.) As shown in Table 2 of RDEIR Vol. 2, Appendix F, this determination was based on the low probability (<1%) of a damaging natural or induced seismic events, which is supported by evidence in RDEIR, Vol. 2, Appendix E-1, Preliminary Soil and Geological Evaluation, and discussed above.

GR-7h, Risk of CO_2 Leakage from Legacy Well Bores

Commenters claim that the many existing legacy well bores above the Approved Storage Space, as the result of past oil and gas operations, combined with high pressure storage of supercritical phase CO_2 and seismic risk, present a substantial risk of CO_2 leakage that has not been sufficiently considered. Commenters correctly note that well bore Kern County Code of Building Regulations, California Building Code and certain State of California design standards do not apply to wellbore integrity. Instead, compliance with building regulations and design standards will protect surface structures from significant seismic impacts, while oil and gas wellbore integrity is regulated by CalGEM under the California Public Resources Code and implementing regulations, and Class VI injection wellbore design is regulated by EPA under the Safe Drinking Water Act and its UIC program. (See below regarding injection well blowout risk.) These agencies have developed standards to prevent fluid from migrating between underground rock layers in the setting of California's geology and seismic regime. The proposed project must comply with federal and state regulations which ensure that the well bores are designed and constructed so as to retain integrity given the project's geologic setting.

Commenters also assert that the RDEIR fails to adequately disclose the project's environmental setting regarding existing wellbores in the project area and their risk of leakage, and note that integrity failure of plugged and abandoned wellbores can be common based on data from Canada and various U.S. jurisdictions. In particular, the DiGiulio Report asserts that the density of plugged and abandoned wells in project area, at 9.6 wells/km2, represents a worst-case scenario for long-term CO_2 storage. This claim is based on academic studies (Callas et al. 2022 and Alcalde et al. 2018) which conducted modeling based on assumed abandoned well leakage rates derived from generic datasets, across different regions with different well regulatory regimes. In California, plugging and abandonment of post-production oil and gas wells is regulated by CalGEM, which imposes detailed requirements (14 Cal. Code Regs. § 1723 et seq.) and reviews and approves abandonments by issuing final abandonment letters. Pursuant to these requirements, wellbore integrity at Elk Hills has been monitored for decades of oilfield operations. CalGEM makes

information for individual wells publicly available on its website at https://www.conservation.ca.gov/calgem/Pages/WellFinder.aspx and https://www.conservation.ca.gov/calgem/for_operators/Pages/WellSTAR.aspx. [For the proposed project, project-specific evaluation data were gathered on every well penetrating the reservoirs, and wells were identified for plugging and abandonment which will be carried out consistent with CalGEM requirements. RDEIR Vol. 2, Appendix E-2, P&A Procedure for Wells To Be Abandoned Prior to Injection, identifies each well requiring abandonment and provides well-specific plugging plans, with pluggings to be examined by CalGEM to confirm that its requirements, designed to ensure that wells "will not be a potential conduit for fluid migration outside the approved injection zone" (14 Cal. Code Regs. § 1724.8), are satisfied.

Commenters assert that the proposed project's evaluation of wellbore risk is uncertain and lacks performance standards for wellbore integrity, due to use of qualifying terms such as "if necessary", "if conditions allow", "adequate" and "sufficient." These terms are not intended to introduce indeterminacy; they describe conditional steps in the evaluation process established and enforced by CalGEM. See 14 Cal. Code Regs. § 1724.8(a) (emphases added): CalGEM's "evaluation for the potential for a well to allow fluid migration will include evaluation of the cementing records. Where cementing records are inadequate or unreliable, [CalGEM] *may* require a cement evaluation log. The operator should identify, and [CalGEM] confirm, wells which *may* require integrity testing, well logging, or monitoring in order to provide the requisite assurances that such wells will not act as conduits for fluid migration. [CalGEM] *may* require wells be examined, remediated, plugged and abandoned, or monitored… if [CalGEM] is concerned that the well has the potential to allow fluid to migrate outside of the approved injection zone." These requirements "apply, at minimum and subject *to augmentation by [CalGEM]* on a *project-specific basis,* to *ensure that wells within the area of review will not be a potential conduit for fluid migration outside the approved injection zone*" – which constitutes a performance standard for CalGEM's determinations of what is necessary, adequate, sufficient or allowed under project-specific conditions. The comment that mechanical integrity testing is necessary for every well is not correct; see 14 Cal. Code Regs. §§ 1724.8(a)(1), 1772 and 1774.

As required by EPA's Class VI permitting process, each existing wellbore within the project's Area of Review was individually evaluated to identify wellbores that must be plugged and abandoned prior to CO_2 injection to remove a conduit for leakage. Commenters suggest that it is not credible that evaluation of the 204 wellbores identified in the 26R reservoir and 150 identified wellbores in the A1A2 reservoir found no "deficiencies requiring corrective action." The well-by-well evaluation found no deficiencies in well casing or quality of prior plugging and abandonment. However, this does not mean that no wells were found to require abandonment prior to CO_2 injection. RDEIR Vol. 2, Appendix E-2, Area of Review and Corrective Action Plans for the 26R and A1A2 projects identified 157 (out of 204) wellbores atop the 26R reservoir and 33 (out of 150) wellbores atop the A1A2 reservoir that require pre-operational abandonment. Completion of these abandonments is a requirement of EPA approval to begin injection. If deficiencies are found in already abandoned wells, then the EPA permit will require remediation to CalGEM standards.

Commenters requested definitions of certain technical terms used in the wellbore evaluation, which are defined as follows:

> "Sidetrack – open hole with sidetrack" means a "sidetrack" is a drilling operation that involves drilling a secondary wellbore away from the original wellbore. An "open-hole" means the well does not have any casing or tubulars cemented across the reservoir section.
>
> "Sidetrack – directional cased cemented" means a well drilled in a non-vertical orientation with casing installed and cemented.
>
> "Not open" mean the zone of interest is not perforated.
>
> "Isolated" means the zone of interest was perforated but has since been isolated via cemented casing or cement plugs above the perforations.

Regarding monitoring to detect potential leakage through legacy oil and gas wells, please see below. Regarding potential leakage from pipelines, please see Global Response 4, CO_2 Pipelines.

GR-7i, Risk of Injection Well Blowout

Commenters assert that the RDEIR does not address the possibility of a blowout, and associated health risks, at any of the project's six CO_2 injection wells. The RDEIR, Vol. 1, pp. 4.9-14 – 15, notes that no well blowouts have been reported at dedicated CO_2 storage sites to date, and discusses CO_2 injection well blowout incidents and associated health risks during oilfield operations injecting CO_2 for EOR purposes. As described in the Cornerstone Report, a study by Jordan and Benson quantified well blowout rates in the southern San Joaquin Basin, including Elk Hills Oil Field. In the CalGEM district that includes Kern County, from 1991 to 2005, the rate of well blowout incidents in was one in 20,000 well-years for all wells in operation, with a rate of one per 15,000 well-years in oil fields utilizing thermal recovery methods (i.e., steam or hot water injection for EOR) and one per 60,000 well-years in non-thermal-recovery fields. While this study reported well blowout rates for oil and gas operations, it demonstrates that a very low risk of injection well blowouts can reasonably be expected for the proposed project's six injection wells; and any such incidents would be detected by ongoing monitoring throughout and above the injection zone under the Area of Review Corrective Action Plan required by EPA.

Commenters claim that an injection well blowout could release many thousands of tons of CO_2, similar in scale to the pipeline rupture that occurred in Satartia, Mississippi. Please see GR-4, CO_2 Pipelines, for discussion of the Satartia incident.

Mitigation Measure 4.9-14 requires the project to comply with CalGEM requirements including blowout requirements, and to reduce the incidence of well control loss by following the practices described in the American Petroleum Institute's Recommended Practice for Well Control Operations. EPA has also established integrity standards that apply to the project's injection and monitoring wells, which must be constructed so as to prevent migration of fluids out of the injection zone. The draft EPA UIC permits mandate specific standards in the well construction plan regarding well casing, cementing, and tubing and packer specifications, including meeting or

exceeding ASTM International and other standards developed for such materials. In addition, the draft EPA UIC permits contain provisions to prevent well blowout: at all times, the permittee must maintain a pressure which will prevent the return of the injection fluid to the surface; the well bore must be filled with a high specific gravity fluid during workovers to maintain a positive (downward) gradient or a plug must be installed which can resist the pressure; a blowout preventer must be installed and kept in proper operational condition whenever the wellhead is removed to work on the well; and the permittee must limit temperature and/or corrosivity and assure that pressure imbalances do not occur. See RDEIR Vol. 2, Appendix E-3, 26R UIC Permits.

GR-7j, Mitigation for Geologic and Seismic Impacts

Under CEQA, an EIR must provide mitigation measures that are effective to reduce potentially significant impacts to less than significant levels or, for significant and unavoidable impacts, all feasible mitigation. Commenters assert that the RDEIR's mitigation measures requiring compliance with other agencies' regulations – such as EPA Class VI permit regulations, CARB CCS standards, and CalGEM well integrity requirements – provide inadequate mitigation for purposes of CEQA. However, "requiring compliance with regulations is a common and reasonable mitigation measure" for CEQA purposes. *Oakland Heritage Alliance v. City of Oakland* (2011) 195 Cal.App.4th 884, 906. Lead agencies may presume that impacts mitigated by compliance with regulatory agency requirements "normally will be determined to be less than significant." *Protect the Historic Amador Waterways v. Amador Water Agency* (2004) 116 Cal.App.4th 1099. Commenters objecting to reliance on regulatory requirements of expert agencies such as EPA, CARB and CalGEM must present substantial evidence that, notwithstanding compliance with the regulations, the impact will be significant. *See, e.g., Berkeley Keep Jets Over the Bay Committee v. Board of Port Commissioners of the City of Oakland* (2001) 91 Cal. App. 4th 1344 (notwithstanding compliance with federal aviation noise requirements, commenters provided substantial evidence of significant noise impacts from nighttime airplane flights). This Global Response addresses commenters' specific objections to RDEIR mitigation measures and recommendations for other mitigation measures that, commenters assert, would constitute effective and feasible mitigation. Please see also Global Response 8, Mitigation Effectiveness and, regarding mitigation for GHG impacts, Global Response 5, Greenhouse Gas Emissions.

In total, there are 21 mitigation measures in the RDEIR that directly or indirectly mitigate impacts from the risk of CO_2 releases from geological storage, including but not limited to releases due to natural or induced seismicity. RDEIR Geology and Soils Impacts 4.7-1, 4.7-2 and 4.7-10 involving natural and induced seismicity are directly mitigated by Mitigation Measure 4.7-1, which provides:

> Seismic activity monitoring plan that includes, but is not limited to, connection to the Statewide seismic monitoring program of California Seismic Network (CISN). The draft plan shall be submitted concurrently to all the following agencies: Environmental Protection Agency, Region 9, California Seismic Network, California Air Resources Board and Kern County Public Works and Kern County Planning and Natural Resources. The final plan shall be approved by the California Air Resources Board and include all requirements of State law including but not limited to: Appropriate subsurface monitoring to ensure geologic sequestration of injected carbon dioxide; Identification of hazards and conditions that may

> require the suspension of carbon dioxide injections; notification protocols for all applicable agencies and emergency procedures. All requirements for seismic monitoring adopted by the California Air Resources Board – "Carbon Capture, Removal, Utilization and Storage Program" shall be implemented.

Relatedly, Mitigation Measure 4.8-1 provides:

> Prior to any injection of CO_2 the owner/operator shall submit a monitoring plan that complies with all requirements of the EPA UIC permit issued for the project to demonstrate the retention of CO_2 in the injection/hydrocarbon reservoir zone. The plan shall be submitted to the Kern County Planning and Natural Resources Department concurrent with submittal to the EPA for review. A copy of the final approved plan from the EPA shall be provided to the Kern County Planning and Natural Resources Department.

For commitment to compliance with EPA requirements, including but not limited to those addressing seismic risk, Mitigation Measure 4.9-9 provides:

> Prior to commencement of any construction or grading, the owner/operator is required to provide written evidence of all of the following requirements: 1. Issuance of an EPA UIC Program Construction permit. . . .

and Mitigation Measure 4.9-10 provides:

> Prior to commencement of any testing or full operation to inject CO_2, the owner/operator is required to provide written evidence of all of the following requirements: 1. Written correspondence from the Environmental Protection Agency (Region 9) UIC program to the Kern County Planning and Natural Resources Department that the owner/operator has fully complied with all requirements of the EPA issued UIC CCS Program permit and EPA is authorizing commencement of injection, for testing or commencement of injection for full operations. . . . .

For commitment to compliance with CalGEM requirements, including but not limited to those addressing releases from oil and gas wellbores, Mitigation Measure 4.9-14 provides:

> The owner/operator shall comply with the California Geologic Energy Management Division requirements for assuring safe drilling and drill casing practices, well design, construction and well management requirements, blowout requirements, and all other provisions of 14 California Code of Regulations 1744 and other applicable Geologic Energy Management Division regulations to any wells being abandoned as a result of the CCS project. The Owner/operator shall also reduce the incidence of well control loss by following the practices described in the American Petroleum Institute's Recommended Practice for Well Control Operations.

In addition to EPA requirements to monitor for CO_2 releases from geologic storage, fenceline monitoring for CO_2, among other air pollutants, is required by Mitigation Measure 4.3-8:

> Prior to issuance of any construction or grading permits, the Owner/operator shall consult with the San Joaquin Valley Air Pollution Control District and develop a draft Air Monitoring program for fence line monitoring of all air constituents generated by the CCS project including but not limited to: criteria pollutants, CO_2, and H2S. The plan shall be reviewed and approved by both the San Joaquin Valley Air District and the California Air Resources Board, with a draft copy to the EPA UIC Program and Kern County Planning and Natural Resources, and implemented before any construction on the CCS facilities can occur. The final approved plan shall be provided to the EPA UIC Program and Kern County Planning and Natural Resources.

To protect public health and safety in the event of CO_2 release from geologic storage, including but not limited to those caused by seismic events, Mitigation Measure 4.3-6 provides:

> No Class VI or Class II injection well for use in this CCS project shall be located within 4000 feet of any sensitive receptor.

and Mitigation Measure 4.9-18 provides:

> Prior to commencement of any injection of CO_2, and in addition to the emergency response plan required by the EPA UIC permit, the owner/operator shall prepare an emergency incident response plan that addresses, advance leak detection methods and communication with fire responders, emergency medical response, Kern County Fire and Kern County Sheriff notification and protocols for incident management. The plan shall be reviewed and approved by the Kern County Fire Department in consultation with EPA UIC Program, State of California Fire Marshall, Kern County Sheriff and all other State agencies identified by the California Air Resources Board.

The RDEIR contains numerous additional relevant mitigation measures:

> Mitigation Measure 4.7-2 prohibits wells or accessory equipment and facilities on slopes greater than 30%; Mitigation Measure 4.7-3 requires the owner/operator to implement all requirements of a site-specific geotechnical report; Mitigation Measure 4.7-4 prohibits infrastructure construction on expansive soil; Mitigation Measure 4.9-4 requires compliance with federal and state requirements for CO_2 pipeline safety (see Global Response 4, CO_2 Pipelines); Mitigation Measure 4.10-4 prohibits injection into groundwater with current or future beneficial use, including drinking water, and requires compliance with EPA Class VI UIC permit conditions; Mitigation Measure 4.9-12 requires communication of emergencies or releases immediately on discovery to the Kern County Fire Marshall and Public Health, and within 24 hours to the Kern County Planning and Natural Resources Department; Measures 4.11-1 through 4.11-6 prevent conflicting land uses from encroaching on the storage area; and Mitigation Measure 4.15-4 requires an annual payment of $250,000 for the Kern County Fire

Department to purchase equipment and provide training specific to the detection and control of emergency situations caused by CO_2.

Collectively these mitigation measures are sufficient to address impacts associated with CO_2 releases from geological storage. For clarification, RDEIR p. 4.7-18 is revised to read as follows:

Mitigation Measures

MM 4.7 1 The owner/operator shall prepare a comprehensive seismic activity monitoring plan that includes, . . .

In addition, implement MMs 4.3-6, 4.3-8, 4.7-2 through 4.7-4, 4.8-1, 4.9-4, 4.9-9, 4.9-10, 4.9-12, 4.9-14, 4.9-18, 4.10-4, 4.11-1 through 6, and 4.15-4.

RDEIR p. 4. 7- 19 is revised to read as follows:

Mitigation Measures

Implement MM 4.7-1, as described above, and MMs 4.3-6, 4.3-8, 4.7-2 through 4.7-4, 4.8-1, 4.9-4, 4.9-9, 4.9-10, 4.9-12, 4.9-14, 4.9-18, 4.10-4, 4.11-1 through 6, and 4.15-4.

RDEIR p. 4. 7- 27 is revised to read as follows:

Mitigation Measures

Implement MM 4.7-1 to MM 4.-7-6, as described above, and MMs 4.3-6, 4.3-8, 4.8-1, 4.9-4, 4.9-9, 4.9-10, 4.9-12, 4.9-14, 4.9-18, 4.10-4, 4.11-1 through 6, and 4.15-4.

Commenters assert that Mitigation Measure 4.7-1 cannot reduce impacts from seismicity to less than significant because seismic monitoring is not mitigation; monitoring can detect seismic events but does not avoid or reduce them. Mitigation measures under CEQA often provide monitoring requirements, and CEQA requires a Mitigation Monitoring and Reporting Program for adopted mitigation measures. Although Mitigation Measure 4.7-1 refers to a seismic monitoring plan, it and the other mitigation measures listed above also include required actions in response to seismic events, including compliance with the requirements of EPA Class VI permit's Emergency and Remedial Response Plan, that would avoid, reduce, correct or compensate for impacts associated with natural or induced seismicity per the definition of mitigation in CEQA Guidelines § 15370.

Commenters claim that seismic monitoring under Mitigation Measure 4.7-1 is inadequately described and unenforceable due to the use of terms such as "appropriate" subsurface monitoring which lack specificity. Mitigation Measure 4.7-1 properly relies on compliance with comprehensive seismic activity monitoring plans and construction standards to mitigate potentially significant risks associated with seismic events and CO_2 release. Performance standards for seismic and related monitoring and for construction are incorporated into the project-specific Class VI UIC permits, as supplemented by EPA regulations that specify terms and compliance requirements applicable to Class VI permits. Class VI permits are subject to oversight and enforcement by EPA, and compliance with Class VI permit requirements is required by Mitigation Measures 4.7-1, 4.8-1, 4.9-4, 4.9-9, 4.9-10 and 4.10-4.

Class VI permit conditions require seismic activity monitoring via a seismic monitoring network that covers the area of review, establishing a baseline and performing continuous seismic monitoring to detect for both natural and induced seismic activity. Seismic monitoring must be performed continuously throughout CO_2 injection as required by 40 C.F.R. § 146.90(g). RDEIR Vol. 2, Appendix E-3, 26R UIC Permits, Attachment C at 25-28. These EPA requirements provide the specific performance standards which Mitigation Measure 4.7-1 must accomplish to mitigate seismic impacts, e.g., what specific forms of monitoring are "appropriate to ensure geologic sequestration of injected carbon dioxide."

As explained in the Cornerstone Report, the seismic array for the proposed project is designed to record and locate seismic events down to magnitudes of completeness of 0.5, with a location accuracy of approximately 100 meters horizontal and 200 meters vertically, and a 1,000 ft vertical resolution. RDEIR, Vol. 2, Appendix E-2, Indirect Monitoring. This is a much lower, more accurate standard than the 1.0 km resolution suggested by the DiGiulio Report. [Seismic monitoring data quality (including data collected during the baseline phase of seismicity monitoring) must be submitted to and reviewed by EPA.

In addition, MM 4.7-1 requires the project to connect to the California Integrated Network (CISN), in compliance with both Class VI permit conditions and state law (SB 905), as well as with all requirements for seismic monitoring adopted by CARB's Carbon Capture, Removal, Utilization and Storage Program. See RDEIR 4.7-26 discussing the CISN statewide seismic monitoring program. Connection to the monitoring data from existing broadband seismometers and strong motion accelerometers in the network would detect even small seismic events that cannot be felt by surrounding communities. This requirement will apply to all other CCS projects as well, enabling evaluation of potential induced seismicity events, both individually and cumulatively. Seismic events would be detected, reported, and evaluated against any potential leakage detected at the injection sites.

EPA's Class VI UIC permits require the project to install and use continuous recording devices to monitor injection pressure, rate and volume which mitigates the risk of exceeding geologically safe injection pressure; testing and corrosion monitoring to ensure well integrity; and monitoring water quality and geochemical changes above the confining zone to detect any CO_2 migration, including but not limited to changes following seismic events. RDEIR, Vol. 1, p. 4.7-18, and Vol. 2, Appendix E-2, Attachment C: Testing and Monitoring Plan. For the proposed project, monitoring features incorporated in the Class VI permits consist of the following:

- CO_2 injection well monitoring especially for pressure, temperature, and injection rate.
- Pressure and saturation monitoring within the injection zones.
- Monitoring of pressure and fluid sampling below the injection zone at the A1A2 reservoir.
- Monitoring wells in geologic formations above the upper confining layer.
- Temperature monitoring above injection zone at all injection zone monitoring wells.
- A water well to monitor conditions in the fluids atop the project.

- Manned operations to directly observe site conditions.
- The use of multiple eddy covariance towers to directly measure net CO_2 exchange with the atmosphere.
- Periodic soil gas monitoring.

The Cornerstone Report provides an expert opinion that the monitoring proposed by the project, and required pursuant to federal standards as discussed above, is fully sufficient to monitor for and detect any CO_2 leakage during and after injection. Commenters note that EPA's UIC program requirements are focused on protecting underground sources of drinking water (USDW), but there are no shallow aquifers in the project area suitable as USDWs. However, the EPA Class VI permit requirements prohibit movement of injected fluids into any unauthorized zones, not just into USDWs. As the DiGuilio Report (p. 13) acknowledges: even in the absence of a USDW in the 26R and A1A2 reservoirs, migration of CO_2 or other fluids into overlying or underlying formations is prohibited under the Class VI permit.

Commenters claim that monitoring under Mitigation Measure 4.7-1, and also under Mitigation Measure 4.8-1, are deficient because they will not detect seismicity-induced or other leakage from legacy wellbores. Implementation of above-zone monitoring is part of the Class VI permit Testing and Monitoring Program required by the Class VI UIC permit; see RDEIR, Vol. 2, Appendix E-2, Attachment C. This monitoring will utilize eddy covariance towers, which take measurements over a broad area based on micrometeorology and directly measure the net CO_2 exchange with atmosphere. The purpose of the broad aerial monitoring is to monitor for surface leakage over a large area, covering the Area of Review. Any indications of increases in CO_2 flux over baseline would be reported to the regulatory agencies and trigger additional targeted point source monitoring efforts as required by the agencies. As described in the Cornerstone Report, this technology is recognized in scientific literature as appropriate to identify evidence of leaks to the surface

The DiGiulio Report asserts that atmospheric monitoring with eddy covariance towers is insufficient and must be supplemented with periodic monitoring of individual wellbores; and recommends converting additional legacy oil and gas wellbores to monitoring wells to detect wellbore leakage. Air monitoring with eddy covariance towers would capture leakage from all well bores in the area and is more likely to detect leakage than periodic monitoring of any selected set of wellbores. As the DiGuilio Report (p. 14) points out, based on a study of wells in Pennsylvania, a relatively small number of wells accounts for the majority of leakage. If leakage does occur, the wells selected for individual monitoring might not prove to be the wells that leak. Overall monitoring of atmospheric CO_2 differentials using eddy covariance towers as required for the proposed project is therefore a more reliable method of detecting leakage above and outside the reservoirs, and additional monitoring wells are unnecessary for this purpose.

In addition to monitoring, Mitigation Measure 4.7-1, and other mitigation measures that require compliance with Class VI permit requirements, incorporate response actions in the required Emergency and Remedial Response Plan that would mitigate potentially significant impacts following the occurrence of seismic events and/or CO_2 leakage. The project's Emergency and Remedial Response Plan, in turn, covers a variety of specific risk scenarios including well integrity

failure, injection well or monitoring equipment failure, and an induced or natural seismic event; see RDEIR Vol. 2, Appendix E-3, 26R Storage Project Draft Permits, Attachment F. As provided in Attachment F, Table 2, if seismic monitoring is detected that changes the project's operating state, specific and mandatory response actions are identified, which are specifically designed to mitigate the risks associated with seismic events and the migration or release of CO_2. The response scale runs from seismic events less than or equal to M 1.5 ("green" operating state), through three intermediate stages, up to a seismic event greater than M 3.5 or greater than M 2.0 with local reports and confirmation of damage ("red" operating state). In the "green" operating state, notice to EPA is sufficient. In the "red" operating state, the project must initiate shutdown of all injection wells, vent CO_2 from surface facilities, limit access to wellheads to authorized personnel only, communicate with local authorities to initiate evacuation plans, take a variety of steps to collect and evaluate seismic and operational data to determine whether CO_2 storage has been compromised and report to EPA. In the event of an emergency that requires venting of CO_2 from surface facilities, monitoring of flow rates of flow through surface facilities will allow for quantifying and reporting the amount released. In addition, the mitigation measures require compliance with state law (SB 905) and CARB requirements, under which CARB can shut down CO_2 injection if monitoring detects increased seismicity or CO_2 leakage, thereby reducing impacts associated with injection. These requirements provide the performance standards for determining response actions including shutdown of injection wells.

The DiGiulio report recommends additional mitigation in the form of post-earthquake assessment of leakage at wellbores and replugging in the event of CO_2 leakage. The Cornerstone Report provides an expert opinion that implementation of Class VI permit and state law requirements is sufficient to monitor for and detect any CO_2 leakage during and after injection. If previously plugged and abandoned legacy well bores within the Area of Review show evidence of leakage, then re-entry and re-abandonment consistent with CalGEM requirements would be triggered in accordance with the Class VI permit Corrective Action Plan in RDEIR Vol. 2, Appendix E-2. Mitigation Measure 4.7-1 also requires implementation of all requirements of CARB's Carbon Capture, Removal, Utilization and Storage Program. Specifically for seismic events, CARB's LCFS CCS Protocol includes the requirement to determine the integrity of any well, facility, or pipeline when an earthquake of magnitude 2.7 or more has been detected within a one mile radius of CO_2 injection operations. The proposed project will follow the state's CCS protocol which includes this requirement for post-earthquake integrity testing. In addition, operating oil and gas fields throughout California are currently subject to leak detection and repair programs administered by regional air districts, which will continue when the proposed project is in operation, as required by the Class VI permit. Operator leak detection and repair efforts are subject to oversight through regular inspections by both the San Joaquin Valley Air Pollution Control District and CalGEM. Inspectors from both agencies actively search for leaks.

In addition, commenters assert that risk-based setback distances should be identified and imposed as requirements in a mitigation measure to protect health and safety. Risk analysis revealed no risk to the closest sensitive receptors at a 4 mile distance from the modeled worst-case CO_2 plume dispersal, a distance of 867 feet (0.16 mile) which is within the 9,104 acres of the project's CCS Surface Land Area. [Beyond the modeled dispersal distance, the worst-case CO_2 plume poses no

risk of health or safety impacts to receptors. Nevertheless, the RDEIR includes several mitigation measures imposing setbacks beyond the maximum dispersal distance of 867 feet:

MM 4.3-6 No Class VI or Class II injection well for use in this CCS project shall be located within 4000 feet of any sensitive receptor.

MM 4.9-4 All CCS related CO_2 facility pipelines shall require construction permit site plan review by the Kern County Planning and Natural Resources Department. . . . The plan shall include all details and features to show compliance with 49 CFR Part 195.

49 CFR Part 195 includes 49 CFR § 195.210(b) which provides: "No pipeline may be located within 50 feet (15 meters) of any private dwelling, or any industrial building or place of public assembly in which persons work, congregate, or assemble, unless it is provided with at least 12 inches (305 millimeters) of cover in addition to that prescribed in § 195.248."

Commenters also claim that the RDEIR does not address restrictions on future land use within the CO_2 storage site to prevent encroaching development. The comment is incorrect. Encroachment by future development is limited by Mitigation Measure 4.11-2, which restricts use of the CCS Surface Land Area to agricultural cultivation, solar and energy storage, conservation, and permitted oil and gas exploration and production, and related provisions in Mitigation Measures 4.11-3, 4 and 5 regarding procedures for building permits, lot line adjustments and deed restrictions in the CCS Surface Land Area. No additional mitigation measures imposing setbacks or limiting encroachments are needed.

8: Mitigation Effectiveness

Commenters question the adequacy and enforceability of the RDEIR mitigation measures. An EIR must propose feasible mitigation measure that will avoid or substantially lessen significant environmental effects. Pub. Res. Code § 21002; CEQA Guidelines 15126.4(a)(1). Mitigation is defined as an action that minimizes, reduces, or avoids a significant environmental impact or that rectifies or compensates for the impact. CEQA Guidelines § 15370 (definition of mitigation). The mitigation measures discussed in the EIR must be feasible. CEQA Guidelines §§ 15126.4(a), 15364 (definition of feasible). CEQA imposes several requirements on mitigation measures.

Section 21081.6, subdivision (b) provides: "A public agency shall provide that measures to mitigate or avoid significant effects on the environment are fully enforceable through permit conditions, agreements, or other measures. Conditions of project approval may be set forth in referenced documents which address required mitigation measures ...." Similarly, Guidelines section 15126.4, subdivision (a)(2) states: "Mitigation measures must be fully enforceable through permit conditions, agreements, or other legally-binding instruments." Where substantial evidence supports the approving agency's conclusion that mitigation measures will be effective, courts will uphold such measures against attacks based on their alleged inadequacy. *Laurel Heights Improvement Assn. v. Regents of University of California* (1988) 47 Cal.3d, 376, 407.

Mitigation measures must provide enough detail and specificity to assure that they will be properly enforced. *See* CEQA Guidelines § 15126.4(a)(1)(B) (mitigation measures "may specify performance standards which would mitigate the significant effect of the project and which may be accomplished in more than one specified way"). The specifics of a mitigation measure may be deferred "where the local entity commits itself to mitigation and lists the alternatives to be considered, analyzed and possibly incorporated in the mitigation plan." *Endangered Habitats League, Inc. v. County of Orange* (2005) 131 Cal.App.4th 777, 779. The deferral of the formulation of mitigation measures requires the agency to commit itself to specific performance criteria for evaluating the efficacy of the measures implemented.

Commenters assert that the RDEIR's analysis of mitigation measures was generally flawed due to claimed errors regarding the project description, project objectives, impact analysis (including GHG, air quality and seismic impacts), and other issues (e.g., commenters claim that the project will extend the life of oil and gas facilities). These comments do not raise separate issues. Rather, the comments are derivative of other comments, which are addressed elsewhere in these responses to comments. Please see, e.g., Global Responses 1, 2, 4-7 and 9-10.

GR-8a, Mitigation Measures Are Enforceable

Commenters state that mitigation measures in the RDEIR lack adequate enforcement mechanisms. The County has broad authority to enforce its regulations pursuant to Article XI, Section 7 of the California Constitution, which provides that the County may "make and enforce within its limits all local police, sanitary and other ordinances and regulations not in conflict with the general laws." The County implements its enforcement powers through revocation actions, administrative penalties, nuisance abatement actions, criminal sanctions and injunctive relief authorized by the County Code. In addition, the County may enforce mitigation requirements pursuant to CEQA.

The Zoning Ordinance (Title 19 of the Kern County Ordinance Code) provides for general and specific provisions for enforcement and penalties. The General Provisions Chapter 19.02 of the Zoning Ordinance, Section 19.02.070 Violation-Penalty, provides that any person, firm or corporation using any building, structure or parcel of land in violation of any provision of this title is guilty of a misdemeanor and may be prosecuted to the fullest extent of the law under Chapter 19.114 of this title. Unauthorized activities would be subject to the provisions in Chapter 19.114 Enforcement and Penalties, which provides for the process and authority for inspection, complaints, noticing requirements, administrative penalties, injunctive relief, abatement proceedings and the collection of costs for the abatement proceedings. Kern County Code § 8.54.040 provides that any person who violates any provision of the County zoning regulations may be issued an administrative citation for each day such violation is allowed to continue. Administrative penalties for a violation of the County zoning regulations are assessed as a fine not to exceed $250 for the first violation, $500 for the second violation, and $1,000 for each additional violation thereafter within one year from the date of the first violation. Any County public official may also petition the Board of Supervisors to increase the fine amount, which the Board may approve in its discretion. Failure to pay an administrative penalty is subject to a civil action initiated by the County to collect the unpaid fines with interest, as well as to seek reimbursement of the County's costs to enforce, investigate, establish, and collect such fines. Pursuant to Kern County Code § 19.114.060, any

person who causes or permits a violation of any County zoning regulation commits a misdemeanor that, upon conviction, is punishable by a maximum fine of $1,000 or by imprisonment for up to six months, or both. Each day the violation continues constitutes a separate offense. Accordingly, per the County Code, cumulative punishments may be stacked for each day a zoning violation is continued, a practice upheld by the courts in *People v. Djekich* (1991) 229 Cal.App.3d 1214, 1224. Because the conditions of approval will require compliance with the mitigation measures of the RDEIR, any failure to maintain compliance would constitute a continuing misdemeanor violation subject to criminal prosecution for each day such a violation continues to occur. The mitigation measures are thus enforceable by the County.

GR-8b, Mitigation May Require Compliance with Agency Regulations

Commenters state that the RDEIR's mitigation measures requiring compliance with other agencies' regulations – such as EPA Class VI permit regulations, CARB CCS standards, and CalGEM well integrity requirements – provide inadequate mitigation for purposes of CEQA. For example, commenters state that the Air Monitoring program required by Mitigation Measure 4.3-8 constitutes impermissibly deferred mitigation. Mitigation Measure 4.3-8 requires the applicant to develop in conjunction with the Air Resources Board and SJVAPCD a fenceline monitoring program. This is a requirement for any operator of a "carbon dioxide capture, removal, or sequestration project operator" pursuant to Public Resources Code § 74641, subdivision (c), which specified that the operator must "[c]reate an air monitoring and mitigation plan to measure, track, and minimize potential toxic air contaminants and criteria air pollutants from the site of the carbon dioxide capture, removal, or sequestration project and submit the plan to the state board." "[R]equiring compliance with regulations is a common and reasonable mitigation measure" for CEQA purposes. *Oakland Heritage Alliance v. City of Oakland* (2011) 195 Cal.App.4th 884, 906; *see also Rominger v. Colusa* (2014) 229 Cal. App. 4th 690, 728 (challengers offered "no evidence to suggest that it would be unreasonable to expect" compliance with statewide regulations); Cal. Evidence Code § 664 ("It is presumed that official duty has been regularly performed"). Lead agencies may thus presume that impacts mitigated by compliance with regulatory agency requirements "normally will be determined to be less than significant." *Protect the Historic Amador Waterways v. Amador Water Agency* (2004) 116 Cal.App.4th 1099. This is also consistent with the numerous provisions of the CEQA Guidelines that direct lead agencies to rely on the requirements of previously approved plans or programs to reduce project impacts. *See, e.g.,* CEQA Guidelines §§ 15064, 15130, 15152, 15183. Consistent with the Guidelines, the courts have repeated upheld reliance on existing plans and programs, as well as other regulatory programs that avoid or reduce significant environmental impacts.

Commenters objecting to reliance on regulatory requirements of expert agencies such as EPA, CARB and CalGEM must present substantial evidence that, notwithstanding compliance with the regulations, the impact will be significant. *See, e.g., Berkeley Keep Jets Over the Bay Committee v. Board of Port Commissioners of the City of Oakland* (2001) 91 Cal.App.4th 1344 (notwithstanding compliance with federal aviation noise requirements, commenters provided substantial evidence of significant noise impacts from nighttime airplane flights). *See also* CEQA Guidelines § 15064.7(d) (lead agencies may utilize environmental standards of regulatory agencies as CEQA thresholds of significance). Commenters cite to *Californians for Alternatives to Toxics*

v. Dept. of Food & Agric. (2005) 136 Cal.App.4th 1 and *Kings County Farm Bureau v. City of Hanford* (1990) 221 Cal.App.3d 692 to argue that the County cannot rely on agency programs. But, as the court in in *Oakland Heritage Alliance* explained, the error in *Californians for Alternatives to Toxics* resulted from a lead agency's reliance on a regulatory program that did not and could not account for project-specific activities. By contrast, the regulatory program in *Oakland Heritage Alliance* and the programs on which the RDEIR mitigation measures rely "*do* account for the specific conditions on the project site" and specific project activities. *See Oakland Heritage Alliance*, 195 Cal.App.4th at 904. In *Kings County Farm Bureau*, the lead agency concluded that all air quality impacts were less than significant based on compliance with regulatory programs that addressed only a segment of air quality emissions. No commenter has identified a similar omission that would undercut the County's reliance on existing standards or requirements. In the absence of such evidence or evidence that impacts will not be reduced, the RDEIR properly relies on agency programs and regulatory standards and such reliance does not constitute deferred mitigation.

GR-8c, Mitigation measures are not impermissibly deferred

Commenters assert that Mitigation Measures 4.3-8, 4.7-1, 4.8-1, and other measures that refer to plans that will be prepared post-project approval constitute improperly deferred mitigation. CEQA allows deferred mitigation when "practical considerations prohibit devising such measures early in the planning process" so long as the agency commits itself to meeting an achievable performance standard. *Communities for a Better Environment v. City of Richmond* (2010) 184 Cal.App.4th 70, 94. The lead agency must commit to the mitigation, adopt specific performance standards, and identify the project actions to achieve the standards. CEQA Guidelines § 15126.4(a)(1)(B). "Compliance with a regulatory permit or other similar process may be identified as mitigation if compliance would result in implementation of measures that would be reasonably expected, based on substantial evidence in the record, to reduce the significant impact to the specified performance standards." *Id.* Deferral may be appropriate "where another regulatory agency will issue a permit for the project and is expected to impose mitigation requirements independent of the CEQA process so long as the EIR included performance criteria and the lead agency committed itself to mitigation." *Clover Valley Foundation v. City of Rocklin* (2011) 197 Cal.App.4th 200, 237; *see also Oakland Heritage Alliance*, 195 Cal.App.4th 884. This is the scenario contemplated by several mitigation measures, including Mitigation Measure 4.3-8 which requires the owner/operator. Commenters cite to *Gray v. County of Madera* (2008) 167 Cal.App.4th 1099 to contend that a "goal" is not a performance standard. However, the error in *Gray* was a lack of specificity. The goal in *Gray* was to replace lost water, but the court in that case held that "this goal is not a specific performance standard such as the creation of a water supply mechanism that would place neighboring landowners in a situation substantially similar to their situation prior to the decline in the water levels of their private wells because of the mining operations, including allowing the landowners to use water in a substantially similar fashion to how they were previously using water." *Gray*, 167 Cal.App.4th at 1119. Unlike the mitigation measure in the RDEIR, the mitigation in *Gray* did not rely upon or incorporate existing specific regulatory or statutory requirements. In contrast to the unsubstantiated and nonspecific goal in *Gray*, mitigation is not deferred because performance standards and commitments are contained in the EPA appendices and regulatory requirements, which must be complied with as provided in the mitigation measures.

GR-8d, DMA Is Permissible and Effective Mitigation.

Mitigation Measure 4.3-5 requires the owner/operator to enter into a Developer Mitigation Agreement ("DMA") with the SJVAPCD to mitigate criteria emissions for CCS project implementation not already required to be offset pursuant to Mitigation Measure 4.3-1. The owner/operator shall pay fees to "fully offset Project emissions" of NO_x (oxides of nitrogen), ROG (reactive organic gases), PM_{10} (particulate matter of 10 microns or less in diameter), and $PM_{2.5}$ (particulate matter of 2.5 microns or less in diameter) (including as applicable mitigating for reactive organic gases by additive reductions of particulate matter of 10 microns or less in diameter) (collectively, "designated criteria emissions") to avoid any net increase in these pollutants. The offset requirement for the DMA is based on the total estimated emissions from the Project as calculated in the RDEIR. This calculation includes emissions from construction and operation of the Project.

While the County does not sign the actual Developer Mitigation Agreement, compliance with MM 4-3-5 is fully enforceable by the County as imposed. The County will enforce compliance with Mitigation Measure 4.3-5 as with all mitigation measures and permit conditions through its police powers as described in GR-8.a. Emissions reduction agreements entered into by the SJVAPCD are approved through the Governing Board. The District Governing Board explains that it "ensures that the process of developing and implementing the policies, procedures, plans, rules and regulations necessary to fulfill the state and federal mandates is carried out in an open, public forum, as required by California law. Public participation and input are encouraged at meetings of the Governing Board and at rule and plan development workshops. Most information created and used by the District is available to the public. This includes financial and budget reports, rules and regulations, planning documents, data on air quality and meeting agendas."[1] The RDEIR includes an example of the SJVAPCD's emissions reductions agreements in Appendix B-3. The District has previously modified its form agreement to conform to the requirements of mitigation measures

The SJVAPCD ISR Annual Reports report the quantities of air pollution reduced through the expenditure of funds collected under emission reduction agreements such as the DMA in order to ensure that covered project emissions are actually reduced. The RDEIR includes the 2023 Indirect Source Review Program 2023 Annual Report, demonstrating the success of the District's past programs. District Rule 2201 requires offsets for permitted stationary sources to be real, excess, permanent, and enforceable. In addition, the SJVAPCD will assure that mitigation reductions used for increases from unpermitted equipment and activities are likewise real, excess, permanent, and enforceable, although these offsetting reductions are not subject to federal Clean Air Act offset requirements. Contrary to commenters' assertions, the RDEIR need not state the precise amount of emissions reductions because it commits to mitigating all Project emissions, no matter the amount. Some comments cite to the Kern County Superior Court decision in *Vaquero Energy v. County of Kern* (Kern County Superior Case No. BCV-15-101645-GP, June 7, 2022) regarding the necessity to specify particular pollutants. However, in the unpublished portion of *V Lions Farming, LLC v. County of Kern* (2024) 100 Cal.App.5th 412, the Court of Appeal explained that the "phrases 'fully

[1] https://ww2.valleyair.org/public-meetings-and-participation/governing-board/governing-board-information/.

offset' and 'avoid any net increase' adequately describe the standard of mitigation of [specific pollutant] emissions that must be achieved." The Court of Appeal found no additional particularity was required. The Superior Court upheld the revision as adequate in response to its holding, and the Court of Appeal rejected subsequent claim that the revised ERA violated CEQA. The DMA similarly specifies each subject pollutant with particularity and requires the owner/operator to "avoid any net increase" and "fully offset" project emissions.

Although not all of the reductions achieved by the DMA will occur exactly contemporaneously with Project emissions increases, the DMA does not constitute deferred mitigation. There may be a slight lag time between collection of the air emissions mitigation fee and the accomplishment of the emissions reductions funded by the fee, due to the time required to solicit and vet proposals for emission reduction projects, award the funds, and complete construction or implementation, on a county-wide annual basis. However, the emission reductions from implementing the DMA are expected to match the emissions from the Project on an annual basis.

Fee-based programs are acceptable mitigation measures, and can be the most effective means of addressing cumulative impacts. CEQA Guidelines § 15130 (a)(3) expressly recognizes a project's contribution to a cumulative impact may be found less than cumulatively considerable where the project is required to fund its fair share of a mitigation measure through contributing to a regional mitigation fund. Similarly, courts have found fee-based mitigation programs for cumulative impacts. based on fair-share infrastructure contributions by individual projects adequate mitigation under CEQA. *See, e.g., City of Marina v. Board of Trustees of California State University* (2006) 39 Cal. 4th 341, 364; *Anderson First Coalition v. City of Anderson* (2005) 130 Cal.App.4th 1173, 1188. Courts have held that an agency's imposition of fair-share contributions to a mitigation fund are adequate if they "are part of a reasonable plan of actual mitigation that the relevant agency commits itself to implementing." *City of Marina*, 130 Cal.App.4th at 1187. Courts have also held that when a mitigation program is established, there is a presumption that the agency will comply with its own ordinances, and will spend fees it collects on the purposes for which they have been collected. *Save Our Peninsula Comm. v Monterey County Bd. Of Supervisors* (2001) 87 Cal.App.4th 99, 141, 104.The commenters imply that the applicant is not required to implement the Mitigation Measures, as a description of required implementation and the steps the project proponent must take are not included. The implementation of mitigation measures is accomplished through the Mitigation Monitoring and Reporting Program (MMRP) which is not required to be circulated with the EIR. If the project is recommended for approval by staff than a full MMRP (Mitigation Monitoring and Reporting Program) will be provided for review and comment in the staff report for the Planning Commission and Board of Supervisors along with the 15091 Findings of Fact and 15093 Statement of Overriding Considerations. The staff report will also include the recommended conditions which will include a mandatory requirement that all Mitigation Measures be implemented. The CEQA process is not separate from a land use approval. It is implemented, if the project is approved, through the land use entitlements and mandatory MMRP.

Commenters have not shown that additional mitigation is necessary, feasible or that implementation will not occur.

9: Alternatives

GR – 9a, Comments on Alternatives Derived From Other Comments

Commenters assert that the RDEIR's analysis of alternatives in comparison to the proposed project was generally flawed due to claimed errors regarding the project description, project objectives, impact analysis (including GHG, air quality and seismic impacts), and other issues (e.g., commenters claim that the project will extend the life of oil and gas facilities). These comments do not raise separate issues. Rather, the comments are derivative of other comments, which are addressed elsewhere in these responses to comments. Please see, e.g., Global Responses 1, 2, 4-7 and 10.

GR – 9b, Alternatives Analysis and Feasibility

Commenters claim that the RDEIR failed to consider alternatives that would substantially lessen environmental impacts and would satisfy project objectives. CEQA does not require an EIR to consider alternatives that are infeasible, even if they would lessen environmental impacts and satisfy project objectives. CEQA Guidelines § 15126.6(a) (EIR "must consider a reasonable range of potentially feasible alternatives. . . . An EIR is not required to consider alternatives which are infeasible"). Commenters assert that the County's conception of "feasibility" is improperly constrained and not objective, but do not explain why this is allegedly the case. The RDEIR applied the definition of "feasibility" in CEQA Guidelines § 15364: the term "feasible" means "capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors." In an initial screening step, the RDEIR considered a number of alternatives that were eliminated from further consideration due to infeasibility and/or inability to meet project objectives. See RDEIR Section 6.7, pp. 6-9 – 6-11. Next, the RDEIR evaluated the no project alternative (Alternative 1), as required by CEQA, and two project alternatives: Alternative 2 - Direct Air Capture Alternative and Alternative 3- Nature-Based Carbon Storage Alternative. RDEIR Section 6.8, pp. 6-12 - 24. Alternatives 2 and 3, having been found feasible at the screening stage, were evaluated for capacity to substantially lessen environmental impacts and to satisfy project objectives.

GR – 9c, Drilling Ban Alternative

Commenters claim that the RDEIR failed to consider an alternative of eliminating or reducing oil extraction from California Resources Corporation (CRC) oilfields, as alternative means of satisfying most project objectives, e.g., "Support California's Executive Order B-55-18, for California to achieve carbon neutrality by 2045 and net negative emissions thereafter." Commenters argue that project objectives such as "Contribute to CRC's adopted goals of Full-Scope Net Zero emissions. . . by 2045 by capturing and storing CO_2 emissions from CRC's Elk Hills field gas operations" are improperly narrowly framed to exclude consideration of an alternative eliminating or reducing oil extraction.

The RDEIR did consider a "Drilling Ban on All Lands 'Leave It In The Ground' Alternative"; see RDEIR Section 6.7.1, pp. 6-9 – 6-10. This alternative was eliminated from further consideration due to infeasibility as well as inability to meet project objectives. As the RDEIR explained, in addition to failing to meet three out of the five project objectives, the Drilling Ban alternative would require a policy decision by the County to undertake its own project to amend its Oil and Gas Zoning Ordinance, which is outside the scope of the CTV-1 project proposed by a private applicant that is seeking a permit from the County. The Drilling Ban Alternative would be legally infeasible, conflicting with applicable legal limitations on the County's authority to prohibit access to subsurface mineral interests and exposing the County to unreasonable liability. In addition, the Drilling Ban Alternative assumes that, where oil and gas activities were halted, the land would be remediated and restored to pre-oilfield conditions which would have its own environmental impacts, exceeding those of the proposed project if extended to the entire 596,199 acres of Kern County's administrative oilfields.

To the extent that commenters propose a narrower alternative than the RDEIR's Drilling Ban Alternative, limited to a drilling ban in the Elk Hills oilfield and without the remediation component, such a narrower drilling ban alternative would remain legally and economically infeasible because it is beyond the scope of the private project and because existing legal restrictions would subject the County to unreasonable liability for prohibiting access to privately owned minerals. The County's police power to adopt land use restrictions is limited by the Fifth Amendment to the U.S. Constitution (applicable to the states through the Fourteenth Amendment) and Article I, Section 19 of the California Constitution. Zoning and land use regulations may not be so oppressive that they effect a taking of private property without just compensation. As held in the leading U.S. Supreme Court case, *Pennsylvania Coal Co. v. Mahon* (1922) 260 U.S. 393, 415, a land use regulation prohibiting extraction of privately owned subsurface minerals goes "too far" and effects an unconstitutional taking without just compensation. Since *Pennsylvania Coal*, both the United States Supreme Court and the California Supreme Court have established that a regulation that deprives "all economically beneficial or productive use" of private property effects a per se taking of such property. See *Kavanau v. Santa Monica Rent Control Bd*. (1997) 16 Cal.4th 761, at 774, citing *Lucas v. South Carolina Coastal Council* (1992) 505 U.S. 1003, 1015. A regulation that stops short of destroying all economically beneficial use of private property may also effect a taking depending on the economic impact of the regulation, the extent to which the regulation interferes with distinct investment-backed expectations, and the character of the governmental action. See *Kavanau* at 775-776, citing *Penn Cent. Transp. Co. v. N.Y.* (1978) 438 U.S. 104, 124. "[T]he property owner may bring an inverse condemnation action, and if it prevails, the regulatory agency must either withdraw the regulation or pay just compensation. Even if the agency withdraws the regulation, the property owner may have the right to just compensation for the temporary taking while the regulation was in effect." *Kavanau* at 773.

As recognized by the California Supreme Court, the owner of a mineral interest "has a property right in oil and gas beneath the surface" that includes "the exclusive right to drill[.] … This is a right which is as much entitled to protection as the property itself, and an undue restriction of the use thereof is as much a taking for constitutional purposes as appropriating or destroying it." *Bernstein v. Bush* (1947) 29 Cal.2d 773, 778 (internal citations omitted.) Thus, California courts have held that land use regulations that provide "no adequate means of protection or substitute for

their right to extract oil" effects a compensable taking of private property. See, e.g., *Braly v. Board of Fire Com'rs. of City of Los Angeles* (1958) 157 Cal.App.2d 608, 616; *Bernstein v. Bush* at 780. Similarly, federal courts recognize that owners of oil and gas interests "have the right to reduce to possession the oil and gas beneath the surface, and that they could not be absolutely deprived of that right without a taking of private property." *Ohio Oil Co. v. Indiana* (1900) 177 U.S. 190, 209.

The Drilling Ban Alternative as described in the RDEIR, or a narrower version limited to the Elk Hills oilfield, would deprive the affected mineral owners the right to extract oil and gas beneath the surface, exposing the County to potentially large legal liability for takings. According to the most recent California State Oil and Gas Supervisor Annual Report (2021), the Elk Hills oil field is the largest contributor to California's total production of natural gas, at 58 percent of total, and ranks seventh in oil production statewide. As of 2020, the oil and gas industry accounted for roughly $15 billion of the County's property tax valuations, almost 15% of the Countywide total for all property. (Kern Economic Development Foundation, The Economic Contribution of the Oil and Gas Industry in Kern County, January 2021 (Kern EDC).

In addition to takings liability, a Drilling Ban Alternative would result in substantial losses of jobs and tax revenue to the County. The oil and gas industry in Kern County generates significant regional economic activity and has the highest gross domestic product and tax contribution level in the County. The industry produces high revenues, creates high wage jobs, and contributes significant tax revenue to all levels of government. Direct activity includes the materials purchased and the employees hired by the industry itself. Indirect effects are those which stem from the employment and business revenues motivated by the purchases made by the industry and any of its suppliers. Increased output generates money in the community, resulting in increased spending on new homes, durable goods such as cars and appliances, plus additional spending on restaurants and entertainment options. Taxes paid by the oil and gas industry play a major role in the support of local infrastructure, including schools, public safety, streets and roads, and parks. As described in the Kern EDC report (presenting economic data prior to and unaffected by the COVID pandemic), economic activity associated with the oil and gas industry in Kern County generated an estimated $925 million in state and local tax revenues in 2017 including $392 million from sales taxes; $331 million from property taxes paid by households and businesses; $68 million from personal and corporate income taxes; and $134 million from other categories. In FY 2018-2019, the industry contributed over $80 million in property taxes to the County of Kern; over $103 million for local school districts; and over $12 million for local special districts for a total of almost $200 million per year. Banning drilling in County oil fields or in the Elk Hills oil field, as the largest natural gas producing and seventh largest oil producing field in the state, would have a substantial economic effect on the County and its residents.

For these reasons, the Drilling Ban Alternative, as described in the RDEIR or confined to the Elk Hills oilfield, is considered economically and legally infeasible and does not require further evaluation.

GR – 9d, Reasonable Range of Alternatives and Project Objectives

Commenters assert that, in order to inform the identification of a reasonable range of alternatives, project objectives must be identified by the lead agency rather than by a private project applicant to provide a public purpose and need independent of the applicant. As authority for this requirement, commenters cite CEQA Guidelines 15124(b) and *North Coast Rivers Alliance v. Kawamura* (2015) 243 Cal.App.4th 647, 666, 668.

CEQA Guidelines §15124(b) states that an EIR must include a "statement of the objectives sought by the proposed project" which "will help the lead agency develop a reasonable range of alternatives to evaluate in the EIR and will aid the decision makers in preparing findings or a statement of overriding considerations if necessary." On its face, Section 15124(b) makes the lead agency responsible for developing the alternatives but not for identifying objectives which are "sought by the proposed project." (See also CEQA Guidelines §15126.6(a): "The lead agency is responsible for selecting a range of project alternatives for examination….") The Guideline language refers to "objectives sought by the proposed project", not to "objectives determined by the lead agency." By referring generally to "objectives sought by the proposed project", CEQA Guidelines §15124(b) allows both for applicants to identify objectives for the private projects they propose, and for lead agencies to develop objectives for their own public projects.

Notwithstanding a perfunctory reference to "establishment of project objectives by the lead agency" in *North Coast* (243 Cal.App.4th at 666), quoting *In re Bay–Delta Programmatic Environmental Impact Report Coordinated Proceedings* (2008) 43 Cal.4th 1143, 1163, neither case holds that a public agency, not the applicant, is responsible for setting project objectives for a private project and do not adopt objectives in an EIR that were identified by a private applicant. In *North Coast*, the project objectives were necessarily established by the lead agency because there was no one else to establish them. The case concerned objectives and alternatives in the EIR for a pest control program proposed by the California Department of Food and Agriculture, i.e., a public agency's public project. Similarly, the California Supreme Court's decision in *Bay-Delta* concerned the EIR for the multi-agency CALFED water management program administered by the state Natural Resources Agency. *Bay-Delta* and *North Coast* did not rule on, and cannot stand for, the proposition that an EIR's objectives for a private project cannot be developed by the private applicant, because there were no private applicants and no applicant-developed project objectives in those cases.

This project is proposed by a private applicant and has no county funding or other involvement. Therefore, no objectives from the county are required.

GR – 9e, Alternative 1, the No Project Alternative

Commenters claim that the RDEIR discussion of the No Project Alternative is cursory and fails to incorporate changes that "would reasonably be expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services" (CEQA Guidelines §§15126.6(e)(2), (e)(3)(C)). Commenters cite *Save the Hill Group v. City of Livermore* (2022) 76 Cal.App.5th 1092, which found an EIR deficient for

failing to include adequate information regarding the no project alternative. However, commenters do not identify any such missing information or changes that would reasonably be expected to occur if the proposed project is not approved.

In *Save the Hill*, the court found that the no project alternative analysis omitted specific information regarding what would reasonably be expected to occur in the foreseeable future if the project were not approved. The lead agency rejected the "No Project, No Development" alternative to a development project, based on the assumption that the project site could not feasibly be preserved for conservation purposes. However, the court concluded that the EIR's discussion omitted specific facts suggesting that the lead agency's assumption was wrong and such preservation was in fact feasible: the project opponents identified two existing and available funding sources, established for the precise purpose of enabling the lead agency to acquire environmentally sensitive areas for conservation purposes within a region containing the project site, one of which had been recently used to acquire and preserve a nearby similar property. Commenters have identified no comparable specific information that is available but omitted from the RDEIR's No Project Alternative discussion that would similarly undermine the comparison to the proposed project.

Commenters also assert that the RDEIR considers only what the applicant asserts the consequences of the No Project Alternative would be. The County and its technical consultants, not the applicant, prepared the alternatives analysis in the RDEIR.

Where an alternative has significant effects in addition to those of the proposed project, the alternative's effects "shall be discussed, but in less detail" than those of the proposed project. CEQA Guidelines §15126.6(d). As characterized in the RDEIR, under the No Project Alternative, the CTV-1 facility would not be approved or constructed and its CO_2 storage capacity would not become available. The existing site zoning and land use primarily for existing oil and gas activities would continue, and wells scheduled for abandonment would be abandoned on the existing regulatory schedule rather than abandoned early for purposes of the project. RDEIR Section 6.8.1, pp. 6-12 – 17. The RDEIR's discussion of the No Project Alternative is consistent with the CEQA Guidelines which recognize that "[i]n certain situations, the no project alternative means 'no build' wherein the existing environmental setting is maintained." CEQA Guidelines §15126.6(e)(3)(B). Under these circumstances, the No Project Alternative analysis properly compared "the environmental effects of the property remaining in its existing state against environmental effect which would occur if the project is approved" (*id.*) and concluded that the No Project Alternative would "avoid creating nearly all of the significant and unavoidable impacts associated with the proposed project. This alternative would result in less impact to all remaining environmental issue areas with the exception of GHGs; since this alternative would not capture GHG emissions through the operation of a CCS facility, impacts to GHGs would be greater under this alternative." RDEIR, p. 6-17.

Commenters claim that the RDEIR is inconsistent in determining that, although the project will have significant and unavoidable impacts on GHG emissions, the No Project Alternative will have less-than-significant impacts on GHG emissions, and the No Project Alternative will have greater GHG impacts than the proposed project. There is no inconsistency. The proposed project would capture GHG emissions through the operation of a CCS facility and mitigate its own operational

GHG emissions to net zero. The No Project Alternative would not capture and store any GHG emissions (RDEIR, pp. 6-17, 6-22), resulting in no change to the existing GHG emissions baseline, a less than significant impact. While the GHG impact analysis concluded that the ”contribution to greenhouse emission due to unknown release of emissions or stops to injection for monitoring failures remains significant and unavoidable” (RDEIR, p. 4.8-26), the No Project Alternative analysis compares the unchanged GHG baseline with no project to the expected “environmental effects which would occur if the project is approved” (CEQA Guidelines §15126.6(e)(3)(B)), where the project is operating to capture and store CO_2. In that comparison, where the RDEIR states “impacts to GHGs would be greater” under the No Project Alternative (RDEIR, p. 6-17), the statement is intended to convey that the No Project Alternative will have a poorer GHG outcome (with no change from baseline conditions) than the proposed project operating a carbon capture and storage facility. Please see also Global Responses GR-5, Greenhouse Gas Impacts, and GR-7, Geological and Induced Seismicity Risk.

GR – 9f, Alternatives 2 and 3

Commenters claim that the RDEIR’s discussion of Alternatives 2 and 3 are cursory and fail to describe and analyze impacts of the alternatives, or their ability to meet project objectives, with sufficient specificity or support. However, commenters do not identify any specific information that is available but has been omitted, or any specific objections to the impact comparisons and conclusions presented in the RDEIR.

Where an alternative has significant effects in addition to those of the proposed project, the alternative’s effects “shall be discussed, but in less detail” than those of the proposed project. CEQA Guidelines §15126.6(d). For both Alternative 2, the Initial Source Direct Air Capture Alternative, and Alternative 3, the Nature Based Carbon Storage Alternative, no specific projects have been proposed and the analysis is necessarily hypothetical.

For Alternative 2, the RDEIR provides general discussion of direct air capture (DAC) technology and facilities and expected impacts (RDEIR, pp. 6-17 – 6-20) but, in the absence of a specific proposed project, the information commenters requested regarding DAC facility size, infrastructure, selected technology, construction, maintenance and operation does not exist. Had the RDEIR incorporated arbitrary assumptions regarding such parameters of an unknown DAC facility, the resulting analysis would have been speculative and misleading. Speculation does not constitute substantial evidence for purposes of CEQA analysis. CEQA Guidelines §15384.

Similarly, for Alternative 3, the RDEIR provides general discussion and an example of nature based carbon storage by remediating the existing oilfield property and planting vegetation (RDEIR, pp. 6-20 – 6-21). In the absence of a specific proposed project, no more specific information as to configuration or implementation of this alternative is available. Had the RDEIR incorporated arbitrary assumptions regarding such parameters of an unknown nature-based carbon storage solution, the resulting analysis would have been speculative and misleading.

Commenters question the methodology behind the RDEIR's calculation that an estimated 400 to 1,000 trees per acre, for a total estimate of 3.6 million to 9 million trees, could be planted on the 9,000 acre project site (RDEIR, p. 6-20). The analysis is designed to connect the permanent sequestration of CO 2 to this form of sequestration. In order to sequester the same amount of CO 2 this project will store would take from 3.6 million to 9 million trees. (https://8billiontrees.com/carbon-offsets-credits/carbon-ecological-footprint-calculators/how-much-carbon-does-a-tree-capture/)

10: Cumulative Impacts

GR-10a Cumulative Impact Analysis Generally

Commenters assert that the RDEIR fails to provide an adequate cumulative impact analysis of the impacts of the proposed project together with impacts of other projects. Among other things, commenters claim that the RDEIR should provide additional cumulative impact analysis regarding other projects that could become sources of CO_2 for injection into the proposed project reservoirs in the future. At the same time, commenters assert that potential future CO_2 source projects were improperly excluded or "piecemealed" from the RDEIR Project Description and impact analysis. These comments are inconsistent. If future CO_2 source projects were part of the proposed project itself, as commenters claim, their impacts would be project impacts, not contributions to cumulative impacts. Conversely, comments on cumulative impacts from future CO_2 source projects are premised on the assumption that these are separate projects, not part of the proposed project. This Global Response 10 addresses comments regarding cumulative impacts. Please see Global Response 1, Source Identification, regarding piecemealing.

Cumulative impacts under CEQA are defined as two or more individual environmental effects "which, when considered together, are considerable or which compound or increase other environmental impacts." CEQA Guidelines § 15355. CEQA requires an EIR to discuss cumulative impacts when two conditions are present: (1) the combined impact of the project and other projects is significant, and (2) the project's incremental contribution to the combined impact is "cumulatively considerable." CEQA Guidelines § 15130(a).

An EIR may evaluate cumulative impacts using a "list of past, present, and probable future projects producing related or cumulative impacts, including, if necessary, those projects outside the control of the agency[.]" CEQA Guidelines § 15130(b)(1)(A). "[F]actors to consider when determining whether to include a related project should include the nature of each environmental resource being examined, the location of the project and its type." CEQA Guidelines § 15130 (b)(2). A future project that is undergoing environmental review qualifies as a "probable future project" requiring cumulative impacts review in an EIR only to the extent that the particular environmental review at issue provides evidence that the proposed project is both probable and sufficiently certain to allow for meaningful cumulative impacts analysis. *City of Maywood v. Los Angeles Unified School Dist.* (2012) 208 Cal.App.4th 362, 399. "[W]here future development is unspecified and uncertain, no purpose can be served by requiring an EIR to engage in sheer speculation as to future environmental consequences." *Id.* at 397-98.

The description and analysis of cumulative impacts should reflect the severity of the cumulative impacts and the likelihood of their occurrence. CEQA Guidelines §15130(b); *City of Long Beach v. Los Angeles Unified Sch. Dist.* (2009) 176 Cal.App.4th 889, 906. The discussion need not provide detail as extensive as that required for effects attributable solely to the project. The discussion of cumulative impacts should be guided by standards of practicality and reasonableness. CEQA Guidelines §15130(b). When specific information on the impacts of potential future cumulative development is not available, an EIR is not required to speculate about the cumulative impacts that might occur. *Preserve Wild Santee v. City of Santee* (2012) 210 Cal.App.4th 260, 277.

GR-10b Cumulative CCS Projects

Commenters contend that the RDEIR's cumulative impact analysis is deficient in that it does not analyze the impacts associated with other reasonably foreseeable carbon capture and sequestration (CCS) projects in the County. The comment is incorrect. RDEIR Vol. 1, Table 3-8 on pp. 3-45 to 3-47 provides the list of cumulative projects, including several CCS projects proposed in the County. These projects were assessed as part of the cumulative analysis for the Project and are expressly referenced under several environmental impact topics. For example, in describing the cumulative effects on energy impacts, the RDEIR explains, "Further using a conservative estimate that the four other known CCS projects listed in Chapter 3, Project Description, would each use 31 MW, the total consumption of electricity from just one source to capture and store CO_2 would be 124 MW—the equivalent of power for 49,600 to 124,000 homes." RDEIR Vol. 1, p. 4.6-17. In describing the cumulative effects of geologic and soils impacts, the RDEIR explains, "Other CCS projects in the region would be evaluated under CEQA with individual site-specific EIRs and individual UIC permitting to ensure the area of review is appropriate with limits on quantities and characteristics of the CO_2 injected. However, due to the uncertainty of the implementation of multiple projects and the ability to simultaneously cease injection during an event, the impacts from cumulative induced seismic activity from this project plus any future permitted CCS project is significant and unavoidable, even with the monitoring and actions of MM 4.7-1 and there are no other feasible and reasonable mitigations available." RDEIR Vol. 1, p. 4.7-26. In describing cumulative impacts to public services, the RDEIR explains that "The cumulative impacts of the continued loss of oil and gas revenues due to State policies combined with these new CCS projects deepens the ongoing fiscal emergency for the county." RDEIR Vol. 1, p. 4.15-21. Such qualitative consideration is adequate under CEQA. CEQA is clear that the description and analysis of cumulative impacts should reflect the severity of the cumulative impacts and the likelihood of their occurrence, is guided by the standards of practicality and reasonableness, and need not provide the same detail as analysis of project-specific impacts. CEQA Guidelines § 15130(b); *City of Long Beach v. Los Angeles Unified Sch. Dist.* (2009) 176 Cal.App.4th 889. As the RDEIR notes, there are no CCS projects currently operational in California, where the captured CO_2 is injected for underground storage. RDEIR Vol. 1, p. 4.8-28. The cumulative impact analysis is thus guided by the practicality that no such projects are available for analysis.

The above examples describe specific contributions that other CCS projects, as distinct from other types of projects, would make to particular cumulative impacts, such as energy impacts associated with the high energy demand of CCS operations, geological impacts associated with CO_2 injection, and public services impacts due to the tax treatment and public revenue consequences of CCS

projects. By contrast, where the contribution to a cumulative impact from other CCS projects is generic and not distinct from that of other types of development projects, it is not necessary to specifically call out other CCS projects in the cumulative analysis. Rather, the contribution of CCS projects is included together with that of other types of projects. See RDEIR Vol. 1, p. 4.1-27: "Analysis of cumulative impacts takes into consideration the entirety of impacts that the projects, zone changes, and general plan amendments discussed in Section 3.9, *Cumulative Projects*, would have on aesthetics and visual resources"; p. 4.2-17 (same for cumulative impacts to agriculture resources), etc.

Commenters cite *Bakersfield Citizens for Local Control v. City of Bakersfield* (2004) 124 Cal.App.4th 1184 to support an assertion that the RDEIR is flawed for failure to discuss a particular project from RDEIR Vol. 1, Table 3-8, the CarbonFrontier Project, in detail. However, the EIR in *Bakersfield Citizens* did not even mention the similar projects at issue. *Id.* at 1213-14. That is not the case here where the RDEIR list of cumulative projects includes other CCS projects, among them the CarbonFrontier Project. The EIR in *Bakersfield Citizens* also did not engage in any analysis of the cumulative effects caused by the similar project. Here, the RDEIR done analyze cumulative impacts, guided by the practicalities and with an appropriate focus reflecting the severity of the potential cumulative impacts and their likelihood of occurrence. For discussion of the cumulative impacts associated with air quality and greenhouse gases, please see Global Response GR-5 and Global Response GR-6.

GR-10c Potential Future CO_2 Source Projects

Commenters claim that the RDEIR's cumulative analysis must include impacts from probable future sources of CO_2 injected into the proposed project reservoirs. The scope of a cumulative analysis is guided by standards of practicality and reasonableness. CEQA Guidelines § 15130(b); *City of Long Beach v. Los Angeles Unified Sch. Dist.* (2009) 176 Cal.App.4th 889. Mere awareness of proposed expansion plans or other proposed development does not necessarily require the inclusion of those proposed projects in the EIR. Rather, these projects must become "probable future projects" in order to require considered in cumulative impact analysis. CEQA Guidelines § 15130(b); *Gray v. Madera* (2008) 167 Cal.App.4th 1099, 1127. Projects actively undergoing environmental review or in which an applicant has devoted significant time and financial resources in anticipation of such review are considered sufficiently "probable." *Gray*, 167 Cal.App.4th at 1127-28.

The RDEIR identifies the initial source of CO_2 for the project storage as pre-combustion Elk Hills field gas, which is evaluated as part of the proposed project. RDEIR, Vol. 1, p. 3-12. In addition, the RDEIR identifies categories of potential future sources of CO_2 that could contribute to CO_2 stored in the proposed project reservoirs together with CO_2 from the existing Elk Hills field gas streams. RDEIR, Vol. 1, p. 3-13 and Vol. 2, Appendix K-4. These include other oil and gas operations, power plants, hydrogen production, direct air capture of CO_2, biomass carbon removal and storage, alternative fuels production, and cement and steel production.

Where environmental review or investment of time and financial resources in anticipation of such review has progressed to the point that a project is considered a "reasonably probable" future project, that project was included in the cumulative projects list in RDEIR Vol. 1, Table 3-8. Oilfield field gas streams are identified as a potential future CO_2 source (RDEIR Vol. 1, p. 3-13) and Table 3-8 includes oil and gas development under the Kern County Oil and Gas Development Zoning Ordinance. While no other potential future CO_2 source project is currently undergoing environmental review, Lone Cypress Energy Services' hydrogen project, which commenced environmental review but was withdrawn for reassessment by the applicant, is considered a "reasonably probable" future project and is included in Table 3-8. In addition, Table 3-8 includes potential future CO_2 source projects without pending applications or environmental review that have been announced in the media, including projects listed in RDEIR Vol. 1, p. 3-15 which have entered into preliminary agreements or discussions with the proposed project applicant to explore the possibility of future CO_2 storage. The County does not have information from the proponents of these projects and It is uncertain whether any of them will be approved and constructed. See Global Response 1, Source Identification. Nevertheless, on the conservative assumption that these projects are under development, with investment of time and financial resources by the project proponents in anticipation of submittal for environmental review, they were added to the RDEIR's cumulative projects list.

Commenters assert that more detailed identification and analysis of potential future CO_2 source projects is required, including effects of the proposed project on the operation and lifespan of such sources. The RDEIR provides a good faith disclosure of the general nature of potential future CO_2 source projects; see RDEIR Vol. 2, Appendix K-4. There are no currently operational CCS projects in California, and therefore no CCS-dependent CO_2 sources such as blue hydrogen or direct air capture facilities, or other CO_2 source categories operating in conjunction with CCS, on which to base a more definitive analysis. It is not possible to identify potential future sources of CO_2 more specifically or provide more detailed analysis of such projects without engaging in speculation, and it would require even greater speculation to attempt to assess the potential effect of the proposed project on the operation or lifespan of these already speculative sources. Regarding the potential effect of the proposed project on extending the life of fossil fuel facilities, see Global Response 2.

Commenters assert that two potential CO_2 source projects should be included in the cumulative impacts analysis: Lone Cypress Energy Services' hydrogen project and the Avnos Direct Air Capture (DAC) project. Both projects are listed in RDEIR Vol. 1, Table 3-8 and thus were included in the RDEIR's cumulative impact analysis. Their inclusion is conservative given that no CUP application has been submitted by the Avnos DAC project and the Lone Cypress CUP application has been withdrawn by the project proponent, which "presently intends to reassess the nature, timing, and technical elements of the project." May 10, 2024 letter from Greg Brooks, president of Lone Cypress Energy, to Jamal Ferguson, Kern County Planning and Natural Resources Department. Contrary to commenters' contentions, the uncertainty regarding both projects renders more detailed discussion of potential impacts speculative at this time. The Lone Cypress project is being reassessed and may or may not be resubmitted; if it is resubmitted, changes to the project may be made. The Avnos DAC project has never submitted an application and so has not provided sufficiently detailed project plans to support an application.

Commenters assert that sufficient detail to inform a more specific cumulative analysis could be derived from the applicant's submissions to CARB. Specifically, commenters state that these submissions "clearly identify a hydrogen plant as the main source for CO_2" with detail as to the type of hydrogen and maximum production sufficient to enable more detailed cumulative analysis. While hydrogen plants remain potential CO_2 sources, the specific Lone Cypress project has been withdrawn as noted above. Commenters also assert that information on the Lone Cypress and Avnos DAC projects submitted to EPA for the proposed project's Class VI UIC permit applications can provide the basis for CEQA review. The information on CO_2 sources required to be submitted to both CARB and EPA focused on ensuring secure carbon sequestration and do not provide a sufficiently definitive description of the projects or their broader environmental effects to inform more detailed cumulative analysis. Nevertheless, both the Lone Cypress and Avnos projects are considered "reasonably probable future projects" and as such are listed in RDEIR Vol. 1, Table 3-8 and included in cumulative impact analysis, commensurate with currently available detail.

Commenters question why the RDEIR focuses on the contribution of cumulative impacts from oil and gas development. RDEIR Vol. 1, Table 3-8 and the cumulative impact analyses in the specific impact sections include oil and gas development under the Kern County Oil and Gas Development Zoning Ordinance, as analyzed in the Final Environmental Impact Report - Revisions to the Kern County Zoning Ordinance - 2015(C) Focused on Oil and Gas Local Permitting, certified on November 9, 2015; supplemented by a Supplemental EIR certified on December 11, 2018; a Supplemental Recirculated EIR (SREIR) certified on March 8, 2021; and an Addendum adopted on August 23, 2022 (collectively referred to as the "Oil and Gas EIR"), which is incorporated by reference in the RDEIR. Oilfield gas streams beyond the initial CO_2 source are the only identified potential future CO_2 source category for the proposed project (RDEIR Vol. 1, p. 3-13) as to which detailed information developed from prior CEQA reviews is available. In addition, given location of the proposed project within the Elk Hills oilfield, continued development of oil and gas resources is the most likely contributor to contribute to cumulative impacts in the project area. Moreover, the cumulative impact analysis in the Oil and Gas EIR covers cumulative impacts from oil and gas development together with other planned development based on the Kern County General Plan and the regional growth plan and projections included in the Kern Council of Governments Regional Transportation Plan/Sustainable Communities Strategy. See the Oil and Gas EIR (2015), Vol. 1, p. 3-79. Commenters also question whether the RDEIR improperly "tiers" from the Oil and Gas EIR. As stated in the RDEIR, Vol. 1, p. 2-16, the Oil and Gas EIR is incorporated by reference as a source of information, pursuant to CEQA (Pub. Res. Code) § 21061 and CEQA Guidelines § 15150. The RDEIR provides CEQA review of the Carbon TerraVault I project, not subsequent or supplemental site-specific review of the project in the Oil and Gas EIR, i.e., the Kern County Zoning Ordinance amendments and associated oil and gas development. See CEQA Guidelines 15385 (definition of tiering).

Commenters claim that, despite inclusion of potential future CO_2 source projects in Table 3-8, the RDEIR fails to provide detailed information on cumulative impacts from such projects other than oil and gas development. As discussed above for other CCS projects, where the contribution to a cumulative impact from potential future CO_2 source projects is generic and not distinct from that of other types of development projects, it is not necessary to specifically call out such projects in

the cumulative analysis. Rather, the contribution of CCS projects is included together with that of other types of projects.

Nevertheless, for clarification, the RDEIR is revised to add express references to additional categories of potential future CO_2 sources beyond oil and gas development. Because these projects were listed in RDEIR Vol. 1, Table 3-8, and therefore included in the assessment of cumulative impacts, these revisions do not alter the previous cumulative impact analysis in the RDEIR or constitute significant new information demonstrating new or substantially more severe significant cumulative impacts. The RDEIR is revised to insert the following text in each "Cumulative Setting" section immediately following the paragraph beginning either "The documents provide…" or "The aforementioned documents provide…":

> Other potential future CO_2 source projects are insufficiently definite for a detailed assessment of their contribution to potentially significant cumulative impacts. In addition, it is not certain what other sources are likely to contribute CO_2 for storage at the Project and there are no currently operational CCS projects in California on which to base a more concrete analysis of CO_2 source impacts. The extent of contributions to cumulative impacts from these projects are dependent on many variables and are not knowable at this time. However, any such project in the County would be accompanied by a separate CUP and associated environmental review process. It is reasonably anticipated that these future projects would be sited consistent with zoning and land use controls, would comply with all applicable federal, state, and local regulations, and would implement mitigation measures to minimize or avoid environmental impacts. As a result, these source projects are anticipated to result in impacts typical of similar scale development projects.

The "Impact 4.1-5: Contribute to Cumulative Aesthetic Impacts" discussion of Section 4.1.5 is modified as follows:

> Regarding impacts to aesthetic and visual resources, the project has the potential to contribute to cumulative impacts within the region. A complete analysis and evidence for the record of the cumulative impacts on visual resources of the various ground-disturbing activities from oil and gas are provided 4.1, Aesthetics of the Oil and Gas EIR.
>
> As discussed above, there is uncertainty regarding potential future CO_2 source projects, including the exact location and nature of any such facilities and whether they would be new facilities or utilize existing facilities requiring modification. It is generally anticipated that these facilities would be located within areas of consistent zoning for similarly scaled land uses, thus limiting impacts to aesthetic resources. However, construction and operation of these facilities nonetheless has the potential to introduce or increase features such as heavy equipment or buildings that could degrade the visual character of their surroundings. The extent of contribution to the visual impacts from potential future CO_2 source projects would depend on many variables that are not knowable at this time. Such CO_2 source projects will be subject to their own permitting and environmental review.

The "Cumulative Setting" discussion of Section 4.2.5 is modified to insert the following immediately preceding the paragraph beginning, "Population growth…":

> As discussed above, there is uncertainty regarding potential future CO_2 source projects, including the exact location and nature of any such facilities and whether they would be new facilities or utilize existing facilities requiring modification. Depending on siting, these facilities have the potential to result in conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, Williamson Act conservation contracts, or forest land or timberland, resulting in impacts to these resources. The extent of contribution to these impacts from potential future CO_2 source projects would depend on many variables that are not knowable at this time. Such CO_2 source projects will be subject to their own permitting and environmental review.

The "Impact 4.3-5: Result in Other Cumulatively Considerable Air Quality Impacts" discussion of Section 4.3.5 is modified to insert the following immediately preceding the first paragraph:

> Regarding impacts to air quality, the project has the potential to contribute to cumulative impacts within the region. A complete analysis and evidence for the record of the cumulative impacts on air quality of the various activities from oil and gas are provided 4.3, Air Quality of the Oil and Gas EIR.
>
> As discussed above, there is uncertainty regarding potential future CO_2 source projects, including the exact location and nature of any such facilities and whether they would be new facilities or utilize existing facilities requiring modification. It is generally anticipated that these facilities would be located within areas of consistent zoning for similarly scaled land uses, thus limiting impacts to sensitive receptors. However, construction and operation of these facilities nonetheless has the potential to result in increases in criteria air pollutants and toxic air contaminants in the vicinity of such operations, as well as potentially offensive odors near sensitive receptors. The extent of contribution to these impacts from potential future CO_2 source projects would depend on many variables that are not knowable at this time. Such CO_2 source projects will be subject to their own permitting and environmental review.

The "Impact 4.4-7: Contribute to Cumulative Biological Resource Impacts" discussion of Section 4.4.5 is modified to insert the following immediately preceding the paragraph beginning, "Future activities…":

> Regarding impacts to biological resources, the project has the potential to contribute to cumulative impacts within the region. A complete analysis and evidence for the record of the cumulative impacts on biological resources of the various ground-disturbing activities from oil and gas are provided 4.4, Biological Resources of the Oil and Gas EIR.
>
> As discussed above, there is uncertainty regarding potential future CO_2 source projects, including the exact location and nature of any such facilities and whether they would be new facilities or utilize existing facilities requiring modification. It is generally anticipated that these facilities would be located within areas of consistent zoning for similarly scaled land uses, thus

limiting impacts to biological resources. However, construction and operation of these facilities nonetheless has the potential to result in disturbance of undeveloped areas or developed areas suitable for certain species, which may adversely affect biological resources potentially present in those areas. The extent of contribution to these impacts from potential future CO_2 source projects would depend on many variables that are not knowable at this time. Such CO_2 source projects will be subject to their own permitting and environmental review.

The "Impact 4.5-4: Contribute to Cumulative Cultural Resources Impacts" discussion of Section 4.5.5 is modified to insert the following immediately preceding the paragraph beginning, "There is potential for unanticipated…":

With regard to impacts to significant cultural resources, the project has the potential to contribute significantly to cumulative impacts within the region. A complete analysis of the cumulative impacts of the various ground disturbing activities from oil and gas are provided in Section 4.5, Cultural and Paleontological Resources of the Kern County Oil and Gas EIR.

As discussed above, there is uncertainty regarding potential future CO_2 source projects, including the exact location and nature of any such facilities and whether they would be new facilities or utilize existing facilities requiring modification. It is generally anticipated that these facilities would be located within areas of consistent zoning for similarly scaled land uses, thus limiting impacts to cultural resources. However, construction and operation of these facilities nonetheless has the potential to result in ground disturbing activities that could adversely impact prehistoric and historical archaeological sites, paleontological resources, historic buildings and structures. The extent of contribution to these impacts from potential future CO_2 source projects would depend on many variables that are not knowable at this time. Such CO_2 source projects will be subject to their own permitting and environmental review.

The "Impact 4.6-3: Contribute to Cumulative Energy Impacts" discussion of Section 4.6.5 is modified to insert the following immediately preceding the paragraph beginning, "The main contribution of energy…":

As discussed above, there is uncertainty regarding potential future CO_2 source projects, including the exact location and nature of any such facilities and whether they would be new facilities or utilize existing facilities requiring modification. Construction and operation of these facilities nonetheless has the potential to result in temporary increases in energy demand associated with construction as well as operational demands for gas and electricity. The extent of contribution to these impacts from potential future CO_2 source projects would depend on many variables that are not knowable at this time. Such CO_2 source projects will be subject to their own permitting and environmental review.

The "Impact 4.7-10: Contribute to Cumulative Geologic and Soils Impacts" discussion of Section 4.7.5 is modified to insert the following immediately preceding the first paragraph:

Regarding impacts associated with geology and soil, the project has the potential to contribute to cumulative impacts within the region. A complete analysis and evidence for the record of the cumulative impacts on air quality of the various activities from oil and gas are provided 4.6, Geology and Soils of the Oil and Gas EIR.

As discussed above, there is uncertainty regarding potential future CO_2 source projects, including the exact location and nature of any such facilities and whether they would be new facilities or utilize existing facilities requiring modification. It is generally anticipated that these facilities would be located within areas of consistent zoning for similarly scaled land uses. Construction and operation of these facilities nonetheless has the potential to be located in areas of potentially hazardous geological or soil conditions. The specific design, location, slope, geologic and soil conditions for every CO_2 source project are not known at this time and would be analyzed on a site-specific basis at the project level. Thus, the extent of these impacts from potential source projects are not knowable at this time. Such CO_2 source projects will be subject to their own permitting and environmental review.

The "Impact 4.8-3: Cumulative Greenhouse Gas Emissions Impacts" discussion of Section 4.8.5 is modified to insert the following immediately preceding the paragraph beginning, "Emissions of GHGs and their contributions…":

As discussed above, there is uncertainty regarding potential future CO_2 source projects, including the exact location and nature of any such facilities and whether they would be new facilities or utilize existing facilities requiring modification. Construction and operation of these facilities has the potential to result in increases in GHG emissions. The extent of these impacts from potential CO_2 source projects would depend on many variables that are not knowable at this time. Such CO_2 source projects will be subject to their own permitting and environmental review.

The "Impact 4.9-9: Contribute to Cumulative Hazards and Hazardous Materials Impacts" discussion of Section 4.9.5 is modified to insert the following immediately preceding the first paragraph:

A complete analysis and evidence for the record of the cumulative impacts on air quality of the various activities from oil and gas are provided 4.8, Hazards and Hazardous Materials/Public Health Risks of the Oil and Gas EIR.

As discussed above, there is uncertainty regarding potential future CO_2 source projects, including the exact location and nature of any such facilities and whether they would be new facilities or utilize existing facilities requiring modification. It is generally anticipated that these facilities would be located within areas of consistent zoning for similarly scaled land uses, thus limiting impacts to sensitive receptors. However, construction and operation of these facilities nonetheless has the potential to require the transport or use of hazardous materials. The extent

of contribution to these impacts from potential future CO_2 source projects would depend on many variables that are not knowable at this time. Such CO_2 source projects will be subject to their own permitting and environmental review. The handling of hazardous materials is required to comply with all applicable federal, state, and local laws. Additionally, potential CO_2 source projects are anticipated to be subject to siting controls applicable to similar scale industrial uses that will limit exposure hazards.

The "Impact 4.10-6: Contribute to Cumulative Hydrologic Resources Impacts" discussion of Section 4.10.5 is modified to insert the following immediately preceding the paragraph beginning, "As described in Chapter 3…":

With regard to impacts to significant hydrologic resources, the project has the potential to contribute significantly to cumulative impacts within the region. A complete analysis of the cumulative impacts of the various ground-disturbing activities from oil and gas and the region wide basin groundwater conditions are provided in Section 4.9, Hydrology and Water Quality (Kern County Oil and Gas EIR).

As discussed above, there is uncertainty regarding potential future CO_2 source projects, including the exact location and nature of any such facilities and whether they would be new facilities or utilize existing facilities requiring modification. It is generally anticipated that these facilities would be located within areas of consistent zoning for similarly scaled land uses, thus limiting impacts to hydrologic resources. However, construction and operation of these facilities nonetheless has the potential to be located in varying drainage and other hydrological conditions, potentially resulting in hydrologic resource impacts. The specific design, location, drainage, and other conditions for potential future CO_2 source projects are not known at this time and would be analyzed on a site-specific basis at the project level. Such CO_2 source projects will be subject to their own permitting and environmental review.

The "Impact 4.11-3: Contribute to Cumulative Land Use and Planning Resource Impacts" discussion of Section 4.11.5 is modified as follows:

With regard to impacts to land use and planning resources, the project does not have the potential to contribute significantly to cumulative impacts within the County. A complete analysis of the cumulative impacts to land use and planning resources from oil and gas operations are provided in Section 4.10, Land Use and Planning of the Oil and Gas EIR.

As discussed above, there is uncertainty regarding potential future CO_2 source projects, including the exact location and nature of any such facilities and whether they would be new facilities or utilize existing facilities requiring modification. It is generally anticipated that these facilities would be located within areas of consistent zoning for similarly scaled land uses, but the specific design and location for potential future CO_2 source projects are not known at this time and would be analyzed on a site-specific basis at the project level. Such CO_2 source projects will be subject to their own permitting and environmental review.

The "Impact 4.12-3: Contribute to Cumulative Mineral Resources Impacts" discussion of Section 4.12.5 is modified to insert the following immediately preceding the paragraph beginning, "The project could result…":

As discussed above, there is uncertainty regarding potential future CO_2 source projects, including the exact location and nature of any such facilities and whether they would be new facilities or utilize existing facilities requiring modification. Depending on siting, these facilities have the potential to adversely impact mineral resources. The extent of contribution to these impacts from potential future CO_2 source projects would depend on many variables that are not knowable at this time. Such CO_2 source projects will be subject to their own permitting and environmental review.

The "Impact 4.13-4: Contribute to Cumulative Noise Impacts" discussion of Section 4.13.5 is modified to insert the following immediately preceding the paragraph beginning, "Other projects associated with…":

As discussed above, there is uncertainty regarding potential future CO_2 source projects, including the exact location and nature of any such facilities and whether they would be new facilities or utilize existing facilities requiring modification. It is generally anticipated that these facilities would be located within areas of consistent zoning for similarly scaled land uses, thus limiting noise impacts. However, these projects have the potential to result in increases in noise typical of construction and operation associated with similarly scaled land uses. The extent of contribution to these impacts from potential future CO_2 source projects would depend on many variables that are not knowable at this time. Such CO_2 source projects will be subject to their own permitting and environmental review. Both construction and operation would be required to comply with applicable noise regulations.

The "Impact 4.14-3: Contribute to Cumulative Population and Housing Impacts" discussion of Section 4.14.5 is modified to insert the following immediately preceding the paragraph beginning, "In addition, the County is…":

As discussed above, there is uncertainty regarding potential future CO_2 source projects, including the exact location and nature of any such facilities and whether they would be new facilities or utilize existing facilities requiring modification. It is generally anticipated that these facilities would be located within areas of consistent zoning for similarly scaled land uses. Construction typically generates short-term demand for a relatively small workforces that is unlikely to require additional housing or generate changes in land uses. Operations of similarly scaled land uses typically do not generate large scale workforces. However, the extent of contribution to these impacts from potential future CO_2 source projects would depend on many variables that are not knowable at this time. Such CO_2 source projects will be subject to their own permitting and environmental review.

The "Impact 4.15-4: Contribute to Cumulative Public Services Impacts" discussion of Section 4.15.5 is modified to insert the following immediately preceding the first paragraph:

A complete analysis and evidence for the record of the cumulative impacts on public services of the various activities from oil and gas are provided 4.14, Public Services of the Oil and Gas EIR.

As discussed above, there is uncertainty regarding potential future CO_2 source projects, including the exact location and nature of any such facilities and whether they would be new facilities or utilize existing facilities requiring modification. It is generally anticipated that these facilities would be located within areas of consistent zoning for similarly scaled land uses. Construction typically generates short-term demand for a relatively small workforces that is unlikely to require additional public services. Operations of similarly scaled industrial uses typically do not generate large scale workforces. The extent of contribution to these impacts from potential future CO_2 source projects would depend on many variables that are not knowable at this time. Such CO_2 source projects will be subject to their own permitting and environmental review.

The "Impact 4.16-3: Cumulative Impact on Recreational Facilities" discussion of Section 4.16.5 is modified to insert the following immediately preceding the first paragraph:

A complete analysis and evidence for the record of the cumulative impacts on public services of the various activities from oil and gas are provided 4.15, Recreation of the Oil and Gas EIR.

As discussed above, there is uncertainty regarding potential future CO_2 source projects, including the exact location and nature of any such facilities and whether they would be new facilities or utilize existing facilities requiring modification. It is generally anticipated that these facilities would be located within areas of consistent zoning for similarly scaled land uses, thus limiting impacts to recreational activities. Construction typically generates short-term demand for a relatively small workforces that is unlikely to generate additional demand for or use of existing parks and recreational facilities such that these resources would become deteriorated. Similarly, operations of similarly scaled industrial uses typically do not generate large scale workforces. The extent of contribution to these impacts from potential future CO_2 source projects would depend on many variables that are not knowable at this time. Such CO_2 source projects will be subject to their own permitting and environmental review.

The "Impact 4.17-5: Contribute to Cumulative Transportation Impacts" discussion of Section 4.17.5 is modified to insert the following immediately preceding the paragraph beginning, "Cumulative impacts from the project…":

With regard to impacts to significant transportation resources, the project has the potential to contribute significantly to cumulative impacts within the region. A complete analysis of the cumulative impacts of the various ground disturbing activities from oil and gas are provided in Section 4.16, Transportation and Traffic Resources of the 2015 Final EIR.

As discussed above, there is uncertainty regarding potential future CO_2 source projects, including the exact location and nature of any such facilities and whether they would be new facilities or utilize existing facilities requiring modification. It is generally anticipated that these facilities would be located within areas of consistent zoning for similarly scaled land uses, thus limiting impacts to transportation. Construction could result in short term increases in commuter and truck trips that would depend on the particular construction activity. Operations would also involve vehicle trips typical of similarly scaled industrial uses. The extent of contribution to these impacts from potential future CO_2 source projects would depend on many variables that are not knowable at this time. Such CO_2 source projects will be subject to their own permitting and environmental review.

The "Impact 4.18-2: Contribute to Cumulative Tribal Cultural Resource Impacts" discussion of Section 4.18.5 is modified to insert the following immediately preceding the paragraph beginning, "Potential impacts to tribal…":

With regard to impacts to significant tribal cultural resources, the project has the potential to contribute significantly to cumulative impacts within the region. A complete analysis of the cumulative impacts of the various ground disturbing activities from oil and gas are provided in Section 4.5, Cultural and Paleontological Resources (2015 Final Oil and Gas EIR).

As discussed above, there is uncertainty regarding potential future CO_2 source projects, including the exact location and nature of any such facilities and whether they would be new facilities or utilize existing facilities requiring modification. It is generally anticipated that these facilities would be located within areas of consistent zoning for similarly scaled land uses, thus limiting impacts to tribal cultural resources. However, construction and operation of these facilities nonetheless has the potential to result in ground disturbing activities that could adversely impact properties important to tribal communities. The extent of contribution to these impacts from potential future CO_2 source projects would depend on many variables that are not knowable at this time. Such CO_2 source projects will be subject to their own permitting and environmental review.

The "Impact 4.19-6: Cumulative Impacts on Utilities and Service Systems" discussion of Section 4.19.5 is modified to insert the following immediately preceding the heading "Stormwater Drainage":

With regard to impacts to utilities and service systems, the project has the potential to contribute significantly to cumulative impacts within the region. A complete analysis of the cumulative impacts of the various ground disturbing activities from oil and gas are provided in Section 4.17, Utilities and Service Systems of the Oil and Gas Final EIR.

As discussed above, there is uncertainty regarding potential future CO_2 source projects, including the exact location and nature of any such facilities and whether they would be new facilities or utilize existing facilities requiring modification. It is generally anticipated that these facilities would be located within areas of consistent zoning for similarly scaled land uses. New or modified facilities could generate increases in demand for public utilities such as water

supply, wastewater treatment, or solid waste disposal consistent with similarly scaled industrial uses. The extent of contribution to these impacts from potential future CO_2 source projects would depend on many variables that are not knowable at this time. Such CO_2 source projects will be subject to their own permitting and environmental review.

The "Impact 4.20-5: Contribute to Cumulative Wildfire Impacts" discussion of Section 4.20.5 is modified to insert the following immediately preceding the paragraph beginning, "With regard to impairment…":

With regard to impacts to wildfire, the project has the potential to contribute significantly to cumulative impacts within the region. A complete analysis of the various ground disturbing activities from oil and gas is provided in Section 4.20, Wildfire (2015 FEIR).

As discussed above, there is uncertainty regarding potential future CO_2 source projects, including the exact location and nature of any such facilities and whether they would be new facilities or utilize existing facilities requiring modification. It is generally anticipated that these facilities would be located within areas of consistent zoning for similarly scaled land uses, thus limiting cumulative wildfire impacts. The extent of contribution to these impacts from potential future CO_2 source projects would depend on many variables that are not knowable at this time. Such CO_2 source projects will be subject to their own permitting and environmental review.

7.2.2 State Agencies

1: California Department of Fish and Wildlife

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State of California – Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
Central Region
1234 East Shaw Avenue
Fresno, California 93710
(559) 243-4005
www.wildlife.ca.gov

GAVIN NEWSOM, Governor
CHARLTON H. BONHAM, Director

July 1, 2024

Keith Alvidrez, Planner II
Kern County Planning and Natural Resources Department
2700 "M" Street, Suite 100
Bakersfield, California 93301

Subject: Carbon TerraVault 1 Project (Project)
Draft Recirculated Environmental Impact Report (DREIR)
State Clearinghouse No. 2022030180

Dear Keith Alvidrez:

01-001

The California Department of Fish and Wildlife (CDFW) has reviewed the Draft Recirculated Environmental Impact Report (DREIR) prepared by your agency acting as Lead Agency for the Project pursuant the California Environmental Quality Act (CEQA) and CEQA Guidelines.[1]

Thank you for the opportunity to provide further comments and recommendations regarding those activities involved in the Project that may affect California fish and wildlife and/or the habitat it relies on. CDFW also appreciates 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.

01-002

It should be noted that CDFW provided comments through early consultation, in a letter dated April 6, 2022. CDFW provided additional comments in a letter dated March 1, 2024, responding to the circulation of the Draft Environmental Impact Report. The Lead Agency summarizes CDFW's comments contained in the April 6, 2022, comment letter in the DREIR, however, does not acknowledge receiving our March 1, 2024, comment letter. CDFW's March 1, 2024, comments are restated herein.

01-003

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,

[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.

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01-003 cont'd

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 projects and related activities that have the potential to adversely affect fish and wildlife resources.

01-004

CDFW is also submitting the following 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 will be required.

As a responsible agency, CDFW is responsible for providing, as available, biological expertise during public agency environmental review efforts (e.g., CEQA), focusing specifically on project activities that have the potential to adversely affect fish and wildlife resources. CDFW provides recommendations to identify potential impacts and possible measures to avoid or reduce those impacts.

Fully Protected Species: CDFW has jurisdiction over fully protected species of birds, mammals, amphibians and reptiles, and fish, pursuant to Fish and Game Code sections 3511, 4700, 5050, and 5515. Take of any fully protected species is prohibited except where specifically authorized in Fish and Game Code; CDFW cannot authorize their incidental take for this Project.

Bird Protection: 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).

Other Special Status Species: Species of plants and animals need not be officially listed as Endangered, Rare, or Threatened on any State or federal list pursuant to CESA and/or the federal Endangered Species Act (ESA) to be considered Endangered, Rare, or Threatened under CEQA. If a species can be shown to meet the criteria specified in the CEQA Guidelines (California Code of Regs tit. 14, Chapter 3, § 15380), it should be fully considered in the environmental analysis for the Project.

01-005

PROJECT DESCRIPTION SUMMARY

Proponent: California Resources Corporation (CRC)

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Objective: The Project proposes to construct a carbon capture and storage (CCS) facility for permanent underground storage of up to 48 million tons of CO_2 in two reservoir formations underlying approximately 9,104 surface acres in the Elk Hills Oilfield in unincorporated Kern County and the related initial source for the capture of CO_2. The overlying 9,104-acre estimate represents a reduction from the 9,130 acres originally estimated in the DEIR/DREIR, and consequently a change in the "area of review" evaluated by the Environmental Protection Agency for consideration of an underground injection control (UIC) permit and a reason for the Lead Agency's recirculation of the environmental document.

The initial source of CO_2 is the pre-combustion oilfield gas from infield locations, including uses associated with the existing Elk Hills Power Plant. Maximum injection per year from future sources would be up to 2, 210,000 tons per year divided between the two formations (R-26 and A1-A-2). The Project consists of: 1) underground pore space, approved by the Environmental Protection Agency (EPA) as the "area of review" where CO_2 will become permanently mineralized into rock; 2) the CCS Surface Land Area over the underground storage area where limited uses will be permitted; 3) approval of six (6) EPA Class VI UIC wells; 4) conversion and creation of wells for CO_2 leak monitoring and seismic activity; 5) approximately 13 miles of facility and injection underground pipeline for capture of pre-combustion gas; and 6) the related infrastructure improvements for the capture, transfer, and permanent storage of CO_2.

Location: The Project is within the administrative boundary of the Elk Hills oilfield which is owned and operated by CRC in an unincorporated portion of Kern County. The proposed Project area is located on the west side of Elk Hills Road and north side of Skyline Road, within the Elk Hills Oil Field, approximately 26 miles from the city of Bakersfield, approximately 8.5 miles from the city of Taft, and approximately 4 miles from the unincorporated community of Buttonwillow. The Project is located within sections 7, 8, 9, 10, 13, 15, 16, 17, 18, and 26 of Township 30 South, Range 23 East, Mount Diablo Base and Meridian, in Kern County.

Timeframe: Unspecified

COMMENTS AND RECOMMENDATIONS

01-006

As CDFW did in response to the Lead Agency's circulation of the DEIR, CDFW offers the comments and recommendations below in response to the DREIR to assist the Lead Agency in adequately identifying and/or mitigating the Project's significant, or potentially significant, direct, and indirect impacts on fish and wildlife (biological) resources.

The Project Area is known to support high densities of several special-status animal species including the State and federally endangered and State fully protected blunt-nosed leopard lizard (*Gambelia sila*); the State and federally endangered giant kangaroo rat (*Dipodomys ingens*); the State threatened and federally endangered San

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Joaquin kit fox (*Vulpes macrotis mutica*); the State threatened Swainson's hawk (*Buteo swainsoni*) and San Joaquin (also known as Nelson's) antelope squirrel (*Ammospermophilus nelsoni*); the State species of special concern American badger (*Taxidea taxus*), short-nosed kangaroo rat (*Dipodomys nitratoides brevinasus*), burrowing owl (*Athene cunicularia*), and California glossy snake (*Arizona elegans occidentalis*). The Project Area is also in the range of several special-status plant species including but not limited to the State and federally endangered and California rare plant rank (CRPR) 1B.1 California jewelflower (*Caulanthus californicus*). Since preparation of the April 6, 2022, early consultation comment letter, two species have become candidates for listing under CESA and remain candidates as of the date of this letter. These species include Temblor legless lizard (*Anniella alexanderae*) and Crotch's bumble bee (*Bombus crotchii*). 01-006 cont'd

There is an abundance of information about the extensive rare biological resources present throughout the Elk Hills Oil Field (EHOF), due to its history as the Naval Petroleum Reserve 1 (NPR1). NPR1 was sold to Occidental Petroleum as part of the 1996 National Defense Act that directed the Department of Energy (DOE) to sell the oilfield; Occidental Petroleum (OXY) completed the purchase in 1998. In addition to the extensive biological information collected by DOE, a joint Program Environmental Impact Report/Supplemental Environmental Impact Statement was prepared by DOE/Kern County in 1997 to support the transfer. CDFW issued a 1997 CESA Memorandum of Understanding and subsequent amendments, which was then superseded by a 2014 Incidental Take Permit (ITP), which authorized take of State listed species associated with oilfield exploration and operation. CDFW's ITP was supported by the Kern County Oil and Gas Environmental Impact Report. CDFW's 2014 ITP permitting effort was supported by extensive biological survey information and related modeling provided by OXY. CDFW requests that the EIR fully identify potential impacts to biological resources, including the above-mentioned species by evaluating the extensive existing biological information collected over decades within the EHOF. Specific examples follow. For all the species referenced above, CDFW can provide some of this information if needed, as we relied heavily upon it for our more recent permitting efforts. In addition to comments in the April 6, 2022, early consultation letter, CDFW recommends that the following modifications and/or edits be incorporated into the Final EIR (FEIR) including proposed avoidance, minimization, and compensatory measures, prior to its adoption by Kern County. 01-007

Blunt Nosed Leopard Lizard (BNLL). The Biological Resources section of the DEIR/DREIR appears to rely primarily on reconnaissance level surveys conducted for the DEIR/DREIR and ignores the substantial body of biological information collected within the EHOF. For example, the DEIR/DREIR blunt-nosed leopard lizard (BNLL) analysis states, "*The blunt-nosed leopard lizard was not observed during reconnaissance surveys. However, the BSA is within the known range for the species, suitable habitat is present, and there is a recent CNDDB record of the species within one mile of the BSA.*" This is wholly misleading given the extensive distribution of BNLL known to occur within the EHOF, as supported by decades of surveys and research on 01-008

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01-008 cont'd

this species both during the NPR1 designation as well as after being acquired by OXY, with annual surveys conducted by OXY/CRC since 1998; there is no other area within the range of BNLL as extensively studied for BNLL as the EHOF. BNLL densities are extremely dense in portions of the EHOF, particularly in the vicinity of the North flank and the Elk Hills Conservation Area. BNLL densities at EHOF likely exceed those observed anywhere else in the species range. CDFW recommends that the FEIR discloses OXY's BNLL Kernal probability densities, ongoing monitoring routes and associated detections, and historical observations to better inform the CEQA impact analysis, as well as to inform the likelihood for Project related impacts to this Fully Protected species to be avoided as required by Fish and Game Code.

San Joaquin antelope squirrel (SJAS). The DEIR/DREIR indicates that multiple detections of SJAS were during reconnaissance level surveys, but no reference was made to the substantial body of SJAS detection data that exists for EHOF. SJAS are considered fairly widespread throughout the EHOF, though estimates of population size have not been published. OXY's information previously provided to CDFW indicates that the total number of observations has fluctuated with a low of 29 in 2000, and a high of 179 in 2003. During seismic surveys conducted on and adjacent to the EHOF between 1998 and 2001, the locations of SJAS were collected and mapped using GPS (n = 1,298). CDFW recommends that the DREIR discloses OXY/CRC's ongoing SJAS monitoring and associated detections, and historical observations to better inform the CEQA impact analysis.

01-009

Giant Kangaroo Rat (GKR). The DEIR/DREIR indicates that "G*iant kangaroo rat was not observed during reconnaissance surveys. However, the BSA is within the known range of the species, suitable habitat is present.*" Like the species mentioned above, there is also extensive giant kangaroo rat (GKR) survey data within EHOF. OXY/CRC has a compilation of historical observations of GKR occurrences from the late 1970's through 2003 and monitored GKR consistently from 1994 through 2002 which allows for comparisons within this time period. For year 2003 forward, the survey effort was effectively doubled so data from subsequent years will allow for comparisons back to 2003. The EHOF sections surveyed for GKR presence are located in the non-High Production Area on the perimeters of the EHOF, in the existing EHOF Conservation Area, as well as adjacent areas off of EHOF within the 2-mile buffer along the Northeast Flank, Northwest Flank and Southwest Flank of EHOF. These GKR survey areas overlap substantively with the proposed Project boundaries; CDFW recommends that the FEIR discloses OXY/CRC's ongoing GKR monitoring and associated detections, and historical observations to better inform the CEQA impact analysis.

01-010

San Joaquin kit fox (SJKF). The DEIR/DREIR states that "*No San Joaquin kit fox were observed during reconnaissance surveys. However, potentially suitable dens, some including diagnostic sign such as scat and track, were observed throughout the BSA. San Joaquin kit fox den in a variety of areas, such as ROWs and vacant lands, and they may be attracted to the BSA because of the type and level of ground-disturbing activities and the loose, friable soils resulting from intensive ground*

01-011

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01-011 Cont'd

disturbance." Like the species mentioned above, there has been extensive SJKF surveys and research conducted at the EHOF; much of the original contemporary published research on SJKF was conducted at NPR-1. OXY/CRC has a compilation of historical observations of SJKF occurrences within the EHOF from the late 1970's through 2003; these data were collected from many different survey efforts. Methods of monitoring for kit fox on the EHOF changed substantially between the time periods of 1981-1995 and 1998-2011. Between 1981 and 1995, SJKF were systematically trapped and radio collared (Cypher et al. 2000). Monitoring of population trends from 1998 to present has consisted of spotlighting and scent stations. As described above under GKR occurrence on EHOF, the areas surveyed for SJKF presence are also located in the non-High Production Areas on the perimeters of the EHOF, in the existing EHOF Conservation Area, as well as adjacent areas off of EHOF within the 2-mile buffer; these SJKF survey areas overlap substantially with the proposed Project footprint. EHOF SJKF data includes an observed low of one (1) kit fox in 1998 with a high of 173 detections in 2004. This species experiences large natural fluctuations in population densities throughout their ranges. Earlier (prior to 1998) monitoring efforts on EHOF allowed for the calculation of density and population estimates. Total population estimates reached a high in 1994 of 363 (density estimate of 4.35 per sq mi or 1.68 per sq km) and a low in 1991 of 46 (density estimate of 0.55 per sq mi (0.21 per sq km). This time period was characterized with fairly dramatic decreases and increases, and kit fox numbers have been observed to fluctuate in other areas (Cypher et al. 2000). CDFW recommends that the FEIR discloses OXY/CRC's SJKF monitoring and associated detections, and historical observations to better inform the CEQA impact analysis.

01-012

Temblor legless lizard. The DEIR indicated in Table 4.4-4 Special Status Animal Species with Potential to Occur on Site that Temblor legless lizard (TLL) could potentially be affected by the Project. The DEIR also indicated that to reduce to less than significant the Project-related impacts to the species, the Project proponent will: determine the presence of the species by conducting "protocol surveys" at and near the Project Area, and employ a biological monitor to conduct pre-disturbance surveys within 30 days of commencing ground-disturbing activities (MM 4.4-1); maintain a 30-foot protective buffer from dens and/or active burrows which harbor the species (MM 4.4-3); implement a Worker Environmental Awareness Program for on-site workers (MM 4.4-11); and implement MM 4.4-13 which includes a list of Project-related prohibitions and limits designed to minimize take of the species. March 1, 2024, CDFW recommended the Lead Agency incorporate the three TLL minimization measures listed below.

The DREIR requires the Project proponent to commit to implementing Mitigation Measure 4.4-14 which requires surveys for TLL and avoid individual species, or obtain take authorization if avoidance is not feasible, therefore, addressing CDFW's comments to the DEIR. CDFW's comments provided to the Lead Agency in response to the DEIR included the following:

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01-012 Cont'd

Recommended Mitigation Measure 1: TLL Surveys
CDFW recommends the Lead Agency require the Project proponent conduct surveys of the Project Area implementing a CDFW-approved methodology to determine the presence of TLL at and near the Project Area.

Recommended Mitigation Measure 2: TLL Avoidance
CDFW recommends the Lead Agency require the Project proponent consult with, and provide an avoidance plan for approval by, CDFW in the event the surveys reveal the presence of TLL at and/or near the Project Area.

Recommended Mitigation Measure 3: TLL Take Authorization
In the event complete avoidance of TLL is not feasible, CDFW recommends the Lead Agency require the Project applicant obtain incidental take authorization from CDFW prior to commencing ground disturbing activities.

01-013

Crotch's Bumble Bee. The DEIR indicated in Table 4.4-4 Special Status Animal Species with Potential to Occur on Site that Crotch's bumble bee (CBB) could potentially be affected by the Project. The Lead Agency further stated that to reduce to less than significant the Project-related impacts to the species, the Project proponent will: determine the presence of the species by conducting protocol surveys at and near the Project Area, and employ a biological monitor to conduct pre-disturbance surveys within 30 days of commencing ground-disturbing activities (MM 4.4-1); implement a Worker Environmental Awareness Program for on-site workers (MM 4.4-11); and implement MM 4.4-13 which includes a list of Project-related prohibitions and limits designed to minimize take of the species. March 1, 2024, CDFW recommended the Lead Agency incorporate the three CBB minimization measures listed below.

The DREIR requires the Project proponent to commit to implementing Mitigation Measure 4.4-14 which requires surveys for CBB and avoid individual species, or obtain take authorization if avoidance is not feasible, therefore, addressing CDFW's comments on the DEIR. CDFW's comments provided to the Lead Agency in response to the DEIR included the following:

Recommended Mitigation Measure 4: CCB Surveys
CDFW recommends that a qualified biologist conduct focused surveys for CBB and their requisite habitat features during the blooming period immediately prior to Project construction, following the methodology outlined in the Survey Considerations for California Endangered Species Act Candidate Bumble Bee Species (CDFW 2023).

Recommended Mitigation Measure 5: CBB Avoidance Buffer
If surveys cannot be completed, CDFW recommends that all small mammal burrows and thatched/bunch grasses be avoided by a minimum of 50 feet to avoid take and potentially significant impacts. If ground-disturbing activities will occur during the

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01-013 cont'd

overwintering period (October through February), consultation with CDFW is warranted to discuss how to implement Project activities and avoid take. Any detection of CBB prior to or during Project construction warrants consultation with CDFW to discuss how to avoid take.

Recommended Mitigation Measure 6: CBB Take Authorization
If CBB is identified during surveys or at any time during Project construction, 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 is warranted. Take authorization would occur through issuance of an ITP by CDFW, pursuant to Fish and Game Code section 2081(b).

EDITORIAL COMMENTS AND/OR SUGGESTIONS

Mitigation Measures : MM 4.4-1 B states, "*As an alternative to individual pre-disturbance surveys for each application, and after consultation with and concurrence by the California Department of Fish and Wildlife and the United States Fish and Wildlife Service, multiple parcels or areas of CCS activities (including lands which may have multiple surface or mineral ownership) may be consolidated for the purpose of more efficiently managing pre-disturbance surveys and determinations regarding the absence of protected species in areas of proposed new ground disturbance activities*.." It is unclear what this statement means for implementation of protocol surveys and CDFW recommends the FEIR provide clarification.

01-014

Impacts to Conserved Lands: As a condition of previous CDFW and USFWS permits, OXY placed 7,878 acres of high-quality habitat ("Elk Hills Conservation Area") within the EHOF into permanently conserved status via recordation of a Conservation Easement in favor of CDFW. The Elk Hills Conservation Area is present along the north and south flanks of the EHOF, which is within and adjacent to a portion of the Project. Specifically, the proposed pore space underlies a portion of the Elk Hills Conservation Area. CDFW recommends the FEIR analyze any potential direct or indirect impacts to this conserved land and the associated special status species. Project related impacts to conserved lands may make the project proponent liable for making whole, the loss of mitigation associated with the CDFW and USFWS permits.

01-015

The DEIR/DREIR indicates that Project facilities would be located within the Elk hills Conservation Area. However, while a portion of the Project Pore Space may underly the Elk Hills Conservation area, any Project related surface disturbance is prohibited by the Conservation Easement recorded in favor of CDFW. For example, Project surface infrastructure such as but not limited to pipelines and injection wells must completely avoid the Elk Hills Conservation Area parcels. Further, an appropriate buffer (at least 500 feet) for such surface infrastructure should be observed from the periphery of the Elk Hills Conservation Area boundary to minimize the potential for CO_2 leaks impacting the rare species inhabiting the Elk Hills Conservation Area. CDFW requests that these avoidance measures be made an explicit condition of approval in the FEIR.

01-016

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Federally Listed Species: CDFW recommends consulting with USFWS regarding potential impacts to federally listed species including but not limited to BNLL, GKR, SJKF, and California jewelflower. Take under the ESA is more broadly defined than CESA; take under ESA 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 ESA is advised well in advance of any Project activities. 01-017

Lake and Streambed Alteration: Based on the information provided in the DEIR/DREIR, as well as our familiarity with the EHOF, the Project Area contains multiple streams. The DEIR/DREIR contemplates that Project activities may be subject to CDFW's regulatory authority pursuant to Fish and Game Code section 1600 et seq. which 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 (including the removal of riparian vegetation): (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, intermittent, or episodic, as well as those that are perennial. CDFW is required to comply with CEQA in the issuance of a Lake or Streambed Alteration Agreement; therefore, if the CEQA document approved for the Project does not adequately describe the Project and its impacts to streams, a subsequent CEQA analysis may be necessary for Lake or Streambed Alteration Agreement issuance. For information on notification requirements, please refer to CDFW's website (https://wildlife.ca.gov/Conservation/LSA) or contact CDFW staff in the Central Region Lake and Streambed Alteration Program at (559) 243-4593 or R4LSA@wildlife.ca.gov. 01-018

ENVIRONMENTAL DATA 01-019

CEQA requires that information developed in environmental impact reports and negative declarations be incorporated into a database, 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 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 01-020

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

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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**).** 01-020 cont'd

CONCLUSION 01-021

CDFW appreciates the opportunity to comment on the DREIR to assist Kern County in identifying and mitigating Project-related impacts on biological resources. Please see the attached Mitigation Monitoring and Reporting Program (MMRP) table (Attachment 1) which corresponds with recommended mitigation measures in this comment letter.

If you have any questions, please contact Steve Hulbert, Senior Environmental Scientist Specialist, at the address provided on this letterhead, by telephone at (559) 575-6415, or by electronic mail at Steven.Hulbert@wildlife.ca.gov.

Sincerely,

DocuSigned by:
Julie Vance
FA83F09FE08945A...

Julie A. Vance
Regional Manager

Attachment

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REFERENCES

CDFW 2023. Survey considerations for California Endangered Species Act candidate bumble bee species. California Department of Fish and Wildlife, Sacramento, California, USA.

Cypher, B. L., G.D. Warrick, M. R. M. Otten, T. P. O'Farrell, W. H. Berry, D. E. Harris, T.T. Kato, P. M. McCue, J. H. Scrivner, and B. W. Zoellick. 2000. Population dynamics of San Joaquin kit foxes at the Naval Petroleum Reserves in California. Wildlife Monographs 145: 1-43.

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Attachment 1

MITIGATION MONITORING AND REPORTING PROGRAM (MMRP) FOR CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE RECOMMENDED MITIGATION MEASURES

PROJECT: Carbon TerraVault 1
SCH No.: 2022030180

RECOMMENDED MITIGATION MEASURE	STATUS/DATE/INITIALS
Before Disturbing Soil or Vegetation	
Mitigation Measure 1: Temblor Legless Lizard Surveys	
Mitigation Measure 3: Temblor Legless Lizard Take Authorization	
Mitigation Measure 4: Crotch's Bumble Bee Surveys	
Mitigation Measure 6: Crotch's Bumble Bee Take Authorization	
During Construction	
Mitigation Measure 2: Temblor Legless Lizard Avoidance	
Mitigation Measure 5: Crotch's Bumble Bee Avoidance	

Comment 1
California Department of Fish and Wildlife

1-001

Thank you for your comment and participation in the public process. This comment does not state a specific concern related to the adequacy of the DREIR and therefore does not require a detailed response. This comment is noted for the record and will be provided to the Planning Commission and Board of Supervisors for consideration.

1-002

County staff has determined, following a review of the written comments and release of the EPA Class VI Permit for Reservoir 26R, that changes should be made in the previously circulated Draft EIR. CEQA Guidelines Section 15088.5 (f)(1) provide that when an EIR is revised and the entire EIR is circulated, Kern County, as the lead agency, may require reviewers to submit new comments, and the lead agency need not respond to comments received during an earlier circulation period. Per Section 15105 of the CEQA Guidelines, Kern County provided for a 45-day public review period on the Draft REIR, which began on June 4, 2024 and ended July 18, 2024. Therefore, comments provided during the initial public circulation period are considered, but not formally responded to. The comment does not raise any specific issues related to the adequacy of the REIR.

1-003

The comment states that 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. The comment does not raise any specific issues related to the adequacy of the REIR and therefore does not require a detailed response.

1-004

The comment states that CDFW is also submitting comments as a Responsible Agency and has legal responsibility for the welfare of fully protected species, birds, their eggs and nests, and other special status plants and animals pursuant to the California Endangered Species Act. The comment does not raise any specific issues related to the adequacy of the REIR and therefore does not require a detailed response.

1-005

The comment reviews the description and location of the proposed project. The comment does not raise any specific issues related to the adequacy of the REIR and therefore does not require a detailed response.

1-006

The comment notes that the project area is known to support high densities of several special-status animal species including the blunt-nosed leopard lizard, giant kangaroo rat, and San Joaquin kit fox. It is noted that the Project Area is also in the range of several special-status plant species including the California jewelflower. The comment further notes that since the April 6, 2022, early consultation letter, two species have become candidates for listing under CESA and remain candidates. These species include Temblor

legless lizard and Crotch's bumble bee. The comment does not raise any specific issues related to the adequacy of the DREIR and therefore does not require a detailed response.

1-007

The comment provides information on previously completed environmental analyses and permitting efforts for oil and gas activities in the Elk Hills Oil Field (EHOF). The comment requests that the EIR fully identify potential impacts to biological resources by evaluating the extensive existing biological resources collected over decades within the EHOF and further provides specific examples in the following comments. The comment is a general introduction to comments. No response is necessary, and it is noted for the record.

1-008

This comment makes specific recommendations regarding including probability densities, ongoing monitoring routes and associate detections, and historical observations of BNLL to better inform the CEQA impact analysis. Page 4.4-17 of the Draft REIR includes information regarding the extensive pre-activity surveys that were conducted from 2001 - 2005. Information regarding historic and ongoing monitoring activities and the total number of historical detections of the species is included.

1-009

The comment makes specific recommendations regarding monitoring and associated detections, and historical observations of the San Joaquin antelope squirrel to better inform the CEQA impact analysis. While this disclosure is not required by CEQA, the analysis determined that SJAS is likely to occur throughout the project site. Therefore, mitigation measures MM 4.4-1, MM 4.4-3, MM 4.4-8, MM 4.4-11, and MM 4.4-13 would be implemented to reduce impacts to the SJAS. Furthermore, the proposed project is covered under the Elk Hills Oil and Gas Field Incidental Take Permit (2081-2014-019-04). The ITP contains species specific monitoring, avoidance, and relocation plans to further minimize incidental take of SJAS. These mitigation measures will be incorporated into this EIR and implemented to reduce impacts to SJAS to a less than significant level.

1-010

This comment makes specific recommendations regarding including probability densities, ongoing monitoring routes and associate detections, and historical observations of Giant kangaroo rat to better inform the CEQA impact analysis. Page 4.4-21 of the Draft REIR includes information regarding the extensive pre-activity surveys that were conducted. Information regarding historic and ongoing monitoring activities and the total number of historical detections of the species is included.

1-011

This comment makes specific recommendations regarding including probability densities, ongoing monitoring routes and associate detections, and historical observations of Giant kangaroo rat to better inform the CEQA impact analysis. Page 4.4-23 of the Draft REIR includes information regarding the extensive pre-activity surveys that were conducted. Information regarding historic and ongoing monitoring activities and the total number of historical detections of the species is included.

1-012

The comment summarizes the mitigation measures identified in the DEIR that would be implemented to reduce significant impacts to the species. The comment further notes that the Draft Recirculated EIR included MM 4.4-14, which addresses CDFW's comments to the DEIR. The comment summarizes CDFW's original comment provided in response to the DEIR. Because the Lead Agency addressed CDFW's original comment, no response is necessary and it is noted for the record.

1-013

The comment summarizes the mitigation measures identified in the DEIR that would be implemented to reduce significant impacts to Crotch's Bumble Bee (CBB). The comment further notes that the Draft REIR included MM 4.4-15, which addresses CDFW's comments to the DEIR. Additionally, DREIR MM 4.4-3 states that "protective buffers shall be established around active dens and/or burrows of special-status animal species, or populations of special-status plant species to avoid unauthorized take of protected species as listed in Table 4.4-5"; this includes 50 feet for CBB, consistent with CDFW guidance noted in the comment.

1-014

This comment recommends that clarification be provided in the Final REIR regarding MM 4.4.-1 B and what the measures mean for implementation of protocol surveys. However, the commentor does not specify what part of the mitigation measure is unclear. This comment is noted for the record and will be provided to the Planning Commission and Board of Supervisors for consideration.

1-015

The comment recommends the FEIR analyze any potential direct or indirect impacts to the adjacent conserved land and the associated special status species. It is noted that project-related impacts to conserved lands may make the project proponent liable for making whole, the loss of mitigation associated with the CDFW and USFWS permits.

As discussed in Section 4.4 of the Draft REIR, California Resources Corporation has a Conservation Area Management Plan (CAMP) that governs the Elk Hills Conservation Area. This area was established in fulfillment of the Biological Opinion issued by the U.S. Fish and Wildlife Service (USFWS) in 1995. The conservation easement is to be acted through by the California Natural Resource Agency, Department of Fish and Wildlife (CDFW) subdivision.

The project would be located within the CAMP, which includes a Section 2081 ITP for the take of CESA-listed species incidental to ongoing oil and gas extraction, processing, and related activities. If the project proponent elects in the future to pursue any disturbance within the CAMP that requires additional take authorization, conflicts with the CAMP would be potentially significant. Therefore, per MM 4.4-2, additional Section 2081 ITP(s) would be obtained as required by the CAMP.

1-016

The commenter requests that the FREIR include an explicit condition of approval that any Project related surface disturbance is prohibited by the Conservation Easement recorded in favor of CDFW. The

commenter also requests that an appropriate buffer (at least 500 feet) for such surface infrastructure should be observed from the periphery of the Elk Hills Conservation Area boundary.

The project would be required to comply with conditions already recorded as part of the conservation easement present on the property, as specified in MM 4.4-2, including new impacts to covered species. New buffer distances for protective species are detailed in Table 4.4-5 on page 4.4-52 of Section 4.4, Biological Resources. The Final EIR has been revised to include a 250-foot buffer for non-listed birds and a 500-foot buffer for non-listed raptors.

Table 4.4-5: Disturbance Buffers for Sensitive Resources

Sensitive Resource	Buffer Zone from Disturbance (feet)
Potential San Joaquin kit fox den	50
Known San Joaquin kit fox den	100
Natal San Joaquin kit fox den	500
Atypical San Joaquin kit fox den	50
Rodent burrows, small mammal burrows	50
Listed bird species active nests	0.5 miles
NON-Listed bird active nests NON-Listed Raptor	250 feet 500 feet
Burrowing owl burrow (breeding and non-breeding season)	Pursuant to California Department of Fish and Wildlife guideline
San Joaquin coachwhip, all legless lizards, coast horned lizard	30
American badger: Non-maternity dens Maternity dens	 50 200
Crotch's bumble bee	50
Special-status plants	50

1-017

The commenter recommends consulting with USFWS regarding potential impacts to federally listed species including but not limited to BNLL, GKR, SJKF, and California jewelflower.

Through implementation of MM 4.4-1, the project proponent will be required to conduct protocol surveys in advance of any project permit application to determine the presence/absence of sensitive species protected by state and federal Endangered Species Acts and potential project impacts to those species. Furthermore, as detailed in MM 4.4-2, no incidental take of any species lists as threatened or endangered under the federal or state endangered species act may occur unless the incidental take is authorized by applicable federal and state wildlife agencies in the form of a permit or other written authorization.

1-018

Commenter notes that if the CEQA document approved for the project does not adequately describe the Project and its impacts to streams, a subsequent CEQA analysis may be necessary for Lake and Streambed Alteration Agreement issuance.

As described on page 4.4-63 of the Draft REIR, implementation of the Biological Resources mitigation measures MM 4.4-16 and MM 4.4-17 would ensure that project activities would not disturb state or federally regulated wetlands and waters unless the activity is specifically authorized by the issuance of permits or approvals as required by state and federal laws and that activities in the vicinity of wetlands and water bodies would not adversely disturb them.

1-019

Commenter's remarks regarding reporting any special-status species and natural communities detected during project surveys to the CNDDB is noted.

1-020

Commenter's remarks regarding filing fees is noted.

1-021

Thank you for your comment and participation in the public process. This comment does not state a specific concern related to the adequacy of the DREIR and therefore does not require a detailed response. This comment is noted for the record and will be provided to the Planning Commission and Board of Supervisors for consideration.

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7.2.3 Local Agencies

2: Kern County Fire Department

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Office of the Fire Marshal
Kern County Fire Department
Fire Prevention Unit

2820 M St. • Bakersfield, CA 93301 • www.kerncountyfire.org
Telephone 661-391-3310 • FAX 661-636-0466/67 • TTY Relay 800-735-2929

June 11, 2024

Kern County Planning and Natural Resources Department
2800 M St., Bakersfield, CA 93301
Attn: **Keith Alvidrez, Planner II**

Re: Kern County Fire Department Comments Regarding Planning Department Project

To Whom It May Concern:

The Kern County Fire Department (KCFD), as the local fire authority, has received a request for comments regarding Carbon Terra Vault I. Upon initial review, it has been determined that all new construction will require fire water flowing a minimum of 1,500 GPM for 2 hours with 20 PSI residual. Unique signage required for hazards determined by the California Fire Code and Kern County Ordinances. All fire access roads to each parcel must meet specifications set forth in Section 503.2 of the California Fire Code and the applicable Appendix and Ordinance sections.

Comment 2-001
Comment 2-002
Comment 2-003
Comment 2-004

A more detailed review and project comments will be conducted when the building permit is obtained, and plans are submitted to KCFD.

Comment 2-005

Please feel free to call our Fire Prevention Office at (661) 391-3310 with any questions.

Respectfully,
Sean Riley
Deputy Fire Marshal
Kern County Fire Department

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Comment 2
Kern County Fire Department

2-001

Thank you for your comment and participation in the public process. This comment does not state a specific concern related to the adequacy of the DREIR and therefore does not require a detailed response. This comment is noted for the record and will be provided to the Planning Commission and Board of Supervisors for consideration.

2-002

The comment states that new construction will require fire water flowing a minimum of 1,500 GPM for 2 hours with 20 PSI residual. As indicated in Section 4.15, *Public Services*, all project facilities would have been designed and constructed in accordance with the current California Fire Code and Kern County Fire Code. Furthermore, as described in Section 4.9*, Hazards and Hazardous Materials*, the project would also comply with the Uniform Fire Code (UFC), where local fire departments are required to adopt local fire codes that are no less stringent than the California Fire Code.

2-003

The comment states that unique signage would be required for hazards as determined by the California Fire Code and Kern County Ordinances. As indicated in Section 4.15*, Public Services*, all project facilities would have been designed and constructed in accordance with the current California Fire Code and Kern County Fire Code.

2-004

The comment states that all fire access roads to each parcel must meet specifications set forth in Section 503.2 of the California Fire Code and the applicable Appendix and Ordinance sections. See response to Comment 007.02. Additionally, implementation of MM 4.17-1 would ensure the project's contribution to emergency access (see Section 4.17, *Transportation*).

2-005

Thank you for your comment and participation in the public process. This comment does not state a specific concern related to the adequacy of the DREIR and therefore does not require a detailed response. This comment is noted for the record and will be provided to the Planning Commission and Board of Supervisors for consideration.

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7.2.4 Interested Parties

3: Earthjustice & Group

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Via Email
July 18, 2024

Kern County Planning and Natural Resources Department
Attn: Keith Alvidrez, Planner II
2700 "M" Street, Suite 100
Bakersfield, CA 93301
CTV1EIRComments@kerncounty.com
Alvidrezk@kerncounty.com

Re: Comments on the Recirculated Draft Environmental Impact Report for Carbon TerraVault I

Dear Mr. Alvidrez:

On behalf of Center for Biological Diversity, Center on Race, Poverty & the Environment, Central California Environmental Justice Network, Central Valley Air Quality Coalition, and Sierra Club, we are writing to submit the following comments regarding the Recirculated Draft Environmental Impact Report (the Recirculated Draft EIR) for the Carbon TerraVault I Project (the CTV I Project) for carbon capture and storage (CCS) in the Elk Hills oil field. These comments are offered to ensure that Kern County (the County) complies with the California Environmental Quality Act (CEQA)[1] and CEQA Guidelines[2] in its consideration of the CTV I Project.

In addition, we submit technical expert analyses prepared by Ron Sahu, PhD, QEP, CEM (Attachment A); Dominic DiGiulio, PhD (Attachment B); and Richard Kuprewicz (Attachment C). We refer the County to these reports, both here and throughout these comments, for further discussion of the Recirculated Draft EIR's inadequacies.

These comments build upon previous comments we submitted on March 1, 2024 in response to the original December 19, 2023 Draft EIR for the CTV I Project. The Recirculated Draft EIR fails to remedy the legal deficiencies noted in our previous comments, and for those reasons and others it is inadequate under CEQA. This letter supplements and expands upon the arguments in our prior letter, but it is not intended to be exhaustive and incorporates by reference arguments made previously.

Because the County's approach to the CTV I Project has not materially changed, our requests remain the same. As in our previous letter, we urge the County not to double down on a CCS project that is designed to facilitate continued fossil fuel extraction and combustion in the County for years longer than necessary. By extending the life of the Elk Hills oil field and the existing gas plant and power plant supporting the field, and justifying the build-out of multiple new polluting facilities as future CO_2 sources, the CTV I Project will ultimately exacerbate pollution and ongoing harms to the County's frontline communities. Rather than further locking

3-001

[1] Pub. Resources Code, § 21000 *et seq*.
[2] Cal. Code Regs., tit. 14, § 15000 *et seq*. (CEQA Guidelines).

in its dependence on the fossil fuel industry, the County should adopt measures that improve health and safety protections for local communities already threatened by oil and gas operations, and invest in the transition to renewable clean energy solutions. 3-001 Cont'd

We also continue to urge the County to conduct a genuinely inclusive public process for the CTV I Project, which should allow for the County's many Spanish speakers to participate meaningfully. Issuing a Recirculated Draft EIR without a detailed summary of revisions made to the original draft,[3] and without notations or other clear indications of changes made to the text (e.g. underlined or italicized text), has the opposite effect and creates burdens for the public to participate in the County's decisionmaking process. Given the magnitude of the industrial activities authorized by the Project and the long-term threat these activities pose to community members' health and safety, the County's already overburdened residents deserve a reasonable opportunity to provide input on a decision that will disproportionately affect them. To that end, our organizations submitted a letter on June 21, 2024 outlining additional steps the County must take to address the flaws in its public participation process for this Project and ensure better community engagement going forward.[4] We have not received a response to that letter to date. 3-002

As with the original Draft EIR, the Recirculated Draft EIR is missing critical details about the CTV I Project and is vague throughout, making it impossible to sufficiently analyze the range of impacts due to the Project and to adopt adequate mitigation measures. The Recirculated Draft EIR therefore fails in its basic purpose of being an informational document "to provide public agencies and the public in general with detailed information about the effect that a proposed project is likely to have on the environment; to list ways in which the significant effects of such a project might be minimized; and to indicate alternatives to such a project."[5] 3-003

After carefully reviewing the Recirculated Draft EIR, we have nonetheless concluded that it suffers from the same flaws as the original Draft EIR and similarly fails in numerous respects to comply with CEQA. As explained below, the Recirculated Draft EIR violates CEQA because it fails to: (1) properly define the project description and the scope of the CTV I Project's foreseeable impacts; (2) adequately analyze and mitigate growth-inducing impacts; (3) employ appropriate Project objectives; (4) properly consider alternatives to the Project; and (5) adequately analyze and mitigate numerous foreseeable environmental impacts and cumulative impacts. As the first CCS project of its kind to undergo environmental review in California, the Recirculated Draft EIR for CTV I falls far short of establishing appropriate standards and safeguards should more of these projects move forward in the future. 3-004

For these and the additional reasons expressed below, we strongly urge the County to reject the Recirculated Draft EIR as an informational document, and to prepare and circulate a revised version that complies with CEQA.

We include a table of contents on the next page to facilitate review.

[3] CEQA Guidelines, § 15088.5(g).
[4] Letter from undersigned groups to Kern County Planning & Natural Resources Dept., *Re: Public Participation for the Carbon TerraVault 1 (CTV 1) Carbon Capture and Storage Project* (June 21, 2024).
[5] See Pub. Resources Code, § 21061.

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I. THE RECIRCULATED DRAFT EIR'S ANALYSIS AND MITIGATION ARE BASED ON AN IMPROPER PROJECT DESCRIPTION

CEQA aims to foster greater transparency in order to ensure that decisionmakers and stakeholders are informed of potentially harmful environmental consequences of proposed projects, receive a clear and robust analysis of those consequences, and are assured that feasible mitigation is implemented. This level of transparency requires a complete understanding of the project and an analysis that encompasses the project's full scope. "Only through an accurate view of the project may outsiders and public decision-makers balance the proposal's benefits against its environmental cost, consider mitigation measures, assess the advantage of terminating the proposal . . . and weigh other alternatives in the balance."[6] Here, the County does not achieve the level of transparency required by CEQA because of an inappropriately narrow project description. 3-005

Under CEQA, a "project" is defined as the whole of an action that has the potential to cause direct or indirect physical changes to the environment.[7] A project description that omits integral components of the full project may result in an EIR that fails to disclose all the impacts of the project.[8] EIR project descriptions have been rejected as inadequate when, as is the case here, the EIR limited the scope of environmental review by artificially narrowing the project description, thus minimizing the project's impacts and undermining public review.[9]

A proper description and analysis must include "future action" that is "a reasonably foreseeable consequence of the initial project" and would "be significant in that it will likely change the scope or nature of the initial project or its environmental effects."[10] As explained below, the Recirculated Draft EIR fails to include the whole of the action in its analysis, and to analyze reasonably foreseeable and significant consequences of the CTV I Project.

The Recirculated Draft EIR's scope is too narrow because it fails to address critical components of the CTV I Project, including the Project's effect on the development of industries in Kern County that will send CO_2 for sequestration to the Elk Hills oil field, and the effect of the Project on the development of CO_2 transportation infrastructure. The narrow and vague 3-006

[6] *County of Inyo v. City of Los Angeles* (1977) 71 Cal.App.3d 185, 192.
[7] CEQA Guidelines, § 15378(a); see *Habitat Watershed Caretakers v. City of Santa Cruz* (2013) Cal.App.4th 1277, 1297.
[8] *Santiago County Water Dist. v. County of Orange* (1981) 118 Cal.App.3d 818, 829 (project description for sand and gravel mine omitted water pipelines serving project); *City of Santee v. County of San Diego* (1989) 214 Cal.App.3d 1438, 1454 (concluding that complete project description is necessary to ensure that environmental impacts of entire project are considered).
[9] See, e.g., *Rural Landowners Assn. v. City Council* (1983) 143 Cal.App.3d 1013, 1024 (EIR for city general plan amendment and rezoning that failed to describe or analyze the impacts of development that would follow annexation to the city); *County of Inyo, supra*, 71 Cal.App.3d at 193 (EIR for groundwater pumping and water export project that failed to describe or analyze groundwater exports and instead improperly sought to characterize expanding groundwater exports as a separate, ongoing project).
[10] *Laurel Heights Improvement Assn. v. Regents of Univ. of Cal* (1988) 47 Cal.3d 376, 396, as modified on denial of reh'g (Jan. 26, 1989).

3-006 Cont'd

description of the Project and its scope also renders the Recirculated Draft EIR informationally inadequate.

3-007

The project description states that CTV I includes "the construction and operation of an approximately 9,104-acre carbon capture and storage (CCS) facility with related capture facilities and pipeline for the initial source."[11] That "initial source," according to the Recirculated Draft EIR, would be the pre-combustion Elk Hills oil field gas, which is processed at the natural gas plant (CGP-1) facility and used at the Elk Hills power plant. The Recirculated Draft EIR goes on to say that "[n]o additional sources of CO_2 (from outside Elk Hills) or other new development are proposed for the CCS Surface Land Area or injection into the project."[12]

However, as the Recirculated Draft EIR makes clear, the "initial source" it analyzes is only the first among several sources that will inevitably send CO_2 for storage in the Project:

> Only one source has been identified and is analyzed in this EIR: existing Elk Hills field gas streams in specific locations. That operation, which is related to oilfield operations, will not provide enough captured CO_2 to produce the maximum injection capacity […] *Additional existing and new CO_2 sources, completely outside the CCS boundary of 9,104 acres, will need to be permitted and conveyed to CTV I for permanent underground storage*.[13]

3-008

The Recirculated Draft EIR also makes clear the initial source is a minor source: the storage reservoirs have the capacity to store almost 50 million metric tons (MMT) of CO_2, and the Project proponent is seeking to approve *the whole project's storage capacity* in the Recirculated Draft EIR.[14] At the same time, the Recirculated Draft EIR's analysis discloses that at a maximum, the initial source's CO_2 will add up to 203,485 tons per year (tpy) of captured CO_2.[15] Even this number is hypothetical and might in fact be much lower, as it assumes continuous operations of the power plant into the year 2045, while the Recirculated Draft EIR admits that the plant "may be forced to close sooner" due to California's fossil fuels policies.[16] Assuming a continuous injection from the initial source over the next 20 years, that source will at most provide about 4 million tons total of CO_2 for injection, leaving a minimum of about 45 million tons to be sent from other sources.[17]

It is also evident that the Project has no financial or practical viability without its future sources, beyond the initial source. The Recirculated Draft EIR explicitly admits that "[t]he life of the project is dependent on the sources permitted for injection into the storage" and on "the

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[11] RDEIR, Vol. 1 at 3-1.
[12] RDEIR, Vol. 1 at 3-1.
[13] RDEIR, Vol. 1 at 3-13 (emphasis added).
[14] RDEIR, Vol. 1 at 4.8-19.
[15] RDEIR, Vol. 1 at 3-2.
[16] RDEIR, Vol. 1 at 4.8-24.
[17] Of course, as discussed in the cumulative impacts section of this comment letter below, a scenario where the vast majority of CO_2 over the life of the Project comes from the initial source is impossible, given the projections of CO_2 sourcing in the initial years of the Project and the disclosures made in the EPA Class VI permit applications as well as the California Air Resources Board (CARB) CCS Protocol certification.

ability of the project year by year to obtain CO_2 and inject at the maximum 2,210,000 million tons per year."[18] That financial dependency is also stressed in the Recirculated Draft EIR appendix titled "Envisioning a Carbon Management Park." This report states, regarding a potential carbon sequestration project, that "[f]or those wells to be cost effective, there will need to be a significant source of CO_2 – on the scale of millions of metric tons annually – available for injection."[19]

3-008 Cont'd

While the Recirculated Draft EIR acknowledges that other sources could be sending CO_2 to the Project, it fails to disclose all the meaningful information regarding these sources and, most importantly, it fails to disclose and analyze the sources' potential impacts.

3-009

In response to the comments that were submitted regarding the original Draft EIR for the CTV I Project released in December 2023, the County added to the Recirculated Draft EIR a new short section titled "Future Sources – Identification."[20] In this section, the County briefly describes companies that "have announced contractual relationships or interest in locating on [California Resources Corporation (CRC)] properties outside CTV I project boundary or sending CO_2 for injection at CTV I."[21] The Recirculated Draft EIR lists six broad potential sources and describes their purpose and status in a few lines. Out of the six, the Recirculated Draft EIR states that four have entered into a Carbon Dioxide Management Agreement (CDMA) with the Project's applicant CRC. The Recirculated Draft EIR notes that one of the two other potential sources is in "preliminary commercial discussions with the applicant" (the Avnos direct air capture (DAC) project). For the last one, the Elk Hills Power Plant, the Recirculated Draft EIR states that the "CalCapture project would explore capturing CO_2 emissions" from the CTV I Project's operations.[22]

In addition, the "Future Sources – Identification" section states that future sources of CO_2 will be "limited" to specific "industries" within Kern County. These "industries" include "hydrogen — green and blue," biomass carbon removal and storage (BiCRS), cement production, green steel production, oilfield field gas streams, power plants, DAC, and alternative fuel production.[23]

3-010

The Recirculated Draft EIR also includes an updated list of "cumulative projects." The list includes seven other CCS projects, two "Carbon Capture and Transport for Storage" projects, five oil and gas extraction projects (as well as the County's oil and gas ordinance), two DAC projects, and five other projects that can be potential CO_2 sources, including hydrogen and alternative fuels, and the "CTV Clean Energy Park" that is described as "multiple projects."[24]

Just as in the original Draft EIR, the Recirculated Draft EIR provides nothing more than the name, location, type, acreage, and status of each project. Most projects' status is described in the Recirculated Draft EIR as "Not submitted – media PR," some as "Application incomplete"

[18] RDEIR, Vol. 1 at 4.8-24.
[19] RDEIR, Vol. 2, App'x K.2, Envisioning A Carbon Management Business Park at 3.
[20] RDEIR, Vol. 1 at 3-13 to 3-15.
[21] RDEIR, Vol. 1 at 3-14.
[22] RDEIR, Vol. 1 at 3-15.
[23] RDEIR, Vol. 1 at 3-13.
[24] RDEIR, Vol. 1 at 3-45 to 3-47.

and some as "EIR in process."[25] The Recirculated Draft EIR does not provide any useful information on the reason why these projects are listed as cumulative, and whether they are potential CO_2 sources for the Project, or whether they are expected to have cumulative impacts for other reasons. 3-010 Cont'd

The Recirculated Draft EIR explains that all information regarding potential CO_2 sources has been provided by the applicant and, "if and when" any of them advances further, it will require a new environmental review process. Therefore, the Recirculated Draft EIR concludes: 3-011

> [T]hese projects are not required to be analyzed further in this EIR as approval of the project does not compel approval, nor presume completion, of any other of the contemplated projects, no applications of these other projects are pending before the county, and there is not otherwise sufficient information available to allow for meaningful environmental review of the other projects at this time.[26]

This project description violates CEQA for several reasons: first, it fails to analyze the whole of the action and presents a partial and misleading picture of the proposed development. Second, it contradicts the Recirculated Draft EIR's analysis of greenhouse gas impacts, and finally, it omits important project elements.

A. The Project Description Fails to Analyze the Whole of the Action That Has Potential to Cause Changes to the Environment. 3-012

A proper project description and analysis must include "future action" that is "a reasonably foreseeable consequence of the initial project" and would "be significant in that it will likely change the scope or nature of the initial project or its environmental effects."[27] The Recirculated Draft EIR's project description fails in both aspects.

1. The future CO_2 sources are a reasonably foreseeable consequence of the initial Project.

The Recirculated Draft EIR's representation of future sources is both lacking and misleading, leaving the document inadequate as an informational document under CEQA.

First, the new "Future Sources – Identification" section downplays the financial dependency of the Project on its CO_2 sources, and in particular the financial relationships between the Project proponent and those sources. The County inappropriately hides behind the argument that all information is provided by the applicant, and that the County is "not party" to financial agreements.[28] 3-013

The County's argument ignores the fact that the applicant *is* a party to these agreements, however, and can shed more light on the financial connections between the CTV I Project and its

[25] RDEIR, Vol. 1 at 3-45 to 3-47.
[26] RDEIR, Vol. 1 at 3-14 to 3-15.
[27] *Laurel Heights*, *supra*, 47 Cal.3d at 396.
[28] RDEIR, Vol. 1 at 3-14.

3-013 Cont'd

future sources. More importantly, this argument ignores publicly available information showing that the financial ties between CRC and its sources go beyond carbon management agreements. In fact, several of these projects contemplate CRC, CTV, or affiliated or subsidiary companies possessing an "equity stake" in the CO_2-sending facilities.[29] As CRC has noted publicly, these projects "play an important role within Carbon TerraVault's strategy" in developing the Project.[30] It is the County's responsibility to ensure it obtains all relevant information from CRC in order to disclose, assess, and mitigate Project impacts.

As explained above, the Recirculated Draft EIR admits that the Project is financially and practically dependent on future sources permitted for injection into the storage reservoirs.[31] The Recirculated Draft EIR's argument that "approval of the project does not […] presume completion […] of any other of the contemplated projects"[32] is thus misleading. This statement downplays the fact that the Project has no practical or financial justification without its CO_2-sending sources. These sources are not just a reasonably foreseeable consequence of the initial Project, but also an inseparable part of it, and must be properly disclosed and analyzed in the Recirculated Draft EIR.[33]

2. The future CO_2 sources are significant because they will likely change the scope or nature of the initial Project or its environmental effects, and the Recirculated Draft EIR must be revised to disclose and analyze these impacts.

3-014

An accurate and stable project description is necessary so that the lead agency and the public have enough information to "ascertain the project's environmentally significant effects,

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[29] CRC, *Carbon TerraVault Provides Second Quarter 2023 Update* (July 31, 2023), https://www.crc.com/news/news-details/2023/Carbon-TerraVault-Provides-Second-Quarter-2023-Update/default.aspx ("CTV JV and Verde are discussing CRC's potential financial participation in the RG facility, including potentially a significant equity stake") (accessed Mar. 1, 2024); CRC, *Carbon TerraVault Announces Two New Storage-Only Carbon Dioxide Management Agreements and Submission of Another Class VI Permit to the EPA* (May 1, 2023), https://www.crc.com/news/news-details/2023/Carbon-TerraVault-Announces-Two-New-Storage-Only-Carbon-Dioxide-Management-Agreements-and-Submission-of-Another-Class-VI-Permit-to-the-EPA/default.aspx ("CTV and InEnTec are discussing CRC's potential financial participation in the rDME facility, including potentially a significant equity stake").

[30] CRC, *Carbon TerraVault Provides Second Quarter 2023 Update* ("This project highlights the value proposition of our CTV Clean Energy Park and its important role within Carbon TerraVault's strategy . . . . We welcome NLCE as a trusted partner in developing and furthering California's decarbonization efforts and supporting Kern county's ambitions to become the leading carbon sequestration area in the state.").

[31] RDEIR, Vol. 1 at 4.8-24.

[32] RDEIR, Vol. 1 at 3-14 to 3-15.

[33] See also James Temple, MIT Technology Review, *The World's on the Verge of a Carbon Storage Boom* (June 12, 2024), https://www.technologyreview.com/2024/06/12/1093477/the-worlds-on-the-verge-of-a-carbon-storage-boom/ ("Carbon sequestration projects can qualify for 12 years of U.S. subsidies. If Carbon TerraVault injects half a million tons of carbon dioxide into each of the 31 wells it has applied for over that time period, the projects could secure tax credits worth more than $15.8 billion.").

assess ways of mitigating them, and consider project alternatives."[34] Information about and analysis of the sources for the CO_2 that will be injected into the CTV I Project's storage facility is crucial for this very reason. The industrial processes that will emit the CO_2, the capture technology, the CO_2 properties, and the mode of transportation to the Project all have major implications for the CTV I Project's impacts on air pollution, greenhouse gas emissions, hazardous materials, and public health, among other issues. 3-014 Cont'd

As just one example, whether CO_2 will be transported to the Project by trucks or pipelines, and the routes of such trucks or the locations of the pipelines, are all critical pieces of information necessary to assess the Project's potential impacts. Courts have held that an EIR for a mining operation failed as an informational document because it failed to include a "description of the facilities that will have to be constructed to deliver water to the mining operation."[35] In the same way, the Recirculated Draft EIR fails to describe the methods and facilities that will be used to send CO_2 into the CTV I Project. As discussed below, the expert Kuprewicz Report attached to these comments also finds that important information regarding pipelines is missing from the Recirculated Draft EIR. 3-015

While the Recirculated Draft EIR provides no information on the methods of CO_2 transportation from its potential sources, its project description section states that "[i]t is anticipated that diesel heavy heavy [sic] duty trucks would make 40 trips per day following the access routes designated for travel"[36] as part of the Project's operational traffic. The Recirculated Draft EIR fails to include *any* explanation as to the reason for these heavy-duty truck trips. Moreover, these trips are not mentioned or analyzed in the transportation analysis section or in the air quality section. 3-016

The "Future Sources – Identification" section added to the Recirculated Draft EIR, listing the specific "industries" that will be allowed to send CO_2 to the Project and the applicable rules, only exacerbates the serious concerns around the Project's impacts that are left undisclosed and unanalyzed. 3-017

First, it appears that instead of reducing emissions, the CTV I Project will instead incentivize new CO_2-emitting and other criteria pollutant-emitting industries, as the list is extremely broad and includes multiple industries and processes, some of which will be new to the area, some of which could be built, permitted, and operated only with a commitment to store the resulting CO_2, and all of which may create both greenhouse gas and criteria pollutant emissions.

The fact that CO_2 source facilities will now be limited to Kern County exacerbates this problem.[37] As shown above, the Project's financial viability is wholly dependent on its CO_2-sending industries. Under this new condition, existing industries that could send CO_2 but are outside the County will not be allowed to do so, thus creating an incentive for new potentially polluting development where it is not actually needed. 3-018

[34] *Sierra Club v. City of Orange* (2008) 163 Cal.App.4th 523, 533.
[35] *Santiago County Water Dist. v. County of Orange* (1981) 118 Cal.App.3d 818, 829.
[36] RDEIR, Vol. 1 at 3-38.
[37] RDEIR, Vol. 1 at 4.11-53.

In this context, it should be noted that the new appendix added to the Recirculated Draft EIR, titled "Source Identification Memo," includes in its discussion of "Source Limitations" the following statement: 3-019

> Any additional CO_2-emitting facilities added to the CTV I carbon hub would be limited to sources that are capable of mitigating criteria pollutants from the CO_2 capture and transportation process with no net increase for existing operations.[38]

This statement limits itself to carbon capture and transportation emissions only, not addressing operational or construction emissions. Tellingly, even this limited statement, or *any* guarantee that future sources would mitigate at least part of their criteria pollutant emissions, is nowhere to be found in the project description. It is also nowhere to be found in Mitigation Measure 4.11-7, the new Measure added to the Recirculated Draft EIR that sets rules for future sources.[39] There is no guarantee that the Project will not incentivize more pollution and more CO_2 emissions. The project description must therefore disclose and analyze these potential impacts.

Second, the list of sources in the Recirculated Draft EIR highlights the risk that the Project will serve to extend the life of fossil fuel sources that will continue to operate under the guise of "zero emission" when they would have been phased out but for the Project: the sources list includes both oil field gas streams and power plants—a fossil fuel and a fossil fuel operated facility—as potential sources.[40] The recirculated cumulative projects list now includes multiple oil and gas operations as well as two existing gas power plants (in an "unknown" location).[41] The Project description fails to provide any details on the potential life extension of these heavy emitters that the Project may cause, or include any measure to safeguard against such impacts. 3-020

B. The Recirculated Draft EIR Improperly Piecemeals the Project.

The Recirculated Draft EIR engages in impermissible piecemealing under CEQA by failing to analyze, at the very least, two projects that should be analyzed as part of the CTV I Project: the Avnos DAC Project and the Hydrogen Project, which will serve as CO_2 sources. 3-021

The new "Future Sources – identification" section of the Recirculated Draft EIR lists the sources allowed to send CO_2 to the Project. The list includes both blue hydrogen and DAC projects.[42]

Both the DAC project and the blue hydrogen project were included in CRC's application to the U.S. EPA for a Class VI injection well permit: "CTV plans to source carbon dioxide initially from Lone Cypress, a proposed hydrogen plant, Elk Hills pre-combustion gas treatment, and the proposed Avnos direct air capture facility."[43] Following the application, EPA issued

[38] RDEIR, Vol. 2, App'x K.4 at 1.
[39] RDEIR, Vol. 1 at 4.11-53.
[40] RDEIR, Vol. 1 at 3-13.
[41] RDEIR, Vol. 1 at 3-45 to 3-47.
[42] RDEIR, Vol. 1 at 3-13.
[43] EPA, *Public Comments Sought on Class VI UIC Injection Well Carbon Storage Draft Permits* (Dec. 2023) at 1.

3-021 Cont'd

draft permits that included both sources, stating the drafts were issued following "a thorough technical review of all information submitted by CTV in its permit application, as well as the operational standards, monitoring requirements, and existing geologic setting", that was sufficient for the EPA to make a determination under the Safe Drinking Water Act.[44]

Recently, the EPA issued revised draft permits that do not include the DAC and hydrogen sources. However, CRC and CTV make clear in their letter to EPA that this removal of sources is happening in the "short-term," and that "even if the Lone Cypress and/or Avnos project does not proceed, CRC expects that over time sources of CO_2 for the 26R UIC permits will likely include hydrogen and direct air capture facilities (among other potential future sources of CO_2)."[45]

Both projects are not only a reasonably foreseeable consequence of the initial CTV I Project, but they are also dependent on the Project.[46] A DAC project, by definition, must be tied to a carbon sequestration reservoir to operate. In the same way, the blue hydrogen project relies on the CTV I Project's sequestration for its operations.[47]

At the same time, the CTV I Project is dependent on these sources. As discussed above, the Recirculated Draft EIR admits the Project's financial and functional viability is dependent on its CO_2 sources.[48] It is also evident that the Project relies on sources beyond the initial source to provide CO_2 for sequestration almost immediately after it begins operations: The Recirculated Draft EIR discloses that at a maximum, the oil field's CO_2 will add up to 203,485 tons per year (tpy) of captured CO_2.[49] But its greenhouse gas analysis projects over 300,000 tons of CO_2 to be injected by its second year—which must come from approved sources beyond the initial source.[50]

Both the DAC and Lone Cypress Hydrogen projects come with their own sets of environmental impacts related to both construction and operations, which will likely affect the CTV I Project's environmental effects. Both projects must therefore be included in the Recirculated Draft EIR, and their potential impacts must be disclosed and analyzed.

[44] EPA, *Public Notice of Intent to Issue a Class VI Underground Injection Control Permit for Carbon TerraVault JV Storage Company Sub 1, LLC* (Dec. 2023) at 1.
[45] Letter from Travis Hurst, CRC and CTV, to David Albright, EPA Groundwater Protection Section (June 17, 2024) at 1–2.
[46] *Paulek v. Dept. of Water Res.* (2014) 231 Cal.App.4th 35.
[47] The fact that the Lone Cypress application was recently withdrawn does not change the fact that a blue hydrogen project was analyzed as a likely CO_2 source for the CTV I Project by EPA.
[48] RDEIR, Vol. 1 at 4.8-24.
[49] RDEIR, Vol. 1 at 3-2.
[50] To add sources beyond these permitted sources, the CTV I Project's proponent will have to go through a process of further application, review, and approval by EPA. RDEIR, Vol. 2, App'x E.3 – 26R Storage Project Draft Permits.

C. The Recirculated Draft EIR Contains Contradictory Statements Regarding the Project Description.

The "Future Sources – identification" list in the project description section also contradicts other sections of the Recirculated Draft EIR, particularly its greenhouse gas (GHG) analysis: The GHG analysis claims that future CO_2 sources will come from "essential but hard to decarbonize" industries.[51] As discussed in detail in our comments below on the Recirculated Draft EIR's GHG analysis, several sources in the new list cannot be categorized as "essential but hard to decarbonize" industries by any stretch of the term.[52] 3-022

As discussed more fully below in the GHG analysis section of these comments, some of the sources are not considered appropriate industries for GHG reduction purposes, as they do not have an end product or service. The term "hard to decarbonize" is also completely irrelevant to fossil fuels (like oil field gas) or to fossil fuel-based plants (like gas power plants) that appear in the list. These fuels and facilities are not "hard to decarbonize"—they are the very source of CO_2 that decarbonization efforts aim to eliminate. The Recirculated Draft EIR must be revised to provide a coherent and consistent description and analysis of future CO_2 sources.

D. The Recirculated Draft EIR's Project Description Fails to Disclose Important Project Elements.

The Recirculated Draft EIR is missing important project description information. The original Draft EIR included aerial photos and drawings showing the site layout and the potential locations for the Project's amine units. In the Recirculated Draft, the County inexplicably removed three figures: Figure 3-5 that showed Phase 1 Amine Unit and Possible Relocation Sites for Phase 2 Amine Unit, and Figures 3-6 and 3-7 that showed the existing and new components of each of the two sites in the 26R reservoir. The project description is now missing important information on the location and layout of its components that must be included in a revised draft to properly serve as an informational document and provide the public with sufficient details.[53] 3-023

E. The Recirculated Draft EIR Fails to Disclose or Address the Impacts of CRC's Merger with Aera Energy.

As is clear from public statements from CRC and other significant media coverage throughout 2024,[54] the CTV I Project proponent has now successfully facilitated a merger that has resulted in the combination of CRC and Aera Energy LLC (Aera).[55] CRC now owns Aera 3-024

[51] RDEIR, Vol. 1 at 4.8-26.
[52] See section V.B.1.b of this comment letter.
[53] *Laurel Heights, supra*, 47 Cal.3d at 405.
[54] See, e.g., Fassler, Joe, DeSmog, *As CRC Prepares to Buy Aera, New Law to Stem Orphan Wells Faces its First Test* (Mar. 18, 2024), https://www.desmog.com/2024/03/18/california-resources-corporation-aera-energy-merger-orphan-idle-wells-ab-1167/; Cantu, Aaron, Capital & Main, *Will California's Largest Oil Well Owner Get a Pass on Paying to Clean Up Its Mess?* (June 18, 2024), https://capitalandmain.com/will-californias-largest-oil-well-owner-get-a-pass-on-paying-to-clean-up-its-mess.
[55] Securities and Exchange Com., CRC, Form 8-K (June 28, 2024), Ex. 10.2, Agreement and Plan of Merger (Feb. 7, 2024).

and its significant number of wells and pore space in California, making the combined entity the largest oil and gas company in the state.[56]

3-024 Cont'd

This merger is clearly "significant in that it will likely change the scope or nature of the initial project or its environmental effects."[57] As CRC publicly states, the acquisition of Aera "doubles CRC's premium CO_2 pore space in the San Joaquin Basin."[58] According to a news release, CRC is expecting to expand its carbon management business "through the addition of surface acreage and rights, and significant new carbon dioxide (CO) pore space to enable future carbon capture and sequestration (CCS) development."[59] This new storage potential at the Project site is clearly viewed by CRC as a financial opportunity that can generate significant profits.[60] CRC further states it expects to obtain a pending EPA Class VI permit and apply for additional similar projects in oil fields around CTV I.[61] CRC thus appears to view CTV I as part of a larger project, stating that it "will have the potential to nearly double its injection rate capacity near CTV I, creating a premier 'decarbonization hub' for CO_2 storage."[62]

The County's failure to address the merger and its impacts on CTV I in this Recirculated Draft EIR, despite information being publicly available regarding the merger throughout 2024, violates CEQA and renders the document deficient. The Recirculated Draft EIR should disclose and analyze this potential expansion of the Project's scope and its impacts, particularly as part of the project description analysis.

II. THE RECIRCULATED DRAFT EIR FAILS TO ANALYZE GROWTH-INDUCING IMPACTS

3-025

CEQA requires the Recirculated Draft EIR to describe growth-inducing impacts of the CTV I Project,[63] including ways in which the Project could directly or indirectly foster economic growth that could lead to an adverse physical change to the environment.[64]

In a one-paragraph discussion, the Recirculated Draft EIR explains that because Project operation would include five regular full-time employees, with five potential additional maintenance employees, the Project "would not result in a substantial influx of people" and "is not likely to induce any growth within Kern County."[65]

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[56] CRC, Press Release, *California Resources Corporation to Combine with Aera Energy* (Feb. 7, 2024), https://www.crc.com/news/news-details/2024/California-Resources-Corporation-to-Combine-with-Aera-Energy/default.aspx.
[57] *Laurel Heights, supra*, 47 Cal.3d at 396.
[58] CRC and Aera, Press Release, *Expanding Our Leading Energy Platform* (Feb. 24, 2023) at 6.
[59] CRC and Aera, Press Release, *California Resources Corporation to Combine with Aera Energy* at 2.
[60] *Id.* at 6 ("Incremental pore space has the potential to generate significant EBITDA, ranging from $70MM to $180MM.").
[61] *Id.*
[62] *Id.*
[63] Pub. Resources Code, § 21100(b)(5); CEQA Guidelines, § 15126(d).
[64] CEQA Guidelines, §§ 15126.2(d), 15064(e); *Bakersfield Citizens for Local Control v. City of Bakersfield* (2004) 124 Cal.App.4th 1184, 1205.
[65] RDEIR, Vol. 1 at 5-8.

By focusing on the projected number of employees in the CTV I Project alone, the Recirculated Draft EIR ignores the requirement to discuss the ways in which a proposed project could foster *economic growth*, not only population growth, directly or indirectly.[66] Clearly, as described above, the CTV I Project is just the first step in a much larger development for which CTV has already signed multiple CDMAs. In addition, the storage capacity proposed for approval can accommodate many more metric tons of CO_2 than the Recirculated Draft EIR analyzes. Further economic growth from the Project is clearly what the Project proponents and the County envision, and it should be analyzed. 3-025 Cont'd

Moreover, a report prepared for the County to analyze the potential fiscal and economic benefits of a carbon management park found significant economic growth from such a park development: The potential volume ("output") associated with the carbon management park and related offsite activities is projected in the report to range from $4.5 billion to $6.9 billion per year. Regarding employment, the report finds that, at full buildout, the park and related offsite activities would directly and indirectly support 13,500 to 22,000 permanent jobs.[67] While this report does not directly analyze the specific projects envisioned for the Elk Hills oil field, it shows the potential economic growth that needs to be discussed under a proper growth-inducing analysis. 3-026

III. THE RECIRCULATED DRAFT EIR FAILS TO PROVIDE ADEQUATE PROJECT OBJECTIVES

The Recirculated Draft EIR does not provide an adequate set of project objectives. The document articulates no purpose, need, or objectives for the CTV I Project independent of a list of "the applicant's objectives" for the Project.[68] Because, as discussed below, the integrity and validity of an alternatives analysis depends in significant part on the articulation and assessment of the lead agency's project objectives, an EIR that lacks an adequate statement of those objectives will not be in compliance with CEQA. This deficiency is compounded by the likelihood that the Project will both attract and incentivize the construction of new CO_2-generating facilities instead of focusing on reducing and sequestering CO_2 emissions from existing facilities, and also be used as a rationale to extend the life of existing fossil-fuel infrastructure whose utility otherwise may cease sooner. 3-027 3-028

Here, the Recirculated Draft EIR states:

The following are the applicant's project objectives: 3-029

- Construct and operate a permanent underground storage facility to develop and use existing CO_2 storage capacity at Elk Hills in an economically feasible manner.

[66] CEQA Guidelines, § 15126.2(e).
[67] The Natelson Dale Group Inc., *Analysis of Potential Fiscal and Economic Benefits of Kern County Carbon Management Industry* (Apr. 4, 2023) at 6, https://psbweb.kerncounty.com/planning pdfs/cmbp/CMBP_Potential_Fiscal_Economic_Benefit_Analysis.pdf.
[68] RDEIR, Vol. 1 at 1-5, 3-7, 6-7 to 6-8.

- Contribute to CRC's adopted goals of Full-Scope Net Zero emissions for Scope 1 (direct greenhouse gas emissions), Scope 2 (indirect greenhouse gas emissions associated with the purchase of electricity/steam/heat/cooling) and Scope 3 (all other indirect greenhouse gas emissions resulting from the company's business operations) emissions by 2045 by capturing and storing CO_2 emissions from CRC's Elk Hills field gas operations.
- Support California's Executive Order B-55-18, for California to achieve carbon neutrality by 2045 and net negative emissions thereafter.
- Site and design the project in an environmentally responsible manner consistent with current Kern County and California guidelines.
- Promote economic development and bring living-wage jobs to Kern County.[69]

3-029 Cont'd

The Recirculated Draft EIR articulates no purpose, need, or objectives for the CTV I Project independent of this list of "the applicant's objectives" for the Project. But without a purpose, need, and objectives adopted by the lead agency, the Recirculated Draft EIR cannot meaningfully assess impacts and develop or compare a reasonable range of alternatives to the proposed Project.[70]

Finally, the Project's objectives were revised in the Recirculated Draft EIR such that the Project's goal of contributing to CRC's "adopted goals of Full-Scope Net Zero emissions" is now qualified by the sentence "by capturing and storing CO_2 emissions from CRC's Elk Hills field gas operations."[71] This suggests that the Project will intentionally serve to extend the life of fossil fuels—making that a specific objective of the project, in tension with objectives that support carbon emissions reduction. Because the applicant operates the oil field that will be a major source of CO_2 for the storage facility, and this facility appears to be designed at least in part to enable the oil field operations to continue to emit Scope 1, 2, and 3 emissions and to facilitate the development and operation of new GHG-emitting facilities, working against state carbon neutrality goals, it is particularly important to scrutinize the project objectives and ensure they reflect public agency goals.

3-030

IV. THE RECIRCULATED DRAFT EIR FAILS TO ANALYZE ADEQUATE ALTERNATIVES

The Recirculated Draft EIR is also unlawful for failing to properly put forward, describe, and analyze a reasonable range of alternatives. Under CEQA, a proper analysis of alternatives is essential to comply with the Act's mandate that significant environmental impacts be avoided or

3-031

[69] RDEIR, Vol. 1 at 1-5, 3-7, 6-7 to 6-8.
[70] *North Coast Rivers Alliance v. Kawamura* (2015) 243 Cal.App.4th 647, 666 (citing Pub. Resources Code, §21001(g) (internal quotation omitted)) ("[t]he process of selecting the alternatives to be included in the EIR begins with establishment of project objectives by the lead agency"); see also CEQA Guidelines, §15124(b) (stating an EIR requires a statement of the objectives sought by the proposed project).
[71] RDEIR, Vol. 1 at 3-7.

substantially lessened where feasible.[72] The analysis of alternatives lies at the "core of an EIR,"[73] and an EIR must "ensure that all reasonable alternatives to proposed projects are thoroughly assessed by the responsible official."[74]

3-031 Cont'd

The purpose of the requirement to contemplate alternatives is to identify ways to mitigate or avoid the significant effects of a project.[75] "[A]n agency may not approve a proposed project if feasible alternatives exist that would substantially lessen its significant environmental effects."[76] The alternatives discussion must be "meaningful" and must "contain analysis sufficient to allow informed decision making."[77] The alternatives analysis is critical to the integrity of an EIR.[78] An EIR must "ensure that all reasonable alternatives to proposed projects are thoroughly assessed by the responsible official."[79] An alternatives analysis under CEQA must focus on potentially feasible alternatives to the project, even if these alternatives would impede to some degree the attainment of project objectives, or would be more costly.[80]

As explained below, the Recirculated Draft EIR's alternatives discussion fails to comply with CEQA. The alternatives discussion is flawed for at least seven reasons: (1) it relies on an inadequate project description; (2) it relies on an inadequate set of project objectives; (3) it relies on an inadequate understanding of the Project's own impacts; (4) it fails to consider a reasonable range of alternatives; (5) it fails to properly or coherently discuss the "no project" alternative and compare it to the Project; (6) it fails to meaningfully describe or analyze the action alternatives it considers; and (7) it fails to provide substantial evidence to support its comparisons of alternatives to the proposed Project. The Recirculated Draft EIR must be revised to properly analyze project alternatives, as required by CEQA.

3-032

[72] Pub. Resources Code, § 21002; CEQA Guidelines, §§ 15002(a)(3), 15021(a)(2), 15126(d); *Citizens for Quality Growth v. City of Mount Shasta* (1988) 198 Cal.App.3d 433, 443–45.
[73] *Citizens of Goleta Valley v. Bd. of Supervisors* (1990) 52 Cal.3d 553, 564.
[74] *San Joaquin Raptor/Wildlife Rescue Center v. County of Stanislaus* (1994) 27 Cal.App.4th 713, 735; see also Pub. Resources Code, § 21002.1(a).
[75] Pub. Resources Code, § 21002.1.
[76] *Save Panoche Valley v. San Benito County* (2013) 217 Cal.App.4th 503, 52 (citations omitted); see also Pub. Resources Code, §21081(a); CEQA Guidelines, §15091(a)(3); *Cal. Native Plant Society v. City of Santa Cruz* (2009) 177 Cal.App.4th 957, 1002.
[77] *Laurel Heights*, *supra*, 47 Cal.3d at 403–04.
[78] *In re Bay-Delta Programmatic Envtl. Impact Report Coordinated Proceedings*, 43 Cal.4th 1143, 1162 (2008) ("The EIR is the heart of CEQA, and the mitigation and alternatives discussion forms the core of the EIR.").
[79] *San Joaquin Raptor/Wildlife Rescue Center*, *supra*, 27 Cal.App.4th at 735; see also Pub. Resources Code, § 21002.1(a).
[80] CEQA Guidelines, § 15126.6(b), (f); see also Pub. Resources Code, § 21102.1(a) ("The purpose of an environmental impact report is to identify the significant effects on the environment of a project, to identify alternatives to the project, and to indicate the manner in which those significant effects can be mitigated or avoided.").

A. The Recirculated Draft EIR Cannot Properly Consider Alternatives Without an Adequate Project Description, Adequate Description of the Lead Agency's Project Objectives, and Adequate Analysis of Project Impacts.

The Recirculated Draft EIR's alternatives analysis fails in three threshold ways: it is not based on an adequate project description, it does not articulate a public purpose and need for the Project, and it does not describe, assess, or analyze impacts properly. These deficiencies render the alternatives analysis inadequate. 3-033

First, the Recirculated Draft EIR's alternatives analysis is flawed because it is not based on a stable, accurate project description. As demonstrated above, the Recirculated Draft EIR's analysis and mitigation are based on an improper project description that understates and misstates the CTV I Project's scope, and omits integral components of the full Project. Without a proper project description, it is not possible to effectively develop alternatives or compare Project impacts with alternatives in a way that is coherent and supported by substantial evidence.

Second, without a proper description of the Project's purpose and need and a set of project objectives adopted by the lead agency, it is impossible to adequately assess alternatives to the Project in a way that complies with CEQA. 3-034

A proper statement of the lead agency's project objectives is essential to the development of an adequate alternatives analysis. This principle is apparent throughout the Guidelines and case law. For example, "[t]he process of selecting the alternatives to be included in the EIR begins with establishment of project objectives by the lead agency."[81] The Recirculated Draft EIR must include "[a] clearly written statement of objectives," as this will guide the County in developing a reasonable range of alternatives.[82] CEQA Guidelines section 15124(b) notes that a "clearly written statement of objectives will help the lead agency develop a reasonable range of alternatives to evaluate in the EIR and will aid the decision makers in preparing findings or a statement of overriding considerations, if necessary."[83] That statement of the *lead agency's* objectives, in informing the *lead agency's* reasonable range of alternatives to a proposed project, cannot simply be delegated to a project proponent.

Moreover, "[a] lead agency may not give a project's purpose an artificially narrow definition. An agency 'may structure its EIR alternative analysis around a reasonable definition of underlying purpose and need not study alternatives that cannot achieve that basic goal. For example, if the purpose of the project is to build an oceanfront resort hotel or a waterfront aquarium [citation], a lead agency need not consider inland locations.'"[84] This principle requires, again, that the lead agency take responsibility for articulating the project purpose and need as well as the project objectives.

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[81] *North Coast Rivers Alliance*, *supra*, 243 Cal. App.4th at 666 (citing Pub. Resources Code, §21001(g) (internal quotation omitted)); see also CEQA Guidelines, §15124(b) (stating an EIR requires a statement of the objectives sought by the proposed project).
[82] CEQA Guidelines, § 15124(b).
[83] CEQA Guidelines, § 15124(b).
[84] *North Coast Rivers Alliance*, *supra*, 243 Cal.App.4th at 668 (citing *Bay–Delta*, *supra*, 43 Cal.4th at 1166 [internal citations omitted]).

Here, as noted above, the Recirculated Draft EIR articulates no purpose, need, or objectives for the Project independent of a list of "the applicant's objectives" for the Project.[85] The Recirculated Draft EIR contains no further discussion of purpose, need, or objectives beyond this list. But, as reflected in the case law and Guidelines,[86] it is not possible for a lead agency to meaningfully undertake an independent evaluation of alternatives if the agency uncritically uses an applicant's objectives as the benchmark for evaluation, and fails to include its own statement of purpose and objectives. A range of alternatives that is based exclusively on "the applicant's project objectives," and not incorporating any public purpose, need, or objectives that have been adopted by the lead agency, thus cannot comply with CEQA. Moreover, reliance exclusively on applicant project objectives is particularly inappropriate where there are unmitigable significant impacts that will require the County to find overriding considerations, given the need for the objectives to "aid the decision makers in preparing findings or a statement of overriding considerations, if necessary."[87] 3-034 Cont'd

Third, without a proper analysis of the Project's impacts, any alternatives analysis is necessarily flawed because the comparison of Project impacts to the anticipated impacts of alternatives will be unsupported by substantial evidence. Here, the significant deficiencies in the Recirculated Draft EIR's analysis of Project impacts make any comparison of those impacts with the impacts of proposed alternatives meaningless. 3-035

This deficiency in the Recirculated Draft EIR—flawed impact analysis leading to flawed alternatives analysis—is apparent across multiple impact areas, discussed throughout these comments. Any comparison of the impacts of the Project with the impacts of alternatives will fail if the Project impacts are misstated or improperly analyzed. But the deficiency is most glaring in the context of GHG impacts, where the Recirculated Draft EIR's alternatives analysis asks its readers to accept a paradox: first, the Project will have significant unmitigable impacts on GHG emissions.[88] Second, the no-project alternative will have less-than-significant impacts on GHG emissions.[89] And third, at the same time, according to the Recirculated Draft EIR, the no-project 3-036

[85] RDEIR, Vol. 1 at 3-7, 6-7 to 6-8.
[86] *North Coast Rivers Alliance*, *supra,* 243 Cal.App.4th at 666 (citing Pub. Resources Code, §21001(g) (internal quotation omitted)); see also CEQA Guidelines, §15124(b).
[87] CEQA Guidelines, § 15124(b); see *Preservation Action v. San Jose* (2006) 141 Cal.App.4th 1336, 1351–52 ("Since CEQA charges the agency, not the applicant, with the task of determining whether alternatives are feasible, the circumstances that led the applicant in the planning stage to select the project for which approval is sought and to reject alternatives cannot be determinative of their feasibility. The lead agency must *independently* participate, review, analyze and discuss the alternatives in good faith." [citing *Kings County Farm Bureau v. City of Hanford* (1990) 221 Cal.App.3d 692, 736]).
[88] RDEIR, Vol. 1 at 4.8-28 ("Level of Significance After Mitigation: [GHG] Impacts would be significant and unavoidable."), 4.8-31 (same), 6-5 to 6-6 ("the project would conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing emissions of GHG, thus causing a significant and unavoidable impact, even with mitigation. Finally, the project would make a cumulatively considerable contribution to a cumulative GHG emissions impact, even with mitigation, and this impact is therefore significant and unavoidable"), 6-22 (Project GHG impacts "significant and unavoidable").
[89] RDEIR, Vol. 1 at 6-14 ("Impacts would be less than significant under this alternative [Alternative 1, the "no project" alternative]").

alternative's impacts are "greater than project" impacts.[90] On its face, this analysis cannot stand scrutiny, since it is internally inconsistent. This internal inconsistency, in turn, is a consequence of a fundamental failure in the underlying Project GHG analysis and conclusions, as discussed below. 3-036 Cont'd

These analytical failures render the Recirculated Draft EIR's alternatives analysis deficient. And beyond that, the failures also constitute fundamental informational deficiencies in the document. It is not possible for the public or a decisionmaker to compare the alternatives meaningfully if the conclusions being compared are incoherent or internally inconsistent, as is the case here.

B. The Recirculated Draft EIR Fails to Adequately Consider a Reasonable Range of Alternatives.

An EIR must consider a reasonable range of alternatives which "offer substantial environmental advantages over the project proposal."[91] The Public Resources Code makes it clear that proper alternatives need to "substantially lessen" the significant environmental effects of a project.[92] Here, the Recirculated Draft EIR rejects without analysis several alternatives that meet that criterion and satisfy at least some project objectives. This improper failure to consider alternatives appears to have occurred, at least in part, because the applicant's project objectives are drawn too narrowly,[93] and the applicant's conception of "feasibility" is improperly constrained.[94] 3-037

The lead agency, not the applicant, bears the responsibility to evaluate alternatives based on project objectives, as demonstrated above.[95] "[A]n agency may not approve a proposed project if feasible alternatives exist that would substantially lessen its significant environmental effects."[96] The lead agency also must evaluate feasibility based on objective criteria. "Feasible" means "capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, and technological factors."[97]

Here, the Recirculated Draft EIR should have considered a wider range of alternatives that minimize or avoid impacts from the proposed Project. Alternatives that involve eliminating or reducing oil extraction from CRC's oil fields, for example, satisfy most of even the applicant's project objectives, including contributing to CRC's adopted goals of Full-Scope Net 3-038

[90] RDEIR, Vol. 1 at 6-22 (no-project alternative's GHG impacts identified as "Greater Than Project"), 6-24 ("Alternative 1, the No Project Alternative[,] would be environmentally superior to the project on the basis of the minimization or avoidance of physical environmental impacts but *would have greater impacts than the project for GHG emissions*" [emphasis added]).

[91] *Citizens of Goleta Valley*, *supra*, 52 Cal.3d at 566.
[92] Pub. Resources Code, § 21002; see also CEQA Guidelines, § 15126.6(a).
[93] *North Coast Rivers Alliance*, *supra*, 243 Cal.App.4th at 668.
[94] *Preservation Action*, *supra*, 141 Cal.App.4th at 1351–52.
[95] *Kings County Farm Bureau*, *supra*, 221 Cal.App.3d at 736; *Preservation Action*, *supra*, 141 Cal.App.4th at 1351–52.
[96] CEQA Guidelines, § 21081; *Mountain Lion Foundation v. Fish Game Com.* (1997) 16 Cal.4th 105, 134.
[97] Pub. Resources Code, § 21061.1; *Cal. Native Plant Society*, *supra*, 177 Cal.App.4th at 960.

Zero emissions by 2045, supporting California's Executive Order B-55-18, and siting and designing the Project in an environmentally responsible manner. If the goal is to keep oil field-generated CO_2 out of the atmosphere, there are alternative ways to accomplish this that the Recirculated Draft EIR fails to consider. 3-038 Cont'd

The Recirculated Draft EIR should be revised to consider these and other reasonable alternatives, as required under CEQA.

C. The Recirculated Draft EIR's Discussion of Alternative 1, the "No Project" Alternative, is Inadequate Under CEQA.

The Recirculated Draft EIR's "no project" alternative discussion provides a brief examination, unsupported by evidence or analysis, of the environmental consequences of not permitting the Project or any alternative. This summary discussion of Alternative 1 is inadequate under CEQA because it fails to include basic information about the no-project alternative. 3-039

The CEQA Guidelines require that the no project analysis discuss "what would be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services."[98] Here, however, the discussion lacks "adequate information regarding the no-project alternative" that would allow the decisionmakers to make "an informed, reasoned decision on whether this Project should go forward."[99] In *Save the Hill Group v. City of Livermore*, the court found that a "no-project" alternative that failed to provide adequate information as to what would be reasonably expected to occur if a project would not go forward was in violation of CEQA, and set the EIR approval aside.[100]

The same reasoning applies here. The Recirculated Draft EIR should contrast the impacts of the proposed Project with the impacts of the no-project alternative, with specificity and, where possible, quantification, across all impact categories. It should provide a "factually based forecast of the environmental impacts of preserving the status quo."[101] Instead, the Recirculated Draft EIR includes a cursory narrative discussion, with no supporting evidence or analysis, articulating only what the applicant asserts the consequences of the no-project alternative would be. The Recirculated Draft EIR then bases its comparison with the proposed Project on this thin, non-evidence-based discussion.

This missing information is, in the words of the *Save the Hill Group* court, "just the sort of information CEQA intended to provide those charged with making important, often irreversible, environmental choices on the public's behalf."[102] The alternatives analysis must be revised to provide a robust discussion of the "no-project" reasonable consequences.

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[98] CEQA Guidelines, § 15126.6(e)(2).
[99] *Save the Hill Grp. v. City of Livermore* (2022) 76 Cal.App.5th 1092, 1113, review denied (July 13, 2022).
[100] *Id.* at 1113.
[101] *Ctr. for Biological Diversity v. Dept. of Fish & Wildlife* (2015) 234 Cal.App.4th 214, 253.
[102] *Save the Hill Grp.*, *supra*, 76 Cal.App.5th at 1113.

Additionally, as discussed above, the analysis of the no-project alternative is inadequate because the comparison between the no-project alternative and the proposed Project is misleading, inconsistent, and incoherent. The Recirculated Draft EIR's characterization of Alternative 1 as having greater GHG impacts than the Project, in particular, reflects a failure to adequately and coherently describe and analyze this alternative as well as a failure to coherently analyze the Project's impacts.[103] 3-040

Finally, an adequate analysis of Alternative 1 would also address the failures, highlighted elsewhere in these comments, in framing project objectives and in neglecting to analyze the fact that the Project is designed to facilitate and justify the continued extraction of oil and burning of fossil fuels for energy. An adequate comparative analysis between the impacts of Alternative 1 and the Project would require analysis of the Project's sources of CO_2 and of the Project's facilitation of fossil fuel extraction and combustion. 3-041

D. The Recirculated Draft EIR Fails to Adequately Describe or Analyze Alternatives 2 and 3.

The Recirculated Draft EIR's discussion of the two "action" alternatives, DAC (Alternative 2) and nature-based carbon storage (Alternative 3), is cursory and lacking in specificity, evidence, and support.[104] The Recirculated Draft EIR not only fails to describe either alternative with specificity, but also fails to disclose or even meaningfully attempt to discuss the projected impacts of either alternative. As a consequence, the document fails to support its conclusions—where it compares alternatives' impacts with the Project's impacts—with substantial evidence. 3-042

First, Alternative 2, the DAC Alternative, fails to specify any of the major features of the hypothetical DAC facility that forms the basis of the alternative. The Recirculated Draft EIR does not even attempt to explain, for example, what technology would be used, the size and throughput of the facility, what infrastructure would be built and where, or what resources it would take to build and maintain that infrastructure and operate the facility. Instead, the document presents only a discussion of the generalized features of DAC technology and facilities, with not one word about how those features might or might not appear in the application of DAC as an alternative to the proposed Project, as discussed earlier in these comments.[105] The Recirculated Draft EIR then fails even to make a serious attempt to assess the

[103] Compare RDEIR, Vol. 1 at 4.8-28 ("Level of Significance After Mitigation: [GHG] Impacts would be significant and unavoidable."), 4.8-31 (same), 6-5 ("the project would conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing emissions of GHG, thus causing a significant and unavoidable impact, even with mitigation. Finally, the project would make a cumulatively considerable contribution to a cumulative GHG emissions impact, even with mitigation, and this impact is therefore significant and unavoidable"); 6-22 (Project GHG impacts "significant and unavoidable"), 6-14 ("Impacts would be less than significant under this alternative [Alternative 1, the "no project" alternative]") with Draft EIR, Vol. 1 at 6-22 (no-project alternative's GHG impacts identified as "Greater Than Project"), 6-24 ("Alternative 1, the No Project Alternative[,] would be environmentally superior to the project on the basis of the minimization or avoidance of physical environmental impacts but *would have greater impacts than the project for GHG emissions*" [emphasis added]).

[104] RDEIR, Vol. 1 at 6-17 to 6-21 (containing the Draft EIR's entire discussion of these two alternatives).

[105] RDEIR, Vol. 1 at 6-17 to 6-20 (containing the Draft EIR's discussion of Alternative 2, in full).

impacts of the DAC alternative in each impact category[106]—a task that would have been fruitless, given the lack of specificity about the alternative's basic features. Correspondingly, the Recirculated Draft EIR and appendices do not contain evidence, methodology, modeling, or calculations regarding any such impacts. And following from this, there is no substantial evidence—indeed, no evidence at all—supporting the Recirculated Draft EIR's comparison of Project impacts with the purely speculative conclusions about the DAC alternative's impacts. Nor is the brief discussion of whether Alternative 2 meets project objectives[107] supported by substantial evidence, for the same reasons—and additionally because, as explained above, the project objectives themselves are fatally flawed. The lead agency is required to meaningfully develop and analyze this alternative, and has failed entirely to do that.

3-042 Cont'd

Second, Alternative 3, the "Nature Based Carbon Storage" alternative, also fails to meaningfully specify any of the features of the alternative. While the Recirculated Draft EIR sets forth some general ideas about what types of features this potential alternative might include, the alternative remains completely unformed and unanalyzed.[108]

3-043

This text, with the "example" of "planting of trees," comes closest to articulating the features of Alternative 3:

> The most applicable nature-based carbon storage alternative for the area of the project site would be regenerative agriculture, as it coincides with the current zoning. Planting of trees would be one example of regenerative nature-based carbon storage for the highest ability to store atmospheric carbon.[109]

It is clear on its face that this statement does not present a specific alternative to the proposed Project. As with Alternative 2, the Recirculated Draft EIR lacks any discussion, beyond the speculation above, of what technology will be used, much less how the alternative would be configured, or what, specifically, it would entail.[110] And the closest the Recirculated Draft EIR comes to articulating the scope or size of this alternative is in a purely conditional, hypothetical statement: "If 9,000 acres of the project site were remediated of all oil and gas facilities and prepared for planting, an estimated 400 to 1,000 trees per acre could be planted, resulting in a new forest area of 3.6 million to 9 million trees."[111] Notably, even all these hypothetical statements in the Recirculated Draft EIR lack any evidence or foundation in the document or appendices, but instead just appear as assertions, without any references or citations to articulate or support any methodology, analysis, or conclusions.

Accordingly, there is no meaningful analysis of either the features or impacts of the alternative, making it impossible to compare the Project's impacts with the alternative's impacts, and making the conclusions in that attempted comparison lacking in substantial evidence for support. Nor is the brief discussion of whether Alternative 3 meets project objectives[112]

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[106] *Id.*
[107] *Id.*
[108] RDEIR, Vol. 1 at 6-20 to 6-21 (containing discussion of Alternative 3, in full).
[109] RDEIR, Vol. 1 at 6-20.
[110] RDEIR, Vol. 1 at 6-19 to 6-21.
[111] RDEIR, Vol. 1 at 6-20.
[112] RDEIR, Vol. 1 at 6-21.

supported by substantial evidence, for the same reasons—and additionally because, as explained above, the project objectives themselves are fatally flawed. 3-043 Cont'd

V. THE RECIRCULATED DRAFT EIR FAILS TO ANALYZE AND MITIGATE SIGNIFICANT IMPACTS

3-044

The discussion of a proposed project's environmental impacts is an essential component of an EIR.[113] The fundamental purpose of CEQA is to "inform the public and its responsible officials of the environmental consequences of their decisions *before* they are made."[114] To do so, an EIR must contain facts *and* analysis, not just an agency's bare conclusions.[115]

As explained in detail below, the Recirculated Draft EIR's environmental impacts analysis is deficient under CEQA because it fails to provide the necessary facts and analysis to allow the County and the public to make informed decisions about the CTV I Project.

CEQA also requires an EIR to describe and adopt all feasible mitigation measures to address a project's significant environmental impacts.[116] Mitigation measures must be "fully enforceable through permit conditions, agreements, or other legally binding instruments."[117]

Generally, the "[f]ormulation of mitigation measures should not be deferred until some future time."[118] As an exception, "measures may specify performance standards which would mitigate the significant effect of the project and which may be accomplished in more than one specified way."[119] Crucially, there is a "distinction between stating a generalized goal and adopting specific performance criteria," and "[s]imply stating a generalized goal for mitigating an impact does not allow the measure to qualify for the exception to the general rule against the deferred formulation of mitigation measures."[120] Further, even where the deferred formulation of mitigation might be allowable, there is a point beyond which delayed implementation is not allowed: "[o]nce the project reaches the point where activity will have a significant adverse effect on the environment, the mitigation measures must be in place."[121]

"Where several measures are available to mitigate an impact, each should be discussed and the basis for selecting a particular measure should be identified."[122]

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[113] See CEQA Guidelines, § 15126.2(a) ("An EIR *shall* identify and focus on the significant effects of the proposed project on the environment.") (emphasis added).
[114] *Laurel Heights Improvement Assn. v. Regents of Univ. of Cal.*, 6 Cal.4th 1112, 1123.
[115] *Citizens of Goleta Valley*, *supra*, 52 Cal.3d at 568.
[116] Pub. Resources Code, § 21002; CEQA Guidelines, § 15126.4(a)(1).
[117] CEQA Guidelines, § 15126.4(a)(1)(B), (a)(2).
[118] CEQA Guidelines, § 15126.4(a)(1)(B).
[119] *King & Gardiner Farms, LLC v. County of Kern* (2020) 45 Cal.App.5th 814, 856.
[120] *Id.* at 856.
[121] *Id.* at 860, quoting *POET, LLC v. Cal. Air Resources Bd.* (2013) 218 Cal.App.4th 681, 738.
[122] CEQA Guidelines, § 15126.4(a)(1)(B).

As discussed below, throughout the Recirculated Draft EIR, the County's proffered mitigation measures are insufficient, riddled with inconsistencies, and ultimately not adequate to satisfy CEQA's legal requirements. 3-044 Cont'd

A. The Recirculated Draft EIR's Analysis and Mitigation of Air Quality Impacts is Inadequate.

1. The Recirculated Draft EIR states heavy-duty truck traffic is expected for Project operations but does not describe or analyze the impacts of such traffic.

Within the chapter on project description, in the section for "Operational and Maintenance Activities," the Recirculated Draft EIR describes five full-time employees who will be onsite at all times and another five employes who may need to be onsite when repairs or other maintenance is required.[123] The Recirculated Draft EIR calculates "Operational Traffic" for these employees, who are expected to collectively make 20 daily trips in "Passenger Vehicles."[124] 3-045

Separately, the discussion of "Operational Traffic" includes a heading for "Truck Traffic," which is followed by one sentence that states: "It is anticipated that diesel heavy heavy-duty trucks would make 40 trips per day following the access routes designated for travel."[125] No further information on the nature, purpose, or impacts of this operational heavy-duty truck traffic is provided in the project description chapter. Nor is there any further discussion anywhere else in the Recirculated Draft EIR.

As noted above, the Recirculated Draft EIR must be revised to thoroughly explain this aspect of the CTV I Project. Based on the County's previous statement in the Notice of Preparation/Initial Study that "[t]he proposed project would take local industrial sources of CO_2 that are transported by a combination of truck, pipeline and/or rail to the dedicated Class VI injection wells for the project,"[126] it seems likely these trucks will be carrying CO_2 from offsite industrial sources

In addition to fully explaining the nature and purpose of the operational heavy-duty truck trips in the project description, the impacts of such heavy-duty truck traffic during Project operation must be analyzed and mitigated consistent with CEQA's requirements. As acknowledged in the Notice of Preparation/Initial Study, truck and other vehicle traffic threatens significant direct and cumulative impacts in at least the following categories: air quality, energy demand and consumption, greenhouse gas emissions, hazards and hazardous materials, noise, and transportation and traffic.[127] Depending on the nature and purpose of the operational heavy-duty truck traffic, additional significant impacts are possible. 3-046

[123] RDEIR, Vol. 1 at 3-38.
[124] RDEIR, Vol. 1 at 3-35 to 3-38.
[125] RDEIR, Vol. 1 at 3-38.
[126] *Notice of Preparation/Initial Study* at 4.
[127] *Notice of Preparation/Initial Study* at 24–25, 29, 32, 34–35, 40, 44–45.

2. The Recirculated Draft EIR must be updated to address the revised national ambient air quality standard for $PM_{2.5}$.

The Air Quality section of the Recirculated Draft EIR must be updated to reflect the U.S. EPA's issuance of a new national ambient air quality standard (NAAQS) for fine particulate matter, also known as $PM_{2.5}$. On February 7, 2024, U.S. EPA strengthened the annual health-based NAAQS for $PM_{2.5}$ from a level of 12 micrograms per cubic meter to 9 micrograms per cubic meter.[128] 3-047

Beyond just acknowledging the new standard, the Recirculated Draft EIR should also address the implications of the new annual $PM_{2.5}$ NAAQS: air quality in Kern County currently does not meet the new standard[129] and is not expected to meet it in 2032,[130] meaning the San Joaquin Valley Air Pollution Control District (Air District) will have to institute further restrictions on polluting projects and activities through the San Joaquin Valley airshed, including in Kern County.[131] 3-048

3. The Recirculated Draft EIR must be updated to make clear the full danger posed by increased $PM_{2.5}$ emissions.

a. The Recirculated Draft EIR should disclose that there is no safe level of exposure to $PM_{2.5}$.

Along with U.S. EPA's issuance of its revised $PM_{2.5}$ NAAQS, the agency also summarized the latest scientific studies on the health effects of $PM_{2.5}$. 3-049

The Recirculated Draft EIR should update its discussion of the health effects of $PM_{2.5}$ to reflect the latest science summarized by U.S. EPA in its standard-setting decision. Such an

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[128] See generally EPA, *Reconsideration of the National Ambient Air Quality Standards for Particulate Matter*, 89 Fed. Reg. 16202 (Mar. 6, 2024), https://www.federalregister.gov/documents/2024/03/06/2024-02637/reconsideration-of-the-national-ambient-air-quality-standards-for-particulate-matter; accord, EPA, *EPA Finalizes Stronger Standards for Harmful Soot Pollution, Significantly Increasing Health and Clean Air Protections for Families, Workers, and Communities* (Feb. 7, 2024), https://www.epa.gov/newsreleases/epa-finalizes-stronger-standards-harmful-soot-pollution-significantly-increasing.

[129] See EPA, *EPA Finalizes Stronger Standards for Harmful Soot Pollution, Significantly Increasing Health and Clean Air Protections for Families, Workers, and Communities* at Figure 1; accord EPA, *Fine Particle Concentrations for Counties with Monitors Based on Air Quality Data from 2020 – 2022* at 1, https://www.epa.gov/system/files/documents/2024-02/table_annual-pm25-county-design-values-2020-2022-for-web.pdf (last accessed Mar. 1, 2024).

[130] EPA, *EPA Projects More than 99% of Counties Would Meet the Revised Fine Particle Pollution Standard* (Feb. 7, 2024), https://www.epa.gov/system/files/documents/2024-02/2024-pm-naaqs-final-2032-projections-map.pdf.

[131] Lazo, *California's Pursuit of Clean Air Just Got Much Harder: New Soot Standards Set*, Cal Matters (Feb. 7, 2024) ("Achieving the new target will take wide-ranging new state and local regulations aimed at cutting emissions"), https://calmatters.org/environment/2024/02/california-new-soot-standards.

update is necessary because CEQA requires that an EIR conduct "an analysis that connect[s] the air quality effects to human health consequences."[132]

3-049 Cont'd

Of key importance to disclose to Kern County residents and decisionmakers: currently available evidence indicates there is no safe level of exposure to $PM_{2.5}$.[133] Consequently, it is essential that the County adopt all feasible mitigation for increased $PM_{2.5}$ emissions.

b. The Recirculated Draft EIR should better address the relationship between $PM_{2.5}$ and DPM.

3-050

The Recirculated Draft EIR's description of air pollutants and health effects discusses "Particulate Matter (PM_{10} and $PM_{2.5}$)" separately from "Diesel Particulate Matter."[134]

The discussion of $PM_{2.5}$ notes that "$PM_{2.5}$ constitutes a large portion of combustion particulates, including diesel particulate matter (DPM)," (p. 4.3-14) but does not direct the reader to the separate, further discussion of the dangers of DPM.

To prevent confusion and to convey the full extent of the health risks posed by $PM_{2.5}$, the Recirculated Draft EIR's discussion of $PM_{2.5}$ should include a cross reference to the more detailed discussion of DPM in the section that addresses "Health Effects and Risks of Toxic Air Contaminants."

Confusingly, the Recirculated Draft EIR's discussion of $PM_{2.5}$ currently includes an erroneous cross reference. At Volume 1, page 4.3-15, the text states: "The section below entitled 'Oil and Gas Operations and Health Effects' further discusses potential health effects of $PM_{2.5}$ emissions, among other things." But no such section with that title exists.

c. The Recirculated Draft EIR should address how $PM_{2.5}$ exacerbates illness and death from COVID-19.

3-051

The Recirculated Draft EIR's discussion of the health effects of $PM_{2.5}$ fails to adequately address "the nature and magnitude"[135] of the CTV I Project's increased emissions because it does not acknowledge the studies that demonstrate that exposure to $PM_{2.5}$ has been found to lead to an increase in the death rate for COVID-19, especially for people of color.[136] Indeed, one

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[132] *Sierra Club v. County of Fresno* (2018) 6 Cal.5th 502, 522.
[133] According to EPA: "[t]he currently available evidence does not identify particular PM2.5 concentrations that do not elicit health effects. Rather, health effects can occur over the entire distribution of ambient PM2.5 concentrations evaluated, and epidemiologic studies conducted to date do not identify a population-level threshold below which it can be concluded with confidence that PM2.5-related effects do not occur." 89 Fed. Reg. 16249.
[134] Compare RDEIR, Vol. 1 at 4.3-13 to 4.3-15 with *id.* at 4.3-25 to 4.3-26.
[135] *Sierra Club*, *supra*, 6 Cal.5th at 522.
[136] See Cal. Dept. of Public Health, *State Officials Announce Latest COVID-19 Facts* (News Release No. NR20-111) (June 3, 2020), https://www.cdph.ca.gov/Programs/OPA/Pages/NR20-111.aspx;

recent study determined that thousands of COVID-19 deaths could have been prevented during the first year of the COVID-19 pandemic in California, especially in the San Joaquin Valley, if ambient levels of $PM_{2.5}$ pollution were lower.[137]

3-051 Cont'd

The Recirculated Draft EIR therefore should be updated with a discussion of the health risks posed by COVID-19 generally, along with a further discussion of the COVID-19 morbidity and mortality increased by exposure to $PM_{2.5}$.

Notably, the Recirculated Draft EIR includes a proposed mitigation measure (MM 4.3-7) that addresses COVID-19, stating that: "Owner/operators shall implement all orders related to the COVID-19 pandemic or any other pandemic mandated by Kern County Public Health on well sites and related to worker safety."[138] To provide context for this mitigation measure, the Recirculated Draft EIR should be revised as recommended above to make clear why COVID-19 is a health concern, particularly for a project that is expected to significantly increase $PM_{2.5}$ emissions.

4. The Recirculated Draft EIR contradicts earlier statements about the nearest sensitive receptor.

3-052

The Recirculated Draft EIR states: "The closest sensitive receptor to the project site is McKittrick Elementary School, which is 4.47 miles southwest of the facility pipeline and injection well 357-7R. The nearest residence is approximately 4.4 miles southeast of the injection line and 4.4 miles from injection well 345-36R."[139] In contrast, the Initial Study/Notice of Preparation states: "The sensitive receptor closest to the project site is the rural residence approximately 1 mile to the south of the project site."[140]

It is important for purposes of both impact analysis and mitigation that the Recirculated Draft EIR correctly identifies the nearest sensitive receptor. The County must explain the

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Chow, D.S. et al., *The Disproportionate Rise in COVID-19 Cases Among Hispanic/Latinx in Disadvantaged Communities of Orange County, California: A Socioeconomic Case-Series*, Johns Hopkins Bloomberg School of Public Health (2020), https://www.medrxiv.org/content/10.1101/2020.05.04.20090878v1.full.pdf; Goyal, M.K. et al., *Racial/Ethnic and Socioeconomic Disparities of SARS-CoV-2 Infection Among Children*, Pediatrics (2020), https://pediatrics.aappublications.org/content/pediatrics/early/2020/08/03/peds.2020-009951.full.pdf; Petroni, M., et al., *Hazardous Air Pollutant Exposure As a Contributing Factor to COVID-19 Mortality in the United States*, Environ. Res. Lett., Vol. 15, no. 9 (Sept. 11, 2020), https://iopscience.iop.org/article/10.1088/1748-9326/abaf86; Tian, H. et al., *Risk of COVID-19 is Associated with Long-term Exposure to Air Pollution*, medRxiv (Apr. 24, 2020), https://doi.org/10.1101/2020.04.21.20073700; Wu, X. et al., *Exposure to Air Pollution and COVID-19 Mortality in the United States: A Nationwide Cross-Sectional Study* (updated Nov. 4, 2020), https://projects.iq.harvard.edu/covid-pm/home; Zhu, Y., *Association Between Short-Term Exposure to Air Pollution and COVID-19 Infection: Evidence from China*, 727 Science of the Total Environment (Apr. 2020), https://doi.org/10.1016/j.scitotenv.2020.138704.

[137] English, P.B. et al., *Association Between Long-Term Exposure to Particulate Air Pollution with SARS-CoV-2 Infections and COVID-19 Deaths in California, U.S.A.*, Environmental Advances 9 (2022) 100270, https://doi.org/10.1016/j.envadv.2022.100270.

[138] RDEIR, Vol. 1 at 1-31, 4.3-74.

[139] RDEIR, Vol. 1 at 1-5.

[140] *Notice of Preparation/Initial Study* at 3.

discrepancy between the Recirculated Draft EIR and the Initial Study/Notice of Preparation and, if the nearest sensitive receptor is actually only one mile away, revise its impacts analysis and mitigation measures accordingly. 3-052 Cont'd

5. The Recirculated Draft EIR's air quality impact analysis is premised on unexplained and/or faulty assumptions.

As set forth in the attached Sahu Report, the Recirculated Draft EIR's assessment of impacts and formulation of mitigation measures is inadequate because it is premised on assumptions that are unexplained if not faulty.[141] For example: 3-053

- The data provided on "Existing Air Quality" is dated—covering 2019 to 2021—and therefore may not be representative of current air quality in Kern County.
- Nowhere does the Recirculated Draft EIR or accompanying report prepared by Trinity Consultants explain the assumptions upon which the emissions estimates are made. It is unclear how the various emissions factors were selected and whether they are representative of expected activities and equipment for the CTV I Project.
- Further, assumptions about the expected project activities are unexplained despite their uncanny precision (e.g., well pad construction is expected to take 11 days; every well to be drilled is identified with a specific and unique depth; five hydrocranes are expected to operate exactly 1968.75 hours).
- The Recirculated Draft EIR suggests false precision by failing to disclose quantitative error ranges and/or to qualitatively explain the uncertainty inherent in the emission estimates.
- Additionally, page 4-6 of the Trinity Consultants' report is completely blank. It is unclear whether this was intentional, or perhaps a formatting issue. To the extent information is missing—it should be provided to the public with appropriate time for review.

6. The Recirculated Draft EIR fails to adequately address cumulative air quality impacts.

The Recirculated Draft EIR acknowledges that the CTV I Project will contribute to cumulatively significant air quality impacts. It states: "Because the project's specific emissions would contribute to Kern County's 2020 emissions inventory and to the 2025 projected 3-054

[141] Dr. Sahu's report addresses the original Draft EIR, but his assessment of the County's flawed air quality emissions estimates and inadequate mitigation measures applies fully to the Recirculated Draft EIR. The text of Section 4.3 ("Air Quality") of the Recirculated Draft EIR is nearly word-for-word identical to the original Draft EIR, with no substantive changes made to the County's analysis, emissions estimates, or mitigation measures. Compare, e.g., RDEIR, Vol. 1 at 4.3-60 to 4.3-81 with DEIR, Vol. 1 at 4.3-60 to 4.3-81. Further, Section 4.3 of the Recirculated Draft EIR continues to rely on the same "AIR QUALITY IMPACT ANALYSIS" prepared by Trinity Consultants, dated May 2023 and revised November 2023.

emissions of Kern County, *the project's incremental effects on air quality would be cumulatively considerable* and, even with mitigation, this potentially significant cumulative impact would be cumulatively significant and unavoidable."[142]

3-054 Cont'd

Although the Recirculated Draft EIR acknowledges a significant cumulative impact on air quality, it does not evaluate or explain the severity of the impact or its consequences for local residents. The Recirculated Draft EIR's bare conclusion—without further analysis—violates CEQA because "a sufficient discussion of significant impacts requires not merely a determination of whether an impact is significant, but some effort to explain the nature and magnitude of the impact."[143] Further, the Recirculated Draft EIR is inadequate because, for an analysis of air quality impacts, an EIR must explain the "connection . . . between the two segments of information presented in the EIR—potential project emissions and human health impacts."[144]

To adequately address the CTV I Project's cumulative air quality impacts, the Recirculated Draft EIR should address "how the environmental and public health burdens of a project might specially affect certain communities."[145] As part of this analysis, the document should account for increased emissions from the Project "together with any pollution burdens [nearby] communities already are bearing, or may bear from probable future projects."[146]

A thorough analysis of cumulative air quality impacts is crucial because Kern County already experiences some of the worst and unhealthiest air quality in the country.[147] Not only will the Project itself generate increased air pollution, but it will incentivize the development of other dirty industrial sources that necessarily will be concentrated nearby and will contribute to worse overall air quality owing to the Project's requirement that it will only accept CO_2 from local sources in Kern County.[148]

Such poor air quality is particularly burdensome because "Kern County has a higher percentage of Hispanic, linguistically isolated, and pollution burdened populations than do other areas of California."[149] Indeed the majority-Hispanic residents (63.9 percent) nearest to the proposed CTV I Project are particularly overburdened already: the Project has been proposed for a census tract that already faces one of the highest pollution burdens in the state (96th percentile)

3-055

[142] RDEIR, Vol. 1 at 1-12, 5-3 (emphasis added).
[143] *Sierra Club*, *supra*, 6 Cal.5th at 519.
[144] *Id.* at 520.
[145] Office of the Cal. Attorney General, *Environmental Justice at the Local and Regional Level* (2012) at 3, https://oag.ca.gov/sites/all/files/agweb/pdfs/environment/ej_fact_sheet.pdf.
[146] *Id.* at 4.
[147] American Lung Assn., *State of the Air* (2024) at 15–21 (listing Bakersfield, CA as the most polluted city in U.S. for daily and annual particulate matter and the third-most polluted city for ozone), https://www.lung.org/getmedia/dabac59e-963b-4e9b-bf0f-73615b07bfd8/State-of-the-Air-2024.
[148] RDEIR, Vol. 1 at 4.11-53 to 4.11-54 (stating in MM 4.11-7 that "Source[s] of CO_2 must be from an industry within Kern County").
[149] Kern County Planning & Natural Resources Dept., *Final Supplemental Recirculated Environmental Impact Report (October 2020) for Revisions to Title 19-Kern County Zoning Ordinance–(2020 A), Focused on Oil and Gas Local Permitting* (Jan. 2021), section 7.2.6 (Response to Comments of Interested Parties), response to comment 0010-3.

as well as challenges posed by unemployment (89th percentile), poverty (86th percentile), and linguistic isolation (83rd percentile).[150]

3-055 Cont'd

Notably, in addition to thoroughly addressing the existing air pollution burden in the Project area, the Recirculated Draft EIR must also address "probable future projects."[151] As discussed elsewhere in these comments, the CTV I Project represents merely one component of extensive further industrial development that is expected in the area.

3-056

In addition to adequately analyzing cumulative effects of the CTV I Project in the context of the existing pollution burden on frontline communities and expected future projects, the County must then reassess the Recirculated Draft EIR's evaluation of alternatives and identification of all feasible mitigation measures. As explained by the Office of the Attorney General, "[w]here a local agency has determined that a project may cause significant impacts to a particular community or sensitive subgroup, the alternative and mitigation analyses should address ways to reduce or eliminate the project's impacts to that community or subgroup."[152] Pursuant to CEQA's requirements and consistent with the Office of the Attorney General's guidance, the County should work with the public and affected communities to develop mitigation measures that will adequately address the CTV I Project's cumulative impacts.

3-057

7. The Recirculated Draft EIR fails to adopt all feasible mitigation to control fugitive dust.

The Recirculated Draft EIR acknowledges that PM_{10} is largely emitted as fugitive dust, often generated by construction, demolition, excavation, extraction, and/or other earthmoving activities.[153] Such activities—as well as vehicle traffic, another source of PM_{10}—will occur at the CTV I Project site, and the Recirculated Draft EIR concludes that the Project's construction and operational activities will cause a significant increase in PM_{10} emissions.[154] Consequently, all feasible mitigation for PM_{10} must be adopted.

3-058

Mitigation Measure (MM) 4.3-2 specifies that "The Owner/operator shall develop and implement a Fugitive Dust Control Plan in compliance with San Joaquin Valley Air Pollution Control District fugitive dust suppression regulations."[155] The Measure further specifies 14 specific "dust control measures [that] shall be implemented."[156]

The prescribed specific measures set forth in MM 4.3-2 are inadequate and do not represent all feasible mitigation for fugitive dust at the Project site. Inexplicably, MM 4.3-2 does not include all feasible measures identified by the San Joaquin Valley Air Pollution Control

[150] Office of Environmental Health Hazard Assessment (OEHHA), *CalEnviroScreen 4.0*, results for 6029003700, https://oehha.ca.gov/calenviroscreen/maps-data (last visited Feb. 26, 2024).
[151] Office of the Cal. Attorney General, *Environmental Justice at the Local and Regional Level* at 4.
[152] *Id.* at 4.
[153] RDEIR, Vol. 1 at 4.3-14, 4.3-38 to 4.3-39.
[154] RDEIR, Vol. 1 at 4.3-63 to 4.3-68.
[155] RDEIR, Vol. 1 at 4.3-58.
[156] RDEIR, Vol. 1 at 4.3-58 to 4.3-59.

District in its most recent Guidance for Assessing and Mitigating Air Quality Impacts.[157] Nor does MM 4.3-2 institute all measures contemplated by the Air District's Regulation VIII.[158] Indeed, some of the measures set forth in MM 4.3-2 contradict stricter requirements set forth in Regulation VIII.

3-058 Cont'd

Consistent with CEQA's requirement to adopt all feasible mitigation, MM 4.3-2 should be revised to reflect stronger and/or additional mitigation to control fugitive dust.

MM 4.3-2 must be strengthened not only to comply with CEQA, but to abide by the legislative directive that CCUS projects like CTV I "include . . . [s]trategies to minimize, to the maximum extent technologically feasible, copollutant emissions from facilities where CCUS or CDR technology is deployed to ensure that the use of carbon dioxide removal technologies and carbon capture and storage technologies does not have an adverse impact on local air quality and public health, particularly in low-income and disadvantaged communities."[159]

Consequently, MM 4.3-2 should be revised to include the following:

- Work should be phased to reduce the amount of disturbed surface area at any one time.[160] The Owner/operator should be required to describe how it intends to phase work in the required Fugitive Dust Control Plan.
- At all times, for all activities (i.e., *not* just excavated soil piles, construction activities on unpaved surfaces, and grading), visible dust emissions should be limited to 20% opacity.[161]
- Wind barriers should be constructed and maintained to limit visible dust emissions to 20% opacity.[162] The Owner/operator should be required to describe where and how it will construct and maintain wind barriers in the required Fugitive Dust Control Plan.
- Traffic speeds on unpaved roads should be limited to 15 miles per hour (*not* 25), with speed limit signs posted.[163]
- Construction activities should be discontinued whenever visible dust emissions exceed 20% opacity, even if ambient wind speeds do not exceed 25 miles per hour.[164]

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[157] See San Joaquin Valley Air Pollution Control District (SJVAPCD), *Guidance for Assessing and Mitigating Air Quality Impacts* (Mar. 19, 2015) at 77–78, https://www.valleyair.org/transportation/GAMAQI.pdf.

[158] The Air District's Regulation VIII and its constituent rules are described in the Recirculated Draft EIR in Volume 1 at 4.3-38 to 4.3-39. Further, it is available on the Air District's website at https://ww2.valleyair.org/rules-and-planning/current-district-rules-and-regulations/regulation-viii-fugitive-pm10-prohibitions/.

[159] Health & Safety Code, § 39741.1(a)(3)(A).

[160] Rule 8021, section 5.2 and table 8021-1.

[161] Rule 8021, sections 5.0, 5.2, 5.4.1, and table 8021-1; Rule 8051, section 5.0.

[162] Rule 8021, section 5.2 and Table 8021-1.

[163] Rule 8021, section 5.3.

[164] Rule 8021, section 5.4.1.

- Track out should be prevented by one of the following: a grizzly with rails, pipes or grates to dislodge debris off exiting vehicles; a layer of washed gravel at one inch or larger in diameter, three inches deep; extension of paved road at least 100 feet from publicly maintained road; or installation of a wheel washer.[165]
- All visible carryout and trackout on paved public roads or the paved shoulders of a paved public road should be removed at the end of each workday;[166] it is not sufficient to isolate carryout or trackout behind a locked gate.
- For empty haul trucks, the interior of the cargo compartment must be cleaned or covered before the empty truck leaves the site.[167]

3-058 Cont'd

Additionally, MM 4.3-2 must specify that no construction or grading permits shall be issued, and no activities expected to cause fugitive dust emissions may otherwise commence, unless and until the Air District approves a Fugitive Dust Control Plan for the CTV I Project. The County must specify such a limitation because "mitigation measures must be in place" when a "project reaches the point where activity will have a significant adverse effect on the environment."[168]

8. The Recirculated Draft EIR does not provide adequate mitigation to protect sensitive receptors.

a. MM 4.3-6 is inadequate and does not constitute all feasible mitigation.

To protect sensitive receptors, MM 4.3-6 states: "No Class VI or Class II well shall be located within 4000 feet of any sensitive receptor."[169] According to the Recirculated Draft EIR, this measure is intended to mitigate an "escape" of CO_2 "into the atmosphere," which "could result in health impacts to humans and wildlife."[170]

3-059

While MM 4.3-6 appropriately establishes a sizeable setback from the CTV I Project's injection wells, it is unclear if the setback distance provides adequate mitigation because the Recirculated Draft EIR does not explain how the distance of 4,000 feet was selected. The Recirculated Draft EIR must be updated to substantiate that MM 4.3-6's setback distance is adequate to protect sensitive receptors, reflecting an assessment of site-specific factors.

Notably, as described in the "Failure Investigation Report" for the CO_2 pipeline rupture that occurred not far from Satartia, Mississippi, emissions from the rupture affected community

3-060

[165] See Rule 8041, sections 5.8 and 5.9; see also Kern County Planning & Natural Resources Dept., *Recirculated Draft Environmental Impact Report for 99 Houghton Industrial Park Project* (Oct. 2019) (hereinafter "99 Houghton Recirculated Draft EIR") at 4.3-43, https://psbweb.kerncounty.com/UtilityPages/Planning/EIRS/99_Houghton/DEIR/_99_Houghton_RDEIR_Vol%201.pdf.
[166] Rule 8041, section 5.1.
[167] Rule 8031, table 8031-1.
[168] *King & Gardiner Farms, supra,* 45 Cal.App.5th at 860, quoting *POET, supra,* 218 Cal.App.4th at 738.
[169] RDEIR, Vol. 1 at 1-31, 4.3-74.
[170] RDEIR, Vol. 1 at 4.3-73.

members located "approximately one mile" away.[171] As a consequence of the rupture and the significant leak of CO_2, 45 people were taken to the hospital and all 200 residents of Satartia had to be evacuated.[172] The threat posed by CO_2 emissions from an injection well—particularly in the event of a blowout—would seem to be equal if not greater than the threat posed by a pipeline rupture.

3-060 Cont'd

Beyond the need to substantiate MM 4.3-6's setback distance for injection wells, the stated rationale for the measure makes plain the measure's inadequacy. As the Recirculated Draft EIR aptly notes, the escape of CO_2 "via either well failure *or pipeline rupture* . . . could result in health impacts to humans and wildlife."[173] Indeed, the incident near Satartia demonstrates that it is not only injection wells that pose a threat to public health, but also pipelines and presumably any other equipment or structure that could leak significant quantities of CO_2. Consequently, MM 4.3-6 should be revised to require a protective setback from not only the injection wells, but also the Project's pipelines and any other structures or equipment containing or conveying CO_2.

b. MM 4.3-8 constitutes inadequate and unlawfully deferred mitigation.

3-061

As a further measure to address air quality impacts on sensitive receptors, MM 4.3-8 sets forth the following monitoring requirements:

> Prior to issuance of any construction or grading permits, the Owner/operator shall consult with the San Joaquin Valley Air Pollution Control District and develop a draft Air Monitoring program for fence line monitoring of all air constituents generated by the CCS project including but not limited to: criteria pollutants, CO_2, and H_2S. The plan shall be reviewed and approved by both the San Joaquin Valley Air District and the California Air Resources Board, with a draft copy to the EPA UIC Program and Kern County Planning and Natural Resources, and implemented before any construction on the CCS facilities can occur. The final approved plan shall be provided to the EPA UIC Program and Kern County Planning and Natural Resources.[174]

Given the CTV I Project's potential to expose nearby community members to substantial concentrations of air pollution, both criteria air pollutants and toxic air contaminants, the County can and should insist on a robust monitoring plan to detect elevated pollution levels.

Unfortunately, MM 4.3-8 does nothing more than generically require development and approval of a future plan. The mitigation measure fails to identify any performance standards to be used to develop the monitoring plan and, equally important, neglects to identify performance standards for the mitigation to be instituted when the monitoring identifies significant impacts.

[171] RDEIR, Vol. 2, Failure Investigation Report – Denbury Gulf Coast Pipelines LLC (May 26, 2022) at 3.
[172] RDEIR, Vol. 2, Failure Investigation Report – Denbury Gulf Coast Pipelines LLC at 2.
[173] RDEIR, Vol. 1 at 4.3-73 (emphasis added).
[174] RDEIR, Vol. 1 at 1-31 to 1-32, 4.3-74.

This open-ended and therefore potentially meaningless promise of a mitigation measure to be developed sometime in the future violates CEQA's requirements for deferred mitigation. 3-061 Cont'd

In *Gray v. County of Madera* (2008) 167 Cal.App.4th 1099, the court rejected—for lack of any performance standards—a mitigation measure that required monitoring private wells near a quarry and, if an impact was found, specified that the project must replace the lost water from existing wells on the proponent's property. Even though the respondent county in *Gray* had "committed itself to a specific mitigation goal—the replacement of water lost by neighboring landowners because of mine operations," the court concluded the goal was not a specific performance standard that complied with CEQA.[175] 3-062

MM 4.3-8 is even more deficient than the mitigation measure rejected in *Gray*, as the Recirculated Draft EIR does not identify any performance standards for the monitoring plan to be established beyond the pollutants to be addressed, let alone any performance standards for the mitigation to be implemented upon the identification of impacts. To meet CEQA's requirements, MM 4.3-8 should identify: 3-063

- Specific monitoring parameters (e.g., spacing of monitors, equipment sensitivity, frequency of monitoring) and/or performance standards to be used to select monitoring parameters;
- Requirements for reporting monitoring results to the County and responsible agencies and/or performance standards to be used to develop such reporting requirements;
- Requirements for reporting monitoring results to affected communities, regional community-based organizations, and to the public online and/or performance standards to be used to develop such meaningful public disclosure;
- Threshold level(s) and requirements for notification of nearby residents, other affected communities, and schools when a threshold is exceeded and/or performance standards to be used to develop such public notification requirements;
- Threshold levels of air pollution that, if detected at the fenceline, will trigger mitigation and/or performance standards to be used to select appropriate thresholds for mitigation;
- Mitigation measures to be implemented if monitoring thresholds are exceeded and/or performance standards to be used to select effective mitigation measures.

To adequately protect community members, monitoring parameters for the plan to be developed pursuant to MM 4.3-8 should be developed with input from nearby residents and affected communities. Community input is particularly valuable and important for determining the locations of monitors (including, but not limited to, near sensitive receptors and along the

[175] *Gray, supra,* 167 Cal.App.4th at 1119.

project fenceline), the number of monitors, and the thresholds that will trigger community notification and response requirements. 3-063 Cont'd

9. The Recirculated Draft EIR fails to adopt all feasible mitigation to address Valley Fever.

The Recirculated Draft EIR institutes one mitigation measure, MM 4.3-7, to address Valley Fever.[176] MM 4.3-7 is inadequate and does not incorporate all feasible mitigation to address Valley Fever. 3-064

MM 4.3-7 should be revised to include the fuller protections that the County previously devised for the 99 Houghton Industrial Park Project, as set forth in MM 4.3-1 of the recirculated Draft EIR for the project:[177]

- The Owner/operator should be directed to thoroughly clean equipment, vehicles, and other items of dust before they are moved offsite to other work locations.
- Grading and trenching work should be phased so that earthmoving equipment is working ahead or down-wind of workers on the ground. The Owner/operator should be required to describe how it intends to phase work in the required Fugitive Dust Control Plan.
- The area immediately behind grading or trenching equipment should be sprayed with water before ground workers move into the area.
- In the event that a water truck runs out of water before dust is sufficiently dampened, any ground workers that otherwise would be exposed to dust should be directed to leave the area until a full truck resumes water spraying.
- All heavy-duty earth-moving vehicles should be closed-cab and equipped with a HEPA-filtered air system.
- Evidence of required training on how to spot and report the symptoms of Valley Fever and how to properly use personal protective equipment should be provided by the Owner/operator to the Kern County Planning and Natural Resources Department within 24 hours of the training session.

10. The Recirculated Draft EIR fails to adopt all feasible mitigation for cumulatively significant net increases in nonattainment air pollutants, including $PM_{2.5}$.

The Recirculated Draft EIR acknowledges that the CTV I Project will result in a cumulatively considerable net increase of criteria air pollutants for which the San Joaquin Valley has been designated a "nonattainment" area pursuant to applicable state and federal ambient air quality standards. In particular, the Recirculated Draft EIR states that "[t]he project's total emissions would exceed the San Joaquin Valley Air Pollution Control District thresholds for 3-065

[176] RDEIR, Vol. 1 at 1-31, 4.3-74.
[177] See 99 Houghton Recirculated Draft EIR at 1-27, 4.3-48 to 4.3-49.

nitrogen oxides (NOx), particulate matter with a diameter of 10 micrometers or less (PM_{10}), and particulate matter with a diameter of 2.5 micrometers or less ($PM_{2.5}$), for which the project region is nonattainment under an applicable federal or State ambient air quality standard."[178] 3-065 Cont'd

To address the CTV I Project's significant criteria air pollutant emissions, the Recirculated Draft EIR includes MM 4.3-5, which "requires the execution of a Developer Mitigation Agreement (DMA)" with the Air District.[179] According to the Recirculated Draft EIR: "[t]he implementation of a DMA (MM 4.3-5) to reduce criteria pollutants of NO_X, ROGs, and PM net incremental emissions generated by a project has been incorporated into development projects in the county since 2008."[180]

In several respects, MM 4.3-5 does not meet CEQA's requirement that the County adopt all feasible mitigation, nor does it comply with the requirement of Health and Safety Code section 39741.1(a)(3)(A) that CCS projects "minimize, to the maximum extent technologically feasible, copollutant emissions . . . to ensure that the use of carbon dioxide removal technologies and carbon capture and storage technologies does not have an adverse impact on local air quality and public health, particularly in low-income and disadvantaged communities."

a. The County must approve the DMA and institute other requirements to ensure MM 4.3-5 is enforceable and enforced.

While MM 4.3-5 appropriately requires the Owner/Operator enter into the DMA and pay associated fees due to the Air District prior to the approval of any grading or construction activity, the Measure fails to specify that the agreement must be approved by the County as well, subject to public review and comment. In litigation over Kern County's Oil and Gas Ordinance, courts have found that the specific terms of such an implementing agreement are consequential and must provide for "particular" and "enforceable" mitigation.[181] Further, in correspondence between the County and Air District concerning such agreements, the County has confirmed that it—as lead agency—is ultimately "responsible for the implementation of all mitigation measures."[182] For these reasons, the County must itself review and approve the DMA, subject to the additional steps for community input and public review discussed below. 3-066

The County should withhold its approval of the DMA unless and until the California Air Resources Board (CARB) confirms in writing that the DMA meets the requirements of section 39471.1 of the California Health and Safety Code. MM 4.3-5 currently specifies that the DMA

[178] RDEIR, Vol. 1 at 1-12.
[179] RDEIR, Vol. 1 at 4.3-70.
[180] RDEIR, Vol. 1 at 4.3-68.
[181] *King & Gardiner Farms, LLC v. County of Kern* (Fifth District Court of Appeal Case No. F077656, Feb. 25, 2020), Slip Opinion at 67-74; *Vaquero Energy Inc., et al. v. County of Kern, et al.* (Kern County Superior Case No. BCV-15-101645-GP, June 7, 2022), Ruling on Petitions for (Third) Writ of Mandate at 21–23.
[182] Letter from Kern County Planning & Natural Resources Dept. to SJVAPCD (Sept. 15, 2020) at 2; accord Letter from SJVAPCD to County of Kern Planning & Natural Resources Dept. (Oct. 30, 2020) at 2 (stating the Air District "is not responsible for making whole any shortfalls for emission reductions that the District is not able to achieve with the mitigation funds it receives from the County" pursuant to an emissions reduction agreement because "as the lead agency under CEQA," it is the County's "obligation to ensure implementation of all mitigation measures included in the Environmental Impact Report").

"shall be reviewed by the California Air Resources Board for compliance with" section 39741.1 "before execution and adoption,"[183] but does not specify if or how compliance will be confirmed. MM 4.3-9 should be revised to specify that written confirmation of compliance is required. 3-066 Cont'd

To ensure that MM 4.3-5 and all the other mitigation measures set forth in the Recirculated Draft EIR are implemented and fully enforceable, the County should specify in the CUPs required by the CTV I Project that compliance is required, with construction as well as subsequent operational activities conditioned upon initial and ongoing compliance.

Further, MM 4.3-5 should be revised to require: (a) reporting by the Owner/operator to verify that actual CTV I Project emissions are consistent with the Recirculated Draft EIR's emissions estimates and the fee paid; (b) reporting by the Air District to confirm that funding by the Owner/operator is sufficient to fund local pollution-reducing projects that, in fact, offset the Project's actual emissions; and (c) a mechanism that requires the Owner/operator to pay a supplemental fee or fees if actual Project emissions exceed the Recirculated Draft EIR's estimates and/or the initial fee proves to be insufficient.

b. MM 4.3-5 is ambiguous about exactly what mitigation is required.

The Recirculated Draft EIR and MM 4.3-5 are not clear about precisely what mitigation will be required under the mitigation measure. MM 4.3-5 states: 3-067

> The Owner/operator shall pay fees to fully offset Project emissions of NOx (oxides of nitrogen), ROG (reactive organic gases), PM10 (particulate matter of 10 microns or less in diameter), and PM2.5 (particulate matter of 2.5 microns or less in diameter) (including as applicable mitigating for reactive organic gases by additive reductions of particulate matter of 10 microns or less in diameter) (collectively, "designated criteria emissions") to avoid any net increase in these pollutants.[184]

MM 4.3-5's requirement to "fully offset Project emissions . . . to avoid any net increase in these pollutants" is ambiguous. It is unclear if the County is mandating that, for each air pollutant emitted by the CTV I Project, the DMA will require an equivalent, offsetting reduction in the same air pollutant. Conversely, the County may intend to treat all the criteria air pollutants collectively and interchangeably, with the DMA only required to ensure that the combined sum of all increased criteria air pollutant emissions will be offset by an equivalent reduction in criteria air pollutants—no matter the particular air pollutant reductions achieved. Either way, the Recirculated Draft EIR should be revised to clarify what the terms in the mitigation measure mean. For example, if it is the County's intention to allow reductions in PM_{10} to be credited as mitigation for $PM_{2.5}$ under MM 4.3-5, the Recirculated Draft EIR should clearly say as much so that the public and decisionmakers fully understand how MM 4.3-5 will operate.

[183] RDEIR, Vol. 1 at 4.3-71.
[184] RDEIR, Vol. 1 at 4.3-70.

c. The County must require that increases in $PM_{2.5}$ emissions be offset with commensurate reduction in $PM_{2.5}$.

3-068

To the extent the County intends to treat all the criteria air pollutants interchangeably for purposes of mitigation, such an approach fails to ensure that significant increases in particular air pollutants will be reduced, as CEQA requires. In this regard, the conflation of $PM_{2.5}$ and PM_{10} is especially problematic.

In reviewing mitigation for the Kern County Oil and Gas Ordinance, the courts have twice found that treating $PM_{2.5}$ and PM_{10} interchangeably for purposes of mitigation is unlawful. In 2020, the Fifth District Court of Appeal agreed with petitioners that the County's 2015 EIR failed to adequately mitigate $PM_{2.5}$ pollution. Reviewing the issue as a matter of law, the court observed that $PM_{2.5}$ and PM_{10} "are not the same" and faulted the County's mitigation measure and a related emissions reduction agreement for "[l]umping them together."[185] According to the appellate court, absent a finding that it would be infeasible, the County was required to adopt "fully enforceable" mitigation in the form of a "particular requirement" for $PM_{2.5}$.[186]

More recently, in 2022, the Kern County Superior Court again agreed with petitioners that the County unlawfully failed to adopt all feasible mitigation for $PM_{2.5}$ and to make such mitigation enforceable. In its ruling, the court faulted the County for continuing to "conflat[e] … PM2.5 and PM10."[187]

Although MM 4.3-5 mentions both $PM_{2.5}$ and PM_{10} separately, that is insufficient. Instead, MM 4.3-5 should specify that the Project's $PM_{2.5}$ emissions will be mitigated by funding projects that result in an equivalent quantity of $PM_{2.5}$ reductions. Absent such an explicit requirement in MM 4.3-5, significant increases in $PM_{2.5}$ may, in fact, evade mitigation. In its 2020 opinion, the Fifth District explained how this could happen in a detailed hypothetical:

> Suppose that during a proposed project's first year of operation it was estimated to emit 16 tons of PM2.5 and to emit 17 tons of PM10 that was larger than PM2.5. If the project proponent were to enter into offset agreements that reduced PM10 that was larger than PM2.5 by 30 tons in the first year, then the net particulate matter emissions for the first year would be three tons, which is below the standard of significance for both PM10 and PM2.5. However, the 16 tons of PM2.5 emissions would not have been offset and, under Air District's 15-ton per year threshold of significance for that air pollutant, one would conclude that the project would have a significant adverse effect on air quality despite the offsets of PM10.[188]

[185] *King & Gardiner Farms* Slip Opinion at 70–72.
[186] *King & Gardiner Farms* Slip Opinion at 70–73; accord *King & Gardiner Farms*, 45 Cal.App.5th at 830.
[187] *Vaquero Energy*, Ruling on Petitions for (Third) Writ of Mandate at 22.
[188] *King & Gardiner Farms* Slip Opinion at 71.

d. Additional changes are required to ensure that MM 4.3-5 will effectively reduce air quality impacts to the extent feasible.

MM 4.3-5 recognizes the importance of addressing air quality impacts where the CTV I Project's increased air pollution emissions will be experienced most acutely—i.e., in the communities nearest to the proposed Project. MM 4.3-5 therefore appropriately requires that monies collected pursuant to the DMA will be used to fund pollution-reducing mitigation projects within a 20-mile radius.[189] 3-069

MM 4.3-5 also responds to the need for outreach to local community members to ensure effective operation of the DMA, requiring the Owner/operator to pay an annual fee "for the creation of a county managed community liaison position to provide technical support to the Eligible CCS Air Funding Communities and coordination with the San Joaquin Valley Air Pollution Control District to expedite use of the funding for air mitigation projects."[190] This likewise is a welcome and appropriate requirement.

Nonetheless, further steps can and should be taken to ensure the DMA effectively reduces air quality impacts. Specifically:

- MM 4.3- should require the Owner/operator and the Air District to establish a community-led steering committee made up of affected residents that live within Eligible CCS Air Funding Communities. The purpose of this steering committee would be to provide input to the Owner/operator and the Air District as the terms of the DMA are developed, and to advise the Air District on its funding decisions once the DMA is executed.
- MM 4.3-5 should also specify that, with the support of the DMA-funded community liaison, the steering committee will hold periodic public meetings and/or workshops to hear residents' concerns and to provide information about the availability of DMA funds.
- In addition to requiring funding for the community liaison position, MM 4.3-5 should also require additional funding to ensure that the public liaison and steering committee can conduct outreach in English as well as Spanish—with an ability to provide written materials in both languages as well as interpretation at meetings and/or workshops.

B. The Recirculated Draft EIR's Analysis and Mitigation of Climate Impacts is Inadequate.

The Recirculated Draft EIR's GHG emissions analysis is unsupported, self-contradicting, and violates CEQA's requirements for proper analysis. 3-070

First, the Recirculated Draft EIR's GHG analysis relies on contradictory and false premises: it purports to analyze GHG impacts from future CO_2 sources it also argues are

[189] RDEIR, Vol. 1 at 4.3-71.
[190] RDEIR, Vol. 1 at 4.3-71.

impossible to analyze. Moreover, it claims that these sources will be "hard to decarbonize" while this claim is contradicted by the Recirculated Draft EIR's own evidence. 3-070 Cont'd

The analysis is also missing crucial information: it fails to account for all elements of the CTV I Project, fails to analyze the whole Project's lifespan, fails to account for potential life extension of fossil fuel facilities, and does not disclose potential offset credit generation. Finally, the analysis of CO_2 retention in the ground is not supported by the evidence, as the attached DiGiulio Report shows, because it fails to identify permanence standards and ignores crucial leakage risk factors that contradict the claim that CO_2 will remain permanently in the ground. 3-071 3-072

Second, the GHG analysis reveals a contradiction at the heart of the premise of this Project: the Recirculated Draft EIR's analysis of GHG impacts concludes that even though permanent CO_2 sequestration and reductions in CO_2 emissions are CTV I Project's main objectives, the Project has a potentially significant impact from GHG emissions. Even worse, the Recirculated Draft EIR reaches this conclusion in part based on the assertion that it cannot guarantee that the CO_2 it proposes to inject underground will actually remain underground permanently without release or leakage. No meaningful analysis or evidence supports any of these conclusions in the Recirculated Draft EIR. 3-073

Third, the analysis does not adequately assess consistency with plans and policies relating to GHGs, including California's leading plan for GHG emissions reduction, the 2022 Scoping Plan. 3-074

Fourth, the Recirculated Draft EIR's cumulative impacts analysis is wholly inadequate, self-contradicting, and fails to address any cumulative projects, which is the essence of a cumulative impacts analysis. 3-075

Finally, the Recirculated Draft EIR's mitigation measures are inadequate under CEQA. They are ineffective, unenforceable, and impermissibly deferred without any standards, as required under CEQA. Moreover, some measures rely on offset credits, revealing a fundamental failure in the CTV I Project's ability to meet its objectives. 3-076

1. The Recirculated Draft EIR's GHG analysis is inadequate under CEQA.

a. The GHG analysis relies on data it claims does not exist.

One of the basic flaws at the heart of the GHG analysis is that it purports to present data that, according to the same analysis, does not exist. Table 4.8-6 presents "Projected Injection 2026-2045" and claims that total GHG injected in the CTV I Project is projected to be 31,217,430 MT CO2e.[191] This number, however, represents CO_2 injected from many sources beyond the initial sources the Recirculated Draft EIR describes and analyzes—the Elk Hills field gas streams. The GHG analysis does not only provide a total volume of CO_2 injected underground over twenty years. The analysis goes as far as projecting the exact volume of CO_2 that will be injected in each year of the Project's first 20 years of operation. 3-077

[191] RDEIR, Vol. 1 at 4.8-26.

At the same time, the same analysis states clearly that because these sources "have not been permitted or completed CEQA, information cannot be provided on the total amount of GHG emissions they produce, how much will be captured, how much stored, how much additional created or how much will still be released to the atmosphere."[192] Both parts of the analysis cannot be true at the same time. 3-077 Cont'd

b. The GHG analysis relies on a false premise.

The GHG analysis relies on a premise that is not only vague and unsupported by evidence but is, in fact, contradicted by the Recirculated Draft EIR's own information in a way that renders the whole GHG analysis unsupported and inadequate under CEQA. 3-078

Specifically, the Recirculated Draft EIR argues that "[t]he capture of the GHG from the initial source and other sources will reduce the amount of CO_2 in the atmosphere emitted by industries that are essential but hard to decarbonize, such as concrete and hydrogen transportation fuels" and therefore, "[a]ccounting for the GHG emissions reductions from CCS, the project's impacts related to GHG emissions would be less than significant."[193]

The GHG analysis's premise is that if the Project's CO_2 sources are "essential but hard to decarbonize" industries, the Project would be beneficial from a climate perspective and will have a less than significant impact on GHG. This premise is contradicted by the Recirculated Draft EIR's own information and mitigation measures.

The analysis fails to define what are "essential but hard to decarbonize" industries. At the same time, MM 4.11-7 limits future Project sources to a list of sectors and industries. These sectors and industries include "hydrogen—green and blue," biomass carbon removal and storage (BiCRS), cement production, green steel production, oilfield field gas streams, power plants, DAC, and alternative fuel production.[194]

Several sources on this list cannot be categorized as "essential but hard to decarbonize" under any reasonable definition. First, some of them are not industries at all. As explained below, industries in the climate context are usually defined by the end-product or service, like cement or steel. But oil field gas streams, blue hydrogen, and alternative fuels are energy sources, not industries with an essential end-product.

Moreover, the term "hard to decarbonize" is completely irrelevant to fossil fuels (like oil field gas) or fossil fuel-based plants (like gas power plants). These fuels and facilities are not "hard to decarbonize"—they are the very source of CO_2 that decarbonization efforts are aimed at eliminating. CARB's Scoping Plan, which lays out the path to achieve California's climate goals, and which the Recirculated Draft EIR claims to be consistent with,[195] states that the "transition away from fossil combustion" is the plan's overriding goal.[196]

[192] RDEIR, Vol. 1 at 4.8-25.
[193] RDEIR, Vol. 1 at 4.8-26.
[194] RDEIR, Vol. 1 at 4.11-53 to 4.11-54.
[195] RDEIR, Vol. 1 at 4.8-30.
[196] CARB, *2022 Scoping Plan for Achieving Carbon Neutrality* at 183.

3-078 Cont'd

The CARB Scoping Plan also includes a discussion of key sectors that it covers, contradicting any suggestion that the full range of industries, fuels, and processes listed as potential CO_2 sources might be considered "hard to decarbonize." Under "Industry," the Scoping Plan's discussion makes a clear distinction between industries and their energy sources and explains that different fossil fuels "provide energy to meet three broad industry needs: electricity, steam, and process heat."[197] It then explains that "[e]lectrification and solar thermal heat are best-suited to industrial processes that have relatively low heat requirements,"[198] but that "[t]here are fewer commercially available and economically viable electrification options to replace industrial processes that require higher-temperature heat."[199] The Scoping Plan goes on to say that "[i]ndustries in California with high heat needs include *steel forging, glass manufacturing*, and industries with calcination processes, such as *manufacturing lime and cement*."[200] It is clear that oil field gas, gas power plants, blue hydrogen, and alternative fuels cannot be treated as "essential but hard to decarbonize" industries under the Scoping Plan, and the premise of the GHG analysis is therefore contradicted by the Recirculated Draft EIR's own mitigation measures.

This contradiction is apparent even in the Recirculated Draft EIR's discussion of potential CO_2 sources. The "Source Identification Memo" ("Source Memo") added to the Recirculated Draft EIR explains that "[d]ue to the high heat required, cement plants are one of a few industries that are hard to decarbonize."[201] When discussing steel plants as potential sources, the Source Memo again explains that "[s]teel forging requires high heat and onsite combustion, with few electrification options to replace fossil gas for high heat requirements, and as such is among the industries hard to decarbonize." The Source Memo makes clear that "hard to decarbonize" industries are those where electrification options are hard to come by to produce the end product. Tellingly, the Source Memo does not use the term "hard to decarbonize" when discussing any other potential sources for the Project, such as gas power plants and hydrogen plants. Any conclusion based on the assertion that the listed sources are "hard to decarbonize" is erroneous and unsupported by substantial evidence.

The "hard to decarbonize industry" definition is also irrelevant to DAC, which is not an industry, but a process aimed at pulling CO_2 from the atmosphere, and to green hydrogen which, as the Source Memo explains, generates no GHG byproducts.[202]

The erroneous use of the "hard to decarbonize" concept in listing potential CO_2 source industries underscores the failure at the heart of the Recirculated Draft EIR's process—in which the County attempts to certify a major carbon injection and storage operation without accounting for its sources and their impacts. The Recirculated Draft EIR must be revised to include a clear and supported definition of "essential but hard to decarbonize" industries and provide evidence that the CTV I Project's future sources fall squarely within the definition.

[197] *Id*. at 207.
[198] *Id*. at 208.
[199] *Id*. at 209.
[200] *Id*. (emphasis added).
[201] RDEIR, Vol. 2, App'x K.4 - Source Identification Memo at 3.
[202] *Id*.

c. The GHG analysis fails to account for all project elements.

The Recirculated Draft EIR's analysis of GHG emissions is informationally inadequate and lacks substantial evidence to support its conclusions. It fails to disclose the full range of projected emissions from the overall scope of activities relating to the CTV I Project, or even from the full operations of capture and storage activities. 3-079

The GHG impact analysis discloses that the County plans to issue entitlements for the whole storage capacity of 49.25 MMT of CO_2, as well as CCS facilities capturing CO_2 from the existing plants (the gas plant and power plant) at the Elk Hills oil field. Future sources, according to the Recirculated Draft EIR, "are required to be permitted with a separate CUP process and environmental review for compliance with CEQA."[203]

The analysis then provides an estimate of the construction and operations emissions. The analysis is provided only for the existing plants and the new capture facilities built for them. Under Table 4.8-4, "Estimated Operational Greenhouse Gas Emissions", the Recirculated Draft EIR presents the expected emissions from the existing plant, the projected emissions from mobile sources of the capture facility, and the projected amounts of CO_2 captured and sequestered until the year 2045.[204] The Recirculated Draft EIR concludes that over 20 years, the Project will result in net emissions reduction of 31,217,430 MT CO_2e.[205] 3-080

But the Recirculated Draft EIR fails to disclose the operational emissions from the capture facility *stationary sources*; instead, the document includes only its mobile emissions in Table 4.8-4. This is misleading and inadequate. Section 3.4 of the Recirculated Draft EIR details the proposed Project characteristics. The Project, according to the document, will include two amine plants for the capture process, CO_2 compression and pumping facilities including compressors, pumps, chiller system and heat exchangers,[206] pipelines and pipeline appurtenances, including potential pump stations,[207] and injection facilities that include compression or pumping stations.[208] All these Project components are completely missing from the Project GHG analysis. In addition, the attached expert report of Dr. Ron Sahu notes that the analysis is missing, and should include, GHG emissions associated with the maintenance of equipment, including "blowdown" or similarly necessary emissions in order to allow for proper preventive maintenance.[209] Relatedly, the DiGiulio Report notes that in the Emergency and Remedial Response Plan, CTV discussed venting CO_2 from surface facilities in the event of an emergency, but this potential loss of CO_2 is not accounted for or quantified in the analysis.[210] The analysis must include the projected GHG emissions from *all* Project operations.

[203] RDEIR, Vol. 1 at 4.8-19.
[204] RDEIR, Vol. 1 at 4.8-23 to 4.8-24 ("Table 4.8-4 shows only the initial source permitted with this EIR (collection of pre-combustion oilfield gas from in-field CRC facilities) at the same rate").
[205] RDEIR, Vol. 1 at 4.8-24.
[206] RDEIR, Vol. 1 at 3-18.
[207] RDEIR, Vol. 1 at 3-20.
[208] RDEIR, Vol. 1 at 3-22.
[209] Sahu Report at 4.
[210] DiGiulio Report at 12.

d. The GHG analysis fails to analyze the whole Project's lifespan.

3-081

The Recirculated Draft EIR also fails to explain why the analysis goes only to the year 2045 and up to 31 MMT of CO_2,[211] when the Recirculated Draft EIR seeks to approve the whole storage capacity of almost 50 MMT, and the Project's lifespan is currently estimated to be 30 years (or roughly to 2054),[212] and potentially longer. EPA's docket for the CTV I Project Class VI permit indicates that CTV would be required to implement an EPA-approved Post-Injection Site Care and Site Closure Plan, and that it will include post-injection monitoring for at least 50 years and until it demonstrates non-endangerment of underground sources of drinking water (USDW) based on monitoring and other site data.[213]

The analysis should account for the whole storage capacity the Recirculated Draft EIR is seeking to approve, and for the whole projected life of the related CCS facilities and sources.

e. The GHG analysis fails to account for potential life extension of fossil fuel facilities.

3-082

The first proposed source for CO_2 sequestration in the CTV I Project is the pre-combustion Elk Hills oil field gas, which is processed at the natural gas plant (CGP-1) facility and used at the Elk Hills power plant.[214] The GHG analysis assumes continuous operations of the power plant, which is already over 20 years old, at least into the year 2045.[215]

The GHG analysis fails to provide any information about the expected life of the power plant independently of its role as a CO_2 source for the Project, despite acknowledging that California aims to reduce its dependency on fossil fuels.[216] In some places, the Recirculated Draft EIR even assumes continued operations for the 30-year duration of the proposed Project.[217]

As the Sahu Report notes, the proposed Project would require the power plant to operate for over 50 years, while "[w]ithout significant additional investments to extend the life of the power plant, it is likely that the Elk Hills power plant would have shut down but for the proposed project."[218]

Moreover, the sources list in the Recirculated Draft EIR includes both oil field gas streams and power plants—a fossil fuel and a fossil fuel operated facility—as potential sources.[219] The recirculated cumulative projects list includes multiple oil and gas operations as well as two existing gas power plants (in an "unknown" location).[220] The Project's objectives were revised in the Recirculated Draft EIR in a way that raises the concern that the Project will

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[211] RDEIR, Vol. 1 at 4.8-24.
[212] RDEIR, Vol. 1 at 4.2-14.
[213] EPA, *Public Comments Sought on Class VI UIC Injection Well Carbon Storage Draft Permits* at 4–5.
[214] RDEIR, Vol. 1 at 3-1.
[215] Cal. Energy Com. (CEC), *Elk Hills Power Project* (last accessed July 15, 2024), https://www.energy.ca.gov/powerplant/combined-cycle/elk-hills-power-project.
[216] RDEIR, Vol. 1 at 4.8-24.
[217] Sahu Report at 3
[218] Sahu Report at 3–4.
[219] RDEIR, Vol. 1 at 3-13.
[220] RDEIR, Vol. 1 at 3-45 to 3-47.

serve to extend the life of fossil fuels—and in fact suggests that is a specific objective of the project: the Project's objective of contributing to CRC's "adopted goals of Full-Scope Net Zero emissions" is now qualified by the sentence "by capturing and storing CO_2 emissions from CRC's Elk Hills field gas operations."[221]

3-082 Cont'd

The Recirculated Draft EIR fails to address the critical question of whether the CTV I Project may facilitate extending the life of the Elk Hills power plant or of any other fossil fuel source, and the resulting GHG emissions implications.

f. The GHG analysis does not disclose potential offset credit generation.

3-083

The Recirculated Draft EIR does not discuss or disclose whether Project proponents believe its operations will—or should—receive credit as offsets in the cap-and-trade market. A recent report by the Independent Emissions Market Advisory Committee noted that "there are conflicting views on whether carbon dioxide removals should be given credit as offsets in the cap-and-trade market and resolving this will be an important issue for CARB and the legislature."[222] CRC's presentation regarding the CTV I Project from November 2023 states that "[t]he capture project is targeting 45Q credit generation as well as the potential for LCFS qualification and Cap & Trade (C&T) avoidance."[223]

The question of whether the CTV I Project can generate offset credits is crucial for a full analysis of the Project's impacts. If the Project is allowed to generate credits, it means its overall GHG impacts will be materially different than those claimed under the GHG analysis, as its operation may allow for continued emissions elsewhere. The analysis must disclose and analyze the issue of offset credits generation by the Project.

g. The GHG analysis is not supported by the evidence.

3-084

The Recirculated Draft EIR's analysis for Impact 4.8-1, "Generate Greenhouse Gas Emissions, Either Directly or Indirectly, that may have a Significant Impact on the Environment," is unsupported by substantial evidence and internally contradictory. This analysis assumes that unless "any of the injected CO_2 leak at injection," or "additional, unmitigated GHG emissions be created from the capture facility operations," the injected CO_2 will remain in the reservoirs, resulting in reduction of CO_2 emitted by the CO_2 source industries.[224] The Recirculated Draft EIR also, however, acknowledges briefly that leaks might happen "at injection." And even more confusingly, the document makes a significance finding based on the acknowledged (and vaguely-stated) risk of a GHG "release due to unforeseen circumstances or equipment failure."[225] Moreover, as the DiGiulio Report shows, to the extent the Recirculated Draft EIR relies on the assumption that stored CO_2 will actually both reach and remain in the reservoirs as required for the Project to meet its objectives, that assumption suffers from two major flaws. First, it does not rely on any clear standard to support the analysis and the

3-085

[221] RDEIR, Vol. 1 at 3-7.
[222] Independent Emissions Market Advisory Committee, *2023 Annual Report* (Feb. 2024) at 27.
[223] CRC and CTV, *Third Quarter 2023 Results* (Nov. 01, 2023).
[224] RDEIR, Vol. 1 at 4.8-26.
[225] RDEIR, Vol. 1 at 4.8-26.

conclusion that CO_2 will be permanently retained in the ground. Second, it is not supported by the evidence, and is often contradicted by it. 3-085 Cont'd

In his report, Dr. DiGiulio explains that "[a] permanence standard should be established in the recirculated DEIR to determine the effectiveness and impact of the project. In the absence of a permanence standard, there is no metric to determine whether CO_2 is permanently retained."[226] Dr. DiGiulio explains that the EPA standards are aimed at water protection, and prohibit *any* leakage into the Etchegoin Formation, while CTV refers to the Etchegoin Formation as a "dissipation interval", which means it allows migration from the storage formation.[227] To analyze the Project's potential impacts, therefore, the Recirculated Draft EIR must define its permanence criteria. The Recirculated Draft EIR fails to address this deficiency. Dr. DiGiulio recommends that a permanence criterion be specified as a 95% probability of occurrence that 99% of CO_2 will be retained in the 26R and A1/A2 reservoirs over a period of 100 years. He further recommends that a criterion for leakage to the atmosphere will be specified as a 95% probability of occurrence that 99% of CO_2 will be retained within all subsurface media over a period of 1,000 years.[228]

In addition, Dr. DiGiulio concludes in his report that the information presented in the Recirculated Draft EIR and Class VI permit applications does not support a finding that the Project will have greater than 95% probability that 99% of CO_2 will be retained in the storage reservoirs over a period of 100 years, or even a lower standard set by CARB for crediting purposes under the CCS Protocol.[229] Dr. DiGiulio explains that the retention is not credible due to the large number of wellbore penetrations in the area, the high pressure of storage, the fact the storage will primarily consist of supercritical fluid, and the elevated risk of seismic activity in the vicinity of the Project area.[230]

Dr. DiGiulio explains that leakage of CO_2 from wellbores is widely considered to be one of the most significant leakage pathways for geologic storage of CO_2.[231] Given the large number of well penetrations in the area, a robust evaluation of wellbore integrity of both plugged and unplugged wells prior to injection is required to assess the CO_2 retention.[232] However, as the DiGiulio Report shows, the Recirculated Draft EIR fails to support its conclusions regarding CO_2 retention with evidence.

The full extent of the failure to support the Recirculated Draft EIR's analysis and conclusions with evidence is detailed in the DiGiulio Report. A few examples of that failure are provided below.

First, Dr. DiGiulio shows that the evidence does not support the Recirculated Draft EIR's claims for confinement of CO_2 to storage areas. The Elk Hills oil field is an anticlinal structure. The Recirculated Draft EIR argues that the Monterey Formation in the 26R and A1/A2 storage

[226] DiGiulio Report at 10.
[227] DiGiulio Report at 10.
[228] DiGiulio Report at 11.
[229] DiGiulio Report at 11.
[230] DiGiulio Report at 11.
[231] DiGiulio Report at 14.
[232] DiGiulio Report at 14.

reservoirs have "*minimal*" connection outside the Area of Review. But as Dr. DiGiulio notes, the isolation of injected CO_2 in anticlinal structures is a concern, and the Recirculated Draft EIR fails to provide evidence to show that anticlinal structures in fact provide full containment.[233] In addition, the Recirculated Draft EIR claims that confinement of the Reef Ridge Shale has been demonstrated, because large quantities of gas and water have been injected into the reservoir without leakage over the years. The DiGiulio Report shows this claim suffers from two flaws: first, there is evidence to the contrary. Even more importantly, there is no evidence of how and if leakage was even monitored, and thus no support for the conclusion that gas and water that were injected in the past did not leak.[234]

3-085 Cont'd

As stated above, a major issue highlighted in Dr. DiGiulio's report is the Recirculated Draft EIR's failure to properly evaluate the current well penetrations from legacy oil and gas wells and the risk of leakage they pose. Dr. DiGiulio shows that wellbore integrity failure is common, and that such failure is not necessarily addressed through well plugging and can persist after the well is "properly" plugged.[235]

Dr. DiGiulio shows that despite the fact CTV identified 204 wellbores in the 26R reservoir and 150 wellbores in the A1/A2 reservoirs, no wellbores were deemed deficient by CTV in either reservoir and none require corrective action. As Dr. DiGiulio notes, this 0% wellbore barrier failure rate for 354 wellbores "is at odds with the published rates of wellbore failure rates ranging from 2-75% in the literature."[236] At the same time, no information that will enable verifying the accuracy of this statement is provided in the Recirculated Draft EIR. As Dr. DiGiulio explains, because the plugged wells at the Project site are expected to contain highly pressurized supercritical CO_2 for hundreds, if not thousands of years, "the County should not ignore the serious gaps in the existing regulatory framework and must require full investigation and remediation" of these wells.[237] The Recirculated Draft EIR must be revised to include all relevant information, including but not limited to wellbore diagrams, cement evaluation logs, and internal and external mechanical integrity tests, to support its conclusions with evidence.[238]

Moreover, Dr. DiGiulio notes that CTV states that there are 150 wellbores in the A1/A2 storage reservoir penetrating the Reef Ridge shale. Seventy-nine of these are currently unplugged wellbores and CTV states that 33 wells in the A1/A2 reservoir have been identified for abandonment. Accounting for these wells and 6 more that will be reconfigured, Dr. DiGiulio finds there are 40 more wells that are unaccounted for in the Recirculated Draft EIR.[239]

Dr. DiGiulio also explains that wellbore schematics are "absolutely vital" in understanding the need or potential need for corrective action, but that since CTV claimed that these schematics are business confidential information, this information is not available to those reviewing the Recirculated Draft EIR. The information on plugging locations that is now provided in Appendix 2 in the Recirculated DEIR is not a substitute for wellbore schematics, and

[233] DiGiulio Report at 6–7.
[234] DiGiulio Report at 8.
[235] DiGiulio Report at 14.
[236] DiGiulio Report at 16–17.
[237] DiGiulio Report at 14–15.
[238] DiGiulio Report at 17.
[239] DiGiulio Report at 15.

CTV should make all information associated with wellbores relevant to wellbore integrity publicly available.[240]

3-085 Cont'd

Finally, the DiGiulio Report highlights the fact that the Recirculated Draft EIR "is replete with vague terms that lack definitions and measurable standards."[241] The technical documents often use terms like "adequate" and "sufficient" in places where exact, measurable definitions are necessary for a proper analysis. As an example, the Recirculated Draft EIR argues that all wells within the Area of Review in the A1/A2 reservoir are protective of the USDW because there is "sufficient" annular cement within the confining Reef Ridge Shale. But what "sufficient" means in this context is left undefined.[242] In other places, wells are described as being in "adequate" condition regarding annular isolation, without any explanation of what "adequate" is.[243] Dr. DiGiulio highlights multiple such uses of vague and undefined terms that must be clarified to allow for proper review of the Recirculated Draft EIR and guarantee its conclusions are supported by the evidence.

In sum, the analysis takes credit for the potential CO_2 storage of the Project, but fails to support the conclusion that CO_2 will be retained in the ground with evidence.

2. The Recirculated Draft EIR's halfhearted and contradictory finding of potentially significant GHG impacts violates CEQA.

3-086

The Recirculated Draft EIR's conclusions and findings regarding the significance of GHG impacts are incoherent and internally contradictory, finding at once both that GHG emissions impacts are, and are not, significant. The finding of significant impact, specifically, is not accompanied by any data or analysis describing or analyzing the nature or extent of the significant impact, and the document also appears to deny that this impact exists alongside its disclosure of the impact. These conclusions and findings cannot, by their own terms, be informationally adequate, nor are they supported by substantial evidence. The document should instead provide a detailed analysis of impacts supporting its finding, as set forth below.

The environmental analysis finds that "[a]ccounting for the GHG emissions reductions from CCS, the Project's impacts related to GHG emissions would be less than significant."[244] But then it goes on to make a significance finding, saying:

> However, the estimated reductions are contingent upon injected CO_2 remaining in the identified geographically confined reservoirs for storage in perpetuity without leakage from injection and capture activities. Should any of the injected CO_2 leak at injection or additional, unmitigated GHG emissions be created from the capture facility operations, then GHG emissions from the project would be potentially significant.[245]

[240] DiGiulio Report at 16.
[241] DiGiulio Report at 15.
[242] DiGiulio Report at 15.
[243] DiGiulio Report at 15–16.
[244] RDEIR, Vol. 1 at 4.8-26.
[245] RDEIR, Vol. 1 at 4.8-26.

3-086 Cont'd

With this brief statement, the Recirculated Draft EIR concludes that despite implementation of several mitigation measures, "the possibility of a release due to unforeseen circumstances or equipment failure remains" and the CTV I Project's impacts from GHG emissions "remain significant and unavoidable."[246] This specific acknowledgment of significant impact from the risk of unintended releases of GHGs is articulated in the Recirculated Draft EIR's GHG impacts section as one of the rationales for the GHG significance finding, but is not included in the summary of impacts in Table 1.1.[247] Moreover, as discussed more fully above and in the DiGiulio Report, the Recirculated Draft EIR's impact analysis fails to properly disclose and analyze this risk.

First, if this conclusion is correct—if the Project may have a significant (negative) impact on GHG emissions because of the risk of release from failure at any stage in Project operations—then the County should not approve the CTV I Project, as it does not fulfill its fundamental objective: to capture and permanently store CO_2 emissions underground.

3-087

Second, the Recirculated Draft EIR's handling of this issue violates CEQA. The document attempts to avoid accounting for the Project's impacts by acknowledging the possibility of leakage and finding that risk to be a significant and unavoidable impact, and at the same time failing to include any analysis of the nature, extent, or magnitude of this risk—and elsewhere the Recirculated Draft EIR appears to deny the risk even exists. The document thus does not comply with CEQA's requirement that an EIR will "be prepared with a sufficient degree of analysis to provide decisionmakers with information which enables them to make a decision which intelligently takes account of environmental consequences."[248] And the conclusions are thus not supported by substantial evidence.

The courts are clear that "[A]n EIR's designation of a particular adverse environmental effect as 'significant' does not excuse the EIR's failure to reasonably describe the nature and magnitude of the adverse effect."[249] Yet the Recirculated Draft EIR does exactly that. The GHG discussion makes no reasonable effort "to explain the nature and magnitude of the impact" from GHG leakage, as CEQA requires.[250] It includes no information regarding the probability of CO_2 leakage, the circumstances under which it might happen, the potential magnitude of such leakage, or its impacts on GHG emissions. It simply classifies the impact as significant and unavoidable without any meaningful discussion. By doing so, it also violates the rule set by the courts that an EIR must set forth the bases for its findings; a bare conclusion regarding an environmental impact without an explanation of its factual and analytical basis is not sufficient.[251]

As stated in the DiGiulio Report, CO_2 leakage from geologic storage is bound to occur, and "the important question is not whether there will be leakage, but whether the extent of

[246] *Id*.
[247] RDEIR, Vol. 1 at 1-13.
[248] *Sierra Club, supra*, 6 Cal.5th 502 at 514.
[249] *Cleveland Nat'l Forest Found. v. San Diego Assn. of Governments* (2017) 3 Cal.5th 497, 514.
[250] *Sierra Club, supra*, 6 Cal.5th 502 at 519.
[251] *Laurel Heights*, *supra*, 47 Cal.3d at 404.

leakage is acceptable […] and how leakage will be monitored and quantitated."[252] The Recirculated Draft EIR fails to do just that.

3-087 Cont'd

There are several leakage risks that a proper analysis must account for and analyze. First, the risk of leakage from well penetration: the DiGiulio Report explains that research shows that more than 8 wells/km^2 concentrations are considered worst case scenario regarding CO_2 retention in the ground.[253] The presence of 354 well penetrations in the storage area leads to a well penetration density of 9.6 wells/km^2, which represents a worst-case scenario for permanence for geologic storage of CO_2.[254] The Recirculated Draft EIR must be revised to include a robust evaluation of wellbore integrity of both plugged and unplugged wells, to properly reflect the risk of leakage from these wells.

Leakage from wellbores can also manifest in the form of a CO_2 well blowout.[255] Despite the fact that release of CO_2 from an injection well or failed plugged or unplugged wellbores could be catastrophic depending on surface topography and meteorologic conditions, the Recirculated Draft EIR fails to discuss the probability of such an event when discussing GHG emissions impacts.[256]

The Recirculated Draft EIR also fails to analyze the issue of lateral confinement to storage areas. As the DiGiulio Report shows, there is no evidence to support the assumption that CO_2 stored in reservoirs will in fact be confined and will not migrate beyond them.[257] The document must be revised to support these assumptions and assess the risk of leakage from lateral migration.

The DiGiulio Report also shows that the Recirculated Draft EIR's analysis of seismic risk is highly deficient and not supported by the evidence, as it fails to properly account for all factors of seismic risk.[258] The flaws in the Recirculated Draft EIR's seismic analysis are discussed in detail below. However, as explained in the DiGiulio Report, the effects of natural or induced seismicity are of particular concern at the CTV I Project, due to its effect on wellbores, which can occur even after a well is permanently plugged and abandoned. The Recirculated Draft EIR must be revised to properly account for the seismicity risks, and once this is done, to properly account for the risk of CO_2 leakage resulting from seismic activity.

The Recirculated Draft EIR's GHG analysis must be revised to include an accurate, meaningful discussion of GHG impacts that is supported by the evidence, and this evidence-supported analysis must reflect a consistent conclusion as to the nature, magnitude, and significance of the impact.

[252] DiGiulio Report at 9.
[253] DiGiulio Report at 9.
[254] DiGiulio Report at 9.
[255] DiGiulio Report at 4.
[256] DiGiulio Report at 5.
[257] DiGiulio Report at 6–9.
[258] DiGiulio Report at 25.

3. The Recirculated Draft EIR's GHG consistency analysis is inadequate under CEQA.

Under Impact 4.8-2, the Recirculated Draft EIR purports to analyze whether the Project will conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gas.[259] Under this impact area, the Recirculated Draft EIR first analyzes the CTV I Project's consistency with CARB's 2022 Scoping Plan.[260] The Scoping Plan analysis is inadequate under CEQA. Not only is it short, generic, and superficial, but it also fails to address important ways in which the Project is not consistent with the Scoping Plan. 3-088

The Recirculated Draft EIR's consistency analysis is made up of a few paragraphs generally describing the Scoping Plan discussion of carbon capture, removal and sequestration, followed by a bullet point list of the Scoping Plan's "Strategies for Success" in the sector, and ending with a single paragraph stating flatly that the Project "would support the Strategies for Success identified in the CARB 2022 Scoping Plan," "would comply with any new regulations developed as a result of implementation of the identified Strategies" and "is reasonably expected to reduce region wide and Statewide GHG emissions." The paragraph concludes with no further discussion to show the Project would be consistent with the CARB 2022 Scoping Plan.[261]

First, the analysis is generic. It fails to provide the reader with "sufficient information to foster informed public participation and to enable the decision makers to consider the environmental factors necessary to make a reasoned decision,"[262] as required under CEQA. The analysis also fails to provide substantial evidence to support its conclusions. Except for flatly declaring consistency, the analysis does not address any of the Scoping Plan Strategies beyond simply listing them. It fails to make a connection between the Strategies and the Project, and explain how the Project is consistent with them, or how they are even relevant to the Project. Just as an example, the identified Strategies that call for the state to "Evaluate and streamline permitting barriers to project implementation while protecting public health and the environment" and to "update the CARB Carbon Capture and Sequestration Protocol with the best available science and implementation experience" have nothing to do with the Project.

Second, the analysis fails to address the crucial issue of the Project's CO_2 sources' consistency with the Scoping Plan. The Scoping Plan states that CCS is included in the Scoping Plan "to address emissions from limited sectors, including electricity generation, cement production facilities, and refineries."[263] The Scoping Plan also discusses implementation in the electricity sector in or before 2045 as well as the potential to support hydrogen production.[264] As discussed above, the Recirculated Draft EIR fails to provide information regarding its future CO_2 sources and therefore cannot conclude the Project is consistent with the Scoping Plan. Moreover, the only disclosed CO_2 source in the Recirculated Draft EIR is the pre-combustion Elk Hills oil field gas which provides about one third of its power for oil field operations—not even a sector 3-089

[259] RDEIR, Vol. 1 at 4.8-28.
[260] RDEIR, Vol. 1 at 4.8-28 to 4.8-30.
[261] RDEIR, Vol. 1 at 4.8-30.
[262] *Berkeley Keep Jets Over the Bay Comm. v. Bd. of Port Comm'rs*, 91 Cal.App.4th 1344, 1356, 111 Cal. Rptr. 2d 598, 606 (2001), as modified on denial of reh'g (Sept. 26, 2001).
[263] CARB, *2022 Scoping Plan for Achieving Carbon Neutrality* at 86.
[264] *Id.*

the Scoping Plan lists for CCS implementation. The Recirculated Draft EIR's conclusion that the CTV I Project is consistent with the Scoping Plan is therefore unsupported by the evidence and also contradicted by it. 3-089 Cont'd

Finally, the Recirculated Draft EIR fails to address the fact that the CTV I Project's proposed mitigation measures are inconsistent with the Scoping Plan. As discussed below, a primary mitigation measure proposed in the Recirculated Draft EIR, in addition to monitoring plans and compliance with regulations, is buying credits to offset GHG emissions.[265] However, the Scoping Plan makes clear that GHG mitigation measures come in a hierarchical order: first, the lead agency must "exhaust[] all the on-site GHG" mitigation. Then, "CARB recommends prioritizing local, off-site GHG mitigation measures" and only then use "non-local off-site mitigation, and voluntary offsets issued by a recognized and reputable voluntary carbon registry."[266] As discussed below, the Recirculated Draft EIR fails to comply with the requirement that offsets will be issued by a recognized and reputable registry, and it also fails to exhaust, or even discuss, all onsite GHG mitigation and other local measures. Finally, it fails to acknowledge and discuss the fact that by improperly relying on offsets, it is inconsistent with the Scoping Plan. 3-090

4. The Recirculated Draft EIR fails to analyze and mitigate cumulatively considerable GHG emissions impacts.

The Recirculated Draft EIR's analysis of the CTV I Project's cumulative GHG emissions impacts suffers from many of the same flaws pointed out above regarding its project-level analysis, and from several other serious flaws. The document must be revised to correct these flaws before any decision can be made regarding the Project. 3-091

First, there are basic misstatements and inconsistencies that call the analysis into question. As one example, the analysis claims that "Table 4.8-3 shows total GHG reductions of 3,967,977 MT CO_2e over 20 years from implementation of the project".[267] In fact, Table 4.8-3 shows the estimated construction GHG emissions, not total reductions,[268] and those projected reductions of the Project, according to the other tables in the GHG analysis, are 31,217,430 MT CO_2e over 20 years, not 3,967,977 as stated in the cumulative analysis.[269]

Moreover, the Recirculated Draft EIR frames its cumulative GHG analysis in fundamentally misleading ways. For example, the document includes the following statement: "Since the project individually results in a net reduction in GHG emissions, the project would also contribute to reductions in cumulative GHG emissions."[270] First, this statement directly contradicts the Recirculated Draft EIR's cumulative GHG significance finding, which concludes 3-092

[265] RDEIR, Vol. 1 at 4.8-27 to 4.8-28.
[266] CARB, *2022 Scoping Plan for Achieving Carbon Neutrality* at 270–71.
[267] RDEIR, Vol. 1 at 4.8-32.
[268] RDEIR, Vol. 1 at 4.8-22.
[269] RDEIR, Vol. 1 at 4.8-24.
[270] RDEIR, Vol. 1 at 4.8-32.

that the Project will contribute to cumulatively considerable significant GHG emissions.[271] And second, this statement completely misses the point of cumulative impact analysis: that "environmental damage often occurs incrementally from a variety of small sources [that] appear insignificant when considered individually, but assume threatening dimensions when considered collectively with other sources with which they interact."[272] In other words, if a CEQA analysis could infer a project's cumulative impacts directly from its individual impact, there would be no need for a cumulative impact analysis at all. 3-092 Cont'd

Another major flaw is that the cumulative impacts analysis fails to analyze the CTV I Project's cumulative *projects*. Under CEQA, cumulative impact analysis requires consideration of "other projects causing related impacts,"[273] including "probable future projects."[274] The Recirculated Draft EIR provides a list of cumulative projects under its project description section, but it fails to analyze their impacts in the GHG analysis, claiming that "information cannot be provided" regarding their potential GHG impacts.[275] This claim is not supported by the evidence and is in fact contradicted by it, as discussed above. The cumulative impacts analysis must analyze the projects in its cumulative projects list, as well as any probable future project that plans on sending CO_2 for sequestration at the CTV I Project (as discussed in detail above in the discussion of project description and below in this letter's section on cumulative impacts analysis). 3-093

Instead of discussing the cumulative projects the Recirculated Draft EIR discloses, the Recirculated Draft EIR focuses on the CTV I Project's cumulative impacts together with the impacts of "past, present and reasonably foreseeable future oil and gas development including wells and abandonment activity," explaining this focus is "[d]ue to the proposed project's location within an existing oil and gas field."[276] This is underinclusive. While geographic proximity can be a factor in identifying cumulative projects, it is not the only determinative factor.[277] 3-094

The Recirculated Draft EIR fails to explain why it focuses on the cumulative impacts of the CTV I Project with only the oil and gas development. It is riddled with vague statements like "impacts from oil and gas development in Kern County on cumulative GHG emissions were determined to remain significant and unavoidable despite implementation of mitigation measures"[278] that lack any explanation as to their relevance to the CTV I Project's cumulative analysis. Potentially, there is a connection between the oil field operations and CTV I because of the Project's usage of depleted oil and gas reservoirs, but that cannot explain the analysis, since the depleted reservoirs are already identified. It is unclear whether this connection stems from plans to sequester more CO_2 sourced from oil and gas production. The Recirculated Draft EIR

[271] See, e.g., RDEIR, Vol. 1 at 1-13 ("The project's cumulative contribution to GHG emissions after implementation of the recommended mitigation measures would remain cumulatively significant and unavoidable").
[272] *Communities for a Better Env't v. Cal. Resources Agency* (2002) 103 Cal.App.4th 98, 114, 126.
[273] CEQA Guidelines, § 15130(a)(1).
[274] CEQA Guidelines, § 15130(b)(1)(A).
[275] RDEIR, Vol. 1 at 4.8-25.
[276] RDEIR, Vol. 1 at 4.8-31.
[277] CEQA Guidelines, § 15130(b)(1)(A).
[278] RDEIR, Vol. 1 at 4.8-32.

must be revised to clarify this point, as well as the rest of the connection between the Project and future oil and gas development.

3-094 Cont'd

The Recirculated Draft EIR's cumulative GHG impact analysis is legally inadequate, not supported by substantial evidence, and must be revised to address all the inaccuracies, inconsistencies, and unsupported assumptions, include all relevant cumulative projects, and explain its analysis.

5. The Recirculated Draft EIR does not provide adequate mitigation for GHG impacts.

3-095

The GHG mitigation measures identified in the Recirculated Draft EIR fail to meet CEQA's standards for effective, enforceable mitigation. The proposed measures are ineffective, unenforceable, and vague, and there is no evidence to support their efficacy. To the extent some of the vagueness will be clarified in the future, the document also illegally defers that mitigation.

Under CEQA, proposed mitigation measures must be "fully enforceable" through permit conditions, agreements, or other legally binding instruments.[279] Any proposed mitigation must also provide assurance that such implementation will in fact occur.[280] The proposed measures fail on all counts.

a. MM 4.8-1 constitutes inadequate and unlawfully deferred mitigation.

3-096

To mitigate what the Recirculated Draft EIR finds to be a potentially significant impact from GHG emissions, it proposes a monitoring plan under MM 4.8-1. This Mitigation Measure requires that prior to injection, the owner/operator will submit "a monitoring plan that complies with all requirements of the EPA UIC permit" for the Project, to demonstrate the retention of the CO_2 in the reservoir. The Measure states that the plan shall be submitted to the County, concurrent with submittal to the EPA for review, and that "[a] copy of the final approved plan from the EPA shall be provided to the Kern County Planning and Natural Resources Department."[281]

Given how crucial it is to guarantee that CO_2 stored in the reservoir will remain there, both for mitigating a potentially significant impact and for achieving the Project's stated goal of CO_2 storage, it would be expected the Recirculated Draft EIR will develop a robust monitoring plan. However, the proposed Mitigation Measure is anything but robust.

In fact, all this Mitigation Measure does is reiterate an already existing rule—that CCS projects that receive a UIC permit from the EPA must prepare a monitoring, reporting, and verification (MRV) plan and submit it for the EPA's approval.[282] This Measure adds nothing to this rule except requiring that a copy of the approved plan will be provided to the County.

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[279] Pub. Resources Code, § 21081.6(b); CEQA Guidelines, §15126.4(a)(2).
[280] *Anderson First Coalition v. City of Anderson* (2005) 130 Cal.App.4th 1173, 1186–87.
[281] RDEIR, Vol. 1 at 4.8-27.
[282] 40 C.F.R § 98.448.

Relying solely on the future EPA MRV plan is inadequate under CEQA and constitutes an impermissible deferral of mitigation. The EPA UIC permit is issued under the Safe Drinking Water Act. As a result, it does not, and cannot, cover all relevant aspects of monitoring for CO_2 leakage.[283] Specifically, Dr. DiGiulio notes that the monitoring plan submitted for the Project in the Class VI permit applications does not directly consider leakage from well penetrations—although this is the most likely source of loss of CO_2. The measure must include a monitoring program specific to evaluating leakage from plugged well penetrations.[284]

A major flaw in relying on EPA's MRV plan is the fact that these plans lack clear performance standards. CEQA allows for details to be developed in future time, as long as the agency adopts specific performance standards the mitigation will achieve.[285] MRV plans that were developed under the EPA permit program have been heavily criticized for failing to include specific monitoring strategies, for containing ambiguous language, and for being difficult to verify and enforce.[286] By relying on EPA's future MRV plan for the CTV I Project, the Recirculated Draft EIR impermissibly defers its mitigation.

The DiGiulio Report makes clear why reliance on the EPA MRV plan fails to comply with CEQA's requirement for effective mitigation. For example, Dr. DiGiulio notes that continuous monitoring in the Etchegoin Formation is important to detect leakage, but further notes that under the EPA permit application, there will be only one such well in each reservoir. A proper monitoring plan should analyze and support the number of required monitoring wells above confining zones to guarantee effective detection of leakage.[287]

The DiGiulio Report finds that the Recirculated DEIR "is replete with vague terms that lack definitions and measurable standards",[288] and this problem is manifested in the proposed mitigation as well. For example, in the Corrective Action Plan filed with the EPA, CTV states that all wellbores within the Area of Review will be pressure tested prior to abandonment and will be reviewed to demonstrate adequate confinement "if necessary" and "if conditions allow." As Dr. DiGiulio notes, these statements are far too vague to be of any use,[289] and thus reliance on the plan cannot serve as enforceable and effective mitigation.

Finally, the requirement to submit a monitoring plan "[p]rior to any injection of CO_2"[290] is vague and unenforceable. CO_2 injection will be ongoing in the CTV I Project. The Measure must be revised to clarify at what point exactly a monitoring plan should be submitted, clarify that the approval of such a monitoring plan will be a condition on each new injection from each source, and clarify and guarantee the means of enforcing the plan.

3-096 Cont'd

[283] DiGiulio Report at 10–11.
[284] DiGiulio Report at 18.
[285] CEQA Guidelines, § 15126.4(a)(1)(B).
[286] Environmental Integrity Project, *Flaws in EPA's Monitoring and Verification of Carbon Capture Projects* (Dec. 2023), https://environmentalintegrity.org/news/epas-rules-for-verifying-carbon-capture-projects-are-riddled-with-holes/.
[287] DiGiulio Report at 17.
[288] DiGiulio Report at 15.
[289] DiGiulio Report at 17.
[290] RDEIR, Vol. 1 at 4.8-27.

In particular, MM 4.8-1 must be revised to include a monitoring plan that will effectively address the potentially significant impact of CO_2 leakage or other release from the CTV I Project. As explained in the DiGiulio Report, such monitoring program should be specific to evaluating leakage from plugged well penetrations as general air monitoring may not be sufficiently sensitive to determine leakage.[291] To the extent the revised measure is lacking any specific elements or details, it must at a minimum identify performance standards to be used in developing it, as required under CEQA.[292] Given the potential impacts of the GHG emissions from the Project, it is also crucial that the monitoring plan will be open for public comments and will require the approval of CARB in addition to the County. 3-096 Cont'd

Finally, and crucially, a monitoring plan alone will not fully mitigate the risk of leakage or release to the extent feasible. GHG mitigation measures must also include an action plan that addresses what will happen to address any release, mitigate fully the emissions from any release, and ensure the integrity of the reservoir and overall storage mechanism. 3-097

b. MM 4.8-6 is an ineffective, unenforceable, and impermissibly deferred mitigation measure.

The first part of MM 4.8-6 states as follows: 3-098

> The project shall offset all greenhouse gas emissions associated with the capture facility, and construction equipment not covered by the Cap and-Trade program or other mandatory greenhouse gas emission reduction measures through owner/operator reductions of greenhouse gas emissions as verified by the San Joaquin Valley Air Pollution Control District, through acquisition of offset credits from the California Air Pollution Control Officers Association Exchange Register or other third party greenhouse gas reductions as verified by the San Joaquin Valley Air Pollution Control District, or through inclusion in an Emission Reduction Agreement, to offset Project-related greenhouse gas emissions that are not included in the Cap-and-Trade program to assure that no net increase in greenhouse gas emissions from the Project construction or operation occur. [293]

In essence, this Measure purports to offset any GHG operational emissions "associated with" the Project's capture facility (as well as some construction emissions) using the tool of emission credits, and claims to thus achieve a "no net increase" in GHG emissions from the Project construction or operations. This Measure is not only inappropriate and unlawful as mitigation, but also reveals a fundamental failure in the Project's ability to meet its objectives.

c. MM 4.8-6 goes against the Project's fundamental premises and objectives.

The CTV I Project is a carbon sequestration project. Its main goals are to permanently store CO_2 in the ground and support California's climate goals.[294] But MM 4.8-6 proposes to 3-099

[291] DiGiulio Report at 18.
[292] CEQA Guidelines, § 15126.4(a)(1)(B)
[293] RDEIR, Vol. 1 at 4.8-27 to 4.8-28.
[294] RDEIR, Vol. 1 at 3-7.

allow the Project to allow "acquisition of offset credits from the California Air Pollution Control Officers Association Exchange Register or other third party greenhouse gas reductions as verified by the San Joaquin Valley Air Pollution Control District", to offset any "emissions associated with the capture facility" and "to offset Project-related greenhouse gas emissions that are not included in the Cap-and-Trade program to assure that no net increase in greenhouse gas emissions from the Project construction or operation occur."[295] This Measure thus contemplates that the Project and associated facilities may emit substantial amounts of GHG emissions—potentially without limit—into the atmosphere, as long as they purportedly offset these emissions with emissions credits. 3-099 Cont'd

The notion of a carbon sequestration project that may use carbon credits to offset its own emissions is absurd, and undercuts the rationale behind carbon sequestration. An effective carbon sequestration project should be the place where CO_2 is being put in the ground physically and permanently, not a link in a chain of offsets that creates profits for its owners and harm to the public and the environment.

If a CO_2 sequestration project is allowed to offset its emissions through acquisition of offset credits, then the following scenario is possible: A GHG emitting facility that is looking to mitigate its GHG emissions can go and buy offset credits from certain registries. Alternatively, and higher in the hierarchy of preferred mitigation, that facility can send its CO_2 for sequestration at the CTV I Project and achieve the same GHG mitigation goals. The facility chooses sequestration, theoretically putting the CO_2 in the ground permanently. But the CO_2 the facility sends to CTV I may not stay in the ground; instead, CTV I may purchase the same offset credits the emitting facility could have bought in the first place, to offset the emissions from its sequestration project. The futility of this scenario is clear even before going into the many problems with relying on carbon offsets and before considering the added emissions from CO_2 transportation and the operations of the CTV I Project.

d. MM 4.8-6's reliance on offset credits is not supported by the evidence.

Under CEQA, an agency must have specific evidentiary support for a conclusion that mitigation will be effective.[296] The Recirculated Draft EIR lacks evidentiary support, however, that offset credits can achieve emission reductions. 3-100

Offset programs, in general, are a contentious tool for curbing GHG emissions, and there is mounting criticism in the scientific and environmental communities against using credits in the effort to stop climate change.[297] Research shows that nature-based solutions cannot effectively offset fossil fuel combustion due to the different nature of CO_2 emissions in the two

[295] RDEIR, Vol. 1 at 4.8-27 to 4.8-28.
[296] See, e.g., *Sierra Club v. County of San Diego* (2014) 231 Cal.App.4th 1152, 1168.
[297] Amazon Watch, *Statement: Offsets Don't Stop Climate Change* (Oct. 6, 2021), https://amazonwatch.org/news/2021/1006-statement-offsets-dont-stop-climate-change.

categories,[298] and offsets are likely to increase GHG emissions rather than decrease them.[299] Environmental justice advocates have pointed out that offsets perpetuate environmental injustice by increasing the relative burden of pollution on already overburdened communities, including low-income communities of color, while GHG reduction is happening, if at all, elsewhere. [300]

3-100 Cont'd

There is also a consensus that, to be effective, offsets credits must be real, permanent, additional, verifiable, and enforceable.[301] Additionality is especially hard to ascertain: "additional" emission reductions are reductions not otherwise required by law or likely to occur anyway. Assembly Bill (AB) 32, California's landmark GHG reduction statute, clarifies that "additional" means "in addition to any greenhouse gas emission reduction otherwise required by law or regulation, and any other greenhouse gas emission reduction that otherwise would occur."[302] To be "additional," therefore, an offset credit must not result from actions otherwise legally required, *and* it must be in addition to any reduction that would otherwise occur. MM 4.8-6 fails to include any requirement for additionality of credits, nor for any of the requirements listed above, and thus there is no support for the effectiveness of the mitigation measure.

The Recirculated Draft EIR also lacks evidence that there exist any offset programs capable of ensuring that offsets are "additional." This is a particular concern given that MM 4.8-6 does not include any requirements regarding the offsets' origin, allowing for international offsets, which are especially challenging to verify.[303] There is also no support for the assumption there are enough GHG offset credits available to satisfy the mitigation measures' requirements. This problem is exacerbated by the fact that the Recirculated Draft EIR fails to quantify the volume of emissions that will need to be mitigated using offsets.

e. MM 4.8-6 is ineffective, unenforceable, and impermissibly deferred.

Even if offset credits could be, under certain conditions and limitations, a proper mitigation measure for GHG emissions, and even if they could be acceptable mitigation for a carbon sequestration project, MM 4.8-6 is inadequate as CEQA mitigation.

3-101

First, as mentioned above, there are no performance standards for these offsets, and no requirement they will be real, permanent, additional, verifiable, and enforceable. Instead, the measure relies on offsets issues by different parties, including unidentified "third parties," to issue the credits. As courts have recognized, protocols adopted by voluntary market registries may not meet standards necessary to ensure that credits in fact reduce emissions.[304]

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[298] Carton, W. at el, *Undoing Equivalence: Rethinking Carbon Accounting for Just Carbon Removal*, Frontiers in Climate (Apr. 16, 2021), https://www.frontiersin.org/articles/10.3389/fclim.2021.664130/full.
[299] Anderegg, W., *Gambling With the Climate: How Risky of a Bet Are Natural Climate Solutions?,* AGU Advances (July, 22 2021), https://agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2021AV000490.
[300] Amazon Watch, *Statement: Offsets Don't Stop Climate Change*.
[301] *Golden Door Properties, LLC v. County of San Diego* (2020) 50 Cal. App. 5th 467, 511.
[302] Health & Safety Code, § 38562(d)(2).
[303] *Golden Door Properties, LLC*, *supra*, 50 Cal.App.5th 467 at 513.
[304] *Golden Door Properties, LLC*, *supra*, 50 Cal. App. 5th 467 at 511–12.

The only check on any offsets' effectiveness in mitigating GHG impact is the requirement that they will be "verified" by the San Joaquin Valley Air Pollution Control District (SJVAPCD) or through inclusion in an Emission Reduction Agreement. MM 4.8-6 thus impermissibly defers mitigation.[305] By leaving the decision on verification of the credits solely to the judgment of the SJVAPCD, without setting any performance standards and process for the verification and only generally requiring "no net increase," the Measure violates CEQA. "Simply stating a generalized goal for mitigating an impact does not allow the measure to qualify for the exception to the general rule against the deferred formulation of mitigation measures."[306] 3-101 Cont'd

The option given in the Mitigation Measure to offset emissions through inclusion in an Emission Reduction Agreement is also invalid under CEQA, for the same reasons. Emission Reduction Agreements are not defined anywhere in the Recirculated Draft EIR in the context of GHG emissions and are used by the Air District for reduction of certain other air pollutants, not GHGs. CARB's review of SJVAPCD Emission Reduction Credit (ERC) System states with respect to GHG that: 3-102

> Ultimately, the impact of these GHG ERCs is not clear, as there is no currently authorized use in an NSR context consistent with District rules or in the context of GHG Cap and Trade programs. To CARB's knowledge, none of these GHG ERCs have been used.[307]

Finally, MM 4.8-6 is unenforceable. Mitigation measures must be "fully enforceable through permit conditions, agreements, or other legally binding instruments."[308] Here, the Measure fails to specify in any detail how the Air District will quantify the emissions reductions it needs to achieve, or does achieve, through this measure, the process by which the offsets will be purchased, and proof of their purchase filed, or any enforcement mechanism to ensure that this Measure is actually implemented.

In fact, aside from vaguely stating that the Project "shall offset," the Mitigation Measure fails to state at what point any offset "shall" happen, or whether the Air District or the County will require offsets as a condition of approval of any permit. 3-103

The last part of MM 4.8-6 deals with future sources that will be sending CO_2 for injection in one sentence. It summarily states: "All sources providing CO_2 for injection must certify that any additional CO_2 generated from the source capture facility has been mitigated to "no net increase" before injection at Carbon Terra Vault 1."[309]

This part of the Mitigation Measure aimed at future sources suffers from the same severe flaws as described above, only exacerbated. It is entirely ineffective and unenforceable, as it only

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[305] *King & Gardiner Farms*, *supra*, 45 Cal.App.5th at 856.
[306] *Id.* See also *Sierra Watch v. County of Placer* (2021) 69 Cal.App.5th 86, 110; *Golden Door Properties, LLC*, *supra*, 50 Cal.App.5th 467 at 517.
[307] CARB Enforcement Division, *Review of the San Joaquin Valley Air Pollution Control District Emission Reduction Credit System* (June 2020) at 30, https://ww2.arb.ca.gov/sites/default/files/2020-06/SJV_ERC_FINAL_20200604.pdf
[308] CEQA Guidelines, § 15126.4(a)(1)(B), (a)(2).
[309] RDEIR, Vol. 1 at 4.8-28.

requires vaguely that future CO_2 sources will "certify" that any "additional" CO_2 has been "mitigated to 'no net increase.'" It fails to explain what type of certification can be used and under what conditions, or even to name the agency to whom such "certification" will be submitted and how it will be verified. It also fails to explain what "additional" means in the context of this Measure.

3-103 Cont'd

Moreover, the Measure fails to address in any way the carbon generated by *trucks* that will bring CO_2 for injection. As stated before, the Recirculated Draft EIR, though it fails to provide any analysis on the issue, anticipates that some sources will ship their CO_2 using trucks. Such GHG emission sources must be addressed under the document's GHG mitigation measures.

f. MM 4.8-2 through MM 4.8-5 unlawfully rely on reporting requirements or existing or future regulations or plans, without demonstrating these measures meaningfully mitigate Project impacts.

3-104

The remaining GHG mitigation measures do not, individually or together, succeed in mitigating GHG impacts.

MM 4.8-2 requires quarterly reporting on the amount of CO_2 injected into the CCS project, and the source of the CO_2.[310] While such reporting is essential, it is not enough, taken together with the other mitigation measures, to mitigate impacts to the extent feasible.

MM 4.8-3 merely requires permitted stationary sources to comply with the Cap-and-Trade regulation and implement Best Performance Standards (BPS) applicable to greenhouse gas reduction for Components at Light Crude Oil and Natural Gas Production, Natural Gas Processing Facilities.[311] But these BPS only apply to certain types of facilities, and if these facilities are not subject to Cap-and-Trade, this mitigation measure will not apply to them at all. Moreover, the Final Staff Report prepared for the SJVAPCD Climate Action Plan states explicitly that "[u]se of performance based standards is not a method of mitigating emissions."[312]

Similarly, MM 4.8-4 and MM 4.8-5 merely require compliance with SJVAPCD regulations (Rule 4401 and 4409) and regulations adopted or amended for methane.[313]

MM 4.8-3, MM 4.8-4, and MM 4.8-5 rely on existing or future regulations, without adding any standards or measures to mitigate potential impacts from GHG emissions. CEQA allows the use of compliance with regulatory standards as mitigation, but only where the regulatory standards ensure actual mitigation of project impacts to the extent feasible. CEQA therefore requires that a determination that compliance will be sufficient to prevent significant

[310] RDEIR, Vol. 1 at 4.8-27.
[311] RDEIR, Vol. 1 at 4.8-27.
[312] SJVAPCD, *Final Staff Report - Climate Change Action Plan: Addressing GHG Emissions Impacts under CEQA* (2009) at 59.
[313] RDEIR, Vol. 1 at 4.8-27.

impacts be based on a project-specific analysis of potential impacts and the effect of regulatory compliance.[314]

3-104 Cont'd

C. The Recirculated Draft EIR's Analysis and Mitigation of Energy Use Impacts is Inadequate.

The Recirculated Draft EIR fails to adequately disclose, analyze, and mitigate the CTV I Project's impacts to energy resources. CEQA Guidelines, Appendix F lays out the following directives for proper discussion of a proposed project's energy impacts in an EIR:

3-105

> The goal of conserving energy implies the wise and efficient use of energy. The means of achieving this goal include:
>
> (1) decreasing overall per capita energy consumption,
>
> (2) decreasing reliance on fossil fuels such as coal, natural gas and oil, and
>
> (3) increasing reliance on renewable energy sources.[315]

The analysis required under CEQA thus provides the opportunity for project proponents to evaluate the energy consequences of their decisions.

The Recirculated Draft EIR applies, as a threshold of significance, whether the Project will "result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation."[316] The Recirculated Draft EIR concludes that:

> [C]onstruction activities associated with the proposed project would result in the consumption of petroleum-based fuels. However, there are no unusual project characteristics that would necessitate the use of construction equipment or vehicles that would be less energy efficient than at comparable construction sites in other parts of the state. Therefore, it is expected that construction fuel consumption associated with the proposed project would not be any more inefficient, wasteful, or unnecessary than at other construction sites in the region.[317]

In this conclusion, the Recirculated Draft EIR applies, as a threshold, whether the Project would be "*more* inefficient, wasteful, or unnecessary than at other construction sites in the region." But CEQA instead requires an evaluation of whether this project is energy-efficient, not average; CEQA requires mitigation of impacts to energy consumption, where feasible. The claim that the Project has no significant impact on energy resources is thus not supported by substantial evidence. The EIR should require, for example, use of electricity-powered construction equipment and vehicles in all feasible applications.

3-106

[314] *Californians for Alternatives to Toxics v. Dept. of Food & Agric.* (2005) 136 Cal.App.4th 1.
[315] CEQA Guidelines, Appendix F, § 2.
[316] RDEIR, Vol. 1 at 4.6-12.
[317] RDEIR, Vol. 1 at 4.6-14.

Moreover, the Recirculated Draft EIR does not provide sufficient information or analysis to evaluate the Project's overall relationship to energy consumption, and does not even address this question. CO_2 storage projects will often tend to substitute for, rather than facilitate, decreasing reliance on fossil fuels such as coal, natural gas, and oil. The Project's energy conservation analysis fails for many of the same reasons its project description, GHG impact analysis, and cumulative impact analysis are inadequate. In particular, an analysis that includes information about the relationship between Project CO_2 storage operations and Project CO_2 sources is necessary, to fully disclose and analyze whether and to what extent CTV I will facilitate development and use of fossil fuel infrastructure or extend the life of existing fossil fuel CO_2-emitting industries. The Recirculated Draft EIR's failure to include any meaningful discussion of the Project's CO_2 sources renders the discussion inadequate to evaluate how the Project will decrease reliance on fossil fuels or increase reliance on renewable energy. 3-107 3-108

D. The Recirculated Draft EIR's Analysis and Mitigation of Geologic Risks is Inadequate.

The Recirculated Draft EIR fails to adequately disclose, analyze, and mitigate the significant geologic impacts of the CTV I Project in this region. These failures are unacceptable given the setting in which the Project may occur and render the Recirculated Draft EIR defective as an informational document. 3-109

The expert report of Dr. DiGiulio addresses the numerous deficiencies in the County's analysis and why it underestimates the severity of the Project's geologic impacts in further detail. Dr. DiGiulio's analysis highlights the serious risk of CO_2 leaks from the storage reservoirs as well as seismic hazards on wellbores in the Elk Hills oil field, and concludes:

> Given the large number of well penetrations, high pressure during storage, storage primarily as a supercritical fluid, and natural seismicity, leakage through well penetrations is a major concern. . . .
>
> In the absence of a robust investigation of wellbore integrity at the Carbon TerraVault I project, the [Recirculated Draft EIR] should not be approved.[318]

1. The Recirculated Draft EIR must fully account for the significant risk of leaks due to existing wellbores at the Elk Hills oil field.

The Recirculated Draft EIR fails to properly consider any of these issues because it fails at the outset to fully account for the geologic setting at the Elk Hills oil field. When analyzing a project's adverse environmental impacts under CEQA, "[t]he significance of an activity depends on the setting."[319] It is imperative that an EIR accurately and fully describe a project's environmental setting because this description forms the baseline for evaluating its environmental impacts.[320] Indeed, the Recirculated Draft EIR here must demonstrate not only that the CTV I Project's geologic impacts were adequately investigated but that these impacts 3-110

[318] DiGiulio Report at 36–37.
[319] *Kings County Farm Bureau*, 221 Cal.App.3d at 718; see also CEQA Guidelines, § 15125.
[320] See CEQA Guidelines, § 15125(a).

were "considered *in the full environmental context.*"[321] It is impossible for the Recirculated Draft EIR to fulfill its informational purpose if it is not adequately describing and considering the existing environment and geologic setting that may be impacted by the Project.

3-110 Cont'd

The Elk Hills oil field and its surrounding region have been deeply shaped by oil and gas drilling activity for many decades. Elk Hills is one of the oldest and largest oil fields in the U.S., discovered over 100 years ago, and is characterized by "the presence of a large number of well penetrations."[322] As discussed in the DiGiulio Report, "[l]eakage of CO_2 from wellbores is widely considered to be one of the most significant leakage pathways for geologic storage of CO_2" and the large number of wellbores at Elk Hills therefore "increases the possibility of leakage" which could be "catastrophic."[323]

These risks are exacerbated where, as here, wellbores have not been permanently plugged back to surface, and the Recirculated Draft EIR contains discrepancies in the number of wellbores that require plugging.[324] Some recent estimates indicate that Elk Hills contains nearly 1,400 idle, unplugged wells that have not produced oil or gas for an average 14 years.[325]

Even if properly plugged, Dr. DiGiulio notes that wellbore integrity failure and leaks from plugged wells "is common," with research finding failure rates from 2-75%.[326] Yet the Recirculated Draft EIR found an implausible 0% failure rate in both storage reservoirs, with no wellbores deemed deficient or requiring corrective action.[327]

The Recirculated Draft EIR fails to acknowledge these issues or disclose the inherent and heightened risks of CO_2 storage in a depleted oil field like this one, which renders it lacking in substantial evidence to support its subsequent conclusions about impacts and mitigation.

2. The Recirculated Draft EIR fails to disclose critical details about the Project.

In fact, many of the Recirculated Draft EIR's conclusions about geologic impacts are "impossible to verify" due to missing details.[328] Dr. DiGiulio notes that the document excludes critical information needed to assess wellbore integrity at Elk Hills and the likelihood of leaks

3-111

[321] CEQA Guidelines, § 15125(c) (emphasis added).
[322] Olalde & Menezes, *The Toxic Legal of Old Oil Wells: California's Multibillion-Dollar Problem*, LA Times (Feb. 6, 2020), https://www.latimes.com/projects/california-oil-well-drilling-idle-cleanup/; DiGiulio Report at 4.
[323] DiGiulio Report at 4–5, 7–9 (discussing that the RDEIR appears to have ignored not just the large number of wellbores at the storage areas but also those outside the storage areas at Elk Hills); see also Environmental Integrity Project, *Flaws in EPA's Monitoring and Verification of Carbon Capture Projects* at 5–6.
[324] DiGiulio Report at 15–16; see also RDEIR, Vol. II, App'x A6: Summary of Written Public Comments Received on DEIR (Dec. 2023), Letter from Jeremy Lancaster, State Geologist, Cal. Geological Survey (Mar. 1, 2024) at 850–52 (noting Draft EIR's discrepancy between 7,500+ wells drilled at Elk Hills vs. 354 wellbores at the storage reservoirs).
[325] Olalde & Menezes, *The Toxic Legal of Old Oil Wells: California's Multibillion-Dollar Problem*.
[326] DiGiulio Report at 14.
[327] *Id.* at 16–17.
[328] *Id.* at 16.

from the reservoirs. As one example, the Recirculated Draft EIR repeatedly references appendices with vague or undefined descriptors, and key wellbore schematics are missing.[329] In another example, critical information "relevant to wellbore integrity (e.g., internal and external mechanical integrity tests, drilling and cementing records, cement bond/variable density logs, cement squeeze operations, etc.)" is missing and should be included to facilitate full public participation.[330]

3-111 Cont'd

The Recirculated Draft EIR thus violates CEQA's mandate for an EIR to "include detail sufficient to enable those who did not participate in its preparation to understand and to consider meaningfully the issues raised by the proposed project."[331] Even if pieces of this information are included in EPA's Class VI permit materials or elsewhere, the County is required to include these details with the Recirculated Draft EIR for public review and comment, and to use it to inform its own analysis of impacts and appropriate mitigation for the CTV I Project. The failure of the Recirculated Draft EIR to include this information means the County must revise it with the missing information discussed in the DiGiulio Report included, and provide an adequate public comment period on the recirculated draft.

3. The Recirculated Draft EIR must address how seismic hazards will exacerbate potential geologic impacts.

3-112

The Recirculated Draft EIR also does not accurately describe and consider the full environmental context related to seismic activity in the region. Although the Recirculated Draft EIR notes that the County is in the highest seismic hazard zone and discusses the basic seismic history of the region,[332] it inappropriately narrows its analysis of impacts to the bounds of the Elk Hills oil field, which fails to capture potentially significant adverse geologic and safety impacts in the broader region. The analysis otherwise waves away further review of the potential impacts of natural or induced seismicity due to the project because "there are no known major faults within the project area."[333]

By contrast, Dr. DiGiulio classifies the impacts of seismicity on the Project area as "high risk" (vs. the Recirculated Draft EIR's classification of "low to medium" risk) and recommends the County conduct a detailed seismicity evaluation in order to properly determine that seismicity will not impact containment of injected CO_2.[334] The report defines the appropriate "region of concern" as encompassing all seismic events within 200 kilometers from the storage reservoirs, discusses key seismic events in the region's history, and points out that the Recirculated Draft EIR's discussion of seismic events within a smaller 100-kilometer range of the oil field is insufficient for ensuring the Project avoids catastrophic loss of containment.[335] Critically, the seismic risk analysis fails entirely to consider legacy wells or the significant consequences of leaks through these wells.[336] The Recirculated Draft EIR's omission of this

[329] *Id.* at 15–17.
[330] *Id.* at 16.
[331] *Laurel Heights*, *supra*, 47 Cal.3d at 405.
[332] RDEIR, Vol. 1 at 4.7-14, 4.7-5.
[333] RDEIR, Vol. 1 at 4.7-19.
[334] DiGiulio Report at 20, 25–26, 30.
[335] DiGiulio Report at 20–23.
[336] DiGiulio Report at 25.

requisite level of analysis renders the geologic impacts section lacking in substantial evidence to support its conclusions.

3-112 Cont'd

In addition, the County's dismissal of the risks of seismicity induced from injection of CO_2 at Elk Hills as "unlikely" is inconsistent with the scientific literature linking fluid injection into deep underground wells with earthquakes.[337] The DiGiulio Report notes "[e]ven in areas of low to moderate natural seismic activity, fluid injection may induce earthquakes in excess of [magnitude] 4."[338] The report discusses numerous real-world examples of injection-induced seismicity that the Recirculated Draft EIR fails to disclose or address when considering the impacts of the CTV I Project, including in particular incidents of CO_2 injection inducing seismic events.[339]

Dr. DiGiulio further explains that "[f]or induced seismicity, the primary concern here is pressure transmission below the Monterey Formation, not above it. In the Class VI regulations, the primary concern is leakage through faults in the confining layer, not transmission of pressure and induced seismicity below the storage formation. Hence, neither EPA regulations nor the [Recirculated Draft EIR] adequately consider induced seismicity."[340] Thus, the County cannot outsource its obligations to properly analyze and mitigate the potential impacts of induced seismicity by ceding those obligations to EPA, a tactic it deploys throughout the geologic impacts section.[341]

Given the risks of natural and induced seismicity and the fact that Kern County and the region surrounding the Elk Hills oil field is already one of the most seismically active in the state—the Central Valley is considered a "hot spot" where oil and gas wells and earthquakes are clustered in space[342]—the Recirculated Draft EIR cannot dismiss potential impacts. Indeed, Dr. DiGiulio notes "[s]eismicity may be induced tens of kilometers away from large-scale injection" which further expands the impact area the County should consider for the Project well beyond the Elk Hills oil field.[343]

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[337] RDEIR, Vol. 1 at 4.7-19; see, e.g., Goebel, T.H.W. et al., *Wastewater Disposal and Earthquake Swarm Activity at the Southern End of the Central Valley, California*, Geophys. Res. Lett., 43 (2016), 1092–99 (hydrogeological modeling reveals wastewater disposal likely contributed to seismicity via localized pressure increase along a seismically active fault, with results suggesting induced seismicity may remain undetected in California without detailed analysis of local geologic setting, seismicity, and fluid diffusion, and proximity of high-rate injectors and large active faults can cause noticeable earthquakes under certain geologic conditions).

[338] DiGiulio Report at 31.

[339] DiGiulio Report at 30–33.

[340] DiGiulio Report at 33.

[341] See Environmental Integrity Project, *Flaws in EPA's Monitoring and Verification of Carbon Capture Projects*.

[342] Kang, M. et al., *Potential Increase in Oil and Gas Well Leakage Due to Earthquakes*, Environ. Res. Commun. (2019), 1: 121004 at 3, https://doi.org/10.1088/2515-7620/ab576e.

[343] DiGiulio Report at 31; see also Kuchment, *Drilling for Earthquakes*, Scientific American (2016), 315, 1, 46–53, https://www.scientificamerican.com/article/drilling-for-earthquakes/ ("Evidence suggests that earthquake risks can spread for miles beyond the original disposal sites and can persist for a decade or more after drilling stops.").

Potential impacts here could include damage to project infrastructure like pipelines, compressors, injection wells, or other wells in the oil field, damage to other structures in the region like roads and buildings, and dangerous CO_2 leaks to air and groundwater that harm the environment and health of nearby communities.[344] Even ground shaking from small- to moderate-sized earthquakes is consequential for a CO_2 repository and capable of creating leakage pathways to the surface.[345] The omission of this information violates CEQA's mandate that the data in an EIR "must be presented in a manner calculated to adequately inform the public and decision makers, who may not be previously familiar with the details of the project," and to give the readers "a better road map to the information it intends to convey."[346] 3-112 Cont'd

Overall, the County fails to provide substantial evidence to support the assumptions and conclusions in the geologic impacts section.

4. The Recirculated Draft EIR fails to adequately address cumulative geologic impacts.

The Recirculated Draft EIR's failures described above taint its cumulative impact analysis and render it inadequate under CEQA. While it acknowledges the impacts of cumulative induced seismic activity from the CTV I Project are significant and unavoidable, it otherwise waves away all other geologic impacts and fails to conduct further analysis on the nature and magnitude of the significant risks "due to the uncertainty of the implementation of multiple [CCS] projects and the ability to simultaneously cease injection during a[] [seismic] event."[347] The Recirculated Draft EIR's bare conclusion violates CEQA.[348] 3-113

As discussed throughout these comments, the Recirculated Draft EIR must also address "probable future projects."[349] This includes the numerous other CO_2 sources being prepared for CTV I as well as further industrial development that is expected in the region in connection with the Project.

5. The Recirculated Draft EIR fails to adopt all feasible mitigation to address geologic risks.

The Recirculated Draft EIR sets forth mitigation measures to address the geologic impacts of the CTV I Project that are wholly inadequate under CEQA. The DiGiulio Report 3-114

[344] See, e.g., Millman, *California Earthquakes Caused $200 Million in Damage, Report Says*, Wall Street Journal (July 24, 2019), https://www.wsj.com/articles/california-earthquakes-caused-200-million-in-damage-report-says-11564006544 (pair of recent 6.4 and 7.1 magnitude earthquakes in Kern County caused about $200 million in property damage alone, not including damage to infrastructure such as roads or to a nearby naval base); Natural Resources Defense Council (NRDC), *Drilling in California: Who's at Risk?* (2014) at 9, https://www.nrdc.org/sites/default/files/california-fracking-risks-report.pdf; DiGiulio Report at 24.

[345] Zoback, M. & Gorelick, S., *Earthquake Triggering and Large-Scale Geologic Storage of Carbon Dioxide*, 109 PNAS 10164 (2012) at 10165–66, https://doi.org/10.1073/pnas.1202473109.

[346] *Vineyard Area Citizens*, *supra*, 40 Cal. 4th at 443.

[347] RDEIR, Vol. 1 at 4.7-26 to 4.7-27.

[348] *Sierra Club*, *supra*, 6 Cal.5th at 519.

[349] Pub. Resources Code, § 21083(b)(2).

details numerous deficiencies in the County's mitigation measures and why they must be addressed.

3-114 Cont'd

The Recirculated Draft EIR acknowledges that earthquakes may disturb surface and subsurface facilities like wellbores at the Project site and could result in loss, injury, or death.[350] It also acknowledges that the site may be subject to strong ground shaking that could cause structural damage and other Project components that could injure people.[351] Thus, the County must adopt all feasible mitigation.

MM 4.7-1 requires CRC to prepare a comprehensive seismic activity monitoring plan that includes connection to the Statewide seismic monitoring program of the California Seismic Network and compliance with state requirements, including "[a]ppropriate subsurface monitoring to ensure geologic sequestration of injected carbon dioxide; [i]dentification of hazards and conditions that may require the suspension of carbon dioxide injections; notification protocols for all applicable agencies and emergency procedures."[352]

The elements of MM 4.7-1 are inadequate and do not represent all feasible mitigation for the impacts of earthquakes and ground shaking. The DiGiulio Report points out that, while a seismic monitoring plan would be able to detect an earthquake, it does not reduce damage to surface and subsurface facilities, and thus the impacts should be considered significant and unavoidable, rather than less than significant as the Recirculated Draft EIR concludes.[353]

The DiGiulio Report provides numerous recommendations for seismic monitoring network design that are missing and should be included in MM 4.7-1 to comply with CEQA's requirement to adopt all feasible mitigation.[354] As the Report notes, "monitoring of natural seismicity is not mitigation."[355]

In addition, MM 4.7-1 is riddled with vague and indefinite terms. Under CEQA, a mitigation measure must include criteria or performance standards against which the mitigation's actual implementation can be measured.[356] MM 4.7-1, however, is a laundry list of vague actions such as "appropriate" subsurface monitoring, "[i]dentification of hazards and conditions," and "notification protocols for all applicable agencies and emergency procedures."[357] The Recirculated Draft EIR must be revised to include measurable and enforceable mitigation measures to address the Project's impacts. Open-ended and therefore potentially meaningless terms in a mitigation measure that will be developed at an unspecified time in the future also violate CEQA's requirements for deferred mitigation.

MM 4.7-1 is also effectively unenforceable because the Recirculated Draft EIR does not contain permit conditions, agreements, or other legally binding instruments that ensure the

[350] RDEIR, Vol. 1 at 4.7-17.
[351] RDEIR, Vol. 1 at 4.7-19.
[352] RDEIR, Vol. 1 at 4.7-18.
[353] DiGiulio Report at 29.
[354] DiGiulio Report at 33–36.
[355] DiGiulio Report at 29.
[356] *San Joaquin Raptor Rescue Ctr.*, *supra*, 149 Cal.App.4th at 670.
[357] RDEIR, Vol. 1 at 4.7-18.

seismic monitoring plan will be prepared and implemented, and who will enforce it.[358] The Measure must specify that no construction or grading permits shall be issued, and no activities expected to cause earthquakes or ground shaking may otherwise commence, unless and until the County, EPA Region 9, CARB, and California Seismic Network all approve the seismic monitoring plan for the CTV I Project. The County must specify such a limitation because "mitigation measures must be in place" when a "project reaches the point where activity will have a significant adverse effect on the environment."[359] 3-114 Cont'd

The DiGiulio Report points out that the Recirculated Draft EIR's claim that mitigation of strong ground shaking "is typically provided by designing structures in accordance with the latest edition of the California Building Code" is flawed.[360] Because the Building Code does not address wellbore integrity, compliance would not mitigate potential impacts for this Project, thus the impacts should be considered significant and unavoidable, not less than significant.[361]

It is important to note that merely requiring compliance with agency regulations or other existing requirements like the California Building Code does not conclusively indicate that the Project would not have a significant and adverse impact. Those legal requirements may not be strong enough to protect against environmental impacts. In *Kings County Farm Bureau v. City of Hanford*, for example, the court found that the fact that EPA and the local air pollution control district had issued the necessary air emission permits for the construction of a coal fired cogeneration plan did not nullify the CEQA requirement that the lead agency analyze the significant air quality impacts of the entire project.[362] Similarly here, the Recirculated Draft EIR cannot rely on the Building Code to conclude that impacts would not be significant based on those requirements, without at least describing what those requirements are and how they would reduce the Project's geologic impacts to less than significant. 3-115

MM 4.7-3 is also inadequate and does not represent all feasible mitigation for the impacts of unstable soil or land that could result in landslides, subsidence, liquefaction, or collapse. The Measure states that CRC "shall implement all requirements of a site-specific geotechnical report" with no further detail or direction.[363] This language is vague and indefinite, and defers development of the geotechnical report until an unspecified time in the future. The Recirculated Draft EIR must be revised to include measurable and enforceable terms for the report to address the Project's impacts. Moreover, without any permit conditions or other legally binding instruments to ensure the report will be prepared and implemented, this measure is entirely unenforceable. The Recirculated Draft EIR must specify that no permits shall be issued and no activities expected to cause landslides, subsidence, liquefaction, or collapse may begin until the County and other relevant agencies approve the report.

The flaws in the Recirculated Draft EIR's analysis of geologic risks also impacts its development of mitigation measures to address cumulative impacts. After acknowledging 3-116

[358] Pub. Resources Code, § 21081.6(b); CEQA Guidelines, § 15126.4(a)(2).
[359] *King and Gardiner Farms, supra,* 45 Cal.App.5th at 860, quoting *POET*, *supra,* 218 Cal.App.4th at 738.
[360] RDEIR, Vol. 1 at 4.7-19.
[361] DiGiulio Report at 29.
[362] *Kings County Farm Bureau*, *supra*, 221 Cal.App.3d at 716.
[363] RDEIR, Vol. 1 at 4.7-22.

significant and unavoidable cumulative impacts, the document makes no attempt to adopt feasible mitigation, claiming "there are no other feasible and reasonable mitigations available" other than the deficient measures discussed above.[364] This failure violates CEQA, particularly given the analysis and recommendations in the DiGiulio Report.

3-116 Cont'd

In addition to addressing the deficiencies in the Recirculated Draft EIR's current mitigation measures for geologic impacts and strengthening its seismic monitoring and mitigation plan measures, the DiGiulio Report recommends numerous additional feasible mitigation measures that the County should adopt to address the CTV I Project's serious impacts. One example that would protect nearby communities—and reflect measures already considered for other impacts in the Recirculated Draft EIR—is to "determine safe distance(s) for injection wells, wellbores, and pipelines from human receptors and adopt setback(s) that prohibit development at unsafe distance(s)."[365]

E. The Recirculated Draft EIR's Analysis and Mitigation of CO_2 Pipeline Safety Hazards is Inadequate.

The Recirculated Draft EIR fails to adequately disclose, analyze, and mitigate the serious carbon dioxide pipeline safety hazards of the CTV I Project. The attached Kuprewicz Report addresses the numerous deficiencies in the County's analysis in further detail and why they obscure the severity of the Project's pipeline safety impacts. The issues raised in the report highlight why the Recirculated Draft EIR is defective as an informational document.

3-117

1. The Recirculated Draft EIR fails to provide critically important pipeline information.

As the Kuprewicz Report concludes, "[i]mportant pipeline information is missing in the [Recirculated Draft EIR] that will not permit decisionmakers to make an informed decision about this Project."[366] The Report offers a list of key examples of the Recirculated Draft EIR's "major shortcomings" and failure to disclose critical details about the Project.[367]

The missing details about the nature of the CTV I Project's pipeline construction and operations prevent understanding of the applicable regulations and safety jurisdiction of relevant agencies, and thus a complete analysis and appropriate mitigation. As one example, the Recirculated Draft EIR includes a laundry list of potential sources for the Project "without identifying how such sources will be transported to the Elk Hill facilities—a critical omission."[368]

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[364] RDEIR, Vol. 1 at 4.7-27.
[365] DiGiulio Report at 5.
[366] Kuprewicz Report, Attachment A at 2. The Kuprewicz Report consists of a brief cover note addressing the Recirculated Draft EIR, and Attachment A, which is Richard Kuprewicz's assessment of the original Draft EIR. The cover note states that the Recirculated Draft EIR did not meaningfully address his assessment of the original Draft EIR, which still fully applies, and that the pipeline safety analysis and relevant mitigation measures remain inadequate.
[367] Kuprewicz Report, Attachment A at 2–5.
[368] Kuprewicz Report at 1.

The Recirculated Draft EIR also contains inaccurate and misleading details that obscure a full understanding of potential pipeline safety impacts. For example, the Kuprewicz Report discusses the Recirculated Draft EIR's attempts to minimize the extent of impacts from the Satartia, MS pipeline rupture.[369] Relatedly, the Recirculated Draft EIR also completely fails to address the possibility of a CO_2 injection well blowout, which "can release many thousands of tons from essentially an infinite supple of CO_2 in the reservoir, easily surpassing pipeline rupture releases."[370] 3-117 Cont'd

The deficiencies in the Recirculated Draft EIR are particularly consequential given the history of explosions and disasters that have harmed people in pipeline-related incidents,[371] and the ongoing harms faced by communities in the Elk Hills region due to oil and gas activity. In fact, as recently as February 2024, a pipeline burst in Bakersfield, releasing barrels of oil on a public street next to Buena Vista Elementary School.[372] Between January 1, 2010, and January 19, 2023, a total of 8,140 pipeline incidents were reported to the Pipeline and Hazardous Materials Safety Administration (PHMSA), an average of 1.7 incidents per day. Hazardous liquid pipelines (which encompass CO_2 pipelines) accounted for more than half of these incidents.[373] The DiGiulio Report also discusses at length examples of large-scale CO_2 releases and their impacts on neighboring communities.[374] 3-118

Notably, a prior similar carbon capture proposal in the Elk Hills oil field that would have compressed CO_2 from a hydrogen plant and transported it to the field via pipeline to 25 injection wells for enhanced oil recovery found serious safety risks.[375] Specifically, the project risk assessment for its approximately 3 mile pipeline—about a quarter of the length of the CTV I Project's planned pipelines—determined that a large amount of CO_2 could be released into the atmosphere if it failed.[376] Studies find that exposure to large amounts of CO_2 could lead to harmful impacts like irritation, chronic or irreversible tissue damage, or narcosis, and to irreversible health effects, impairing, or even death for close exposure to the release.[377] None of these issues are addressed in the Recirculated Draft EIR, rendering it lacking in substantial evidence to support its conclusions. 3-119

[369] Kuprewicz Report, Attachment A at 6.
[370] Kuprewicz Report, Attachment A at 6–7.
[371] See, e.g., Zegart, Dan, *The Gassing of Satartia*.
[372] LaVigne, *Pipe Burst Spills Oil in Front of Buena Vista Elementary School*, KERO-TV (Feb. 8, 2024), https://www.turnto23.com/news/in-your-neighborhood/bakersfield/pipe-burst-spills-oil-in-front-of-buena-vista-elementary-school.
[373] FracTracker Alliance, *2022 Pipeline Incidents Update: Is Pipeline Safety Achievable?* (Feb. 1, 2023), https://www.fractracker.org/2023/02/2022-pipeline-incidents-update-is-pipeline-safety-achievable/.
[374] DiGiulio Report at 4–5.
[375] Submitted by Occidental of Elk Hills, Inc. to Cal. Dept. of Conservation, *Proposed Enhanced Oil Recovery Project (Phase 1), Underground Injection of Carbon Dioxide Gas, Stevens Reservoirs – T30, 31S, R23, 24E, Sections 33S, 34S, 35S, 2G, 3G, & 4G, Engineering Study, Geologic Study, and Injection Plan* (Oct. 2, 20212) at 1, 6.
[376] Stantec, *Hydrogen Energy Center Application for Certification Amendment –Attachment D: Hazards Assessment of CO_2 Supply Line* (Apr. 12, 2011) at 7.
[377] *Id.* at 6–7.

The Recirculated Draft EIR's failures are particularly stark given the evidence that most CCS pipelines fall largely within environmental justice communities, like those surrounding Elk Hills, that live in close proximity to industrial pollution.[378] 3-119 Cont'd

Given its serious deficiencies, the Recirculated Draft EIR's dismissal of all pipeline-related impacts, including cumulative impacts, as less than significant is not supported by substantial evidence.

2. The Recirculated Draft EIR fails to adopt all feasible mitigation to address pipeline safety hazards.

Because of the missing and inaccurate information regarding CO_2 pipeline safety issues, it is impossible for the Recirculated Draft EIR to satisfy CEQA's requirement to adopt all feasible mitigation measures for these impacts. The proposed measures are also ineffective, unenforceable, and vague, and illegally defer mitigation. 3-120

For example, MM 4.9-4 requires a construction permit site plan for all CO_2 pipelines, which will be reviewed and approved by the County and California State Fire Marshall (OSFM), noting that PHMSA has delegated CO_2 pipeline oversight to OSFM.[379] In addition to this Measure being vague and improperly deferring the plan to an unspecified future date, it is unclear whether OSFM actually has proper jurisdiction over the CTV I Project's CO_2 pipelines. As discussed in the Kuprewicz Report, the Recirculated Draft EIR's failure to provide CO_2 purity information and clearly distinguish between facility and injection pipelines obscures whether either agency has jurisdiction and responsibility for the Project.[380] The report also highlights that federal pipeline safety regulations are seriously inadequate, thus the County cannot rely on compliance alone to avoid fulfilling its own separate obligations under CEQA to properly assess and mitigate impacts.[381]

As another example of the Recirculated Draft EIR's deficient mitigation measures, MM 4.9-10 only requires compliance with EPA's Class VI permit before injection can begin.[382] As discussed throughout these comments, merely requiring compliance with existing regulations or other requirements like the Class VI requirements without further review or analysis does not conclusively indicate that the Project would not have significant and adverse impacts. 3-121

Concerningly, MM 4.11-7 seems to indicate that offsite sources can inject at CTV I via CO_2 pipelines permitted by the California Public Utilities Commission (PUC) for common carrier companies—without explaining the nature of these offsite sources or any relevant details about the connecting pipelines or potential common carrier companies.[383] This measure is therefore vague, indefinite, and does not represent all feasible mitigation. Moreover, given the current moratorium on intrastate pipelines in the state due to the requirements of Senate Bill

[378] Rota, M., *Carbon Dioxide Waste Capture and Injection: A False Solution for Louisiana and the World* (2023), https://healthygulf.org/carbon-waste-injection-false-solution-for-louisiana/.
[379] RDEIR, Vol. 1 at 4.9-58.
[380] Kuprewicz Report, Attachment A at 2–3.
[381] Kuprewicz Report, Attachment A at 5.
[382] RDEIR, Vol. 1 at 4.9-61.
[383] RDEIR, Vol. 1 at 4.11-54.

905,[384] the relevance of common carrier CO_2 pipelines is vague and "should be raising serious concerns about possible efforts to move CO_2 in converted existing pipelines as a gas to circumvent the moratorium."[385] Given it appears CRC has recently applied to the PUC for a certificate to operate as a gas utility in the state, the Recirculated Draft EIR's omission of these details, or CRC or CTV's larger plans for pipeline transport, is glaring and improper under CEQA.[386] 3-121 Cont'd

These highlighted examples are just a sample and illustrate the overall failures of the Recirculated Draft EIR to analyze and adopt all feasible CO_2 pipeline safety mitigations for the CTV I Project. The Kuprewicz Report recommends additional feasible mitigation measures that the County should adopt to address CO_2 pipeline impacts, including, as noted elsewhere, that the County should adopt setbacks from the pipelines.[387] 3-122

F. The Recirculated Draft EIR's Analysis and Mitigation of Water Supply Impacts is Inadequate.

An accurate analysis of the CTV I Project's impact on the local water supply is crucial because water is scarce in Kern County and groundwater pumping has occurred at unsustainable levels for decades, resulting in overdraft conditions region-wide, county-wide, and within the Project Area. Unfortunately, the Recirculated Draft EIR fails to adequately disclose and analyze water supply impacts and correspondingly fails to adopt all feasible mitigation. 3-123

As an initial matter, it is worth noting that the Recirculated Draft EIR is confusing because the header for the section on Utilities and Service Systems—one of the several sections that address water supply issues—is mislabeled as "4.17 Utilities and Service Systems."[388] The section on Utilities and Service Systems is actually section 4.19. The erroneous header should be corrected because it is confusing to the reader and complicates navigation of the document. 3-124

1. The Recirculated Draft EIR's description of the environmental and regulatory setting for water supply is inadequate.

The Recirculated Draft EIR is misleading and fails as an informational document because, remarkably, it fails to acknowledge the most basic fact about water supply in Kern County: there is "no surplus water available" in the County to meet domestic and/or irrigation demands, meaning that any use of municipal and industrial (M&I) quality water by the proposed 3-125

[384] Senate Bill No. 905 (2021–2022 Reg. Sess.), approved by Governor, Sept. 16, 2022.
[385] Kuprewicz Report at 1.
[386] Cal. P.U.C., *Application of California Resources Production Corporation for a Certificate of Public Convenience and Necessity to Operate as a Gas Corporation in the State of California* (July 10, 2023).
[387] Kuprewicz Report, Attachment A at 4–5; DiGiulio Report at 5; see also Hillebrand, M. et al., *Toxicological Risk Assessment in CO_2 Capture and Storage Technology*, International Journal of Greenhouse Gas Control 55 (2016) 118–43 (concentrations of CO_2 releases from pipelines are function of distance, thus safety distances have to be calculated wherein no hazardous concentrations are reached, varying between <1 m and 7.2 kilometers).
[388] See, e.g., RDEIR, Vol. 1 at 4.19-2 (with "4.17 Utilities and Service Systems" in the header).

CTV I Project necessarily "reduces potential supplies for other purposes and users."[389] The Recirculated Draft EIR should disclose this reality upfront to the public and decisionmakers. 3-125 Cont'd

The details that the Recirculated Draft EIR does provide downplay the Project's water supply impacts and are inadequate. For example, in describing the relevant "Environmental Setting" for the CTV I Project's impact on water supply, the document merely notes that "[t]he project site is located within the Tulare Lake Basin," which "is ranked as 'high priority' in a statewide ranking of groundwater importance."[390] The Recirculated Draft EIR also notes "[t]he Kern County Subbasin ('Subbasin') is the specific groundwater subbasin in which the project resides."[391] 3-126

To meaningfully inform readers, the Recirculated Draft EIR must explain the significance of the Tulare Lake Basin's designation of "high priority" and offer more details on conditions in the Tulare Lake Basin generally and the Kern County Subbasin specifically.

The Tulare Basin is designated as "high priority" both because the region is heavily reliant on groundwater and because groundwater supplies are in a condition of "critical overdraft."[392] Similarly, the Kern County Subbasin has been identified as "high priority," reflecting that the area is "critically overdrafted" and suffers from related problems including "land subsidence and groundwater quality degradation."[393] Persistent overdraft of groundwater also "dries up wells."[394]

Although the Recirculated Draft EIR acknowledges that the Kern County Subbasin, "as a whole, has an overdraft of 324,326 acre-feet per year over the baseline conditions,"[395] nowhere is the significance of this fact explained. 3-127

The Recirculated Draft EIR is similarly misleading and incomplete in its description of the regulatory setting for water supply. The document includes a general discussion of the Sustainable Groundwater Management Act (SGMA) and how it is being implement in the Project Area.[396] As part of this discussion, the Recirculated Draft EIR notes the status of six groundwater sustainability plans (GSPs) that have been prepared for the San Joaquin Valley Kern County Subbasin.[397] However, nowhere does the Recirculated Draft EIR explain that 3-128

[389] Kern County Planning & Natural Resources Dept., *Draft Supplemental Recirculated Environmental Impact Report for Revisions to Title 19-Kern County Zoning Ordinance, Supplemental Water Supply Baseline Technical Report* (July 2020) at 4, 58.
[390] RDEIR, Vol. 1 at 4.10-1.
[391] RDEIR, Vol. 1 at 4.10-2.
[392] RDEIR, Vol 2., Water Supply Assessment for the Carbon Terravault 1 Project at 2–3.
[393] RDEIR, Vol. 2, West Kern Water District, Urban Water Management Plan 2020 Update (June 2021) at 34.
[394] Rachel Becker, *San Joaquin Valley growers may face probation for failing to protect groundwater*, Cal Matters (Oct. 12, 2023), https://calmatters.org/environment/2023/10/san-joaquin-valley-groundwater/.
[395] RDEIR, Vol. 1 at 4.10-35, 4.19-2, 4.19-21.
[396] RDEIR, Vol. 1 at 4.10-15 to 4.10-17, 4.19-7 to 4.19-8.
[397] RDEIR, Vol. 1 at 4.10-16, 4.19-8; see also *id*. at 4.19-13 to 4.19-14.

SGMA applies to Kern County and the Project Area because the Act was designed to address chronic groundwater overdraft and its negative consequences. 3-128 Cont'd

Further, the Recirculated Draft EIR neglects to address whether or how the six GSPs will affect the available water supplies in the Kern County Subbasin generally or for the Project specifically. Although the Recirculated Draft EIR indicates that state authorities have determined that the six GSPs are deficient in some respects, the Recirculated Draft EIR also confirms that, under SGMA, local Groundwater Sustainability Authorities are still "required to begin implementation of the plans . . . while working to amend the plans and address the deficiencies."[398] The Recirculated Draft EIR should address the expected consequences of the GSPs—if any—on the proposed CTV I Project and its planned operations and water use.

2. The Recirculated Draft EIR's analysis of the Project's impact on water supply is contradictory, inaccurate, and misleading.

The Recirculated Draft EIR fails as an informational document because it does not clearly explain the source or amount of water that will be used by the Project. 3-129

First, the Recirculated Draft EIR makes conflicting statements about the source of water to be used by the CTV I Project. In section 4.10, the Recirculated Draft EIR states: "[t]he proposed project would use water during construction and for operation of the project. Water for the project would be supplied by the WKWD from existing water allocations for Elk Hills and CRC."[399] Further, according to section 4.10, "all water would be trucked to the site from the WKWD." [400]

The foregoing description of the source of the Project's water supply is contradicted by text in section 4.19 which states that—for Project operations—"[w]ater to operate the carbon capture and storage (CCS) facilities is proposed to be sourced from produced water from existing oil and gas operations within Elk Hills."[401]

Second, no matter the source, the Recirculated Draft EIR inaccurately and misleadingly describes the Project's water supply demand. Table 4.19-2 describes the Project's water demand as follows: 3-130

[398] RDEIR, Vol. 1 at 4.10-17, 4.19-8, 4.19-14.
[399] RDEIR, Vol. 1, at 4.10-34.
[400] RDEIR, Vol. 1 at 4.10-35.
[401] RDEIR, Vol. 1 at 4.19-19.

3-130 Cont'd

Table 4.19-2: Water Supply Availability

	Allotment (acre-feet per year)	Project Demand	Usage of Water Allotment
Elk Hills	3,000		
CRC	2,200		
Construction (18 months)		75 acre-feet	1.4%
Operation (per year)		19.49 acre-feet	0.37%
Total	**5,200**	**94.49 acre-feet**	**1.77%**

Key:
CRC = California Resources Corporation

This table is clearly wrong. The table incorrectly combines a one-time water demand for construction (75 acre-feet) with an annual operational demand (19.49 per year) and concludes that the "Total" Project demand is 94.49 acre-feet. But this is not an accurate total. Just the first phase of the Project is expected to last "26 years,"[402] meaning that operational water demand will amount to at least 506.74 acre-feet (19.49 acre-feet annually x 26 years). The Recirculated Draft EIR must be revised to eliminate Table 4.19-2, which is inaccurate and misleading. Further, the document must disclose how much water the Project will use over its full operational lifetime.

3. The Recirculated Draft EIR's finding that the Project will not substantially reduce groundwater supplies is not supported by substantial evidence.

3-131

The Recirculated Draft EIR offers several reasons to support its conclusion that the CTV I Project will not substantially decrease groundwater supplies, all of which are erroneous.

First, the Recirculated Draft EIR states: "Project operation would not rely on locally sourced groundwater wells, as all water would be trucked to the site from the WKWD [West Kern Water District]."[403] But WKWD supplies the water it provides from "groundwater within the Kern County subbasin,"[404] meaning the Project's water use will still impose a burden on local groundwater supplies.

3-132

Second, the Recirculated Draft EIR asserts that, even accounting for pre-Project water use at the Project site, water use is expected to remain below the WKWD's future water budget for CRC and Elk Hills, which affords 5,200 acre-feet per year.[405] As an initial matter, it is unclear if the future water budget adopted for the Project site by WKWD in 2020 remains valid, given that the Kern Groundwater Authority (KGA) is currently responsible for an annual

[402] RDEIR, Vol. 1 at 1-6, 2-1, 3-2, 3-12.
[403] RDEIR, Vol. 1 at 4.10-35.
[404] RDEIR, Vol. 1 at 3-36; accord 4.10-40, 4.10-43, 4.19-2 (stating "WKWD primarily pumps groundwater").
[405] RDEIR, Vol. 1 at 4.19-20 to 4.19-21.

overdraft of 239,346 acre-feet per year,[406] and state authorities have disapproved KGA's proposed Groundwater Sustainability Plan for the area.[407]

3-132 Cont'd

In any event, the fact that the WKWD may have budgeted for operations at the site does not mean that the Project's expected water use will not have a significant impact. As noted above, there is no surplus water in Kern County, groundwater in the Kern Subbasin is suffering from critical overdraft, and the water to be used by the Project will all be sourced from groundwater. Whether water use at the site was anticipated or not, the Project will still be using substantial quantities of groundwater.

Third, the Recirculated Draft EIR avers that, "[s]hould the project require water supplies in excess of the allotment from the District, impacts to water supplies would be considered potentially significant. In order to address this, MM 4.19-1 would be implemented, ensuring that any groundwater or reclaimed water used is accounted for and regulated."[408]

3-133

The Recirculated Draft EIR's adoption of MM 4.19-1 does not support a finding that the Project's groundwater use will be mitigated to a level of insignificance. That is because MM 4.19-1 in no way limits or mitigates the Project's water use. Rather, the Measure just specifies that the Project Owner/operator shall "provide information on any groundwater . . . that will be used," and County officials, in turn, "shall compile the water use information in a report" to be posted online annually.[409] This Measure does not reduce or limit water use; it merely requires that "that any groundwater . . . used is accounted for."[410]

4. The Recirculated Draft EIR fails to adopt all feasible mitigation for the Project's cumulative impacts on water supply.

Putting aside the Recirculated Draft EIR's unsupported finding that the Project will not have a significant direct impact on groundwater supplies, the document does acknowledge that "the cumulative impacts of any use of groundwater in the area are considered significant."[411] Consequently, the County must adopt all feasible mitigation to address this cumulative impact.

3-134

The Recirculated Draft EIR identifies several mitigation measures that will purportedly address this significant cumulative impact on water supply: MMs 4.9-1, 4.10-1, 4.10-2, 4.10-3, 4.10-4, 4.10-5, and 4.19-1.[412] But none of these measures will actually reduce the Project's impact on groundwater supplies:

[406] See, e.g., RDEIR, Vol. 1 at 4.19-21
[407] See, e.g., RDEIR, Vol. 1 at 4.19-13 to 4.19-14.
[408] RDEIR, Vol. 1 at 4.10-35, 4.19-21.
[409] RDEIR, Vol. 1 at 1-65, 4.19-21 to 4.19-22.
[410] RDEIR, Vol. 1 at 4.19-27.
[411] RDEIR, Vol. 1 at 1-14 to 1-15, 4.10-43, 4.19-28, 5-5 to 5-6, 6-7.
[412] RDEIR, Vol. 1 at 4.10-43 to 4.10-44.

3-134 Cont'd

- MM 4.9-1 provides worker training on the handling of hazardous substance,[413] but the Project site is not a source of groundwater for M&I uses, which is supplied from elsewhere by WKWD.[414]
- MMs 4.10-1 through 4.10-5 all address onsite operations (i.e., stormwater measures and management of drilling muds, drilling fluids, and produced water)[415] but, again, the Project site is not a source of groundwater for M&I uses, which is supplied from elsewhere by WKWD.
- MM 4.19-1, as discussed above, merely requires reporting on groundwater use, and does not limit its use in any way.

Consistent with CEQA's requirement to adopt all feasible mitigation, the County should require the following feasible measures to mitigate the Project's impacts on local groundwater supplies:

- The County should identify specific purposes for which the Project may use M&I quality water—limited to those purposes for which such high-quality, freshwater is truly necessary—and direct that all other water uses in the Project area shall be met by recycling oil field-produced water. The Recirculated Draft EIR indicates that such recycling and reuse of oil filed-produced water already occurs at the site.[416] The County should make this voluntary practice mandatory.
- The County should set a cap on the CTV I Project's water use. According to the Recirculated Draft EIR, if construction activities (75 acre-feet) and operational activities (19.49 acre-feet) were to occur in the same year, the Project's water demand would total 94.49 acre-feet annually.[417] The Project should be held accountable for its estimated water needs and limited to an annual cap of 95 acre-feet per year or less for its CCS operations. In setting the cap, the County should subtract any use(s) included in the Project's estimated water demand that could be met by recycling oil field-produced water.
- The County should levy and collect an annual "fair-share" fee from the Owner/operator to be paid to the KGA to account for the Project's contribution to cumulative impacts on local groundwater supplies that KGA must mitigate pursuant to SGMA.

[413] RDEIR, Vol. 1 at 1-46, 4.9-56.
[414] RDEIR, Vol. 1 at 4.10-7 to 4.10-8 (noting "there is no appreciable quantity of groundwater in the project area" and "any groundwater encountered in this area is generally unusable"); 4.19-2 (stating WKWD's "[w]ater supply is obtained within the District from wells located in the northeast corner of the District in the underflow area of the Kern River Basin and from an area north and adjacent to the State of California's Tule Elk Reserve").
[415] RDEIR, Vol. 1 at 1-53 to 1-56, 4.10-29 to 4.10-33.
[416] RDEIR, Vol. 1 at 4.10-8.
[417] RDEIR, Vol. 1 at 4.19-21.

5. The Recirculated Draft EIR inadequately analyzes and mitigates disposal of oil field-produced water.

3-135

The Recirculated Draft EIR notes that "[a] significant percentage of the oil field-produced water in the project area is either recycled into the same geologic zones from which it was produced or is sequestered in deeper zones that are isolated from sources of drinking water."[418] Water that is not recycled or sequestered underground requires disposal. According to the Recirculated Draft EIR, produced water "may also be transported, via truck or pipeline to existing wastewater treatment facilities permitted to receive production water for disposal" or "stored in surface impoundments where it percolates into groundwater and/or evaporates."[419]

The Recirculated Draft EIR is inadequate as an informational document because it does not specify what percentage of the oil field-produced water is currently (in the oil field) or will be (for the Project) recycled and reinjected onsite as opposed to disposed of in some other way. Instead, the Recirculated Draft EIR merely surmises that "very little water is disposed of . . . because purchasing fresh water is more expensive than recycling water."[420] The document can and should be more specific to inform the public and decisionmakers; it should detail current water disposal volume(s) and practice(s) at the Project site and how these are expected to change, if at all, with the construction and operations of the proposed CCS facility.

It is important that the Recirculated Draft EIR accurately address the fate of oil field-produced water because it has consequences for the CTV I Project's impacts:

- As the Recirculated Draft EIR suggests, a high rate of recycling would lessen the degree to which the Project will compete with other users for scarce municipal and industrial-quality water.[421]
- Conversely, if transportation of the oil field-produced water by truck or pipeline is required for disposal, related environmental impacts must be evaluated and mitigated. For example, the Recirculated Draft EIR notes that truck traffic impacts air quality.[422]
- Surface disposal of oil field-produced water in ponds also threatens impacts that should be disclosed if the practice will occur. "Because it was commingled with hydrocarbons in the formation," produced water "typically contains chemicals associated with the formations, such as salts, oils and greases, inorganic and organic chemicals, and naturally occurring radioactive material, that exceed state and federal standards for drinking water."[423] Disposal in surface impoundments can therefore increase air pollution as well as contaminate the soil and harm biological resources.

[418] RDEIR, Vol. 1 at 4.10-8.
[419] RDEIR, Vol. 1 at 4.9-7.
[420] RDEIR, Vol. 1 at 4.10-8.
[421] RDEIR, Vol. 1 at 4.10-8.
[422] See, e.g., RDEIR, Vol. 1 at 4.3-63, 4.3-66, 4.3-72.
[423] RDEIR, Vol. 1 at 4.9-7.

Although the Recirculated Draft EIR does not analyze the impact, the document seems to contemplate that surface impoundments will, in fact, be used for disposal of oil field-produced water. More specifically, MM 4.10-5 states: "[t]he Owner/operator shall not discharge produced water into any surface disposal facility unless the facility has received the Waste Discharge Requirements from the Central Valley Regional Water Quality Control Board, or the need for Water Discharge Requirements has been waived by the Central Valley Regional Water Quality Control Board."[424] Likewise, MM 4.1-2 states: "[s]umps and ponds shall be permitted only to the extent authorized by the Central Valley Regional Water Quality Control Board . . . and shall comply with all applicable legal requirements and mitigation measures for . . . percolation or evaporation ponds for produced water."[425] 3-135 Cont'd

If the CTV I Project proposes to use such surface impoundments at the Project site, the extent to which they may be used and the impacts of such use must be disclosed. An adequate impact analysis is necessary to inform the development of all feasible mitigation measures and to include meaningful public input on the impacts and proposed mitigation.

G. The Recirculated Draft EIR's Analysis and Mitigation of Biological Resources Impacts is Inadequate.

Protecting biological resources is a fundamental tenet of CEQA. Under Public Resources Code section 21001(c), it is the policy of the state to "[p]revent the elimination of fish or wildlife species due to man's activities, insure that fish and wildlife populations do not drop below self-perpetuating levels, and preserve for future generations representations of all plant and animal communities." EIRs must provide an in-depth analysis of whether a project will: reduce substantially the habitat of a fish or wildlife species; cause a fish or wildlife population to drop below self-sustaining levels; threaten to eliminate a plant or animal community; or reduce substantially the number or restrict the range of an endangered, rare, or threatened species.[426] 3-136

In addition to review under CEQA, when a project has the potential to significantly impact a species listed under the federal or California Endangered Species Act, consultation with wildlife agencies and an Incidental Take Permit (ITP) are required.[427]

1. The Recirculated Draft EIR must account for the threatened, endangered, and sensitive animal and plant species in the Central Valley and Elk Hills oil field.

The Elk Hills oil field and surrounding area is known to support high densities of species protected by state and federal law. The California Department of Fish and Wildlife (CDFW) has specifically called out several species known to be supported in the area through prior biological surveys, including the blunt-nosed leopard lizard, giant kangaroo rat, San Joaquin kit fox, Swainson's hawk, San Joaquin antelope squirrel, American badger, short-nosed kangaroo rat, 3-137

[424] RDEIR, Vol. 1 at 1-56, 4.10-33.
[425] RDEIR, Vol. 1 at 1-27, 4.1-23.
[426] CEQA Guidelines, § 15065(c)(1).
[427] Cal. Fish & Game Code, § 2081; Endangered Species Act, § 10.

burrowing owl, California glossy snake, and California jewelflower.[428] As CDFW noted in its comment on the original Draft EIR, since 2022, "two species have become candidates for listing under CESA and remain candidates as of the date . . . . [the] Temblor legless lizard and Crotch's bumble bee."[429]

3-137 Cont'd

In its comments on the Notice of Preparation, CDFW recommended additional surveys for special status plant species and also noted the potential for San Joaquin pocket mouse.[430] In addition, CDFW shared with the California Geologic Energy Management Division (CalGEM) in 2022 that "there is potentially suitable habitat [in the Elk Hills oil field] within the well pad footprints and/or adjacent to the wells that can serve as refugia, denning, breeding, foraging, and dispersal habitat" for additional species "likely to occur within th[e] oil field," including the Tipton kangaroo rat, tricolored blackbird, Temblor legless lizard, Kern mallow, San Joaquin woolly threads, Buena Vista Lake shrew, LeConte's thrasher, loggerhead shrike, Tulare grasshopper, San Joaquin coachwhip, California glossy snake, coast horned lizard, western pond turtle, western spadefoot, prairie falcon, California horned lark, and Crotch bumble bee.[431] That 2022 letter also notes that several special-status plant species may occur in the oil field, including California Rare Plant Rank species Horn's milk-vetch, heartscale, Lost Hills crownscale, slough thistle, recurved larkspur, Temblor buckwheat, Tejon poppy, alkali-sink goldfields, pale-yellow layia, showy golden madia, California alkali grass, and oil neststraw.[432]

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[428] Letter from Bob Stafford, California Department of Fish and Wildlife, to Cindi Hoover, Kern County Planning & Natural Resources Dept. (Apr. 6, 2022), RDEIR, Vol. 2, App'x A.2: Comment Letters at 148 (hereafter "Stafford Letter"); see also RDEIR, Vol. 2, App'x A.6: Summary of Written Public Comments on original Draft EIR (Dec. 2023) at 1067, CDFW Letter: Comment from Julie A. Vance, Cal. Department of Fish & Wildlife, to Keith Alvidrez, Kern County Planning & Natural Resources Dept. (Mar. 1, 2024) (hereafter "CDFW Letter").

[429] RDEIR, Vol. 2, App'x A.6: Summary of Written Public Comments on Draft EIR (December 2023) at 1067–68, CDFW Letter.

[430] Stafford Letter at 159, 162.

[431] Letter from CDFW to CalGEM, Elk Hills Oil Field, Kern County, Special-Status Species Information from CDFW (revised Aug. 12, 2022) at 1.

[432] *Id.* at 6.

Table 1. *Threatened, Endangered and Sensitive Animals, Plants, and Plant Communities of the Elk Hills Area (threatened and endangered species are bolded)*

Common Name	***Scientific Name***	***Federal/State Status***	***CDFW Letter***[433]
	Plants		
California jewelflower	***Caulanthus californicus***	***FE/CE, 1B.1***	**1, 2**
San Joaquin woollythreads	***Monolopia congdonii***	***FE/1B.2***	**2**
Kern mallow	***Eremalche parryi ssp. kernensis***	***FE/1B.2***	**2**
Horn's milk-vetch	*Astragalus hornii var. hornii*	*S/1B.1*	2
heartscale	*Atriplex cordulata var. cordulata*	*S/1B.2*	2
Lost Hills crownscale	*Atriplex coronata var. vallicola*	*S/1B.2*	2
Slough thistle	*Cirsium crassicaule*	*S/1B.1*	2
recurved larkspur	*Delphinium recurvatum*	*S/1B.2*	2
Temblor buckwheat	*Eriogonum temblorense*	*S/1B.2*	2
Tejon poppy	*Eschscholzia lemmonii ssp. kernensis*	*S/1B.1*	2
alkali-sink goldfields	*Lasthenia chrysantha*	*--/1B.1*	2
pale-yellow layia	*Layia heterotricha*	*S/1B.1*	2
showy golden madia	*Madia radiata*	*S/1B.1*	2
California alkali grass	*Puccinellia simplex*	*S/1B.2*	2
oil neststraw	*Stylocline citroleum*	*S/1B.1*	2
	Insects		
Crotch bumble bee	*Bombus crotchii*	*--/WL*	2
	Amphibians		
western spadefoot	*Spea hammondii*	*S/SSC*	2
	Reptiles		
Temblor legless lizard	*Anniella alexanderae*	*Under Review / Candidate*	2
western pond turtle	*Actinemys marmorata*	*/SSC*	2
California glossy snake	*Arizona elegans occidentalis*	*--/SSC*	1, 2
blunt-nosed leopard lizard	***Gambelia sila***	***FE/CE, FP***	**1, 2**
San Joaquin coachwhip	*Masticophis flagellum ruddocki*	*--/SSC*	2
coast horned lizard	*Phyrnosoma blaimvillii*	*/SSC*	2
	Birds		
burrowing owl	*Athene cunicularia*	*S/SSC*	1, 2
tricolored blackbird	***Agelais tricolor***	***CT***	**2**
loggerhead shrike	*Lanius ludovicianus*	*/SSC*	2
California horned lark	*Erempohila alpestris actia*	*/WL*	2
prairie falcon	*Falco mexicanus*	*/WL*	2
Le Conte's thrasher	*Toxostoma lecontei*	*S/SSC*	2
Swainson's hawk	***Buteo swainsoni***	***CT***	**1, 2**
	Mammals		

[433] Stafford Letter at 148; Letter from CDFW to CalGEM, Elk Hills Oil Field, Kern County, Special-Status Species Information from CDFW.

Nelson's (San Joaquin) antelope squirrel	***Ammospermophilus nelsoni***	***S/CT***	**1, 2**
giant kangaroo rat	***Dipodomys ingens***	***FE/CE***	**1, 2**
short-nosed kangaroo rat	*Dipodomys nitratoides brevinasus*	*S/SSC*	1, 2
Tipton kangaroo rat	***Dipodomys nitratoides nitratoides***	***FE/SE***	**1, 2**
Buena Vista Lake shrew	Sorex *ornatus relictus*	*FE/SSC*	2
Tulare grasshopper mouse	*Onychomys torridus tularensis*	*S/SSC*	2
San Joaquin pocket mouse	*Perognathus inornatus*	*--/SSC*	1
American badger	*Taxidea taxus*	*--/SSC*	1, 2
San Joaquin kit fox	***Vulpes macrotis mutica***	***FE/CT***	**1, 2**

Federal Designation

FE—Federally listed as endangered
FT—Federally listed as threatened.
S—BLM Sensitive Species.

State Designation

CE—State listed as endangered.
CT—State listed as threatened. Species that although not presently threatened in California with extinction are likely to become endangered in the foreseeable future.
SSC—California Department of Fish and Wildlife's "Species of Special Concern." Species with declining populations in California.
WL—Watch List
1B.1—Plant rare, threatened or endangered in Cal. and elsewhere, and very threatened in Cal.
1B.2—Plant rare, threatened or endangered in Cal. and elsewhere, and fairly threatened in Cal.

Many of these same species were listed in the letter the Center for Biological Diversity, Central Valley Air Quality Coalition, and Central California Environmental Justice Network submitted in response to the Notice of Preparation for the Project, based on species found in the U.S. Geologic Survey quadrangles surrounding the Project site. 3-138 Cont'd

2. The Recirculated Draft EIR fails to respond to comments from the public and the California Department of Fish and Wildlife.

As an initial matter, between the original Draft EIR and the Recirculated version, there are no substantive changes to survey methodologies or mitigation measures. The County therefore ignored comments from the public as well as CDFW without explanation or support for doing so. 3-139

For example, the Recirculated Draft EIR's Summary of Written Public Comments notes that, when commenting on the original Draft EIR, the CDFW "[r]ecommended *specific mitigation measures for each species*, such as conducting surveys, avoiding disturbance to habitat . . . ."[434] The County did not, however, propose mitigation measures for each species, as detailed below. In fact, the Recirculated (and original) Draft EIR entirely *excludes* some species,

[434] RDEIR, Vol. 2, App'x A.6: Summary of Written Public Comments on original Draft EIR (Dec. 2023) at 1 (emphasis added); see also *id.* at 1065, CDFW Letter.

like the Tipton kangaroo rat, or otherwise fails to offer mitigations that evidence shows would *reduce* impacts to species, such as the blunt-nosed leopard lizard. In another example, the CDFW instructed the County to "obtain incidental take authorization;"[435] our organizations' comment letter pointed out that any existing ITP is deficient. The County ignores this ITP requirement as well. 3-139 Cont'd

The Recirculated Draft EIR also fails, without explanation, to take up the CDFW's specific requests to (1) clarify Mitigation Measure 4.4-1(B), noting that it is unclear what that Measure means for implementation of protocol surveys; (2) analyze the potential direct or indirect impacts to the Elk Hills Conservation Area and the associated listed species, including to ensure that infrastructure and injected CO_2 avoid the protected area's boundary in order "to minimize the potential for CO_2 leaks impacting the rare species"; (3) consult with the U.S. Fish and Wildlife Service; and (4) to adequately describe the Project's impacts to streams, pursuant to Fish and Game Code section 1600 et seq.[436]

The CDFW made clear in its comment on the original Draft EIR that these and other recommendations were "[i]n addition to" its comments sent to the County in 2022[437] and that "the following modifications and/or edits be incorporated into the final EIR, including proposed avoidance, minimization, and compensatory measures, prior to its adoption by Kern County."[438] The County utterly fails to reflect the CDFW's expert advice in the Recirculated Draft EIR.

3. The Recirculated Draft EIR must address construction and operation impacts to species.

While the Recirculated Draft EIR claims there are no significant and unavoidable Project impacts to biological resources, this conclusion misses the mark and reflects a failure to account for the evidence showing that operating CCS projects can be severely detrimental, or even deadly, to wildlife, plants, and habitats. 3-140

The Project poses risks to biological resources from leakage and uncontrolled blowouts of compressed CO_2 from pipelines and injection wells. Compressed CO_2 forms a low dense cloud that can spread long distances from the release site and sicken and asphyxiate living things, including plants and animals.[439] CO_2 injection in oil fields and CO_2 pipeline transport have resulted in leakage and blowouts in several states that have caused wildlife deaths and significant habitat degradation. For example, a CO_2 injection well blowout in the Tinsley field, Mississippi, took 37 days to bring under control and killed deer, birds, fish, and other animals.[440] The

[435] RDEIR, Vol. 2, App'x A.6: Summary of Written Public Comments on Draft EIR (Dec. 2023) at 1.
[436] RDEIR, Vol. 2, App'x A.6: Summary of Written Public Comments on Draft EIR (Dec. 2023) at 1072–73, CDFW Letter.
[437] Aside from the CDFW's recommendations described in this section, we describe and reference other recommendations from the CDFW, sent during the Notice of Preparation and original Draft EIR periods, throughout this comment letter.
[438] *Id.* at 1068.
[439] See Pipeline Safety Trust and AccuFacts, *CO_2 Pipelines: Dangerous and Under-Regulated* (Mar. 2022), https://pstrust.org/wp-content/uploads/2022/03/3-23-22-Final-Accufacts-CO2-Pipeline-Report2.pdf.
[440] Zegart, *The Gassing of Satartia*.

blowout ejected CO_2 along with mud and drilling fluids, requiring the removal of 27,000 tons of drilling mud and contaminated soil and 32,000 barrels of liquids, and causing extensive habitat damage.[441] Other examples of CO_2 harms to wildlife and plants, and research on this topic, include: 3-140 Cont'd

- In 1986, a sudden, catastrophic release of CO_2 from Lake Nyos in Cameroon killed 1,700 people and 3,000 cattle. The CO_2 spread 10 km from the lake. Bird, insect, and small mammal populations in the area were not seen for at least 48 hours after the event.[442]
- Experiments with controlled injections of CO_2 into soil showed adverse effects on plants in response to CO_2 exposure. Biomass changes were seen in all plants studied; for example, clover plants decreased by 79% while grass decreased by 42%. The researchers' overarching conclusion was that elevated concentrations of soil CO_2 damages both soil microbiology and growing vegetation.[443]
- Other research on CO_2 and plants showed reduced plant growth and extensive mortality where CO_2 concentrations were greatest in the soil. For the plants that survived, root and shoot growth was significantly lower than in controls. Reproductive variables such as number of seeds per plant and seed dry weight per plant were also reduced compared to controls.[444]

The Recirculated Draft EIR's analysis must also consider the impacts posed to burrowing species in the Project site, including the area in which the CO_2 plume is expected to spread. (The Recirculated Draft EIR acknowledges that construction could cause loss of burrows and dens during construction at p. 4.4-40, but not during Project operation.) Burrowing animals are particularly vulnerable to death from CO_2 suffocation in the event of CO_2 pipeline or injection well blowout, since released CO_2 could fill nearby burrows where animals are resting or retreating. Federally listed burrowing species in the Project area include the San Joaquin kit fox, San Joaquin antelope squirrel, giant kangaroo rat, and blunt-nosed leopard lizard. 3-141

Finally, the County must explain why, in the Recirculated Draft EIR, it removed all references to the "Biological Study Area" (BSA) and replaced that language with "project area." The original Draft EIR defined the BSA as including "everything within the limits of the project footprint (the carbon capture and storage [CCS] Surface Land Area) and a 250-foot survey buffer, where feasible."[445] We argued in our comment letter on the original Draft EIR that the Project's impacts to species from CO_2 leaks and blowouts must be considered within the scope of 3-142

[441] Amy, *Oil spills in Mississippi, Alabama lead to $3.5 million in penalties for the company,* Clarion Ledger (Apr. 30, 2019), https://www.clarionledger.com/story/news/2019/04/30/oil-spills-penalties-mississippi/3625587002/.
[442] Kling, G.W. et al., *The 1986 Lake Nyos Gas Disaster in Cameroon, West Africa*, 236 Science 169 (1987).
[443] Smith, K.L. et al., *Environmental Impacts of CO2 Leakage: Recent Results from the ASGARD Facility, UK*, 37 Energy Procedia 791 (2013).
[444] Al-Traboulsi et al., *Potential Impact of CO2 Leakage from Carbon Capture and Storage (CCS) Systems on Growth and Yield in Spring Field Bean*, 80 Environ. Exper. Botany 43 (2012).
[445] Draft EIR, Vol. 1 at 4.4-3.

the BSA. The County must explain a) why it removed the BSA; b) if removal of the BSA constitutes a change in how (and where) Project impacts were considered; c) why the maps in the Biological Resource section changed to no longer show the BSA's 250-foot buffer; and d) the reason for the change from BSA to project area in the Recirculated Draft EIR.

3-142 Cont'd

4. The Recirculated Draft EIR's reconnaissance surveys are deficient.

3-143

There are deficiencies in the reconnaissance surveys that the Recirculated Draft EIR relies upon to identify potentially impacted species. In evaluating whether a project will affect endangered, rare, or threatened species, lead agencies can use reconnaissance-level surveys—rather than protocol-level surveys or other methods—*only* where the choice of methodology is supported by substantial evidence.[446] Without explanation or evidence supporting its decision, the Recirculated Draft EIR notes that "[n]o protocol surveys were conducted."[447] And merely changing the name from the original Draft EIR's "reconnaissance surveys"[448] to "biological resource" surveys[449] without making any other changes in the content of surveys conducted does not resolve this error.

Of the 39 species CDFW identified as potentially occurring in the Project area (see Table 1 in section V.G.1), the Recirculated Draft EIR identifies just 27 that may be potentially affected by the Project following literature, database analysis, and reconnaissance surveys in September—December 2022. But the initial database review and reconnaissance/biological resource surveys were insufficient to identify all sensitive species that may potentially occur in the Project area. In particular, despite the poor timing of the reconnaissance/biological resource surveys to detect many species, the Recirculated Draft EIR relies on these sources to exclude the Tipton kangaroo rat and several plant species that CDFW has noted occur or have the potential to occur near the Project site, as explained further below.

a. Tipton Kangaroo Rat

3-144

The Tipton kangaroo rat (TKR) is a "keystone" species in the San Joaquin Valley because it provides important "components of the biological niche."[450] CDFW wrote in comments on the scoping phase of the Project that TKR "have been documented to occur near the Project site" and that suitable habitat is present for the species to "occupy or colonize the Project."[451] CDFW went on to recommend a trapping plan to determine the presence of TKR, to be reviewed and approved by CDFW prior to execution, and that "these surveys be conducted between April 1 and October 31, when kangaroo rats are most active and well in advance of ground- and/or vegetation-disturbing activities in order to determine if impacts . . . could occur."[452]

[446] *Gray*, *supra*, 167 Cal.App.4th at 1124.
[447] RDEIR, Vol. 1 at 4.4-39.
[448] See, e.g., Draft EIR, Vol. 1 at 4.4-39.
[449] See, e.g., RDEIR, Vol. 1 at 4.4-39.
[450] RDEIR, Vol. 1 at 4.4-38.
[451] RDEIR, Vol. 2, App'x A.2: Comment Letters at 154.
[452] RDEIR, Vol. 2, App'x A.2: Comment Letters at 155.

Despite its importance and likelihood to appear in and use the Project site, the Recirculated Draft EIR fails almost entirely to acknowledge this species. First, contrary to CDFW's recommendation, the Biological Analysis Report did not include a trapping plan submitted to and approved by CDFW. Second, the Project's reconnaissance/biological resource survey did not take place in the recommended timeframe of between April 1 and October 1, but instead in winter, when—as one might expect—no Tipton kangaroo rats were observed. Rather than include this species for further evaluation in protocol-level surveys, the Project removed it from consideration with the following flimsy rationale: "The BSA is outside of the known geographic range (east of the California aqueduct) of the species."[453] This statement not only is not supported by substantial evidence, it is contradicted by multiple letters from CDFW. 3-144 Cont'd

The TKR should have been properly surveyed, as CDFW recommended, and included in the Recirculated Draft EIR as potentially occurring in the Project area to ensure it was analyzed and covered by mitigation measures.

b. Blunt-nosed Leopard Lizard

The Recirculated Draft EIR ignores the CDFW's concerns—expressed in both the Notice of Preparation comment and the agency's comment on the original Draft EIR—about survey protocols for the blunt-nosed leopard lizard (BNLL). According to CDFW, "[t]he Biological Resources section of the DEIR appears to rely primarily on reconnaissance level surveys conducted for the DEIR and ignores the substantial body of biological information collected within the [Elk Hills Oil Field]."[454] The CDFW went so far as to call the original Draft EIR's conclusion that no lizards were observed "*wholly misleading* given the extensive distribution of BNLL known to occur . . . as supported by decades of surveys and research."[455] Moreover, as the CDFW explains, "no other area within the range of BNLL [is] as extensively studied for the BNLL" as the Elk Hills oil field, and the populations of these lizards "are extremely dense" in portions of the oil field.[456] The CDFW recommends that the County disclose the species' "probability densities, ongoing monitoring routes and associated detections, and historical observations" to inform the CEQA analysis and related impacts to "this Fully Protected species."[457] 3-145

The Recirculated Draft EIR does none of what the CDFW asked, resulting in a CEQA document that continues to be not only "misleading," but also illegal. Instead, the Recirculated Draft EIR offers only that protocol-level and pre-construction surveys occurred three miles southwest of the Project area five years ago, in 2019; the document also names surveys conducted in several years prior.[458] The Recirculated Draft EIR does not, however, share results of those specific surveys, or as the CDFW requested, any probability densities, monitoring routes, or detections. The document says only in the aggregate, the separate Elk Hills

[453] RDEIR, Vol. 2, App'x C.1: Biological Analysis Report at 1701.
[454] RDEIR, Vol. 2, App'x A.6: Summary of Written Public Comments on original Draft EIR (Dec. 2023) at 1068, CDFW Letter.
[455] *Id.* (emphasis added).
[456] *Id.*
[457] *Id.*
[458] RDEIR, Vol. 1 at 4.4-17.

Conservation Area's semi-annual monitoring since 1999 has yielded 475 BNLL detections.[459] This is utterly insufficient and unresponsive to what the CDFW requested. 3-145 Cont'd

c. San Joaquin Antelope Squirrel

The CDFW correctly notes that while the original Draft EIR indicated that reconnaissance surveys detected multiple occurrences of the San Joaquin antelope squirrel (SJAS), "no reference was made to the substantial body of SJAS detection data that exists for the [Elk Hills oil field]."[460] This species is considered "fairly widespread" throughout the field, and the agency recommended that the County disclose "OXY/CRC's ongoing SJAS monitoring and associated detections," along with historical observations, to better inform the CEQA analysis and mitigations.[461] The Recirculated Draft EIR does none of this, without explaining why. 3-146

d. Giant Kangaroo Rat

Like the species mentioned above, the CDFW points out that the original Draft EIR ignores "extensive giant kangaroo rat (GKR) survey data within [the Elk Hills oil field]" from OXY/CRC.[462] The survey areas "overlap substantially with the proposed Project boundaries" and are therefore highly relevant.[463] Despite this, the Recirculated Draft EIR ignores this evidence without explanation. The Recirculated Draft EIR also fails to take up the CDFW's recommendation to disclose ongoing monitoring, detections, and historical observations. Instead, the Recirculated Draft EIR only adds that surveys conducted between 2001-2005 and semi-annual monitoring in the Elk Hills Conservation Area showed 1,240 active signs of GKR.[464] This is short of what the CDFW said is needed "to better inform the CEQA impact analysis."[465] 3-147

e. Special Status Plants

CDFW identified multiple plant species that may be located in the Project area. The agency recommended in comments on the Notice of Preparation that Project sites should be surveyed "by a qualified botanist following the 'Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities' . . . . 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."[466] The protocol is "meant to help people meet California Environmental Quality Act (CEQA) requirements for adequate disclosure of potential impacts to plants" and further recommends that field surveys be conducted multiple times during flowering or fruiting, when 3-148

[459] *Id.*
[460] RDEIR, Vol. 2, App'x A.6: Summary of Written Public Comments on original Draft EIR (Dec. 2023) at 1069, CDFW Letter.
[461] *Id.*
[462] *Id.*
[463] *Id.*
[464] RDEIR, Vol. 1 at 4.4-21.
[465] RDEIR, App'x A.6: Summary of Written Public Comments on original Draft EIR (Dec. 2023) at 1070, CDFW Letter.
[466] RDEIR, Vol. 2, App'x A.2: Comment Letters at 159.

plants will be evident and identifiable.[467] The Recirculated Draft EIR's methodology and recommendations are at odds with this protocol.

3-148 Cont'd

Surveys are particularly important because information in databases is voluntarily submitted and "obtained opportunistically and is often focused on protected lands or on lands where development has been proposed."[468] CDFW identified with aerial imagery that many plant species could be impacted by the development in the Elk Hills oil field, including Horn's milk vetch, slough thistle, alkali-sink goldfields, pale-yellow layia, and California alkali grass.[469] CDFW further stated that:

> [i]n order to adequately assess any potential impacts to biological resources, focused biological surveys are advised to be conducted by a qualified wildlife biologist during the appropriate survey period(s) in order to determine whether or not any special status species may be present within the well development areas and prior to any ground-disturbing activities. Survey results can then be used to inform the level of environmental review and identify any mitigation, minimization, and avoidance measures necessary to reduce potential impacts to special status biological resources to less than significant.[470]

The Project's Biological Analysis Report appears to recognize the importance of surveys to supplement information in databases. It says that "the absence of recorded occurrence in these databases at any specific location does not preclude the possibility that a special-status resource may be present, which is why site-specific surveys were undertaken."[471] The Recirculated Draft EIR, though, fails to conduct plant surveys in a manner that conforms with the CDFW recommendations and would produce meaningful results.

First, it is not clear if the determination of whether species had the potential to occur was made prior to or after reconnaissance/biological resource surveys.[472] And, if made after surveys, the "site-specific surveys" conducted for the Biological Analysis Report are not the same as the surveys recommended by CDFW to determine the species in the Project area and develop mitigations. For example, the Project conducted surveys between September and December, outside bloom times.[473] The Recirculated Draft EIR's Table 4.4-7 shows the "optimal blooming period[s]" for special-status plants with potential to occur as largely starting in March and April

[467] CDFW, *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* (Mar. 2018) at 1.
[468] RDEIR, Vol. 2, App'x C.1: Biological Analysis Report at 2559.
[469] RDEIR, Vol. 2, App'x A.2: Comment Letters at 151.
[470] *Id.* at 146–47.
[471] RDEIR, Vol. 2, App'x C.1: Biological Analysis Report at 2559.
[472] *Id.* at 2560 ("The results of the database inquiries were reviewed to develop a comprehensive list of sensitive biological resources that may be present on or in the vicinity of the Project site (see Table A-1 in App'x A). This list was then evaluated against existing site conditions observed during the biological field surveys of the BSA to determine which special-status resources have the potential to occur and then the potential for impacts to those resources as a result of the implementation of the Project.").
[473] RDEIR, Vol. 1 at 4.4-57, Table 4.4-7.

and ending in May and June.[474] The Recirculated Draft EIR offers no explanation for conducting plant surveys outside of these blooming periods. 3-148 Cont'd

Further, there is also no evidence that the surveyors possess specific plant knowledge, have experience "conducting floristic botanical field surveys," or that the surveys followed other requirements in CDFW's 2018 protocols for surveying document.[475] CDFW's protocol specifically states that it is inappropriate to conduct "'[f]ocused surveys' that are limited to habitats known to support special status plants or ***that are restricted to lists of likely potential special status plants***" because they "are not adequate to identify all plants in a project area to the level necessary to determine if they are special status plants,"[476] but this is exactly what the Recirculated Draft EIR proposes.[477]

5. The Recirculated Draft EIR's proposed mitigation measures are unsupported and/or insufficient.

A large number of species-specific mitigation measures lack support, ignore scientific evidence, and/or expert agency recommendations submitted during the scoping period, fail to adhere to legal requirements, and ultimately must be substantially revised. Further, the Recirculated Draft EIR lacks entirely mitigations for specific species or offers vague and/or yet-to-be-determined mitigation plans that must be specified and recirculated for comment from the public and experts. 3-149

a. Blunt-nosed Leopard Lizard

The BNLL is a Fully Protected species in California and the proposed Project is located in "what is known as the highest quality BNLL habitat" within the Elk Hills oil field.[478] The Recirculated Draft EIR fails to provide sufficient mitigation measures to detect the species and avoid take, just as it fails to adequately respond to concerns, evidence, and suggestions offered by the CDFW during the Project scoping period. 3-150

<u>Mitigation Surveys</u>

In addition to the failures of the population surveys noted above, the County's proposed mitigation surveys are insufficient. They provide that "[n]o more than one year prior to ground disturbing activities, focused surveys . . . shall be conducted in all potential" habitat" (MM 4.4-9(b)); as well as "[w]ithin 30 days before any ground-disturbing activities in special-status species habitat, the qualified biologist shall conduct a pre-disturbance survey" (MM 4.4-1(C)). But as the CDFW pointed out in their scoping comment: "Protocol-level surveys for BNLL are not synonymous with 30-day 'preconstruction surveys' often recommended for other wildlife species. In addition, the BNLL protocol specifies different survey effort requirements based on whether the disturbance results from maintenance activities or if the disturbance results in habitat

[474] *Id*.
[475] CDFW, *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* at 11.
[476] *Id.* at 4.
[477] RDEIR, Vol. 1 at 4.4-57.
[478] RDEIR, Vol. 2, App'x A.2: Comment Letters at 150.

removal (CDFW 2019)."[479] The Recirculated Draft EIR does not address the difference between protocol-compliant surveys and 30-day preconstruction surveys, or the difference in survey type based on Project activity and impact. The BNLL mitigation measures for surveys must provide more specifics on how the proposed surveys will comply with the nuances in the protocols. 3-150 Cont'd

Further, the County's mitigation measures must be clearer on the timing of the one-year survey and provide more explanation for how the timing will fit with the BNLL's complex lifecycle and the fact that the species can remain below ground for years at a time. MM 4.4-9 says only that "focused surveys . . . shall be conducted" within a year of construction. The BNLL breeds from May to June, and eggs hatch in July and August.[480] The species is then active during the day in the spring, summer, and fall months, though adult activity decreases during the hot summer months of July and August, just as the hatchlings emerge from the burrows.[481] At that point, adults generally retreat into their burrows for the winter.[482] Hatchlings stay out until October or November, before going into burrows.[483] Adults are capable of remaining below ground for two winters when poor environmental conditions, such as drought, are present.[484] The Mitigation Measure for longer-term surveys must therefore account for detecting both adult and juvenile BNLLs, as well as the fact that adults may remain underground for two years in a row.

Deferred Mitigation

MM 4.4-9(c) says that if BNLL are found during surveys, an "avoidance plan shall be prepared." The Mitigation Measure then recommends certain minimum actions to be included in the plan, such as a Worker Awareness Program and a speed limit.[485] 3-151

But the County cannot defer creation of a mitigation measure until a problem is detected. Under the CEQA rule against improper deferred mitigation, an EIR may not outline a mitigation measure in overly general terms, leaving the details to be decided at a later time, without setting performance standards or showing how the impact can be mitigated as described in the EIR.[486] Formulation of a measure's specific requirements for biological impacts may be permissible if the measure refers to the options that will be considered and the measure identifies specific

[479] RDEIR, Vol. 2, App'x A.2: Comment Letters at 150.
[480] California Herps, *Blunt-Nosed Leopard Lizard - Gambelia sila*, https://californiaherps.com/lizards/pages/g.sila.html (last accessed Mar. 1, 2024).
[481] U.S. Fish and Wildlife Service (FWS), *Blunt-Nosed Leopard Lizard*, https://www.fws.gov/species/blunt-nosed-leopard-lizard-gambelia-silus (last accessed Mar. 1, 2024).
[482] *Id.*
[483] *Id.*
[484] *Id.*
[485] *Id;* see also MM 4.4-9(c)(3) (if BNLL are detected during construction, "construction shall cease within a 250-foot radius" until additional measures are determined).
[486] CEQA Guidelines, §15126.4(a)(1)(B); *Preserve Wild Santee v. City of Santee* (2012) 210 CA4th 260, 280 (rejected measure calling for management of species without specifying performance standards or other guidelines for that management); *San Joaquin Raptor Rescue Ctr.*, *supra*, 149 CA.4th at 669 (measure specifying that future surveys for special status species be completed and undefined habitat management plan be developed in response to surveys found legally inadequate).

performance standards.[487] All of these required safeguards and specifics are lacking in MM 4.4-9(c). 3-151 Cont'd

Cumulative Analysis

The CDFW recommended in the scoping period that the County perform a "robust cumulative impact analysis" of the BNLL because of the "significant loss of habitat for the species," the fact that the Project area and surrounding lands "contain some of the highest quality remaining habitat" for the BNLL, and that any "ground disturbing activities . . . may have the potential to significantly impact" populations.[488] The Recirculated Draft EIR entirely ignores this recommendation and it is not reflected either in the analysis or the mitigation measures. There is no explanation for why CDFW's recommendation was ignored. The County must take up this recommendation and adjust its analysis and mitigation measures accordingly. 3-152

Buffer Zones

The mitigation measures for BNLL buffer areas fail to match the analysis and evidence CDFW provided in the scoping period. CDFW sought to determine the appropriately sized buffer to create a "reasonable chance of preventing take."[489] The agency reviewed the best available scientific information on the area which individual BNLL use and the distances that individuals are known to move between points.[490] They summarized relevant findings and concluded that the buffer area would need to be 164 acres *at a minimum* to avoid take.[491] 3-153

Rather than grapple with this informed and reasoned recommendation, the mitigation measures for the BNLL are vastly under-protective. MM 4.4-9(a) provides only a 50-foot buffer where ground-disturbing activities could impact suitable burrows. MM 4.4-9(b) prescribes a 250-foot buffer if the species is detected. (Even here, it is unclear what "detected" means—the same Mitigation Measure states that no buffer is needed if no BNLL "is observed," but "observation" may not be the same as detecting signs of the lizard.)[492]

The Recirculated Draft EIR's prescribed 50-foot buffer is 2% of the CDFW recommendation, and the 250-foot buffer only 10% of the CDFW recommendation. Moreover,

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[487] *Clover Valley Found. v. City of Rocklin* (2011) 197 CA.4th 200, 237 (requirement that permits be obtained from Department of Fish and Wildlife and Corps of Engineers served as performance standards supporting agency's determination that impact to listed species and its habitat would be mitigated); see also *Rialto Citizens for Responsible Growth v. City of Rialto* (2012) 208 CA.4th 899, 945; *Cal. Native Plant Society*, *supra*, 172 CA.4th at 621; *Endangered Habitats League, Inc. v. County of Orange* (2005) 131 CA.4th 777, 794; *Defend the Bay v. City of Irvine* (2004) 119 CA.4th 1261, 1275.

[488] RDEIR, Vol. 2, App'x A.2: Comment Letters at 150.

[489] RDEIR, Vol. 2, App'x A.2: Comment Letters at 151.

[490] RDEIR. Vol. 2, App'x A.2: Comment Letters at 151.

[491] RDEIR. Vol. 2, App'x A.2: Comment Letters at 152–53 (going on to explain that "a reasonable plan for avoidance is to assume that the lizard might utilize up to 98.8 acres in any direction from where it was observed," and assuming a circular home range, the diameter would be 2340.8 feet, or a 395-acre circle as a buffer).

[492] See also MM 4.4-9(c)(3) (if BNLL are detected during construction, "construction shall cease within a 250-foot radius until additional measures are determined").

the evidence the CDFW analyzed showed the *minimum* home range for the BNLL to be 1.1 acres (with other findings extending up to nearly 22 acres). One acre is 660 feet long—meaning the buffers in the mitigation measures are not even half of the bare minimum space needed to protect the species. These buffers simply fall far short of what is needed to meet the County's legal obligations and avoid take of the species. The Recirculated Draft EIR offers no explanation for running counter to the best available scientific evidence of what may be reasonable to avoid take. 3-153 Cont'd

b. San Joaquin Kit Fox

There is both high likelihood of San Joaquin Kit Fox (SJKF) presence and occupation of the Project site and a need for strong mitigation measures. Per the CDFW, SJKF "may be attracted to the Project area due to the type and level of ground-disturbing activities and the loose, friable soils resulting from intensive ground disturbance."[493] Mitigations must eliminate or substantially limit the likelihood of den collapse, inadvertent entrapment, reduced reproductive success, reduction in health and vigor of young, and direct mortality of individuals.[494] 3-154

The current SJKF mitigation measures are deficient and fail to align with scientific evidence and/or legal requirements in several ways. First, the CDFW was clear in its scoping comment that avoiding Project impacts to SJKF "is likely infeasible," and this Project warrants consultation with CDFW and acquisition of a SJKF-specific ITP prior to ground-disturbing activities.[495] This is because the "existing ITP issued to OXY/CRC does not include the proposed Project as a Covered Activity."[496]

Second, while MM 4.4-6 provides for buffers around potential and confirmed dens, it also directs that any dens that "cannot be avoided" will be removed. Calling for den removal fails to align with evidence provided during the scoping period that kit fox relocation is complex and likely to fail.[497] The Mitigation Measure further fails to propose how exactly den "excavation" will occur, if/where relocation will happen, and how relocation will take into account critical factors such as expense, available habitat, impact on existing populations, and documentation.[498] Den removal also implicates species take which, as noted below, requires a separate ITP than what the County currently claims covers Project activities.[499] The Mitigation Measure also fails to acknowledge the USFWS's guideline that occupied natal or pupping dens will not be destroyed until the foxes have vacated, thus requiring postponement of Project 3-155

[493] RDEIR, Vol. 2, App'x A.2: Comment Letters at 153.
[494] *Id.*
[495] *Id.* at 154.
[496] *Id*.
[497] Bremner-Harrison, S. et al., *Feasibility and Strategies for Translocating San Joaquin Kit Foxes to Vacant or Restored Habitats* (2007), https://esrp.csustan.edu/publications/pdf/esrp_2007_kitfoxreloction_w.pdf.
[498] See *id.* at 3-7.
[499] See, e.g., FWS, *Standardized Recommendations for Protection of the Endangered San Joaquin Kit Fox Prior to or During Ground Disturbance* at 4 (2011), https://www.fws.gov/sites/default/files/documents/survey-protocols-for-the-san-joaquin-kit-fox.pdf (emphasizing that "Destruction of any known or natal/pupping kit fox den requires take authorization/permit from the Service" and that if "at any point during excavation, a kit fox is discovered inside the den, the excavation activity shall cease immediately and monitoring of the den as described [therein] should be resumed").

activities.[500] Details such as these must be included in the mitigation measures so that all parties (including the Project developer, workers, and local regulators) are aware of their obligations and limitations. 3-155 Cont'd

Third, other measures to project the SJKF do not align with CDFW and USFWS recommendations. (Of note, MM 4.4-6 directs the reader to other measures "including capping pipes, covering trenches, adding exit ramps to excavated areas" at MM 4.4-15. But MM 4.4-15 concerns wetlands and waters, whereas 4.4-13 concerns additional measures to avoid adverse impacts to species, such as speed limits and covering open trenches. This drafting error should be corrected.) For example, the CDFW recommends all perimeter fencing be raised 5 to 7 inches above ground level to allow SJKF movement through the Project site and to minimize impacts to SJKF habitat connectivity.[501] MM 4.4-13(h) prescribes perimeter fencing to be 4 inches off the ground—meaning, this fencing would be too short for the SJKF to pass. The USFWS also recommends that new sightings of kit fox shall be reported to the California Natural Diversity Database.[502] The County should amend its mitigation measures to take into account these expert agency recommendations. 3-156

c. Giant Kangaroo Rat, Tipton Kangaroo Rat, Short-Nosed Kangaroo Rat, and San Joaquin Antelope Squirrel

As an initial matter, the Recirculated Draft EIR must correct its omission of the TKR. According to CDFW, the GKR, TKR, and Short-Nosed Kangaroo Rat (SNKR) "have been documented to occur near the Project site (CDFW 2022), and the Project Area supports some of the best GKR habitat present in the Elk Hills oil field."[503] It is unclear why the Recirculated Draft EIR fails to discuss the TKR in the Biological Resources section.[504] This omission must be corrected by including an analysis of research and impacts, and inclusion of species-specific mitigation measures. 3-157

Regarding surveys, the CDFW recommended trapping surveys for the GKR, TKR, and SNKR, to be conducted according to trapping plans developed in consultation with CDFW.[505] CDFW further recommended that these surveys be conducted between April 1 and October 31, when kangaroo rats are most active and well in advance of ground- and/or vegetation-disturbing activities.[506] Once completed, they requested that all survey results be sent to CDFW.[507] Without explanation or evidence to explain why it would not have to conduct such surveys (including for the TKR), the Recirculated Draft EIR does not take up any of these recommendations. Relatedly, 3-158

[500] *Id.* at 4 (2011).
[501] RDEIR, Vol. 2, App'x A.2: Comment Letters at 154.
[502] FWS, *Standardized Recommendations for Protection of the Endangered San Joaquin Kit Fox Prior to or During Ground Disturbance* at 6.
[503] RDEIR, Vol. 2, App'x A.2: Comment Letters at 154; *see also* RDEIR, Vol. 1 at 4.4-38 (noting that the USFWS published a recovery plan for species in the San Joaquin Valley, including the TKR, identifying it as a "keystone" species).
[504] RDEIR, Vol. 1 at Table 4.4 (listing the TKR but providing no further information, unlike other species).
[505] RDEIR, Vol. 2, App'x A.2: Comment Letters at 154.
[506] *Id.*
[507] *Id.*

the CDFW recommended seeking ITPs upon detection of any of the protected rat species; it does not appear the Project has done this.[508]

3-158 Cont'd

While the Recirculated Draft EIR's 50-food den buffer aligns with the CDFW recommendation,[509] the mitigation measures ignore the CDFW's caution that buffers may not be sufficient to ensure that the species can "freely disperse to and from burrows."[510] Inhibiting the movement of these protected species could be considered "capture" and/or result in prohibited species take.[511] To address this, the CDFW recommended that no burrow be surrounded more than 180 degrees around by development activities.[512] The Recirculated Draft EIR ignores this recommendation without explanation or evidence. The mitigation measures should adopt this 180-degree protection in addition to buffers around rodent dens.

3-159

The issues above are similar with the San Joaquin antelope squirrel (SJAS), which is known to occur throughout the Elk Hills oil field.[513] Like the rat species, the CDFW recommended that no SJAS burrow be surrounded more than 180 degrees around by development activities.[514] The Recirculated Draft EIR fails to adopt this measure and fails to offer explanation or evidence that omitting this protection would somehow avoid capture and/or take. The CDFW also informed the County of the need for a separate ITP permit for SJAS take.[515]

3-160

d. Swainson's Hawk

Swainson's hawks have been documented to occur in the areas bordering the Elk Hills oil field, and the habitat type present provides suitable foraging and nesting habitat.[516] Despite this, the Recirculated Draft EIR lacks any mitigation measures specific to the species.

3-161

The CDFW recommended specifically for the Swainson's hawk that, upon discovery of an active nest, a minimum half-mile buffer be delineated and that such a buffer be maintained until the breeding season ends or a qualified biologist determines the birds have fledged.[517] Instead, MM 4.4-8 (which broadly covers all bird nests) provides that if a nest is detected, it will be continuously surveyed for 24 hours to establish behavior baseline prior to construction; then continuously monitored to detect any behavioral changes. Monitoring of a nest falls short of an immediate buffer and the Recirculated Draft EIR does not provide evidence that simple monitoring will be sufficient to reduce adverse impacts to the species. Further, the Measure does not clarify who will do the 24-hour monitoring or the continuous behavioral monitoring; at the very least this must be a qualified biologist selected by the County.

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[508] *Id.* at 154–55 (stating that "the existing ITP issued to OXY/CRC does not include the proposed Project as a Covered Activity").
[509] RDEIR, Vol. 1 at Table 4.4-6.
[510] RDEIR, Vol. 2, App'x A.2: Comment Letters at 154.
[511] *Id.*
[512] *Id.*
[513] *Id.* at 156.
[514] *Id.*
[515] *Id.* at 157.
[516] *Id.*
[517] *Id.* at 158.

The Recirculated Draft EIR also entirely fails to address the loss of Swainson's hawk foraging habitat and tree removal, two concerns CDFW raised during the scoping period.[518] The CDFW provided reasoned and supported recommended mitigations to address these concerns that must be incorporated into the Recirculated Draft EIR. 3-161 Cont'd

e. Burrowing Owl

Burrowing owls have been documented in the Project vicinity, per CDFW.[519] The Project has the "potential to significantly impact local [] populations" and, and as described in CDFW's "Staff Report on Burrowing Owl Mitigation" (CDFG 2012), "excluding and/or evicting [burrowing owls] from their burrows is considered a potentially significant impact under CEQA."[520] 3-162

The CDFW's Staff Report is clear that Project-specific CEQA mitigation is important for burrowing owls and unless otherwise provided in a state, local, or regional conservation strategy, mitigation measures must incorporate the following four principles: 1) use of the precautionary principle; 2) use of mitigation effectiveness monitoring and reporting, as well as adaptive management; 3) protect and conserve owls in wild, semi-natural, and agricultural habitats; and 4) protect and conserve natural nest burrows or surrogates.[521] The Staff Report then lists best practices for mitigation measures grounded in scientific literature.[522] These include, broadly, avoidance, pre-construction surveys, site surveillance, and buffer zones.[523]

The Recirculated Draft EIR does not take the CDFW's scoping comment or Staff Report fully into account, leaving its burrowing owl mitigations insufficient to reduce adverse impacts and unsupported by any evidence.

First, accurate surveys to detect burrowing owl presence is key, and CDFW suggested during the scoping period that the Project conduct "three or more surveillance surveys" with each visit occurring at least three weeks apart during peak breeding season (April 15 to July 15).[524] Mitigation Measure 4.4-1 provides only that "any required focused/protocol surveys shall be conducted . . . with protocol survey timelines." The Recirculated Draft EIR does not address the guideline for three or more surveillance surveys for owls, nor does it contain evidence or an explanation for why this approach would not be taken. 3-163

Second, MM 4.4-4 provides that burrowing owls present in the Project area or within 500 feet outside the breeding season "may be moved away . . . using passive relocation techniques." While this measure pledges to follow CDFW guidelines, the Recirculated Draft EIR fails to acknowledge that according to the CDFW, "excluding birds from burrows is not a take 3-164

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[518] *Id.*
[519] *Id.* at 160.
[520] *Id.*
[521] CDFW, *Staff Report on Burrowing Owl Mitigation, State of California* (March 7, 2012) at 3–4, https://www.sandiegocounty.gov/content/dam/sdc/pds/ceqa/JVR/AdminRecord/IBR/RTCReferences/3a%20CDFG%202012_Staff%20Reports%20on%20Burrowing%20Owl%20Mitigation.pdf.
[522] *Id.* at 8.
[523] *Id.* at 8–10.
[524] RDEIR, Vol. 2, App'x A.2: Comment Letters at 160.

avoidance, minimization, or mitigation method and is instead considered a potentially significant impact under CEQA."[525] The Recirculated Draft EIR must therefore acknowledge that displacing owls is an impact and analyze it as such. Should MM 4.4-4 maintain the approach of displacing owls, it must also incorporate the CDFW's guideline that burrow exclusion be conducted only by qualified biologists and only during the non-breeding season, and that occupied burrows be replaced with artificial ones at a ratio of 1:1.[526] 3-164 Cont'd

Finally, there is no logical connection between the full suite of impacts to burrowing owls named in the Recirculated Draft EIR and the mitigation measures named. The document acknowledges that "[n]oise, vibration, and increased human activity" from construction "could alter the daily behaviors of individual owls and affect foraging success, displace owls from their burrows, or lead to nest failure."[527] The Recirculated Draft EIR then claims MMs 4.4-1, -3, -4, -11, and -13 "would reduce impacts,"[528] but these Measures on their face do not fully address the impacts. MM 4.4-1 concerns surveys, MMs 4.4-3 and -4 address buffers and owl nest exclusion, MM 4.4-11 describes worker education, and MM 4.4-13 lists additional measures such as trash and dust control. The Measures listed are a start, but the Recirculated Draft EIR does not fully connect how they will address noise, vibration, and other impacts that could alter the daily behaviors of owls; the impacts are therefore left unmitigated. 3-165

f. Nocturnal Species

There are six protected nocturnal species in the Project area,[529] but the mitigation measures fail to adequately reduce impacts to these species (and other species) from the array of nighttime Project activities expected to occur. 3-166

As an initial matter, the Biological Resources section acknowledges that construction could occur at night and therefore require lighting that may affect diurnal and nocturnal wildlife.[530] But elsewhere in the document, the Recirculated Draft EIR states that nighttime Project activities could include "drilling activities, vehicle and equipment activities supporting drilling, and safety and security lighting for areas, such as construction yards, work areas, vehicle and equipment parking areas, and staging and laydown areas,"[531] and that Class VI well drilling "typically run[s] continuously, 24 hours a day" for "up to 60 days."[532] The full range of nighttime activities mentioned in other parts of the Recirculated Draft EIR must be incorporated, analyzed, and mitigated in the Biological Resources section.

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[525] *Id.* at 161 (citing the CDFW Staff Report).
[526] *Id.* at 161.
[527] RDEIR, Vol. 1 at 4.4-46.
[528] *Id.*
[529] The species are the California glossy snake, RDEIR, Vol. 1 at 4.4-44, 4.4-18; the giant kangaroo rat, *id.* at 4.4-22 (noting that "suitable burrows with diagnostic signs of kangaroo rat were observed" during surveys); the short-nosed kangaroo rat, *id.* at 4.4-22; the San Joaquin pocket mouse, *id.* at 4.4-22; the American badger, *id.* at 4.4-23 (noting that "dens displaying signs consistent with the use of a badger were observed" in the Project area); and the San Joaquin kit fox, *id.* at 4.4-23.
[530] RDEIR, Vol. 1 at 4.4-40.
[531] RDEIR, Vol. 1 at 4.1-24.
[532] RDEIR, Vol. 1 at 4.1-25.

Perhaps because of this disconnect, the only nighttime-related mitigation measure for species merely directs use of "directing lighting" and compliance "with applicable lighting mitigation measures."[533] Nighttime lighting is harmful to nocturnal species, but lighting is far from the only impact of nighttime construction and other activities that needs to be mitigated. (Moreover, the lighting mitigation is far too vague to be evaluated or measured and must be revised to include specifics and information about enforcement.) For example, the San Joaquin kit foxes "are known to sometimes rest and play near the den entrance in the afternoon, but most above-ground activities begin near sunset and continue sporadically throughout the night."[534] Accordingly, for that species, the U.S. Fish and Wildlife Service recommends that "[n]ight-time construction should be minimized" and if it does occur, "then the speed limit should be reduced to 10-mph" and "[o]ff-road traffic outside of designated project areas should be prohibited."[535]

3-166 Cont'd

The County must therefore develop mitigation measures to address the full array of impacts to nocturnal species from activities such as traffic, noise, vibrations, and continuous drilling. The County must also develop measures to address impacts to daytime species whose rest and other behaviors might be disrupted by nighttime disturbances and continuous drilling.

g. Worker Environmental Awareness Program

Mitigation Measure 4.4-11 to create a Worker Environmental Awareness Program is a good start but, as written, falls short of the County's legal requirements and could benefit from adopting recommendations by other agencies.

3-167

For one, the Recirculated Draft EIR defers development of the program, stating only in MM 4.4-11 that it "shall be developed." As noted earlier in this comment section, the County cannot defer development of a mitigation measure and instead must provide specifics prior to finalizing the Recirculated Draft EIR. A worker educational program is not the type of mitigation that requires further data or inputs from operations to prescribe measures, nor is it impractical or infeasible to devise the specifics of such a program now.[536]

One template the County could consider comes from the USFWS regarding the SJKF. They recommend an employee education program that does the following:

> The program should consist of a brief presentation by persons knowledgeable in kit fox biology and legislative protection to explain endangered species concerns to contractors, their employees, and military and/or agency personnel involved in the project. The program should include the following: A description of the San Joaquin kit fox and its habitat needs; a report of the occurrence of kit fox in the project area; an explanation of the status of the species and its protection under the Endangered Species Act; and a list of measures being taken to reduce impacts to the species during project construction and implementation. A fact sheet

[533] RDEIR, Vol. 1 at 4.4-59.
[534] FWS, *Standardized Recommendations for Protection of the Endangered San Joaquin Kit Fox Prior to or During Ground Disturbance* at 3.
[535] *Id.* at 5.
[536] See, e.g., *Defend the Bay v. City of Irvine* (2004) 119 Cal.App.4th 1261, 1275; *Preserve Wild Santee*, *supra,* 210 Cal.App.4th at 281; CEQA Guidelines, § 15126.4(a)(1)(B).

conveying this information should be prepared for distribution to the previously referenced people and anyone else who may enter the project site.[537]

3-167 Cont'd

This type of thorough education is appropriate for all protected species that are or could occur at the Project site. These materials must be developed and shared with the public and decisionmakers prior to finalizing and certifying the Recirculated Draft EIR.

Similarly, MM 4.4-12 provides that "wildlife found that might have been affected by exposure to CO_2 shall immediately cause a shutdown of all injection operations." This measure is important and should therefore be incorporated into the Worker Environmental Awareness Program, along with other information about exactly *how* to identify wildlife suffering symptoms of CO_2 exposure.

h. Cumulative Impacts and Mitigations

3-168

The Recirculated Draft EIR concludes that "the cumulative impacts of the project when combined with other known and unknown projects, would be significant and unavoidable" for biological resources.[538] The Recirculated Draft EIR then offers no additional mitigation measures beyond the ones proposed to address direct impacts.[539]

The Recirculated Draft EIR opts not to independently consider and evaluate potential cumulative impacts to biological resources because of the *Final Environmental Impact Report—Revisions to the Kern County Zoning Ordinance—2015(C) Focused on Oil and Gas Local Permitting*, referred to in the EIR as the Oil and Gas EIR.[540] The relationship to this Recirculated Draft EIR is somewhat opaque. The County uses the Oil and Gas EIR "as a source of information regarding cumulative impacts," but supposedly "does not rely" on it "for purposes of tiered review under CEQA."[541] By way of further explanation, the Oil and Gas EIR's information "provides evidence for the record of the analysis of cumulative impacts" for activities included in the Project.[542]

We agree that CEQA Guidelines section 15152 guides whether the County can tier to a previous analysis, but the County's supposed use but non-reliance on the Oil and Gas EIR is unconvincing. Per the Guidelines, "tiering" is defined as "using the analysis of general matters contained in a broader EIR" with later EIRs, incorporating by reference the general discussions from the broader EIR, and concentrating the later EIR solely on the issues specific to the later project.[543] This definition of tiering describes how the County is using the Oil and Gas EIR for this Project—meaning, the County is tiering to the challenged EIR, even if it claims not to be.

[537] FWS, *Standardized Recommendations for Protection of the Endangered San Joaquin Kit Fox Prior to or During Ground Disturbance* at 6.
[538] RDEIR, Vol. 1 at 4.4-67.
[539] *Id.* at 4.4-66.
[540] *Id.* at 4.4-65 to 4.4-66.
[541] *Id.* (citing CEQA Guidelines, § 15152).
[542] *Id.* at 4.4-66.
[543] CEQA Guidelines, § 15152(a).

6. The Recirculated Draft EIR's reliance on a prior conservation easement deed for Endangered Species Act coverage is improper.

It is unclear to what extent Kern County proposes to rely on previously issued plans for Endangered Species Act coverage for the Project, but reliance on existing coverage through take permits is improper. As the Recirculated Draft EIR recognizes, unauthorized take of species is unlawful, and the County must have an ITP to cover any species take.[544] Yet the Recirculated Draft EIR claims that California Resources Corporation has an ITP from 2012, pointing to Appendix C.2. The Recirculated Draft EIR also references an "Elk Hills Habitat Conservation Plan" but does not provide the plan anywhere in the appendices.[545] 3-169

The Recirculated Draft EIR's discussion of ITP coverage is problematic for several reasons. First, the document provided in Appendix C.2 (both in the original and Recirculated Draft EIR) is not an ITP or Habitat Conservation Plan—it is a conservation easement deed for conservation areas that largely do not overlap with the Project site.[546] The document mentions only a small number of the potentially impacted protected species.[547] And the document mentions "certain impacts of oil and gas production facilities and activities at the Elk Hills oil field," which do not encompass the CO_2 capture, compression, transportation and injection activities of this Project.[548] Although the Center for Biological Diversity is aware that a previous oil field operator prepared a Habitat Conservation Plan in 2009 as part of an ITP application necessary to extend a prior permit beyond 2014 and authorize incidental take of species associated with continued oil and gas production activities,[549] there is no publicly available information indicating that plan was finalized.[550]

Because the original Draft EIR does not contain the actual ITP, the Center for Biological Diversity requested from Kern County the ITP noted in other Elk Hills oil field drilling approval documents.[551] The Center received a document in response, ITP number 2081-2014-019-04, issued to California Resources Corporation Elk Hills, LLC. We are including it with our comment submission since this permit must be part of the administrative record. We note that this document we submitted does not appear in the Recirculated Draft EIR's Volume 2 3-170

[544] RDEIR, Vol. 1 at 4.4-23 (take requires an ITP issued under section 2081 or a finding that an ITP issued under the federal Endangered Species Act is consistent with state requirements); *id.* at 4.4-25 (section 10 of the federal Endangered Species Act allows a permit applicant to obtain an ITP through submission of a habitat conservation plan); see also MM 4.4-2 (stating that there may be no incidental take of any protected species without a permit or approved conservation plan).
[545] RDEIR, Vol. 1 at 4.4-36.
[546] RDEIR, Vol. 2, App'x C.2: Conservation Easement Deed – Elk Hills Conservation Area at 2667 *et seq.*; RDEIR, Vol. 2, App'x C.3: Conservation Easement Deed – Elk Hills Conservation Area Map at 2687 *et seq.*
[547] RDEIR, Vol. 2, App'x C.2: Conservation Easement Deed – Elk Hills Conservation Area; RDEIR, Vol. 1 at 4.4-36.
[548] RDEIR, Vol. 2, App'x C.2: Conservation Easement Deed – Elk Hills Conservation Area.
[549] 71 Fed. Reg. 6883.
[550] See 78 Fed. Reg. 39836.
[551] Letter from Center for Biological Diversity to Kern County Planning & Natural Resources Department, *Elk Hills Oilfield Incidental Take Permit* (Jan. 16, 2024); CalGEM, *Notice of Determination, NOD-OG California Resources 072022-201-1* (Aug. 25, 2022).

appendices, and we believe this is an error. ITP 2081-2014-019-04 must be in the record since it is mentioned in Project documents, including the Biological Analysis Report.[552] 3-170 Cont'd

Second, ITP 2081-2014-019-04 does not sufficiently include the CTV I Project as a Covered Activity. The ITP explains that the activities covered involve "continued oil and gas related activities and the exploration and development of new wells necessary to enhance recovery and processing of oil and gas reserves."[553] The CTV I Project, in contrast, proposes to capture CO_2 from existing oil field operations, but also "is dependent on the sources permitted for injection into the storage, the ability of the project year by year to obtain CO_2 and inject at the maximum 2,210,000 million tons per year."[554] As noted earlier in this comment letter, additional sources of CO_2 could include DAC, hydrogen, and waste to energy facilities. Moreover, CO_2 compressors, pipelines, injection wells, and other infrastructure are fundamentally different from oil and gas counterparts. 3-171

Third, and relatedly, the existing ITP covers only four species—the San Joaquin kit fox, San Joaquin antelope squirrel, giant kangaroo rat, and Tipton kangaroo rat—not the full range of species that could suffer take from the CTV I Project.[555] Even the CDFW—the state's authoritative agency on this issue—reiterated throughout its comment during the Scoping Phase that the existing ITP is insufficient to cover the Project's impacts on protected species.[556] The agency again raised this point in comments on the original Draft EIR, stating that a new ITP and take authorizations are required for candidate species like Crotch's bumble bee.[557] The CDFW issued its opinion based not only on species that the ITP fails to cover, but the deficiency of the existing ITP to address impacts to the four covered species.[558] 3-172

It should also be noted that while the current ITP covers incidental take of the TKR resulting from oil and gas production, the Recirculated Draft EIR arbitrarily excludes this species from surveys and consideration of mitigation measures. CRC must therefore obtain a new ITP to cover *all* activities that could result in take of protected species flagged as occurring or potentially occurring in the Project Area. Obtaining ITP(s) covering CTV I Project activities and other species must occur before any construction begins to avoid unlawful take. The County must therefore revise its conclusion that if it "elects in the future to pursue any disturbance . . . that requires additional take authorization," and the Project would obtain a new ITP, per MM

[552] See, e.g., RDEIR, Vol. 2, App'x C.1: Biological Analysis Report at 2570.
[553] CDFW, ITP No. 2081-2014-019-04, Elk Hills Oil and Gas Field at 2–3 (hereinafter, "ITP Permit 2081"); see also *id.* at 6–10 (listing covered activities and not including CCS).
[554] RDEIR, Vol. 1 at 4.8-24.
[555] ITP Permit 2081 at 11 ("These species and only these species are the 'Covered Species' for the purposes of this ITP.").
[556] RDEIR, Vol. 2, App'x A.2: Comment Letters at 146–65; see also section VI.G, *supra* (noting instances in which the ITP does not cover protected species for the activities proposed).
[557] RDEIR, Vol. 2, App'x A.6: Summary of Written Public Comments on original Draft EIR (Dec. 2023) at 1071, CDFW Letter.
[558] See, e.g., RDEIR, Vol. 2, App'x A.2: Comment Letters at 154 (noting that the Project warrants consultation with CDFW and acquisition of a SJKF-specific ITP prior to ground-disturbing activities and for this species, the "existing ITP issued to OXY/CRC does not include the proposed Project as a Covered Activity").

4.4-2. [559] The Recirculated Draft EIR must then be revised to analyze and account for the new ITP. 3-172 Cont'd

7. The Recirculated Draft EIR must do more to analyze and mitigate impacts to the Project area's two candidate species.

The Temblor legless lizard (TLL) and Crotch's bumble bee are both Special Status Animal Species with Potential to Occur on Site that could potentially be affected by the Project.[560] The CDFW issued recommended mitigation measures and reminded the County of legal requirements should these species be detected. The Recirculated Draft EIR does not incorporate the proposed mitigations, nor is there indication that the County or Project has followed the legal requirements described. 3-173

a. Temblor Legless Lizard

For the TLL, the CDFW notes that habitat loss is the primary threat, and the species is known to occur within and in the vicinity of the Project Area.[561] For this reason, the CDFW concluded that the Project "may have the potential to significantly impact local TLL populations."[562] Despite this, the original and Recirculated Draft EIR propose only "protocol surveys" and pre-disturbance surveys, along with several other generic mitigations associated with other species.[563] The Recirculated Draft EIR ignores the fact that the CDFW points out TLLs "are difficult to detect . . . and are not typically found within dens and/or burrows," making the proposed protocol surveys and avoidance buffers from dens and/or burrows insufficient to "constitute avoidance."[564] The Recirculated Draft EIR offers no evidence to contradict the CDFW, nor does it explain why it ignored these facts.

The CDFW then proposes three mitigation measures: (1) surveys using a CDFW-approved methodology; (2) consultation and development of an avoidance plan; and (3) take authorization prior to commencing ground disturbing activities.[565] The Recirculated Draft EIR ignores each recommendation, as these measures are not reflected in the updated document.

b. Crotch's Bumble Bee

The CDFW is starkly clear in its comment that, for Crotch's bumble bee (CBB), it "does not concur that the Mitigation Measures" in the original Draft EIR "are sufficient to mitigate impacts, to ensure that the Project Area is surveyed sufficiently to determine the presence or absence" of the species, "and to adequately mitigate for the species."[566] The CDFW then recommended three mitigation measures to remedy these deficiencies. The Recirculated Draft 3-174

[559] RDEIR, Vol. 1 at 4.4-64 (emphasis added).
[560] See RDEIR, Vol. 1 at Table 4.4-4.
[561] RDEIR, Vol. 2, App'x A.6: Summary of Written Public Comments on original Draft EIR (Dec. 2023) at 1070, CDFW Letter.
[562] *Id.*
[563] *Id.*
[564] *Id.*
[565] *Id.* at 1070–71.
[566] *Id.* at 1071.

EIR, without explanation, does not address the CDFW's concerns, nor does it incorporate any of the proposed changes.

3-174 Cont'd

Specifically, the CDFW suggested (1) focused surveys for the CBB and its habitat during the blooming period prior to construction, to be conducted by a qualified biologist and in line with the CDFW's methodology; (2) an avoidance buffer if surveys cannot be completed and consultation with the CDFW to discuss how to avoid take; and (3) take authorization through a new ITP.[567] These measures are reasoned and from an expert agency, and the County must not ignore these important steps to protect this species and its habitat.

H. The Recirculated Draft EIR's Analysis and Mitigation of Land Use Impacts is Inadequate.

1. The Land Use analysis fails to disclose the impacts it purports to mitigate with MM 4.11-7.

The Recirculated Draft EIR introduces a new mitigation measure, MM 4.11-7, that was not part of the original Draft EIR, into the land use section.[568] This measure is added under the analysis of Impact 4.11-2, which considers whether the CTV I Project would "[c]onflict with Any Applicable Land Use Plan, Policy, or Regulation Adopted for the Purpose of Avoiding or Mitigating an Environmental Effect."[569]

3-175

MM 4.11-7 limits future CO_2 sources to specific industries, industrial sources, and fossil fuel facilities and types, requires that all sources be located in Kern County, and includes several other conditions regarding the approval and planning processes for such future sources.

CEQA requires an EIR to describe and adopt all feasible mitigation measures to address a project's significant environmental impacts.[570] It requires that "[d]irect and indirect significant effects of the project on the environment shall be *clearly identified and described*, giving due consideration to both the short-term and long-term effects.[571] The discussion of mitigation measures under CEQA "[…] shall identify mitigation measures *for each significant environmental effect identified* in the EIR."[572] MM 4.11-7 fails on all counts.

First, the Recirculated Draft EIR fails to disclose the land-use impact that MM 4.11-7 is set to mitigate. In the discussion under Impact 4.11-2, the Recirculated Draft EIR explains how mitigation measures MM 4.11-1 to 4.11-6 are aimed at avoiding "conformality issues", making sure only specific uses can be approved on the Project site, and avoiding activities that could penetrate the capstone of the storage reservoir or disturb its wildlife protective buffer.[573] MM 4.11-7 is not mentioned in this discussion.

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[567] *Id.* at 1071–72.
[568] RDEIR, Vol. 1 at 4.11-53 to 4.11-54.
[569] RDEIR, Vol. 1 at 4.11-24.
[570] Pub. Resources Code, § 21002; CEQA Guidelines, § 15126.4(a)(1).
[571] CEQA Guidelines, § 15126.2(a) (emphasis added).
[572] CEQA Guidelines, §15126.4(a)(1)(A) (emphasis added).
[573] RDEIR, Vol. 1 at 4.11-50.

The only statement in the Recirculated Draft EIR with some relevance to MM 4.11-7 is where it generally refers to *all* measures together, saying all measures "will provide additional protections, notification for surrounding property owners, and full review of all future sources for compliance with the Zoning Ordinance, General Plan, and CEQA."[574] 3-175 Cont'd

But the land use section fails to disclose *what is the impact* MM 4.11-7 will mitigate, or how such impact will be mitigated by it. Because of that omission, it is impossible for the public and decisionmakers to assess MM 4.11-7's effectiveness or even understand the County's logic for proposing it. For example, what is the rationale behind the different requirements the Measure sets for incorporated versus non-incorporated cities? There is no information on this issue in the Recirculated Draft EIR. The general statement above about measures guaranteeing "full review of all future sources for compliance with the Zoning Ordinance, General Plan, and CEQA" is meaningless, as all projects must comply with the law and with general plans, and MM 4.11-7 adds nothing to this requirement.

It is particularly confounding why the new Measure was placed under the land use section. While all the other measures in the section are tied to land use issues and include land use instruments, requiring specific land use entitlements, notices or notations,[575] MM 4.11-7 sets requirements that are more relevant to the CTV I Project's potential impacts on *other* resource areas, mostly GHG emissions and air quality.

The Recirculated Draft EIR must be revised to account for the impacts MM 4.11-7 is set to mitigate, which are not limited to land use impacts, and properly analyze how the Measure will address and mitigate those impacts.

2. MM 4.11-7 is vague and unenforceable.

Under CEQA, proposed mitigation measures must be "fully enforceable" through permit conditions, agreements, or other legally binding instruments.[576] Any proposed mitigation must also provide assurance that such implementation will in fact occur.[577] 3-176

Section C.2 of MM 4.11-7 sets the following requirement for CO_2 sources within an incorporated City in Kern County: "the listed use has capture technology for CO_2 that shows compliance with the preparation of an environmental document, with Kern County as a Responsible Agency and not the use of an exemption from CEQA review."

The requirement for capture technology to show "compliance with the preparation of an environmental document" is vague to the point of being meaningless. Technologies, as such, do not require a CEQA process. If the measure intends to condition source approval on the preparation of environmental documents, it should say so explicitly.

[574] RDEIR, Vol. 1 at 4.11-51
[575] RDEIR, Vol. 1 at 4.11-51 to 4.11- 53.
[576] Pub. Resources Code, § 21081.6(b); CEQA Guidelines, §15126.4(a)(2).
[577] *Anderson First Coalition v. City of Anderson* (2005) 130 Cal.App.4th 1173, 1186–87; *Federation of Hillside & Canyon Ass'ns v. City of Los Angeles* (2000) 83 CA4th 1252, 1260.

Similarly, section C.2 of the Measure lists requirements for CO_2 pipelines, stating that any CO_2 pipelines permitted by the California Public Utilities Commission (CPUC) for a common carrier company that requests to connect to CTV I for injection must either "comply with a CUP and EIR" or that "Kern County has participated in the CPUC process and reasonable and feasible mitigation for protection of Kern County communities has been included." Again, the answer to what is "reasonable and feasible mitigation for protection of Kern County communities" is left completely open, without any standards to determine whether this condition is indeed fulfilled.[578] MM 4.11-7 should be revised to include clear and enforceable terms and conditions. 3-176 Cont'd

I. The Recirculated Draft EIR Fails to Analyze and Mitigate Cumulatively Considerable Impacts.

Under CEQA, an EIR must discuss significant "cumulative impacts."[579] Cumulative impacts are defined as "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts."[580] A legally adequate cumulative impacts analysis views a particular project over time and in conjunction with other related past, present, and reasonably foreseeable future projects with impacts that might compound or interrelate with those of the project at hand.[581] Such analysis is necessary because "environmental damage often occurs incrementally from a variety of small sources [that] appear insignificant when considered individually, but assume threatening dimensions when considered collectively with other sources with which they interact."[582] 3-177

As is the case for all impact categories, a lead agency's threshold findings of significance with regard to cumulative impacts must "be supported by substantial evidence"; and, where found, cumulatively considerable impacts must be adequately mitigated.[583]

CEQA requires an agency to analyze "probable future projects."[584] The courts have found that "[P]rojects that are undergoing environmental review are reasonably probable future projects"[585] and that "any future project where the applicant has devoted significant time and financial resources to prepare for any regulatory review should be considered as probable future projects for the purposes of cumulative impact."[586]

An adequate cumulative impacts analysis and discussion requires a thorough assessment of the incremental significance of the CTV I Project's impacts over time, and in consideration of "other projects causing related impacts."[587] The Recirculated Draft EIR concludes that the CTV I Project will cause potentially significant impacts for a number of impact areas. For some impact

[578] *Gray*, *supra*, 167 Cal.App.4th at 1119.
[579] CEQA Guidelines, § 15130(a).
[580] CEQA Guidelines, § 15355(b).
[581] Pub. Resources Code, § 21083(b)(2); CEQA Guidelines, § 15065(a)(3).
[582] *Communities for a Better Environment*, *supra*, 103 Cal.App.4th at 114.
[583] See CEQA Guidelines, § 15064.7(b).
[584] CEQA Guidelines, § 15130(b)(1)(A).
[585] *Gray, supra,* 167 Cal. App. 4th 1099 at 1127–28.
[586] *Id.* at 1127–28.
[587] CEQA Guidelines, § 15130(a)(1).

areas, the EIR concludes the impact will be cumulatively significant and unavoidable. These areas include aesthetics, agricultural resources, air quality, biological resources, cultural resources, energy, geology and soils, hydrology and water quality, GHG, mineral resources, noise, and utilities and service systems.[588]

3-177 Cont'd

However, the Recirculated Draft EIR fails to conduct an appropriate cumulative impacts analysis and support its conclusions with evidence, because it fails to consider the full range of projects that are required in a cumulative impact analysis. Simply declaring a potentially significant cumulative impact is not sufficient, because that declaration by itself neither discloses, nor analyzes, nor guarantees mitigation for, the projected incremental impacts of the project in combination with other projects.

3-178

As described above, the project description section of the Recirculated Draft EIR lists under "Cumulative Projects" several projects in the County, and provides nothing more than the name, location, type, acreage, and status of these projects.[589] In doing so, the Recirculated Draft EIR ignores "probable future projects" that must be analyzed in a proper cumulative impacts analysis.

1. The Recirculated Draft EIR must analyze all the projects included in its "cumulative projects" list.

The Recirculated Draft EIR must analyze all the projects included in its "cumulative projects" list in a proper cumulative impacts analysis, and properly assess their potential significant impacts. The Recirculated Draft EIR fails to do so, and most of the projects in the cumulative impacts list are never mentioned again elsewhere in the document. One example of the failure to analyze the cumulative impacts of the Project is the CarbonFrontier CCS Project proposed by Aera (CarbonFrontier Project).

3-179

Kern County published the draft EIR for the CarbonFrontier Project in June 2024, at nearly the same time as the Recirculated Draft EIR for CTV I. The CarbonFrontier EIR contemplates a CCS project with over 200,000 acres storage space, located about 9 miles from the CTV I Project site. Similar to CTV I, this project will source CO_2 from an oil field's gas stream, and will have the capacity to receive CO_2 from outside sources.[590] This project is clearly a reasonably probable future project undergoing environmental review. The CarbonFrontier draft EIR briefly mentions CTV I in its short discussion of the Aera merger with CRC, but otherwise dismisses any relationship between the projects, stating that "[t]hey are both included in the respective cumulative impact list in each individual EIR."[591]

But the CarbonFrontier Project is not discussed *anywhere* in the Recirculated Draft EIR beyond its listing as a cumulative project in Table 3-8. Merely listing a project as cumulative

[588] RDEIR, Vol. 1 at 1-13 to 1-15.
[589] RDEIR, Vol. 1 at 3-45 to 3-47 (Table 3-8).
[590] Kern County, *Draft Environmental Impact Report CarbonFrontier CCS Project by Aera Energy, LLC,* (June 2024) at 1-2.
[591] Kern County, *Draft Environmental Impact Report CarbonFrontier CCS Project by Aera Energy, LLC* at 3-16.

does not satisfy the requirement under CEQA to analyze and mitigate cumulative impacts. The Recirculated Draft EIR must be revised to include an analysis of all its cumulative impacts together with the listed projects. 3-179 Cont'd

In *Bakersfield Citizens for Local Control v. City of Bakersfield*, 124 Cal. App. 4th 1184, the court found that the cumulative impact analyses for two shopping centers with similar features, a few miles apart from each other, "were fundamentally flawed because they did not recognize that the shopping centers were relevant projects and did not analyze the type and severity of impacts that will result from construction and operation of both projects."[592] While the Recirculated Draft EIR does the first step of including the CarbonFrontier in its cumulative project list, it completely fails to take the required second step—it does not analyze the type and severity of cumulative impacts from CTV I's construction and operation together with the CarbonFrontier Project.

The *Bakersfield* court looked into the potential individual impacts of each shopping center and found that each EIR found an unavoidable adverse impact on ambient air quality. Based on this and a few other impacts, the court concluded that "CEQA compels assessment and disclosure of these combined environmental effects."[593] Similarly, both Draft EIRs for the two CCS projects find significant impacts on air quality and greenhouse gases,[594] but fail to assess and disclose them cumulatively.

2. The Recirculated Draft EIR must analyze cumulative impacts from its probable future sources.

Some of the projects on the cumulative projects list are mentioned as potential CO_2 sources in the "Future Sources – Identification" section in the Recirculated Draft EIR. Analysis of a carbon sequestration project's sources of CO_2 is an essential element of review of cumulative project impacts. An analysis of these sources is necessary not only to understand the impact of their operation together with the CTV I Project, but also in order to give the public and the County decisionmakers information regarding whether and to what extent CTV I will facilitate and incentivize new GHG emissions, rather than reduce existing emissions, whether it will extend the life of existing fossil fuel CO_2-emitting industries, and whether it will create pollution from construction or operation of new facilities. The cumulative analysis fails to include any meaningful discussion of the Project's CO_2 sources. 3-180

From the list of cumulative projects, two potential sources are notably absent, and the Recirculated Draft EIR must, at a minimum, analyze them:

a. Hydrogen Plant

The new "Future Sources – identification" section in the Recirculated Draft EIR includes blue hydrogen as a potential source of CO_2 for the CTV I Project.[595] The new section also

[592] *Bakersfield Citizens*, *supra*, 124 Cal. App. 4th at 1214.
[593] *Bakersfield Citizens*, 124 Cal. App. 4th at 1216.
[594] Kern County, *Draft Environmental Impact Report CarbonFrontier CCS Project by Aera Energy, LLC* at 1-2 to 1-16; RDEIR, Vol. 1 at 1-11 to 1-15.
[595] RDEIR, Vol. 1 at 3-13.

describes briefly "[c]ompanies that have publicly indicated their interest in sending CO_2 to the project."[596] Under "Hydrogen", the Recirculated Draft EIR acknowledges that "Lone Cypress Energy Services, LLC, has entered a CDMA to explore development of a clean hydrogen production plant that would produce hydrogen using a steam methane reforming (SMR) process, using natural gas (methane) as feedstock. CO_2 produced as a by-product of the SMR reaction would be captured for underground storage."[597]

3-180 Cont'd

The Recirculated Draft EIR states that while an application for the SMR hydrogen project was submitted to the County, and a Notice of Preparation was released in February 2024, the project applicant has withdrawn the application.[598] It provides no other details on the status of the Lone Cypress project, whose status was described as "EIR in Process" in the original Draft EIR, nor does it state the reason for the withdrawal of the application or whether the project proponent intends to re-submit it. According to a letter from CRC and CTV to the EPA, the project is not cancelled, but rather "reassessed."[599]

The Recirculated Draft EIR also fails to disclose that beyond the CDMA it now acknowledges. CTV has announced that it is a direct partner in the Lone Cypress project, noting in a media release that "the CTV [Joint Venture (VR)] has the right to take a majority equity stake in the project, as well as to provide sequestration services for all subsequent Lone Cypress hydrogen projects in California."[600]

Moreover, in an email sent to Kern County Planning Department staff, staff is instructed to hold off publishing the Notice of Preparation (NOP) for the Lone Cypress hydrogen project, because the County intended to imminently release the original Draft EIR for CTV I. The email specifically states the reason for delaying the NOP is that "it will complicate the cumulative projects description" and the County does not have time to change anything.[601] It is clear therefore that but for this delay, the Lone Cypress project should have been analyzed as a cumulative project in the original Draft EIR the County published in December 2023.

Regardless of the specific Lone Cypress application, the Recirculated Draft EIR must analyze the cumulative impacts of a hydrogen project as a CO_2-sending source to the Project. A hydrogen plant is clearly a "reasonably probable future project" under CEQA for cumulative impacts analysis purposes.

As the Recirculated Draft EIR summarily acknowledges, the draft EPA Class VI permit for the CTV I Project identified only two other specific sources beyond the oil field gas as an

[596] RDEIR, Vol. 1 at 3-14.
[597] RDEIR, Vol. 1 at 3-15.
[598] RDEIR, Vol. 1 at 3-15.
[599] Letter from Travis Hurst, CRC and CTV to David Albright, Groundwater Protection Section (June 17, 2024) at 1.
[600] CRC, *California Resources Corporation Announces Carbon Dioxide Management Agreement For CTV's First Permanent Carbon Storage Project* (Dec. 7, 2022), https://www.crc.com/news/news-details/2022/California-Resources-Corporation-Announces-Carbon-Dioxide-Management-Agreement-For-CTVs-First-Permanent-Carbon-Storage-Project/.
[601] Email from Lorelei Oviatt, Kern County Planning & Natural Resources Dept., *Re: Elk Hills Blue Hydrogen Parcel Map Waiver and CEQA* (Dec. 1, 2023).

initial source—the Lone Cypress Blue Hydrogen and the Avnos DAC project. The 26R storage project draft permits issued by EPA, attached as appendix E.3 to the Recirculated Draft EIR, lists three sources of CO_2 seeking approval: the oil field gas, the Lone Cypress hydrogen plant, and the Avnos DAC project. The draft permits state they are to be located within the Elk Hills oil field.[602] 3-180 Cont'd

On July 10, 2024, the EPA published a revised versions of the draft permits for comments, noting the revisions include the removal of references to the Avnos Direct Air Capture Facility and Lone Cypress Hydrogen Facility as proposed carbon dioxide sources.[603]

The Recirculated Draft EIR argues that an EPA action on draft permits "[…] does not mean the projects are approved,"[604] but fails to account for the significance of the EPA permit process for a proper cumulative impacts analysis.

EPA is the primary regulatory authority for Class VI injection permits, which are required for CO_2 injection into underground subsurface rock formations, as the Project intends to do. In other words, an EPA permit is an indispensable condition for the Project to move forward. And the permits, in their current draft form, allow injection of CO_2 from only those three sources. The draft permits make clear that the Project proponent may request to inject CO_2 from other sources, but this will require further application, review, and approval by EPA, as described in Section N of the permits.[605] Section N lists the conditions for approval of *additional* emission sources, a process which includes disclosure of the CO_2 stream, description of the source industry, evaluation of potential air pollution impacts, and public notice, among other things.

The draft permit requirements mean that detailed information is already known regarding the oil field gas, the hydrogen plant, and the DAC project, and can be used in the cumulative impacts analysis. EPA is clear that its process to issue the original draft permits included "a thorough technical review of all information submitted by CTV in its permit application, as well as the operational standards, monitoring requirements, and existing geologic setting" that was sufficient for the EPA to make a determination under the Safe Drinking Water Act.[606]

Moreover, the Project evidently relies on sources beyond the oil field gas initial source to send CO_2 to the Project *almost immediately* after it begins operation: The Recirculated Draft EIR's analysis discloses that at a maximum, the oil field's CO_2 will add up to 203,485 tons per year (tpy) of captured CO_2.[607] But its GHG analysis projects over 300,000 tons of CO_2 to be injected by its second year—clearly from approved sources beyond the initial source. 3-181

[602] RDEIR, Vol. 2, App'x E.3 – 26R Storage Project Draft Permits. The same language repeats in all four permit drafts included in the appendix.
[603] EPA, *Public Comments Sought on Class VI UIC Injection Well Carbon Storage Draft Permits* (July 2024) at 1.
[604] RDEIR, Vol. 1 at 3-14.
[605] RDEIR, Vol. 2, App'x E.3 – 26R Storage Project Draft Permits.
[606] EPA, *Public Notice of Intent to Issue a Class VI Underground Injection Control Permit for Carbon TerraVault JV Storage Company Sub 1, LLC* (Dec. 2023) at 1.
[607] RDEIR, Vol. 1 at 3-2.

A hydrogen project, whether it is the Lone Cypress project or a different but substantially similar hydrogen project, is clearly a "reasonably probable future project" given the contents of the EPA draft permits and the applicant's predictions for the Project's capture of CO_2. Regardless of whether the hydrogen project is part of the latest draft permits or not, the SMR hydrogen plant also clearly falls under what the courts describe as a "future project where the applicant has devoted significant time and financial resources to prepare for *any* regulatory review."[608] The EPA regulatory review requires significant time and resources, and the hydrogen project that is part of that ongoing review must be considered a probable future project. 3-181 Cont'd

It should be noted that in their letter to EPA, CRC and CTV are clear that this removal of sources is happening in the "short-term." They are also clear that "even if the Lone Cypress and/or Avnos project does not proceed, CRC expects that over time sources of CO_2 for the 26R UIC permits will likely include hydrogen and direct air capture facilities (among other potential future sources of CO_2)."[609]

It is also evident that CRC contemplates the development of blue hydrogen plants as part of its operation. In a letter to CARB, CRC urges the agency to include in its Low Carbon Fuel Standard (LCFS) amendments hydrogen plants that will rely on CCS to capture GHG emissions, stressing that should the agency act differently, it will "ultimately frustrate the deployment of low carbon hydrogen projects in California."[610] 3-182

In addition, the Recirculated Draft EIR discloses that the Project is already undergoing another regulatory review process: CARB review under the CCS Protocol adopted under the LCFS.[611] The review, which is required for the CTV I Project to qualify for LCFS credits, is highly technical and complex. Project proponents are required to provide detailed, third-party verified information regarding the geological CO_2 sequestration, and show they adhere to the Protocol and qualify for certification that the CO_2 will be retained in the ground. As is clear from the Recirculated Draft EIR, CTV I already filed at least 13 reports with CARB to address the permanence requirements related to site characteristics, risk assessment, plume extent evaluation, testing and monitoring, well operation, post-injection site care, and more.[612]

The reports the Project proponent filed with CARB clearly identify a hydrogen plant as the main source for CO_2, stating: "[t]he anthropogenic CO2 will be sourced from an onsite blue hydrogen plant (up to 200,000 tonnes per annum) with additional potential CO_2 from the Elk Hills 550 MW natural gas combined cycle power plant, direct air capture (DAC), renewable diesel refineries, and/or other sources in the area."[613] This CARB process, including the promise

[608] *Gray v. Cnty. of Madera*, (2008) 167 Cal. App. 4th 1099, 1127–28 (emphasis added).
[609] Letter from Travis Hurst, CRC and CTV, to David Albright, Groundwater Protection Section (June 17, 2024) at 1–2.
[610] CRC letter to CARB, *RE: Proposed 2024 Low Carbon Fuel Standard Amendments* (Feb. 20, 2024) at 3. See also CRC's application to CARB under its CCS Protocol for LCFS certification.
[611] RDEIR, Vol. 1 at 4.6-5 to 4.6-6.
[612] RDEIR, Vol. 1 at 4.6-6; RDEIR, Vol. 2, App'x F: CARB LCFS Report #1, Site Based Risk Assessment at 1.
[613] CARB LCFS Report #3, *Storage Complex Delineation and Corrective Action Plan, CTV Elk Hills Oil Field (EHOF)* at 6-7.

of an SMR hydrogen plant, constitutes a regulatory review that the applicant devoted significant time and resources to prepare.

3-182 Cont'd

It should be noted that the CARB reports do not identify a specific hydrogen project, but "a blue hydrogen plant." Since the industrial process (methane steam reforming) is known, and the volume of production is disclosed in both regulatory processes,[614] the Recirculated Draft EIR must disclose and analyze the potential cumulative impacts, including impacts from co-pollutants, impacts on water resources, and safety hazards resulting from the anticipated "blue hydrogen" facility.

b. DAC Project

Similar to the hydrogen project, the Avnos DAC project is one of the three sources included in CRC's application to the EPA for a Class VI injection well permit and in the EPA's draft permits.[615] It was also removed in the recent permit revisions.[616] Direct air capture is also on the list of future Project sources added to the Recirculated Draft EIR.[617]

3-183

In its short discussion of the DAC project, the Recirculated Draft EIR states that "[i]t is unknown if there is an existing CDMA or other commercial agreement between CRC and Avnos. The applicant notes that CTV I is in preliminary commercial discussions with Avnos, Inc., to construct a DAC facility that would be designed to intake and process atmospheric air to separate out CO2."[618] On its face, the statement "[i]t is unknown if there is an existing CDMA or other commercial agreement" lacks credibility, since CRC could easily provide any information to the County regarding the existence of such agreements, much as CRC has provided all the other information it has provided to the County—including the statement in the sentence following.

Beyond that, this statement downplays the connections between the Project proponent and the DAC project as well as the DAC project status. First, in its 2023 operations updates, CTV describes the California DAC Hub as being "led by CTV's subsidiary CTV Direct, LLC" and states it was selected to receive approximately $12 million in DOE funding.[619] CTV I also describes itself as responsible for assembling "a consortium of organizations across industry, technology, academia, national labs, community, government, and labor, to pursue U.S. Department of Energy (DOE) funding under its Regional Direct Air Capture (DAC) Hubs

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[614] Up to 200,000 tonnes per annum per App'x E.2 – *U.S. Environmental Protection Agency Class VI Underground Injection Control (UIC) Permit Application Narratives for the Elk Hills 26R Storage Project and the A1A2 Storage Project* (Attachment C).
[615] RDEIR, Vol. 2, App'x E.3 – 26R Storage Project Draft Permits. The same language repeats in all four permit drafts included in the appendix.
[616] EPA, *Public Comments Sought on Class VI UIC Injection Well Carbon Storage Draft Permits* (July 2024) at 1.
[617] RDEIR, Vol. 1 at 3-13.
[618] RDEIR, Vol. 1 at 3-15.
[619] Business Wire, *Carbon TerraVault Provides 2023 Update* (Feb. 27, 2024), https://www.businesswire.com/news/home/20240227366330/en/Carbon-TerraVault-Provides-2023-Update.

Initiative to create the California DAC Hub, the state's first full-scale DAC plus storage (DAC+S) network of regional DAC+S hubs."[620]

3-183 Cont'd

In addition, in a quarterly report to the CPUC from January 31, 2024, SoCalGas discloses that it is a member of the California Direct Air Capture Hub Consortium working toward the DAC project in Kern County and that the consortium was awarded an $11.8 million grant from DOE. This report further states that the DAC facility's project manager "is currently in contract negotiations and expects to finalize the negotiation in early 2024, allowing for an expected project kickoff thereafter."[621]

Also similar to the hydrogen project, a DAC project is listed as a potential source in the reports CTV I filed with CARB under the CCS Protocol.[622]

The DAC project is not only a "reasonably probable future project," but also a "future project where the applicant has devoted significant time and financial resources to prepare for any regulatory review."[623] Its impacts must be analyzed cumulatively in order for the Recirculated Draft EIR to be legally and informationally sufficient.

The result of the Recirculated Draft EIR's failure to properly account for cumulative projects and their impacts is that its cumulative impacts analysis is deeply flawed, lacking any analysis of the environmental impacts expected to be produced by probable future projects, or an analysis of whether the impacts are cumulatively considerable.[624]

3-184

It is evident that the Project is completely dependent on its sources. The Recirculated Draft EIR states that "[t]he life of the project is dependent on the sources permitted for injection into the storage" and on "the ability of the project year by year to obtain CO_2 and inject at the maximum 2,210,000 million tons per year."[625] The Recirculated Draft EIR should therefore include a cumulative impacts analysis of all the projects listed in Table 3-8, and in particular of potential CO_2 sources it lists as cumulative projects.[626]

Finally, cumulative impacts analysis cannot merely be a cursory description of probable future projects, without any analysis. The description and analysis of cumulative impacts should reflect their severity and the likelihood of their occurrence.[627] While this analysis does not have to reflect the same level of detail as the primary analysis of the Project's impacts, it still must be

[620] CRC, *California DAC Hub*, https://www.crc.com/carbon-terravault/projects/california-dac-hub/default.aspx (last accessed Mar. 1, 2024).
[621] SoCalGas, *Quarterly Report on Status of Infrastructure Investment and Jobs Act (IIJA), Inflation Reduction Act (IRA), or Creating Helpful Incentives to Produce Semiconductors and Science Act (CHIPS) Projects Pursuant to Resolution E-5254* (Jan. 31, 2024) at 2.
[622] CARB LCFS Report #3, *Storage Complex Delineation and Corrective Action Plan, CTV Elk Hills Oil Field (EHOF)* at 6-7
[623] *Gray*, 167 Cal. App. 4th at 1127–28 (emphasis added).
[624] CEQA Guidelines, § 15065(a)(3).
[625] RDEIR, Vol. 1 at 4.8-24.
[626] RDEIR, Vol. 1 at 3-45.
[627] CEQA Guidelines, §15130(b); *City of Long Beach v. Los Angeles Unified Sch. Dist.* (2009) 176 Cal.App.4th 889.

reasonable and show a good faith effort to disclose the impacts.[628] As described under each impact area section in these comments, the Recirculated Draft EIR does not provide any meaningful analysis of the cumulative impacts attributable to the probable future projects, and ignores even the projects it lists as cumulative projects in Table 3-8.

3-184 Cont'd

The courts made clear that lead agencies have a duty to approach the issue of cumulative impact analysis in a way that will "afford the fullest possible protection to the environment within the reasonable scope of their language."[629]

The Recirculated Draft EIR must be revised to fully account for the cumulative impacts attributable to *all* of the CTV I Project's cumulative projects, including, but not limited to, the CarbonFrontier Project and the hydrogen and DAC CO_2 projects.

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For the reasons set forth above, we urge the County to re-do its analysis, prepare and circulate a revised Draft EIR, and, ultimately, reject the CTV I Project.

We reserve the right to identify new issues, provide additional information, and propose additional mitigation measures during the County's ongoing decisionmaking process for the CTV I Project.

If you have any questions about the foregoing comments, you may reach out to any of us directly or contact the Earthjustice contacts listed below, who helped prepare this submission.

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Respectfully submitted,

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[628] *Citizens for Open Gov't v. City of Lodi* (2012) 205 Cal.App.4th 296, 320.
[629] San Franciscans for Reasonable Growth v. City & Cnty. of San Francisco, 151 Cal. App. 3d 61, 74, 198 Cal. Rptr. 634, 640 (Ct. App. 1984)

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ATTACHMENT A

Comment on the Air Quality and Greenhouse Gas (GHG) Analysis Provided in the Draft Environmental Impact Report (SCH# 2022030180) for the Carbon TerraVault 1 (CTV1) Project in Kern County, California Proposed by California Resources Corporation, December 2023

by

Dr. Ranajit (Ron) Sahu[1]

I provide the following technical comments based on my review of the air quality and GHG analyses provided for the proposed CTV1 project in the DEIR. The lead agency for the EIR is Kern County's Planning and Natural Resources Department (Mr. Keith Alvidrez).

The figure below, taken from the DEIR shows the two dis-jointed parcels (at the surface) where the proposed project will be implemented.

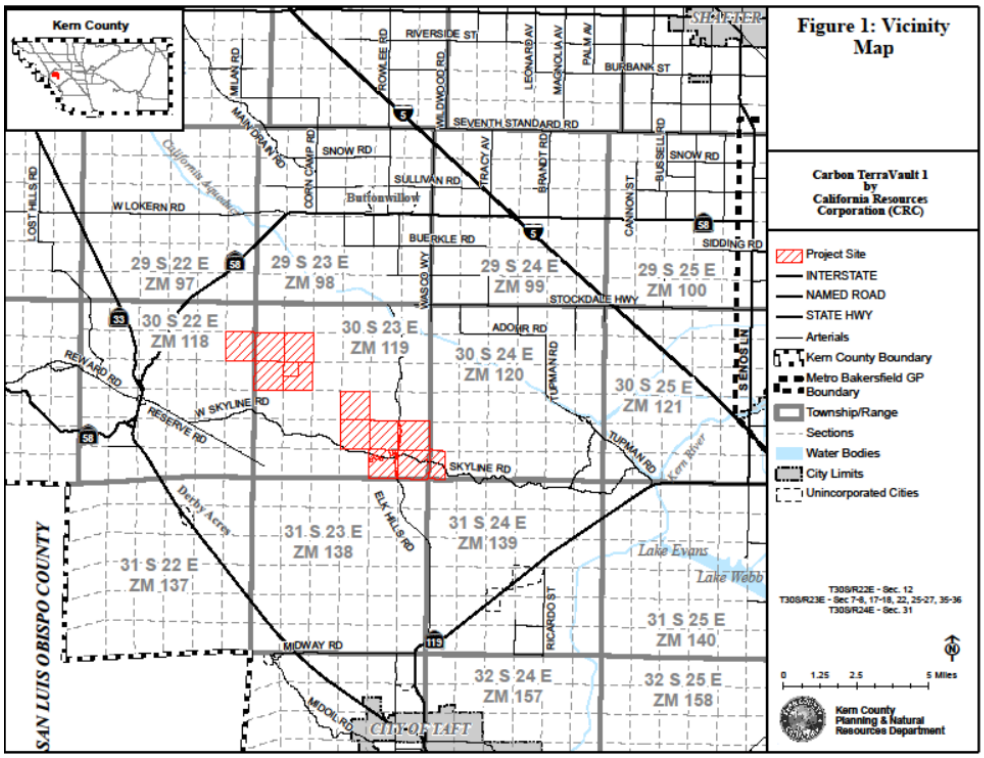

Figure 1: Regional Vicinity Map

[1] Resume provided in Attachment A.

My comments are based on information provided in the body of the DEIR (in Volume 1) and Appendix B (in Volume 2, specifically the report prepared by Trinity Consultants[2]) which contains the supporting information on the air quality and GHG analyses. My comments point out the deficiencies in the analysis, including the lack of support or rationale for critical inputs which should be addressed. Given the lack of publicly available information on the proposed project, I am unable to provide an independent, alternate set of analyses and results.

Comment 0 – Inconsistent Description of the Proposed Project

Page 1-1 (Introduction) and page 3-1 (Project Description) of the DEIR state:

> The Carbon TerraVault I (Kern County) Project (CTV I) proposed by California Resources Corporation (CRC, or project proponent) would request the approval of multiple Conditional Use Permits (CUPs)…for the construction and operation of an approximately 9,130-acre carbon capture and storage (CCS) facility with related capture facilities and pipeline for the initial source and request associated Zone Change Case (ZCC) No. 5, Map 119 and ZCC No. 4, Map 120 from A-1 (Limited Agriculture) to A (Exclusive Agriculture) on approximately 6,160 acres."[3]

Appendix B.1 of the DEIR states that:

> "…[T]he Project will involve a 5,332-acre carbon capture and sequestration field, associated sequestration injection wells and related improvements for storage of Carbon Dioxide (CO_2)."[4]

Yet, later in the same document, it states that:

> "[T]he Carbon TerraVault 1 Carbon Capture and Sequestration Project is consideration of the approval of multiple Conditional Use Permits (CUP) (CUP No. 13, Map no. 118, CUP No. 5, Map 119, CUP No. 3, Map 120) and related changes in zoning designations (ZCC No.5, Map No.118, ZCC No. 5, Map 119, ZCC No. 4, Map 120 for the construction and operation of a 7,385.67 acre carbon capture and storage (CCS) facility, with associated Class VI Underground Injection Control (UIC) wells, 13 miles of facility pipeline for capture from the pre-combustion gas and related infrastructure improvements for the capture, transfer, and storage of CO_2."[5]

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[2] DEIR, Appendix B.1. Air Quality Impact Analysis, May 2023 (revised November 2023), prepared by Trinity Consultants.

[3] DEIR, pages 1-1, 3-1.

[4] DEIR, Appendix B.1, p. 1-1. (emphasis added)

[5] DEIR, Appendix B.1, Section 2.2. (emphasis added)

Please clarify the discrepancies between the three very different acreages noted above.

Comment 1 – Missing Details and Energy/Air Quality Impacts of the Carbon Capture System

The DEIR contains no engineering information about specific design and/or details regarding the operations of the carbon capture (CC) system that is/will be implemented at the Elk Hills power plant or at the existing cryogenic and fractionation natural gas plant (CGP-1) facility (or any other sources of GHG) before those emissions are then managed, ultimately being injected into geologic formations for sequestration.

As an example, while CC systems naturally involve additional equipment such a blowers and ductwork, which incur energy penalties in order to operate, the DEIR does not provide the details supporting the approximately 31 MW per year[6] of energy it estimates that will be needed to operate the CC facilities and associated equipment.

In addition, while the DEIR notes that the energy/power needed to operate the CC facilities would be sourced from the Elk Hills Power Plant, it does not discuss how this additional power generation will change the load factor and other operating characteristics of the power plant. The DEIR, in summary fashion at Appendix B.1, simply states that "…[T]he Elk Hills Power Plant provides about one third of its power to the oilfield for operations and the remainder is distributed to the California power grid via the Pacific Gas and Electric (PG&E) substation in Buttonwillow." It does not discuss how the additional power/energy needed by the proposed CC facilities would be accommodated by the Elk Hills power plant. I note that the DEIR simply assumes that the power plant will continue to operate at an annual (and constant) capacity factor of 93%[7] for every single year of the 30 year duration of the proposed project. The justification for this capacity factor and whether or not it includes the additional energy needed for the CC system is not clear. That should be clarified.

In addition, given that the expected duration of the proposed project is 30+ years, it is presumed that the Elk Hills Power Plant will need to operate for the next three decades to support the project, whether or not the plant would have continued to run for all this additional time into the future without the project. As it stands, the Elk Hills Power Plant is approximately 20 years old already. So, that means the proposed project would require the power plant to operate till it is 50+ years old. Without significant additional investments to extend the life of the power plant, it is likely that the Elk Hills power plant would have shut down but for the proposed project. The DEIR

[6] DEIR, p. 4.6-15.

[7] DEIR, Appendix B, tables on pdf pages 310-311.

should address whether or not the proposed project enables the life extension of the Elk Hills power plant and the impacts of any such extension.

Comment 2 – Cursory and Missing Aspects of GHG Leakage

There is little to no detail on the leakage of GHGs, including but not limited to the various types of potential leakage of CO_2 from different aspects of the entire project.

While the DEIR makes a gross assumption that the GHG capture will be 95%,[8] it is not clear if, therefore, the remaining 5% uncaptured GHG is presumed to be an annual leakage level for the duration of the project. If so, what specifically is included in this 5% leakage is not discussed. That should be clarified.

It appears however, that, at best, this uncaptured GHG might include losses during capture of the power plant's exhaust as well as certain fugitive losses in processing the exhaust waste gases containing GHG to and through the amine system, followed by its conveyance to the injection wells. Importantly, three additional potential loss mechanisms and their GHG losses (and associated leakage) do not appear to have been addressed or quantified:

(i) GHG losses associated with ruptures or failures of the additional new pipelines or pipeline components proposed as part of the project. Given the large geographic extent of CTV1, including the gathering and injection infrastructure and given the assumed three decades of operation, such failures are quite likely;

(ii) GHG losses associated with the maintenance of equipment, including "blowdown" or similarly necessary emissions in order to allow for proper preventive maintenance. Pipeline maintenance typically requires evacuation of pipeline sections in order to safely effect such maintenance. Such evacuation necessitates "blowdown" of the gas contained in the pipeline sections. Unless otherwise gathered or captured – which is not discussed in the DEIR – these events can result in emissions of waste gases, containing GHG and other pollutants to the atmosphere; and

(iii) GHG losses from the geologic formation itself due to the injected GHG/CO_2.[9] While the DEIR generally admits that there could be potentially significant leakage[10], the DEIR does not provide any details including the probabilities of such leakage, the circumstances

[8] Curiously, in Section 4.11 of Appendix B.1, this 95% capture is at the amine units. Why that is the case is not clear. The DEIR should clarify.

[9] DEIR, Appendix B.1, Section 2.2 notes that annually 1.5 million metric tons of CO_2 will be injected, with an overall total project injection of 48 million metric tons. This is roughly a 32 year time period.

[10] For example, DEIR at p. 4.8-26.

under which such leakage may occur, or any quantification of the leakage.

The DEIR does include a few monitoring wells but the logic of their placement (including depths) in the various locations and how just the small number of proposed monitoring wells will provide enough assurance that GHG once injected will not migrated from the intended injected formation, is not provided and is not supported by evidence. This un-sequestered GHG migration may not just be towards the surface (i.e., vertically upwards) but also laterally and even downwards from the formation, eventually manifesting themselves as leakage to the surface. While the timing of this subsurface leakage mechanisms may not occur just during the presumed thirty or so year project period (and its GHG accounting of the benefits of sequestration), that does not mean that leakage after (or long after) the thirty or so year time period should simply be assumed to be zero, with little to no support and little to no verification.

* * * * *

The remainder of my comments address specifics about the air quality and GHG analyses presented in the DEIR. For air quality, I focus mainly on the discussion provided in Chapter 4.3 (specifically Sections 4.3.4 and 4.3.5) and Appendix B (specifically Appendix B.1 – the Trinity Consultants report, from which much of the analysis in the body of the DEIR is drawn from), including certain mitigation measured proposed in the DEIR. For GHG, I have reviewed the analysis presented in Section 4.8 of the DEIR and also in Appendix B. I have also reviewed Appendix F in Volume 2 relating to a site-specific risk assessment.

Comment 3 – Air Quality Emissions Estimates

It is crucial that an air quality analysis fully support the assumptions underlying its emissions estimates, as those assumptions and resulting emissions estimates ultimately affect the DEIR's assessment of project impacts and feasible mitigation.

This is true for all types of air pollutants (i.e., criteria pollutants, air toxics or hazardous air pollutants, and GHG) and from all potential emissions generating sources and activities of the proposed project, including both construction and operational phases.

While it is customary in conducting EIR-type air quality analyses to rely on "standard" models to develop emission estimates as has been done in this DEIR,[11] those models typically only have emission factors (i.e., mass of emissions of pollutant X from a source Y – like piece of fuel-burning

[11] DEIR, Section 4.3.4.

equipment, for example). That such standard models have been used in the present instance is confirmed by the DEIR:

> "[T]he construction and operational emissions were estimated from several emissions models and associated spreadsheet calculations, depending on the source type and data availability. The primary emissions models used included CARB's on-road vehicle emission factor model (EMFAC) version 2021 and the California Emissions Estimator Model (CalEEMod) version 2021.1.13." In addition, the DEIR states that "[T]he capture facilities (new amine unit valve) fugitive emissions have been quantified using the California Implementation Guidelines for Estimating Mass Emissions of Fugitive Hydrocarbon Leaks at Petroleum Facilities…"[12]

The user of the model or the analyst has to input the corresponding activity factor (i.e., how many and what types of equipment, of what sizes, hours of usage, etc.) in order to run the model and obtain estimates of the mass of emissions (i.e., pounds or tons) from those activities over the desired time period (hours, days, weeks, year, etc.).

An accurate analysis and robust evaluation of impacts is especially important here given that the proposed project will be located in an area that is already non-attainment for several criteria pollutants including: ozone (Federal and State); PM_{10} (State); and $PM_{2.5}$ (Federal and State).[13] I should note also that, for $PM_{2.5}$, the EPA has now proposed to make the primary (i.e., health based) annual National Ambient Air Quality Standard (NAAQS) more stringent from its current level of 12 ug/m^3 to a range between 9 – 10 ug/m^3, reflecting the current science on adverse health impacts of this zero-threshold air pollutant.[14] The adoption of the stricter standard means that the air quality in the area is even more unhealthy than understood previously and even further from attaining the health-based NAAQS than acknowledged in the DEIR.

Comment 3.1 – Emission Factors and Errors

I should note for the record that just because the "standard" models incorporate emission factors for various pollutants and for various types of equipment and activities, that does not mean that those emission factors do, in fact, accurately or conservatively represent the emissions of the respective pollutants from specific equipment and specific activities that are part of the project.

[12] *Id.*

[13] DEIR, Table 4.3-2.

[14] https://www.epa.gov/newsreleases/epa-proposes-strengthen-air-quality-standards-protect-public-harmful-effects-soot

First, there are issues of representativeness of the emission factors, especially as they apply to not just new equipment but also to older equipment and the inevitable deterioration of their emissions (including deterioration of any air pollution controls) over time. This specifically applies to the emission factors that are included as part of the "standard" models used to develop emission estimates as noted prior.

Second, there are always issues of precision and error in emission factors (and activity factors, which I discuss later) and the resultant emissions estimates. The emissions estimates in the DEIR in many instances provide values to many significant digits (i.e., implying greater – and false – precision than warranted), thereby misleading the reader as to the accuracy of the air quality emissions estimated. The DEIR contains no estimates of the errors in any of the calculations. In fact, a proper analysis should provide some guidance of the error (or the range) of the emissions as opposed to misleadingly precise estimates for the reader. The DEIR fails completely on this score. To meaningfully inform the public and decision makers, the DEIR should quantify and disclose uncertainties in the emissions estimates.

Comment 3.2 – "Existing" Air Quality Information is Dated And May Not Be Representative

Section 3.2 of Appendix B.1 summarizes "existing" air quality – i.e., ambient monitoring concentrations of several pollutants. Yet, even though the report in Appendix B.1 was revised in November 2023, this "existing" ambient data is only provided for the years 2019 through 2021. Further, the description misleadingly states that these are "the last three years." Clearly that is not the case since no data is provided for 2022. There is also no mention of why 2022 data could not have been reported. That should be fixed. Notably, quality-assured data from 2022 is readily available.[15]

I also note that this "existing" three-year time period of 2019-2021 was substantially impacted by COVID-19 for the years 2020 and 2021. As such, due to changes in economic activities including transportation patterns, and many other factors, it is not assumable, without further discussion, that this impacted three-year period is representative of "existing" air quality. I suggest that a broader time period, say, 5 or even more years, including 2022, be included to describe existing air quality, with comments, as necessary, on any patterns in the data.

Comment 3.3 – None of the Assumptions Made For Estimating Project-Related Emissions Are Supported by Any Justification and/or Rationale

[15] See, https://www.arb.ca.gov/aqmis2/display.php?param=OZONE&units=007&statistic=DAVG&year=2022&mon=12&day=31&county_name=15-Kern&basin=--AIR+BASIN--&latitude=--PART+OF+STATE--&report=7DAY&order=basin%2Ccounty_name%2Cs.name&submit=Retrieve+Data&ptype=aqd&std15=

I will provide examples of these unsupported assumptions in this comment. I also note, that in each instance, there is no verification of any of these assumptions proposed in the DEIR either.

(i) for short-term construction emissions, it is assumed that the construction schedule will be 11 days per well pad, 18 days per well, 2 years for the capture facilities, and 1 year for the pipelines (later noted as 220 days). None of these timelines are supported.

Specifically, Table 4-12 in Appendix B.1 shows the details of the wells to be constructed/repurposed as part of the project. It is excerpted below for easy reference.

Table 4-12. Total Emissions on a Per Well Basis

Well Name	Description	Depth (ft)	Emissions (Tons)
26R Reservoir			
363C-27R	Injector	6290	4.55
353XC-35R (new)	Injector	6390	4.55
373-35R (new)	Injector	7010	5.36
345C-35R (new)	Injector	5690	3.98
341-27R	Plume monitoring	6981	4.55
328-25R	Plume monitoring	5268	3.98
376-36R	Plume monitoring	5832	3.98
355X-26R	Above-zone monitoring	4063	2.35
USDW Monitoring (new)	USDW monitoring	400	1.28
A1/A2 Reservoir			
355-7R	Injector	8387	6.17
357-7R	Injector	8420	6.17
353A-7R	Plume monitoring	8773	6.17
335X-7R	Plume monitoring	8737	6.17
327-7R-RD1	Above-Zone monitoring	3782	2.03
345-7R	A3+ Monitoring	8904	6.17
388X-7R	A3+ Monitoring	8800	6.17
342-17R	A3+ Monitoring	8844	6.17
USDW Monitoring (new)	USDW monitoring	740	1.28
Total			**81.08**

I note that the well depths, excluding the groundwater monitoring wells, in Table 4.12 range from as low as 3782 ft to as high as 8904 feet. Given this wide range of well depths and many other depths noted in Table 4-12, it makes no sense to presume that there will be 18 days required to construct each well. If the intent is to presume that 18 days is the "average" for all wells/various depths noted above, that should be justified. Clearly, the wells in the A1/A2 reservoir will be drilled to deeper depths as compared to the wells in the 26R reservoir. Since they are not expected to be drilled all at once, the construction schedule for the wells should be provided in greater detail, along with supported construction durations.

In addition, it is not clear how the well depths in Table 4-12 were so precisely estimated, right down to the last foot (for example, 6981 feet, 4063 feet, etc.). Please provide the rationale since the depths will affect construction timelines.

(ii) Section 4.2.1 of Appendix B.1 contains a number of mobile source activity assumptions. These include: a 40-mile trip distance; 160 average daily trips (ADTs) for workers during construction; 32 ADTs by 1-ton trucks and 20 ADTs using 5-ton trucks, in addition to 8 water trucks; 16 ADTs by workers and 2 ADTs by vendors during well pad construction; and 12 ADTs by workers and 10 ADTs by vendors during well construction. There is no justification provided for any of these assumptions. Thus, the emission estimation approach is nothing more than an algebraic exercise. As a simple example, it is not clear why there should be a 40-mile trip distance for both workers and vendors. Also, since there is no description of the work that will be done during construction of the well pad and the well, there is no context for understanding if the assumed numbers of workers/vendors, as well as equipment proposed, makes any sense.

These types of assumptions should be supported by actual data that is undoubtedly available to the project proponent since these are not the first well pads nor first wells that are going to be drilled in this area.

(iii) Similarly, there are numerous assumptions about the types, numbers, and operating hours of various construction equipment that will be used in developing the construction emissions. These are inputs to the emissions calculations in the standard models used to develop those estimated. I have excerpted Tables 4-3 through 4-6 from Appendix B.1 below that contain these assumptions.

Table 4-3. Facilities Construction Equipment

Equipment	CalEEMod Equipment Designation	Quantity	Total Operating Hours per	Average Daily Operating Hours
Hydro Crane	Cranes	5	1968.75	3.8
ForkLift	Forklifts	7	1968.75	3.8
Excavator	Excavators	1	1968.75	3.8
Backhoe	Tractors/Loaders/Backhoes	4	1968.75	3.8
Air Compressor	Air Compressors	20	246.09	0.5
Crane	Cranes	3	246.09	0.5
Loader	Rubber Tired Loader	3	246.09	0.5
Dozer	Rubber Tired Dozers	1	1968.75	3.8
Dump Truck	Off-Highway Trucks	2	1968.75	3.8
Welding Truck	Welders	8	1968.75	3.8

Table 4-4. Pipeline Construction Equipment

Equipment	CalEEMod Equipment Designation	Quantity	Average Daily Operating Hours
Crane	Cranes	3	5.0
Boom Truck	Other Construction Equipment	3	5.0
Crane	Cranes	3	2.5
Side Boom	Other Construction Equipment	6	5.0
Bending Machine	Other Material Handling Equipment	1	2.5
Air Compressor	Air Compressors	4	5.0
Air Compressor	Air Compressors	1	2.5
Welding Machines	Welders	8	5.0
DitchWitch	Off-Highway Trucks	1	2.5
Vacuum Truck	Other Construction Equipment	2	2.5

Table 4-5. Well Pad Construction Equipment (Per Well)

Equipment	CalEEMod Equipment Designation	Quantity	Total Operating Hours per	Average Daily Operating Hours
Grader	Graders	1	16	1.5
Front Loader	Tractors/Loaders/Backhoes	1	40	3.6
Excavator	Excavators	1	32	2.9
Water Truck	Other Construction Equipment	1	40	3.6

Table 4-6. Well Drilling Construction Equipment (Per Well)

Equipment	CalEEMod Equipment Designation	Quantity	Total Operating Hours per	Average Daily Operating Hours
Forklift	Forklifts	1	72.0	4.0
Drilling Rig Motor	Bore/Drill Rigs	1	275.4	15.3
Drilling Rig Motor	Bore/Drill Rigs	1	322.2	17.9
Drilling Rig Motor	Bore/Drill Rigs	1	216.0	12.0
Small Generator	Generator Sets	1	8.0	0.4
Light Tower	Generator Sets	2	216.0	12.0
Water Truck	Other Construction Equipment	1	144.0	8.0
Vacuum Truck	Other Construction Equipment	1	432.0	24.0

The DEIR/Appendix B.1 should provide justifications for the equipment type, the numbers of each equipment, and the expected operating hours in each instance. It is also clear that the operating hours are provided with a high degree of precision, with no rationale. For example, 3.8 hours of operation per day for several types of equipment (along with the equally precise annual operating hours (246.09, 1968.75), in Table 4-3. What is the basis of such precision? Similar comments also apply to the other tables above.

(iv) Long-term, i.e., operational emissions are discussed in Section 4.2.2 of the Appendix B.1 for fugitive (dust) emissions (Section 4.2.2.1) and mobile sources (Section 4.2.2.2). However, fugitive dust emissions are simply not quantified. Instead it is noted that these are "…not expected to present a substantial source of fugitive dust (PM_{10}) emissions…" What is the basis for this conclusionary assertion, with no supporting data or calculations?

In addition, the DEIR presumes that the main source of PM_{10} emissions would be from vehicular traffic associated with the project.[16] While this is true, PM_{10} also results from soil disturbance associated with land grading, including stockpiling of soils and also from the storage of other erodible construction materials.

Further, the DEIR does not address fugitive $PM_{2.5}$, for which the area is non-attainment at present and likely to be even more so when the NAAQS for $PM_{2.5}$ is revised downward per EPA's current proposed, as noted prior.

(v) As for mobile source exhaust emissions during operations, like in the case of construction, the DEIR/Appendix B.1 makes numerous unsupported assumptions, with the exception of a reference to a traffic study estimating 20 ADTs from workers. However, other assumptions such as: the 40-mile trip distance; the assumption for 10 additional workers; the complete lack of any vendor-related trips or emissions are not justified or

[16] DEIR, p. 4.3-65.

supported at all. The DEIR should provide that support or revise as needed. The DEIR should provide the justification for why no vendor support would be needed as operational support for the various injection and monitoring wells.

(vi) In addition to the fugitive and mobile source emissions during operations, the only stationary source emissions included in the analysis are from fugitives from component leaks from the two new amine units that will be installed are estimated (in Table 4-11 of Appendix B.1) using the previously mentioned Implelentation Guidelines for Estimating Mass Emissions of Fugitive Hydrocarbon Leaks at Petroleum Facilities. However, the applicability of these estimates for "petroleum facilities" to the amine units is not clear. Please provide the justification. Also, please clarify what fractions of the components of each type are expected to be "leakers" at different levels of assumed leakage, i.e., 50 ppm, 100 ppm, 250 ppm, 500 ppm, 1000 ppm, 10,000 ppm, etc. And, how these leakers have been included (or not) in the current calculations.

(vii) Previously, I have excerpted Table 4-12 showing the depths of the 18 new wells that will be drilled, for the various purposes shown in that table. In connection with the drilling schedule, I have also provided a comment about the precisions of the well depths noted in Table 4-12. In addition, I have additional comments/questions:

- First, I note that the DEIR provided no justification provided for the well depths for just/only the two above-zone monitoring wells (i.e., one for each reservoir) noted in that table.
- Second, the DEIR provides no justification (geologic or otherwise) for the depths of these two monitoring wells, that are approximately 2000 feet or higher than the reservoirs themselves.
- Third, the DEIR does not state how such a single monitoring well will be placed exactly where some leakage might manifest itself, given the vast area/acreages in each reservoir.
- Finally, the DEIR does not discuss or address potential leakages that may occur from the formation in directions other than vertically, such as initially laterally or even downward from the formations, later finding their way to the surface. The DEIR does not address how these potential leakage paths will be monitored.

In sum, it appears that, at least as far as the monitoring of the injection/sequestration at each reservoir is concerned, there are too few wells. Of course including additional wells, at justified and proper depths, will increase construction (and operational) emissions that have not been properly included in the DEIR.

Comment 4 – Mitigation Measures

As an overall comment, none of the mitigation measures for air quality and GHG have verification or monitoring requirements that would provide even reasonable confidence that: (i) the proposed measures are, in fact, being implemented as promised in the DEIR; and (ii) that even if they are being implemented, their effectiveness is similar to that claimed. This includes, for example, monitoring to quantify GHG leakages via the various pathways and sources previously discussed as well as monitoring to address emissions of criteria and air toxic air pollutants from the facilities that are part of the proposed project.

Comment 4.1 – Emission Reduction Agreements and Their Limitations As Proposed Mitigation

The DEIR states repeatedly that, as mitigation, the proposed project will avail itself of a Development Mitigation Contract (DMC) or Voluntary Emission Reduction Agreement (VERA) to address the project's criteria pollutant emissions of NO_x, reactive organic compounds (ROGs) and particulate matter (PM). The goal is to "fully mitigate the project's air quality impacts such that development of the project could be considered to result in no net increase in the designated criteria pollutant emissions over the criteria pollutant emissions that would otherwise exist without the development of the project, all to be verified by the SJVAPCD." In addition, Section 4.10 of Appendix B.1 also makes a similar claim, justifying the lack of any air quality impact (or modeling).

First, this entire construct does not work if the emissions from the project are not properly estimated and/or verifiably and accurately measured. Without such accurate measurements, the amount of mitigation, to achieve "no net increase" using the DMC or similar mechanism is meaningless. Yet, there is nothing in the DEIR that provides any assurance of actual measurements of even these criteria pollutants from each of the project's activities.

Second, as noted in the DEIR, the DMC does not extend to other pollutants, including additional criteria pollutants such as carbon monoxide (CO) or sulfur dioxide (SO_2).

The DMC also does not extend to any of the air toxic compounds that will be emitted as a result of combustion sources and the amine system used for CO_2 concentration. This is true for such air toxics emissions during construction and operations.

Since none of the mitigations identified contain any verifiable measures of their effectiveness and the emissions estimates are simply not verifiable since no monitoring is required, there is a significant uncertainty as to the actual emissions and their impacts (mitigated or otherwise) of air toxic compounds.

Comment 4.2 – Lack of Verification and Effectiveness of PM_{10} Reduction Measures

These are listed in Mitigation Measure 4.3-2. I will not repeat all/both of them for the sake of brevity. But every single item on these lists is simply a promise, with no recordkeeping or

verification. At a minimum, such record-keeping and verification should be included in as part of an enforceable mitigation monitoring plan for PM_{10} (and $PM_{2.5}$) reduction.

Comment 4.3 – The 4,000-foot Setback in MM 4.3-5 Should Be Expanded, as Needed

A reasonable setback distance from any injection well to sensitive receptors is necessary. The DEIR proposes that the setback be 4,000 feet but provides no explanation for this distance.

However, while MM 4.3-5 addresses the setback from injection wells, it is not clear why similar setback distances are not also proposed for other physical infrastructure like pipelines, from which ruptures can cause CO_2 to also escape and could result in adverse impacts to humans and wildlife. For example, if any pipeline passes through a topographically low area, any CO_2 that might escape can accumulate locally and cause adverse impacts. For these reasons, setbacks should be provided from all physical infrastructure associated with the proposed project, based on a site-specific factors such as the locations of such infrastructure and nearby receptors in order to meet CEQA's requirement to provide all feasible mitigation for significant impacts.

Comment 4.4 – MM 4.3-7 and Additional Details of Fence Line Monitoring

While I agree with the goal of MM 4.3-7 that an Air Monitoring program for fence line monitoring of all air constituents generated by the CCS project – including but not limited to criteria pollutants, CO_2, and H_2S – should be developed and implemented, MM 4.3-7 provides no details of how such fence line monitoring will occur. Even basic details of whether this will consist of periodic sampling at specific locations along the fence line (of, say, a well pad; or near the amine units, etc.) or continuous open-path measurements along the entire perimeter of such locations, is not provided in the DEIR. Without this, and additional detail, the efficacy of MM 4.3-7 is not clear. The DEIR should provide additional details, like, for example: (i) specific monitoring parameters (e.g., spacing of monitors, equipment sensitivity, frequency of monitoring) and/or performance standards to be used to select monitoring parameters; (ii) requirements for reporting monitoring results to the County and responsible agencies and for public disclosure of monitoring data and/or performance standards to be used to develop reporting and public disclosure requirements; (iii) any threshold levels (by pollutant) that, if detected at the fence line, will trigger mitigation and/or performance standards to be used to select appropriate thresholds for mitigation; and (iv) mitigation measures to be implemented if monitoring thresholds are exceeded and/or performance standards to be used to select effective mitigation measures.

Attachment A
to Technical Comments of Dr. Ranajit (Ron) Sahu:
Qualifications and Experience

RANAJIT (RON) SAHU, PH.D, CEM (NEVADA)

CONSULTANT, ENVIRONMENTAL AND ENERGY ISSUES

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EXPERIENCE SUMMARY

Dr. Sahu has over thirty two years of experience in the fields of environmental, mechanical, and chemical engineering including: program and project management services; design and specification of pollution control equipment for a wide range of emissions sources including stationary and mobile sources; soils and groundwater remediation including landfills as remedy; combustion engineering evaluations; energy studies; multimedia environmental regulatory compliance (involving statutes and regulations such as the Federal CAA and its Amendments, Clean Water Act, TSCA, RCRA, CERCLA, SARA, OSHA, NEPA as well as various related state statutes); transportation air quality impact analysis; multimedia compliance audits; multimedia permitting (including air quality NSR/PSD permitting, Title V permitting, NPDES permitting for industrial and storm water discharges, RCRA permitting, etc.), multimedia/multi-pathway human health risk assessments for toxics; air dispersion modeling; and regulatory strategy development and support including negotiation of consent agreements and orders.

He has over thirty years of project management experience and has successfully managed and executed hundreds of projects in this time period. This includes basic and applied research projects, design projects, regulatory compliance projects, permitting projects, energy studies, risk assessment projects, and projects involving the communication of environmental data and information to the public.

He has provided consulting services to numerous private sector, public sector and public interest group clients. His major clients over the past three decades include various trade associations as well as individual companies such as steel mills, petroleum refineries, chemical plants, cement manufacturers, aerospace companies, power generation facilities, lawn and garden equipment manufacturers, spa manufacturers, chemical distribution facilities, land development companies, and various entities in the public sector including EPA, the US Dept. of Justice, several states (including New York, New Jersey, Connecticut, Kansas, Oregon, New Mexico, Pennsylvania, and others), various agencies such as the California DTSC, and various cities and municipalities. Dr. Sahu has executed projects in all 50 US states, numerous local jurisdictions and internationally.

In addition to consulting, for approximately two decades, Dr. Sahu taught numerous courses in several Southern California universities as adjunct faculty, including UCLA (air pollution), UC Riverside (air pollution, process hazard analysis), and Loyola Marymount University (air pollution, risk assessment, hazardous waste management). He also taught at Caltech, his alma mater (various engineering courses), at the University of Southern California (air pollution controls) and at California State University, Fullerton (transportation and air quality).

Dr. Sahu has and continues to provide expert witness services in a number of environmental and engineering areas discussed above in both state and Federal courts as well as before administrative bodies (please see Annex A).

EXPERIENCE RECORD

2000-present **Independent Consultant.** Providing a variety of private sector (industrial companies, land development companies, law firms, etc.), public sector (such as the US Department of Justice), and public interest group clients with project management, environmental

consulting, project management, as well as regulatory and engineering support consulting services.

1995-2000 Parsons ES, **Associate, Senior Project Manager and Department Manager for** Air Quality/Geosciences/Hazardous Waste Groups, Pasadena, CA.

Parsons ES, **Manager for Air Source Testing Services**. Responsible for the management of 8 individuals in the area of air source testing and air regulatory permitting projects located in Bakersfield, California.

1992-1995 Engineering-Science, Inc. **Principal Engineer and Senior Project Manager** in the air quality department.

1990-1992 Engineering-Science, Inc. **Principal Engineer and Project Manager** in the air quality department.

1989-1990 Kinetics Technology International, Corp. **Development Engineer.** Involved in thermal engineering R&D and project work related to low-NOx ceramic radiant burners, fired heater NOx reduction, SCR design, and fired heater retrofitting.

1988-1989 Heat Transfer Research, Inc. **Research Engineer**. Involved in the design of fired heaters, heat exchangers, air coolers, and other non-fired equipment. Also did research in the area of heat exchanger tube vibrations.

EDUCATION

1984-1988 Ph.D., Mechanical Engineering, California Institute of Technology (Caltech), Pasadena, CA.

1984 M. S., Mechanical Engineering, California Institute of Technology (Caltech), Pasadena, CA.

1978-1983 B. Tech (Honors), Mechanical Engineering, Indian Institute of Technology (IIT) Kharagpur, India

TEACHING EXPERIENCE

Caltech

"Thermodynamics," Teaching Assistant, California Institute of Technology, 1983, 1987.

"Air Pollution Control," Teaching Assistant, California Institute of Technology, 1985.

"Caltech Secondary and High School Saturday Program," - taught various mathematics (algebra through calculus) and science (physics and chemistry) courses to high school students, 1983-1989.

"Heat Transfer," - taught this course in the Fall and Winter terms of 1994-1995 in the Division of Engineering and Applied Science.

“Thermodynamics and Heat Transfer,” Fall and Winter Terms of 1996-1997.

U.C. Riverside, Extension

"Toxic and Hazardous Air Contaminants," University of California Extension Program, Riverside, California. Various years since 1992.

"Prevention and Management of Accidental Air Emissions," University of California Extension Program, Riverside, California. Various years since 1992.

"Air Pollution Control Systems and Strategies," University of California Extension Program, Riverside, California, Summer 1992-93, Summer 1993-1994.

"Air Pollution Calculations," University of California Extension Program, Riverside, California, Fall 1993-94, Winter 1993-94, Fall 1994-95.

"Process Safety Management," University of California Extension Program, Riverside, California. Various years since 1992-2010.

"Process Safety Management," University of California Extension Program, Riverside, California, at SCAQMD, Spring 1993-94.

"Advanced Hazard Analysis - A Special Course for LEPCs," University of California Extension Program, Riverside, California, taught at San Diego, California, Spring 1993-1994.

"Advanced Hazardous Waste Management" University of California Extension Program, Riverside, California. 2005.

Loyola Marymount University

"Fundamentals of Air Pollution - Regulations, Controls and Engineering," Loyola Marymount University, Dept. of Civil Engineering. Various years beginning 1993.

"Air Pollution Control," Loyola Marymount University, Dept. of Civil Engineering, Fall 1994.

"Environmental Risk Assessment," Loyola Marymount University, Dept. of Civil Engineering. Various years beginning 1998.

"Hazardous Waste Remediation" Loyola Marymount University, Dept. of Civil Engineering. Various years beginning 2006.

University of Southern California

"Air Pollution Controls," University of Southern California, Dept. of Civil Engineering, Fall 1993, Fall 1994.

"Air Pollution Fundamentals," University of Southern California, Dept. of Civil Engineering, Winter 1994.

University of California, Los Angeles

"Air Pollution Fundamentals," University of California, Los Angeles, Dept. of Civil and Environmental Engineering, Spring 1994, Spring 1999, Spring 2000, Spring 2003, Spring 2006, Spring 2007, Spring 2008, Spring 2009.

International Programs

"Environmental Planning and Management," 5 week program for visiting Chinese delegation, 1994.

"Environmental Planning and Management," 1 day program for visiting Russian delegation, 1995.

"Air Pollution Planning and Management," IEP, UCR, Spring 1996.

"Environmental Issues and Air Pollution," IEP, UCR, October 1996.

PROFESSIONAL AFFILIATIONS AND HONORS

President of India Gold Medal, IIT Kharagpur, India, 1983.

Member of the Alternatives Assessment Committee of the Grand Canyon Visibility Transport Commission, established by the Clean Air Act Amendments of 1990, 1992.

American Society of Mechanical Engineers: Los Angeles Section Executive Committee, Heat Transfer Division, and Fuels and Combustion Technology Division, 1987-mid-1990s.

Air and Waste Management Association, West Coast Section, 1989-mid-2000s.

PROFESSIONAL CERTIFICATIONS

EIT, California (#XE088305), 1993.

REA I, California (#07438), 2000.

Certified Permitting Professional, South Coast AQMD (#C8320), since 1993.

QEP, Institute of Professional Environmental Practice, 2000 - 2021.

CEM, State of Nevada (#EM-1699).

PUBLICATIONS (PARTIAL LIST)

"Physical Properties and Oxidation Rates of Chars from Bituminous Coals," with Y.A. Levendis, R.C. Flagan and G.R. Gavalas, *Fuel*, **67**, 275-283 (1988).

"Char Combustion: Measurement and Analysis of Particle Temperature Histories," with R.C. Flagan, G.R. Gavalas and P.S. Northrop, *Comb. Sci. Tech.* **60**, 215-230 (1988).

"On the Combustion of Bituminous Coal Chars," PhD Thesis, California Institute of Technology (1988).

"Optical Pyrometry: A Powerful Tool for Coal Combustion Diagnostics," *J. Coal Quality*, **8**, 17-22 (1989).

"Post-Ignition Transients in the Combustion of Single Char Particles," with Y.A. Levendis, R.C. Flagan and G.R. Gavalas, *Fuel*, **68**, 849-855 (1989).

"A Model for Single Particle Combustion of Bituminous Coal Char." Proc. ASME National Heat Transfer Conference, Philadelphia, **HTD-Vol. 106**, 505-513 (1989).

"Discrete Simulation of Cenospheric Coal-Char Combustion," with R.C. Flagan and G.R. Gavalas, *Combust. Flame*, **77**, 337-346 (1989).

"Particle Measurements in Coal Combustion," with R.C. Flagan, in "**Combustion Measurements**" (ed. N. Chigier), Hemisphere Publishing Corp. (1991).

"Cross Linking in Pore Structures and Its Effect on Reactivity," with G.R. Gavalas in preparation.

"Natural Frequencies and Mode Shapes of Straight Tubes," Proprietary Report for Heat Transfer Research Institute, Alhambra, CA (1990).

"Optimal Tube Layouts for Kamui SL-Series Exchangers," with K. Ishihara, Proprietary Report for Kamui Company Limited, Tokyo, Japan (1990).

"HTRI Process Heater Conceptual Design," Proprietary Report for Heat Transfer Research Institute, Alhambra, CA (1990).

"Asymptotic Theory of Transonic Wind Tunnel Wall Interference," with N.D. Malmuth and others, Arnold Engineering Development Center, Air Force Systems Command, USAF (1990).

"Gas Radiation in a Fired Heater Convection Section," Proprietary Report for Heat Transfer Research Institute, College Station, TX (1990).

"Heat Transfer and Pressure Drop in NTIW Heat Exchangers," Proprietary Report for Heat Transfer Research Institute, College Station, TX (1991).

"NOx Control and Thermal Design," Thermal Engineering Tech Briefs, (1994).

“From Purchase of Landmark Environmental Insurance to Remediation: Case Study in Henderson, Nevada,” with Robin E. Bain and Jill Quillin, presented at the AQMA Annual Meeting, Florida, 2001.

"The Jones Act Contribution to Global Warming, Acid Rain and Toxic Air Contaminants," with Charles W. Botsford, presented at the AQMA Annual Meeting, Florida, 2001.

PRESENTATIONS (PARTIAL LIST)

"Pore Structure and Combustion Kinetics - Interpretation of Single Particle Temperature-Time Histories," with P.S. Northrop, R.C. Flagan and G.R. Gavalas, presented at the AIChE Annual Meeting, New York (1987).

"Measurement of Temperature-Time Histories of Burning Single Coal Char Particles," with R.C. Flagan, presented at the American Flame Research Committee Fall International Symposium, Pittsburgh, (1988).

"Physical Characterization of a Cenospheric Coal Char Burned at High Temperatures," with R.C. Flagan and G.R. Gavalas, presented at the Fall Meeting of the Western States Section of the Combustion Institute, Laguna Beach, California (1988).

"Control of Nitrogen Oxide Emissions in Gas Fired Heaters - The Retrofit Experience," with G. P. Croce and R. Patel, presented at the International Conference on Environmental Control of Combustion Processes (Jointly sponsored by the American Flame Research Committee and the Japan Flame Research Committee), Honolulu, Hawaii (1991).

"Air Toxics - Past, Present and the Future," presented at the Joint AIChE/AAEE Breakfast Meeting at the AIChE 1991 Annual Meeting, Los Angeles, California, November 17-22 (1991).

"Air Toxics Emissions and Risk Impacts from Automobiles Using Reformulated Gasolines," presented at the Third Annual Current Issues in Air Toxics Conference, Sacramento, California, November 9-10 (1992).

"Air Toxics from Mobile Sources," presented at the Environmental Health Sciences (ESE) Seminar Series, UCLA, Los Angeles, California, November 12, (1992).

"Kilns, Ovens, and Dryers - Present and Future," presented at the Gas Company Air Quality Permit Assistance Seminar, Industry Hills Sheraton, California, November 20, (1992).

"The Design and Implementation of Vehicle Scrapping Programs," presented at the 86th Annual Meeting of the Air and Waste Management Association, Denver, Colorado, June 12, 1993.

"Air Quality Planning and Control in Beijing, China," presented at the 87th Annual Meeting of the Air and Waste Management Association, Cincinnati, Ohio, June 19-24, 1994.

Annex A

Expert Litigation Support

A. Occasions where Dr. Sahu has provided Written or Oral testimony before Congress:

1. In July 2012, provided expert written and oral testimony to the House Subcommittee on Energy and the Environment, Committee on Science, Space, and Technology at a Hearing entitled "Hitting the Ethanol Blend Wall – Examining the Science on E15."

B. Matters for which Dr. Sahu has provided affidavits and expert reports include:

2. Affidavit for Rocky Mountain Steel Mills, Inc. located in Pueblo Colorado – dealing with the technical uncertainties associated with night-time opacity measurements in general and at this steel mini-mill.

3. Expert reports and depositions (2/28/2002 and 3/1/2002; 12/2/2003 and 12/3/2003; 5/24/2004) on behalf of the United States in connection with the Ohio Edison NSR Cases. *United States, et al. v. Ohio Edison Co., et al.,* C2-99-1181 (Southern District of Ohio).

4. Expert reports and depositions (5/23/2002 and 5/24/2002) on behalf of the United States in connection with the Illinois Power NSR Case. *United States v. Illinois Power Co., et al.*, 99-833-MJR (Southern District of Illinois).

5. Expert reports and depositions (11/25/2002 and 11/26/2002) on behalf of the United States in connection with the Duke Power NSR Case. *United States, et al. v. Duke Energy Corp.*, 1:00-CV-1262 (Middle District of North Carolina).

6. Expert reports and depositions (10/6/2004 and 10/7/2004; 7/10/2006) on behalf of the United States in connection with the American Electric Power NSR Cases. *United States, et al. v. American Electric Power Service Corp., et al.*, C2-99-1182, C2-99-1250 (Southern District of Ohio).

7. Affidavit (March 2005) on behalf of the Minnesota Center for Environmental Advocacy and others in the matter of the Application of Heron Lake BioEnergy LLC to construct and operate an ethanol production facility – submitted to the Minnesota Pollution Control Agency.

8. Expert Report and Deposition (10/31/2005 and 11/1/2005) on behalf of the United States in connection with the East Kentucky Power Cooperative NSR Case. *United States v. East Kentucky Power Cooperative, Inc*., 5:04-cv-00034-KSF (Eastern District of Kentucky).

9. Affidavits and deposition on behalf of Basic Management Inc. (BMI) Companies in connection with the BMI vs. USA remediation cost recovery Case.

10. Expert Report on behalf of Penn Future and others in the Cambria Coke plant permit challenge in Pennsylvania.

11. Expert Report on behalf of the Appalachian Center for the Economy and the Environment and others in the Western Greenbrier permit challenge in West Virginia.

12. Expert Report, deposition (via telephone on January 26, 2007) on behalf of various Montana petitioners (Citizens Awareness Network (CAN), Women's Voices for the Earth (WVE) and the Clark Fork Coalition (CFC)) in the Thompson River Cogeneration LLC Permit No. 3175-04 challenge.

13. Expert Report and deposition (2/2/07) on behalf of the Texas Clean Air Cities Coalition at the Texas State Office of Administrative Hearings (SOAH) in the matter of the permit challenges to TXU Project Apollo's eight new proposed PRB-fired PC boilers located at seven TX sites.

14. Expert Testimony (July 2007) on behalf of the Izaak Walton League of America and others in connection with the acquisition of power by Xcel Energy from the proposed Gascoyne Power Plant – at the State of Minnesota, Office of Administrative Hearings for the Minnesota PUC (MPUC No. E002/CN-06-1518; OAH No. 12-2500-17857-2).

15. Affidavit (July 2007) Comments on the Big Cajun I Draft Permit on behalf of the Sierra Club – submitted to the Louisiana DEQ.

16. Expert Report and Deposition (12/13/2007) on behalf of Commonwealth of Pennsylvania – Dept. of Environmental Protection, State of Connecticut, State of New York, and State of New Jersey (Plaintiffs) in connection with the Allegheny Energy NSR Case. *Plaintiffs v. Allegheny Energy Inc., et al.,* 2:05cv0885 (Western District of Pennsylvania).

17. Expert Reports and Pre-filed Testimony before the Utah Air Quality Board on behalf of Sierra Club in the Sevier Power Plant permit challenge.

18. Expert Report and Deposition (October 2007) on behalf of MTD Products Inc., in connection with *General Power Products, LLC v MTD Products Inc*., 1:06 CVA 0143 (Southern District of Ohio, Western Division) .

19. Expert Report and Deposition (June 2008) on behalf of Sierra Club and others in the matter of permit challenges (Title V: 28.0801-29 and PSD: 28.0803-PSD) for the Big Stone II unit, proposed to be located near Milbank, South Dakota.

20. Expert Reports, Affidavit, and Deposition (August 15, 2008) on behalf of Earthjustice in the matter of air permit challenge (CT-4631) for the Basin Electric Dry Fork station, under construction near Gillette, Wyoming before the Environmental Quality Council of the State of Wyoming.

21. Affidavits (May 2010/June 2010 in the Office of Administrative Hearings))/Declaration and Expert Report (November 2009 in the Office of Administrative Hearings) on behalf of NRDC and the Southern Environmental Law Center in the matter of the air permit challenge for Duke Cliffside Unit 6. Office of Administrative Hearing Matters 08 EHR 0771, 0835 and 0836 and 09 HER 3102, 3174, and 3176 (consolidated).

22. Declaration (August 2008), Expert Report (January 2009), and Declaration (May 2009) on behalf of Southern Alliance for Clean Energy in the matter of the air permit challenge for Duke Cliffside Unit 6. *Southern Alliance for Clean Energy et al., v. Duke Energy Carolinas, LLC*, Case No. 1:08-cv-00318-LHT-DLH (Western District of North Carolina, Asheville Division).

23. Declaration (August 2008) on behalf of the Sierra Club in the matter of Dominion Wise County plant MACT.us

24. Expert Report (June 2008) on behalf of Sierra Club for the Green Energy Resource Recovery Project, MACT Analysis.

25. Expert Report (February 2009) on behalf of Sierra Club and the Environmental Integrity Project in the matter of the air permit challenge for NRG Limestone's proposed Unit 3 in Texas.

26. Expert Report (June 2009) on behalf of MTD Products, Inc., in the matter of *Alice Holmes and Vernon Holmes v. Home Depot USA, Inc., et al.*

27. Expert Report (August 2009) on behalf of Sierra Club and the Southern Environmental Law Center in the matter of the air permit challenge for Santee Cooper's proposed Pee Dee plant in South Carolina).

28. Statements (May 2008 and September 2009) on behalf of the Minnesota Center for Environmental Advocacy to the Minnesota Pollution Control Agency in the matter of the Minnesota Haze State Implementation Plans.

29. Expert Report (August 2009) on behalf of Environmental Defense, in the matter of permit challenges to the proposed Las Brisas coal fired power plant project at the Texas State Office of Administrative Hearings (SOAH).

30. Expert Report and Rebuttal Report (September 2009) on behalf of the Sierra Club, in the matter of challenges to the proposed Medicine Bow Fuel and Power IGL plant in Cheyenne, Wyoming.

31. Expert Report (December 2009) and Rebuttal reports (May 2010 and June 2010) on behalf of the United States in connection with the Alabama Power Company NSR Case. *United States v. Alabama Power Company*, CV-01-HS-152-S (Northern District of Alabama, Southern Division).

32. Pre-filed Testimony (October 2009) on behalf of Environmental Defense and others, in the matter of challenges to the proposed White Stallion Energy Center coal fired power plant project at the Texas State Office of Administrative Hearings (SOAH).

33. Pre-filed Testimony (July 2010) and Written Rebuttal Testimony (August 2010) on behalf of the State of New Mexico Environment Department in the matter of Proposed Regulation 20.2.350 NMAC – *Greenhouse Gas Cap and Trade Provisions*, No. EIB 10-04 (R), to the State of New Mexico, Environmental Improvement Board.

34. Expert Report (August 2010) and Rebuttal Expert Report (October 2010) on behalf of the United States in connection with the Louisiana Generating NSR Case. *United States v. Louisiana Generating, LLC*, 09-CV100-RET-CN (Middle District of Louisiana) – Liability Phase.

35. Declaration (August 2010), Reply Declaration (November 2010), Expert Report (April 2011), Supplemental and Rebuttal Expert Report (July 2011) on behalf of the United States in the matter of DTE Energy Company and Detroit Edison Company (Monroe Unit 2). *United States of America v. DTE Energy Company and Detroit Edison Company*, Civil Action No. 2:10-cv-13101-BAF-RSW (Eastern District of Michigan).

36. Expert Report and Deposition (August 2010) as well as Affidavit (September 2010) on behalf of Kentucky Waterways Alliance, Sierra Club, and Valley Watch in the matter of challenges to the NPDES permit issued for the Trimble County power plant by the Kentucky Energy and Environment Cabinet to Louisville Gas and Electric, File No. DOW-41106-047.

37. Expert Report (August 2010), Rebuttal Expert Report (September 2010), Supplemental Expert Report (September 2011), and Declaration (November 2011) on behalf of Wild Earth Guardians in the matter of opacity exceedances and monitor downtime at the Public Service Company of Colorado (Xcel)'s Cherokee power plant. No. 09-cv-1862 (District of Colorado).

38. Written Direct Expert Testimony (August 2010) and Affidavit (February 2012) on behalf of Fall-Line Alliance for a Clean Environment and others in the matter of the PSD Air Permit for Plant Washington issued by Georgia DNR at the Office of State Administrative Hearing, State of Georgia (OSAH-BNR-AQ-1031707-98-WALKER).

39. Deposition (August 2010) on behalf of Environmental Defense, in the matter of the remanded permit challenge to the proposed Las Brisas coal fired power plant project at the Texas State Office of Administrative Hearings (SOAH).

40. Expert Report, Supplemental/Rebuttal Expert Report, and Declarations (October 2010, November 2010, September 2012) on behalf of New Mexico Environment Department (Plaintiff-Intervenor), Grand Canyon Trust and Sierra Club (Plaintiffs) in the matter of *Plaintiffs v. Public Service Company of New Mexico* (PNM), Civil No. 1:02-CV-0552 BB/ATC (ACE) (District of New Mexico).

41. Expert Report (October 2010) and Rebuttal Expert Report (November 2010) (BART Determinations for PSCo Hayden and CSU Martin Drake units) to the Colorado Air Quality Commission on behalf of Coalition of Environmental Organizations.

42. Expert Report (November 2010) (BART Determinations for TriState Craig Units, CSU Nixon Unit, and PRPA Rawhide Unit) to the Colorado Air Quality Commission on behalf of Coalition of Environmental Organizations.

43. Declaration (November 2010) on behalf of the Sierra Club in connection with the Martin Lake Station Units 1, 2, and 3. *Sierra Club v. Energy Future Holdings Corporation and Luminant*

Generation Company LLC, Case No. 5:10-cv-00156-DF-CMC (Eastern District of Texas, Texarkana Division).

44. Pre-Filed Testimony (January 2011) and Declaration (February 2011) to the Georgia Office of State Administrative Hearings (OSAH) in the matter of Minor Source HAPs status for the proposed Longleaf Energy Associates power plant (OSAH-BNR-AQ-1115157-60-HOWELLS) on behalf of the Friends of the Chattahoochee and the Sierra Club).

45. Declaration (February 2011) in the matter of the Draft Title V Permit for RRI Energy MidAtlantic Power Holdings LLC Shawville Generating Station (Pennsylvania), ID No. 17-00001 on behalf of the Sierra Club.

46. Expert Report (March 2011), Rebuttal Expert Report (June 2011) on behalf of the United States in *United States of America v. Cemex, Inc.*, Civil Action No. 09-cv-00019-MSK-MEH (District of Colorado).

47. Declaration (April 2011) and Expert Report (July 16, 2012) in the matter of the Lower Colorado River Authority (LCRA)'s Fayette (Sam Seymour) Power Plant on behalf of the Texas Campaign for the Environment. *Texas Campaign for the Environment v. Lower Colorado River Authority*, Civil Action No. 4:11-cv-00791 (Southern District of Texas, Houston Division).

48. Declaration (June 2011) on behalf of the Plaintiffs MYTAPN in the matter of Microsoft-Yes, Toxic Air Pollution-No (MYTAPN) v. State of Washington, Department of Ecology and Microsoft Corporation Columbia Data Center to the Pollution Control Hearings Board, State of Washington, Matter No. PCHB No. 10-162.

49. Expert Report (June 2011) on behalf of the New Hampshire Sierra Club at the State of New Hampshire Public Utilities Commission, Docket No. 10-261 – the 2010 Least Cost Integrated Resource Plan (LCIRP) submitted by the Public Service Company of New Hampshire (re. Merrimack Station Units 1 and 2).

50. Declaration (August 2011) in the matter of the Sandy Creek Energy Associates L.P. Sandy Creek Power Plant on behalf of Sierra Club and Public Citizen. *Sierra Club, Inc. and Public Citizen, Inc. v. Sandy Creek Energy Associates, L.P.*, Civil Action No. A-08-CA-648-LY (Western District of Texas, Austin Division).

51. Expert Report (October 2011) on behalf of the Defendants in the matter of *John Quiles and Jeanette Quiles et al. v. Bradford-White Corporation, MTD Products, Inc., Kohler Co., et al.*, Case No. 3:10-cv-747 (TJM/DEP) (Northern District of New York).

52. Declaration (October 2011) on behalf of the Plaintiffs in the matter of *American Nurses Association et. al. (Plaintiffs), v. US EPA (Defendant)*, Case No. 1:08-cv-02198-RMC (US District Court for the District of Columbia).

53. Declaration (February 2012) and Second Declaration (February 2012) in the matter of *Washington Environmental Council and Sierra Club Washington State Chapter v. Washington State Department of Ecology and Western States Petroleum Association*, Case No. 11-417-MJP (Western District of Washington).

54. Expert Report (March 2012) and Supplemental Expert Report (November 2013) in the matter of *Environment Texas Citizen Lobby, Inc and Sierra Club v. ExxonMobil Corporation et al.*, Civil Action No. 4:10-cv-4969 (Southern District of Texas, Houston Division).

55. Declaration (March 2012) in the matter of *Center for Biological Diversity, et al. v. United States Environmental Protection Agency*, Case No. 11-1101 (consolidated with 11-1285, 11-1328 and 11-1336) (US Court of Appeals for the District of Columbia Circuit).

56. Declaration (March 2012) in the matter of *Sierra Club v. The Kansas Department of Health and Environment*, Case No. 11-105,493-AS (Holcomb power plant) (Supreme Court of the State of Kansas).

57. Declaration (March 2012) in the matter of the Las Brisas Energy Center *Environmental Defense Fund et al., v. Texas Commission on Environmental Quality,* Cause No. D-1-GN-11-001364 (District Court of Travis County, Texas, 261st Judicial District).

58. Expert Report (April 2012), Supplemental and Rebuttal Expert Report (July 2012), and Supplemental Rebuttal Expert Report (August 2012) on behalf of the states of New Jersey and Connecticut in the matter of the Portland Power plant *State of New Jersey and State of Connecticut (Intervenor-Plaintiff) v. RRI Energy Mid-Atlantic Power Holdings et al.*, Civil Action No. 07-CV-5298 (JKG) (Eastern District of Pennsylvania).

59. Declaration (April 2012) in the matter of the EPA's EGU MATS Rule, on behalf of the Environmental Integrity Project.

60. Expert Report (August 2012) on behalf of the United States in connection with the Louisiana Generating NSR Case. *United States v. Louisiana Generating, LLC*, 09-CV100-RET-CN (Middle District of Louisiana) – Harm Phase.

61. Declaration (September 2012) in the Matter of the Application of *Energy Answers Incinerator, Inc.* for a Certificate of Public Convenience and Necessity to Construct a 120 MW Generating Facility in Baltimore City, Maryland, before the Public Service Commission of Maryland, Case No. 9199.

62. Expert Report (October 2012) on behalf of the Appellants (Robert Concilus and Leah Humes) in the matter of Robert Concilus and Leah Humes v. Commonwealth of Pennsylvania Department of Environmental Protection and Crawford Renewable Energy, before the Commonwealth of Pennsylvania Environmental Hearing Board, Docket No. 2011-167-R.

63. Expert Report (October 2012), Supplemental Expert Report (January 2013), and Affidavit (June 2013) in the matter of various Environmental Petitioners v. North Carolina DENR/DAQ and Carolinas Cement Company, before the Office of Administrative Hearings, State of North Carolina.

64. Pre-filed Testimony (October 2012) on behalf of No-Sag in the matter of the North Springfield Sustainable Energy Project before the State of Vermont, Public Service Board.

65. Pre-filed Testimony (November 2012) on behalf of Clean Wisconsin in the matter of Application of Wisconsin Public Service Corporation for Authority to Construct and Place in Operation a New Multi-Pollutant Control Technology System (ReACT) for Unit 3 of the Weston Generating Station, before the Public Service Commission of Wisconsin, Docket No. 6690-CE-197.

66. Expert Report (February 2013) on behalf of Petitioners in the matter of Credence Crematory, Cause No. 12-A-J-4538 before the Indiana Office of Environmental Adjudication.

67. Expert Report (April 2013), Rebuttal report (July 2013), and Declarations (October 2013, November 2013) on behalf of the Sierra Club in connection with the Luminant Big Brown Case. *Sierra Club v. Energy Future Holdings Corporation and Luminant Generation Company LLC*, Civil Action No. 6:12-cv-00108-WSS (Western District of Texas, Waco Division).

68. Declaration (April 2013) on behalf of Petitioners in the matter of *Sierra Club, et al., (Petitioners) v Environmental Protection Agency et al. (Resppondents),* Case No., 13-1112, (Court of Appeals, District of Columbia Circuit).

69. Expert Report (May 2013) and Rebuttal Expert Report (July 2013) on behalf of the Sierra Club in connection with the Luminant Martin Lake Case. *Sierra Club v. Energy Future Holdings Corporation and Luminant Generation Company LLC*, Civil Action No. 5:10-cv-0156-MHS-CMC (Eastern District of Texas, Texarkana Division).

70. Declaration (August 2013) on behalf of A. J. Acosta Company, Inc., in the matter of *A. J. Acosta Company, Inc., v. County of San Bernardino*, Case No. CIVSS803651.

71. Comments (October 2013) on behalf of the Washington Environmental Council and the Sierra Club in the matter of the Washington State Oil Refinery RACT (for Greenhouse Gases), submitted to the Washington State Department of Ecology, the Northwest Clean Air Agency, and the Puget Sound Clean Air Agency.

72. Statement (November 2013) on behalf of various Environmental Organizations in the matter of the Boswell Energy Center (BEC) Unit 4 Environmental Retrofit Project, to the Minnesota Public Utilities Commission, Docket No. E-015/M-12-920.

73. Expert Report (December 2013) on behalf of the United States in *United States of America v. Ameren Missouri*, Civil Action No. 4:11-cv-00077-RWS (Eastern District of Missouri, Eastern Division).

74. Expert Testimony (December 2013) on behalf of the Sierra Club in the matter of Public Service Company of New Hampshire Merrimack Station Scrubber Project and Cost Recovery, Docket No. DE 11-250, to the State of New Hampshire Public Utilities Commission.

75. Expert Report (January 2014) on behalf of Baja, Inc., in *Baja, Inc., v. Automotive Testing and Development Services, Inc. et. al*, Civil Action No. 8:13-CV-02057-GRA (District of South Carolina, Anderson/Greenwood Division).

76. Declaration (March 2014) on behalf of the Center for International Environmental Law, Chesapeake Climate Action Network, Friends of the Earth, Pacific Environment, and the Sierra Club (Plaintiffs) in the matter of *Plaintiffs v. the Export-Import Bank (Ex-Im Bank) of the United States*, Civil Action No. 13-1820 RC (District Court for the District of Columbia).

77. Declaration (April 2014) on behalf of Respondent-Intervenors in the matter of *Mexichem Specialty Resins Inc., et al., (Petitioners) v Environmental Protection Agency et al.,* Case No., 12-1260 (and Consolidated Case Nos. 12-1263, 12-1265, 12-1266, and 12-1267), (Court of Appeals, District of Columbia Circuit).

78. Direct Prefiled Testimony (June 2014) on behalf of the Michigan Environmental Council and the Sierra Club in the matter of the Application of DTE Electric Company for Authority to Implement a Power Supply Cost Recovery (PSCR) Plan in its Rate Schedules for 2014 Metered Jurisdictional Sales of Electricity, Case No. U-17319 (Michigan Public Service Commission).

79. Expert Report (June 2014) on behalf of ECM Biofilms in the matter of the US Federal Trade Commission (FTC) v. ECM Biofilms (FTC Docket #9358).

80. Direct Prefiled Testimony (August 2014) on behalf of the Michigan Environmental Council and the Sierra Club in the matter of the Application of Consumers Energy Company for Authority to Implement a Power Supply Cost Recovery (PSCR) Plan in its Rate Schedules for 2014 Metered Jurisdictional Sales of Electricity, Case No. U-17317 (Michigan Public Service Commission).

81. Declaration (July 2014) on behalf of Public Health Intervenors in the matter of *EME Homer City Generation v. US EPA* (Case No. 11-1302 and consolidated cases) relating to the lifting of the stay entered by the Court on December 30, 2011 (US Court of Appeals for the District of Columbia).

82. Expert Report (September 2014), Rebuttal Expert Report (December 2014) and Supplemental Expert Report (March 2015) on behalf of Plaintiffs in the matter of *Sierra Club and Montana Environmental Information Center (Plaintiffs) v. PPL Montana LLC, Avista Corporation, Puget Sound Energy, Portland General Electric Company, Northwestern Corporation, and Pacificorp (Defendants)*, Civil Action No. CV 13-32-BLG-DLC-JCL (US District Court for the District of Montana, Billings Division).

83. Expert Report (November 2014) on behalf of Niagara County, the Town of Lewiston, and the Villages of Lewiston and Youngstown in the matter of CWM Chemical Services, LLC New York State Department of Environmental Conservation (NYSDEC) Permit Application Nos.: 9-2934-00022/00225, 9-2934-00022/00231, 9-2934-00022/00232, and 9-2934-00022/00249 (pending).

84. *Declaration (January 2015) relating to Startup/Shutdown in the MATS Rule (EPA Docket ID No. EPA-HQ-OAR-2009-0234) on behalf of the Environmental Integrity Project.*

85. Pre-filed Direct Testimony (March 2015), Supplemental Testimony (May 2015), and Surrebuttal Testimony (December 2015) on behalf of Friends of the Columbia Gorge in the matter of the Application for a Site Certificate for the Troutdale Energy Center before the Oregon Energy Facility Siting Council.

86. Brief of Amici Curiae Experts in Air Pollution Control and Air Quality Regulation in Support of the Respondents, On Writs of Certiorari to the US Court of Appeals for the District of Columbia, No. 14-46, 47, 48. *Michigan et. al., (Petitioners) v. EPA et. al., Utility Air Regulatory Group (Petitioners) v. EPA et. al., National Mining Association et. al., (Petitioner) v. EPA et. al.,* (Supreme Court of the United States).

87. Expert Report (March 2015) and Rebuttal Expert Report (January 2016) on behalf of Plaintiffs in the matter of *Conservation Law Foundation v. Broadrock Gas Services LLC, Rhode Island LFG GENCO LLC, and Rhode Island Resource Recovery Corporation (Defendants)*, Civil Action No. 1:13-cv-00777-M-PAS (US District Court for the District of Rhode Island).

88. Declaration (April 2015) relating to various Technical Corrections for the MATS Rule (EPA Docket ID No. EPA-HQ-OAR-2009-0234) on behalf of the Environmental Integrity Project.

89. Direct Prefiled Testimony (May 2015) on behalf of the Michigan Environmental Council, the Natural Resources Defense Council, and the Sierra Club in the matter of the Application of DTE Electric Company for Authority to Increase its Rates, Amend its Rate Schedules and Rules Governing the Distribution and Supply of Electric Energy and for Miscellaneous Accounting Authority, Case No. U-17767 (Michigan Public Service Commission).

90. Expert Report (July 2015) and Rebuttal Expert Report (July 2015) on behalf of Plaintiffs in the matter of *Northwest Environmental Defense Center et. al., v. Cascade Kelly Holdings LLC, d/b/a Columbia Pacific Bio-Refinery, and Global Partners LP (Defendants)*, Civil Action No. 3:14-cv-01059-SI (US District Court for the District of Oregon, Portland Division).

91. Declaration (August 2015, Docket No. 1570376) in support of "Opposition of Respondent-Intervenors American Lung Association, et. al., to Tri-State Generation's Emergency Motion;" Declaration (September 2015, Docket No. 1574820) in support of "Joint Motion of the State, Local Government, and Public Health Respondent-Intervenors for Remand Without Vacatur;" Declaration (October 2015) in support of "Joint Motion of the State, Local Government, and Public Health Respondent-Intervenors to State and Certain Industry Petitioners' Motion to Govern, *White Stallion Energy Center, LLC v. US EPA*, Case No. 12-1100 (US Court of Appeals for the District of Columbia).

92. Declaration (September 2015) in support of the Draft Title V Permit for Dickerson Generating Station (Proposed Permit No 24-031-0019) on behalf of the Environmental Integrity Project.

93. Expert Report (Liability Phase) (December 2015) and Rebuttal Expert Report (February 2016) on behalf of Plaintiffs in the matter of *Natural Resources Defense Council, Inc., Sierra Club, Inc., Environmental Law and Policy Center, and Respiratory Health Association v. Illinois Power Resources LLC, and Illinois Power Resources Generating LLC (Defendants)*, Civil Action No. 1:13-cv-01181 (US District Court for the Central District of Illinois, Peoria Division).

94. Declaration (December 2015) in support of the Petition to Object to the Title V Permit for Morgantown Generating Station (Proposed Permit No 24-017-0014) on behalf of the Environmental Integrity Project.

95. Expert Report (November 2015) on behalf of Appellants in the matter of *Sierra Club, et al. v. Craig W. Butler, Director of Ohio Environmental Protection Agency et al.*, ERAC Case No. 14-256814.

96. Affidavit (January 2016) on behalf of Bridgewatch Detroit in the matter of *Bridgewatch Detroit v. Waterfront Petroleum Terminal Co., and Waterfront Terminal Holdings, LLC.*, in the Circuit Court for the County of Wayne, State of Michigan.

97. Expert Report (February 2016) and Rebuttal Expert Report (July 2016) on behalf of the challengers in the matter of the Delaware Riverkeeper Network, Clean Air Council, et. al., vs. Commonwealth of Pennsylvania Department of Environmental Protection and R. E. Gas Development LLC regarding the Geyer well site before the Pennsylvania Environmental Hearing Board.

98. Direct Testimony (May 2016) in the matter of Tesoro Savage LLC Vancouver Energy Distribution Terminal, Case No. 15-001 before the State of Washington Energy Facility Site Evaluation Council.

99. Declaration (June 2016) relating to deficiencies in air quality analysis for the proposed Millenium Bulk Terminal, Port of Longview, Washington.

100. Declaration (December 2016) relating to EPA's refusal to set limits on PM emissions from coal-fired power plants that reflect pollution reductions achievable with fabric filters on behalf of Environmental Integrity Project, Clean Air Council, Chesapeake Climate Action Network, Downwinders at Risk represented by Earthjustice in the matter of *ARIPPA v EPA, Case No. 15-1180.* (D.C. Circuit Court of Appeals).

101. Expert Report (January 2017) on the Environmental Impacts Analysis associated with the Huntley and Huntley Poseidon Well Pad on behalf citizens in the matter of the special exception use Zoning Hearing Board of Penn Township, Westmoreland County, Pennsylvania.

102. Expert Report (January 2017) on the Environmental Impacts Analysis associated with the Apex Energy Backus Well Pad on behalf citizens in the matter of the special exception use Zoning Hearing Board of Penn Township, Westmoreland County, Pennsylvania.

103. Expert Report (January 2017) on the Environmental Impacts Analysis associated with the Apex Energy Drakulic Well Pad on behalf citizens in the matter of the special exception use Zoning Hearing Board of Penn Township, Westmoreland County, Pennsylvania.

104. Expert Report (January 2017) on the Environmental Impacts Analysis associated with the Apex Energy Deutsch Well Pad on behalf citizens in the matter of the special exception use Zoning Hearing Board of Penn Township, Westmoreland County, Pennsylvania.

105. Affidavit (February 2017) pertaining to deficiencies water discharge compliance issues at the Wood River Refinery in the matter of *People of the State of Illinois (Plaintiff) v. Phillips 66 Company, ConocoPhillips Company, WRB Refining LP (Defendants)*, Case No. 16-CH-656, (Circuit Court for the Third Judicial Circuit, Madison County, Illinois).

106. Expert Report (March 2017) on behalf of the Plaintiff pertaining to non-degradation analysis for waste water discharges from a power plant in the matter of *Sierra Club (Plaintiff) v. Pennsylvania Department of Environmental Protection (PADEP) and Lackawanna Energy Center*, Docket No. 2016-047-L (consolidated), (Pennsylvania Environmental Hearing Board).

107. Expert Report (March 2017) on behalf of the Plaintiff pertaining to air emissions from the Heritage incinerator in East Liverpool, Ohio in the matter of *Save our County (Plaintiff) v. Heritage Thermal Services, Inc. (Defendant), Case No. 4:16-CV-1544-BYP*, (US District Court for the Northern District of Ohio, Eastern Division).

108. Rebuttal Expert Report (June 2017) on behalf of Plaintiffs in the matter of *Casey Voight and Julie Voight (Plaintiffs) v Coyote Creek Mining Company LLC (Defendant),* Civil Action No. 1:15-CV-00109 (US District Court for the District of North Dakota, Western Division).

109. Expert Affidavit (August 2017) and Penalty/Remedy Expert Affidavit (October 2017) on behalf of Plaintiff in the matter of *Wildearth Guardians (Plaintiff) v Colorado Springs Utility Board (Defendant,)* Civil Action No. 1:15-cv-00357-CMA-CBS (US District Court for the District of Colorado).

110. Expert Report (August 2017) on behalf of Appellant in the matter of *Patricia Ann Troiano (Appellant) v. Upper Burrell Township Zoning Hearing Board (Appellee)*, Court of Common Pleas of Westmoreland County, Pennsylvania, Civil Division.

111. Expert Report (October 2017), Supplemental Expert Report (October 2017), and Rebuttal Expert Report (November 2017) on behalf of Defendant in the matter of *Oakland Bulk and Oversized Terminal (Plaintiff) v City of Oakland (Defendant,)* Civil Action No. 3:16-cv-07014-VC (US District Court for the Northern District of California, San Francisco Division).

112. Declaration (December 2017) on behalf of the Environmental Integrity Project in the matter of permit issuance for ATI Flat Rolled Products Holdings, Breckenridge, PA to the Allegheny County Health Department.

113. Expert Report (Harm Phase) (January 2018), Rebuttal Expert Report (Harm Phase) (May 2018) and Supplemental Expert Report (Harm Phase) (April 2019) on behalf of Plaintiffs in the matter of *Natural Resources Defense Council, Inc., Sierra Club, Inc., and Respiratory Health Association v. Illinois Power Resources LLC, and Illinois Power Resources Generating LLC (Defendants)*, Civil Action No. 1:13-cv-01181 (US District Court for the Central District of Illinois, Peoria Division).

114. Declaration (February 2018) on behalf of the Chesapeake Bay Foundation, et. al., in the matter of the Section 126 Petition filed by the state of Maryland in *State of Maryland v. Pruitt (Defendant)*, Civil Action No. JKB-17-2939 (Consolidated with No. JKB-17-2873) (US District Court for the District of Maryland).

115. Direct Pre-filed Testimony (March 2018) on behalf of the National Parks Conservation Association (NPCA) in the matter of *NPCA v State of Washington, Department of Ecology and BP West Coast Products, LLC*, PCHB No. 17-055 (Pollution Control Hearings Board for the State of Washington.

116. Expert Affidavit (April 2018) and Second Expert Affidavit (May 2018) on behalf of Petitioners in the matter of *Coosa River Basin Initiative and Sierra Club (Petitioners) v State of Georgia Environmental Protection Division, Georgia Department of Natural Resources (Respondent) and Georgia Power Company (Intervenor/Respondent)*, Docket Nos: 1825406-BNR-WW-57-Howells and 1826761-BNR-WW-57-Howells, Office of State Administrative Hearings, State of Georgia.

117. Direct Pre-filed Testimony and Affidavit (December 2018) on behalf of Sierra Club and Texas Campaign for the Environment (Appellants) in the contested case hearing before the Texas State Office of Administrative Hearings in Docket Nos. 582-18-4846, 582-18-4847 (Application of GCGV Asset Holding, LLC for Air Quality Permit Nos. 146425/PSDTX1518 and 146459/PSDTX1520 in San Patricio County, Texas).

118. Expert Report (February 2019) on behalf of Sierra Club in the State of Florida, Division of Administrative Hearings, Case No. 18-2124EPP, Tampa Electric Company Big Bend Unit 1 Modernization Project Power Plant Siting Application No. PA79-12-A2.

119. Declaration (March 2019) on behalf of Earthjustice in the matter of comments on the renewal of the Title V Federal Operating Permit for Valero Houston refinery.

120. Expert Report (March 2019) on behalf of Plaintiffs for Class Certification in the matter of *Resendez et al v Precision Castparts Corporation* in the Circuit Court for the State of Oregon, County of Multnomah, Case No. 16cv16164.

121. Expert Report (June 2019), Affidavit (July 2019) and Rebuttal Expert Report (September 2019) on behalf of Appellants relating to the NPDES permit for the Cheswick power plant in the matter of *Three Rivers Waterkeeper and Sierra Club (Appellants) v. State of Pennsylvania Department of Environmental Protection (Appellee) and NRG Power Midwest (Permittee)*, before the Commonwealth of Pennsylvania Environmental Hearing Board, EHB Docket No. 2018-088-R.

122. Affidavit/Expert Report (August 2019) relating to the appeal of air permits issued to PTTGCA on behalf of Appellants in the matter of *Sierra Club (Appellants) v. Craig Butler, Director, et. al., Ohio EPA (Appellees)* before the State of Ohio Environmental Review Appeals Commission (ERAC), Case Nos. ERAC-19-6988 through -6991.

123. Expert Report (October 2019) relating to the appeal of air permit (Plan Approval) on behalf of Appellants in the matter of *Clean Air Council and Environmental Integrity Project (Appellants) v. Commonwealth of Pennsylvania Department of Environmental Protection and Sunoco Partners Marketing and Terminals L.P.*, before the Commonwealth of Pennsylvania Environmental Hearing Board, EHB Docket No. 2018-057-L.

124. Expert Report (December 2019), Affidavit (March 2020), Supplemental Expert Report (July 2020), and Declaration (February 2021) on behalf of Earthjustice in the matter of *Objection to the*

Issuance of PSD/NSR and Title V permits for Riverview Energy Corporation, Dale, Indiana, before the Indiana Office of Environmental Adjudication, Cause No. 19-A-J-5073.

125. Affidavit (December 2019) on behalf of Plaintiff-Intervenor (Surfrider Foundation) in the matter of *United States and the State of Indiana (Plaintiffs), Surfrider Foundation (Plaintiff-Intervenor), and City of Chicago (Plaintiff-Intervenor) v. United States Steel Corporation (Defendant),* Civil Action No. 2:18-cv-00127 (US District Court for the Northern District of Indiana, Hammond Division).

126. Declarations (January 2020, February 2020, May 2020, July 2020, and August 2020) and Pre-filed Testimony (April 2021) in support of Petitioner's Motion for Stay of PSCAA NOC Order of Approval No. 11386 in the matter of the *Puyallup Tribe of Indians v. Puget Sound Clean Air Agency (PSCAA) and Puget Sound Energy (PSE),* before the State of Washington Pollution Control Hearings Board, PCHB No. P19-088.

127. Expert Report (April 2020) on behalf of the plaintiff in the matter of Orion Engineered Carbons, GmbH (Plaintiff) vs. Evonik Operations, GmbH (formerly Evonik Degussa GmbH) (Respondent), before the German Arbitration Institute, Case No. DIS-SV-2019-00216.

128. Expert Independent Evaluation Report (June 2020) for *PacifiCorp's Decommissioning Costs Study Reports dated January 15, 2020 and March 13, 2020 relating to the closures of the Hunter, Huntington, Dave Johnston, Jim Bridger, Naughton, Wyodak, Hayden, and Colstrip (Units 3&4) plants*, prepared for the Oregon Public Utility Commission (Oregon PUC).

129. Direct Pre-filed Testimony (July 2020) on behalf of the Sierra Club in the matter of *the Application of the Ohio State University for a certificate of Environmental Compatibility and Public Need to Construct a Combined Heat and Power Facility in Franklin County, Ohio*, before the Ohio Power Siting Board, Case No. 19-1641-EL-BGN.

130. Expert Report (August 2020) and Rebuttal Expert Report (September 2020) on behalf of WildEarth Guardians (petitioners) in the matter of *the Appeals of the Air Quality Permit No. 7482-M1 Issued to 3 Bear Delaware Operating – NM LLC (EIB No. 20-21(A) and Registrations Nos. 8729, 8730, and 8733 under General Construction Permit for Oil and Gas Facilities (EIB No. 20-33 (A)*, before the State of New Mexico, Environmental Improvement Board.

131. Expert Report (July 2020) on the *Initial Economic Impact Analysis (EIA) for A Proposal To* Regulate *NOx Emissions from Natural Gas Fired Rich-Burn Natural Gas Reciprocating Internal Combustion Engines (RICE) Greater Than 100 Horsepower* prepared on behalf of Earthjustice and the National Parks Conservation Association in the matter of Regulation Number 7, Alternate Rules before the Colorado Air Quality Control Commission.

132. Expert Report (August 2020) and Supplemental Expert Report (February 2021) on the Potential Remedies to Avoid Adverse Thermal Impacts from the Merrimack Station on behalf of Plaintiffs in the matter of *Sierra Club Inc. and the* Conservation *Law Foundation (Plaintiffs) v. Granite Shore Power, LLC et. al., (Defendants)*, Civil Action No. 19-cv-216-JL (US District Court for the District of New Hampshire.)

133. Expert Report (August 2020) and Supplemental Expert Report (December 2020) on behalf of Plaintiffs in the matter of *PennEnvironment Inc., and Clean Air Council (Plaintiffs) and Allegheny County Health Department (Plaintiff-Intervenor) v. United States Steel Corporation (Defendant)*, Civil Action No. 2-19-cv-00484-MJH (US District Court for the Western District of Pennsylvania.)

134. Pre-filed Direct Testimony (October 2020) and Sur-rebuttal Testimony (November 2020) on behalf of petitioners (Ten Persons Group, including citizens, the Town of Braintree, the Town of Hingham, and the City of Quincy) in the matter of Algonquin Gas Transmission LLC, Weymouth MA, No. X266786 Air Quality Plan Approval, before the Commonwealth of Massachusetts, Department of Environmental Protection, the Office of Appeals and Dispute Resolution, OADR Docket Nos. 2019-008, 2019-009, 2019010, 2019-011, 2019-012 and 2019-013.

135. Expert Report (November 2020) on behalf of Protect PT in the matter of *Protect PT v. Commonwealth of Pennsylvania Department of Environmental Protection and Apex Energy (PA) LLC*, before the Commonwealth of Pennsylvania Environmental Hearing Board, Docket No. 2018-080-R (consolidated with 2019-101-R)(the "Drakulic Appeal").

136. Expert Report (December 2020) on behalf of Plaintiffs in the matter of *Sierra Club Inc. (Plaintiff) v. GenOn Power Midwest LP (Defendants)*, Civil Action No. 2-19-cv-01284-WSS (US District Court for the Western District of Pennsylvania.)

137. Pre-filed Testimony (January 2021) on behalf of the Plaintiffs (Shrimpers and Fishermen of the Rio Grande Valley represented by Texas RioGrande Legal Aid, Inc.) in the matter of the Appeal of Texas Commission on Environmental Quality (TCEQ) Permit Nos. 147681, PSDTX1522, GHGPSDTX172 for the Jupiter Brownsville Heavy Condensate Upgrader Facility, Cameron County, before the Texas State Office of Administrative Hearings, SOAH Docket No. 582-21-0111, TCEQ Docket No. 2020-1080-AIR.

138. Expert Reports (March 2021 and May 2021) regarding the Aries Newark LLC Sludge Processing Facility, Application No. CPB 20-74, Central Planning Board, City of Newark, New Jersey.

139. Expert Report (April 2021) for *Charles Johnson Jr. (Plaintiff) v. BP Exploration and Production Inc., et. al. (Defendant)*, Civil Action No. 2:20-CV-01329 (Related to 12-968 BELO in MDL No. 2179). (US District Court for the Eastern District of Louisiana, New Orleans Division).

140. Affidavit (April 2021) for *Clayton Faerber et.al., (Plaintiff), v. BP Exploration and Production Inc., et. al. (Defendant)*, Civil Action No. 20-CV-00328 01329 (Related to 12-968 BELO in MDL No. 2179). (US District Court for the Southern District of Mississippi).

141. Expert Report (April 2021, June 2023) for *Floyd Ruffin (Plaintiff), v. BP Exploration and Production Inc., et. al. (Defendant)*, Civil Action No. 2:20-cv-00334-CJB-JCW (US District Court for the Eastern District of Louisiana, New Orleans Division).

142. Expert Report (April 2021) and Sur-Rebuttal Report (June 2021) on behalf of the Plaintiffs in the matter of *Modern Holdings, LLC, et al. (Plaintiffs) v. Corning Inc., et al. (Defendants)*, Civil Action No. 5:13-cv-00405-GFVT, (US District Court for the Eastern District of Kentucky, Central Division at Lexington).

143. Expert Report (May 2021) for *Clifford Osmer (Plaintiff) v. BP Exploration and Production Inc., et. al., (Defendants)* related to No. 18-CV-12557 (US District Court for the Eastern District of Louisiana).

144. Expert Report (May 2021) and Rebuttal Expert Report (January 2022) for *James Noel (Plaintiff) v. BP Exploration and Production Inc., et. al. (Defendant)*, Civil Action No. 1:19-CV-00694-JB-MU-C (US District Court for the Southern District of Alabama, Southern Division).

145. Expert Report (June 2021) and Declarations (May 2021 and June 2021) on behalf of Plaintiffs in the matter of *Sierra Club (Plaintiff) v. Woodville Pellets, LLC (Defendant)*, Civil Action No. 9:20-cv-00178-MJT (US District Court for the Eastern District of Texas, Lufkin Division.)

146. Expert Witness Disclosure (June 2021) on behalf of the Plaintiffs in the matter of *Jay Burdick, et. al., (Plaintiffs) v. Tanoga Inc. (d/b/a Taconic) (Defendant)*, Index No. 253835, (State of New York Supreme Court, County of Rensselaer).

147. Expert Report (June 2021) on behalf of Appellants in the matter of *PennEnvironment and Earthworks (Appellants) v. Commonwealth of Pennsylvania Department of Environmental Protection (Appellee) and MarkWest Liberty Midstream and resource, LLC (Permittee)*, before the Commonwealth of Pennsylvania Environmental Hearing Board, EHB Docket No. 2020-002-R.

148. Expert Report (June 2021) for *Antonia Saavedra-Vargas (Plaintiff) v. BP Exploration and Production Inc., et. al. (Defendant)*, Civil Action No. 2:18-CV-11461 (US District Court for the Eastern District of Louisiana, New Orleans Division).

149. Affidavit (June 2021) for Lourdes Rubi in the matter of *Lourdes Rubi (Plaintiff) v. BP Exploration and Production Inc., et. al., (Defendants)*, related to 12-968 BELO in MDL No. 2179 (US District Court for the Eastern District of Louisiana, New Orleans Division).

150. Expert Report (June 2021) for *Wallace Smith (Plaintiff) v. BP Exploration and Production Inc., et. al. (Defendant)*, Civil Action No. 2:19-CV-12880 (US District Court for the Eastern District of Louisiana, New Orleans Division).

151. Declaration (July 2021) on behalf of Plaintiffs in the matter of *Stephanie Mackey and Nick Migliore, on behalf* of *themselves and all others similarly situated (Plaintiffs) v. Chemtool Inc. and Lubrizol Corporation (Defendants)*, Case No. 2021-L-0000165, State of Illinois, Circuit Court of the 17th Judicial Circuit, Winnebago County.

152. Declaration (July 2021, August 2021) on behalf of Petitioners in the matter of the Petition for a Hearing on the Merits Regarding Air Quality Permit No. 3340-RMD issued to New Mexico Terminal Services, LLC by *Mountain View Neighborhood Association et. al., (Petitioners) v. City of Albuquerque Environmental Health Department*, AQCB Petition No. 2020-1 before the Albuquerque-Bernalillo County Air Quality Control Board.

153. Expert Disclosure (September 2021) and Affidavit (May 2023) on behalf of the Plaintiffs in the matter of *State of New York, Town of Hempstead, Town of Brookhaven, Incorporated Village of Garden City and Long Island Power Authority et. al., (Plaintiffs) v. Covanta Hempstead Company et. al., (Defendants)*, Index No. 7549/2013 before the Supreme Court of the State of New York, County of Nassau.

154. Expert Report (October 2021) for *John A. Battiste (Plaintiff) v. BP Exploration and Production Inc., et. al. (Defendant)*, Civil Action No. 1:21-CV-00118 (US District Court for the Southern District of Alabama, Mobile Division)

155. Declaration/Expert Report (October 2021) for *Charles K. Grasley et. al., (Plaintiffs) v. Chemtool Incorporated (Defendant)*, Case No. 2021-L-0000162 (State of Illinois, In the Circuit Court of the 17th Judicial Circuit, Winnebago County).

156. Declaration (October 2021) and Expert Report (November 2021) on behalf of the Plaintiffs in the matter of Toll Brothers, Inc., and Porter Ranch Development Company (Plaintiffs) v. Sempra Energy, Southern California Gas Company et. al., (Defendants), Southern California [Aliso Canyon] Gas Leak Cases, JCCP No.: 4861, Lead Case No.: BC674622, Superior Court of the State of California for the County of Los Angeles.

157. Expert Report (November 2021) and Declaration (September 2022) on behalf of Plaintiffs in Re: Deepwater Horizon BELO Cases, Case No. 3:19cv963-MCR-GRJ (US District Court for the Northern District of Florida, Pensacola Division).

158. Declaration (November 2021) for the *United States of America and the State of Kansas, Department of Health and Environment (Plaintiffs) v. Coffeyville Resources Refining & Marketing, LLC (Defendant)*, Civ. No. 6:04-cv-01064-JAR-KGG (US District Court for the District of Kansas).

159. Expert Report/Affidavit (December 2021) on behalf of the City of Detroit in the matter of Marathon Petroleum Company (Claimant) v. City of Detroit Building Safety Engineering and Environmental Department, BSEED Case No. MCR 2018-2525, DAH Appeal No. 21-SWA-01, before the State of Michigan, City of Detroit Department of Appeals and Hearings.

160. Expert Report (December 2021) for *John Pabst (Plaintiff) v. BP Exploration and Production Inc., et. al. (Defendant)*, Civil Action No. 21-CV-00290 (US District Court for the Eastern District of Louisiana).

161. Expert Report (December 2021) for *Audrey Annette Tillery-Perdue individually and as person representative of the estate of Eddie Lewis Perdue (Plaintiff) v. BP Exploration and Production Inc., et. al., (Defendant)*, Civil Action No. 5:19-cv-00052-MCR-GRJ (US District Court for the Northern District of Florida, Pensacola Division).

162. Expert Report (February 2022) for *Richard Dufour (Plaintiff) v. BP Exploration and Production Inc., et. al. (Defendant),* Civil Action No. 19-cv-00591 (US District Court for the Southern District of Mississippi).

163. Expert Report (February 2022) and Rebuttal Expert Report (June 2022, in preparation) for *Kamuda (Plaintiff) v. Sterigenics U.S., LLC, et. al., (Defendant),* Case No. 2018-L-010475 (Circuit Court of Cook County, Illinois).

164. Expert Report (February 2022) in the matter of the *Appeal Petition for Hearing on Air Quality Permit No. 8585 on behalf of Earth Care New Mexico et. al., (Petitioners) v. New Mexico Environment Department and Associated Asphalt and Materials, LLC (Applicant),* No. EIB 21-48 before the State of New Mexico Environmental Improvement Board.

165. Expert Report (March 2022), Affidavit (June 2022), Supplemental Expert Report (April 2023) in the matter of *Clean Air Council et. al., (Appellants) v. Commonwealth of Pennsylvania, Department of Environmental Protection (Appellee) and Renovo Energy Center (Permittee)* EHB Docket No. 2021-055-R before the Commonwealth of Pennsylvania Environmental Hearing Board.

166. Declaration (March 2022) in the matter of Max Midstream Texas LLC Air Quality Permit No. 162941 for the Seahawk Crude Condensate Terminal in Calhoun County Texas, TCEQ Docket No. 2022-0157-AIR, before the Texas Commission on Environmental Quality.

167. Expert Pre-filed Testimony (April 2022) in the matter of Application of TPC Group LLC for New State and PSD Air Quality Permits (various), TCEQ Docket No. 2021-1422-AIR, SOAH Docket No. 582-22-0799, Before the Texas State Office of Administrative Hearings.

168. Expert Report (April 2022) and Rebuttal Report (August 2022) for *Teresa Fornek (Plaintiff) v. Sterigenics U.S., LLC, et. al., (Defendant),* Case No. 2018-L-010744 (Circuit Court of Cook County, Illinois.)

169. Rule 26 Disclosure (May 2022) in the matter of the *Water Works and Sewer Board of the City of Gadsden (*Plaintiff*) v. 3M Company, et. al., (Defendants),* Civil Action No.: 31 CV-2016-900676.00 (Circuit County of Etowah County, Alabama)

170. Expert Report (June 2022) for *Heather Schumacher (Plaintiff) v. Sterigenics U.S., LLC, et. al., (Defendant),* Case No. 2018-L-011939 (Circuit Court of Cook County, Illinois.)

171. Expert Report (June 2022), Rebuttal Reports (August 2022, September 2022) for Plaintiffs in *Phylliss Grayson et. al. (Plaintiffs), v Lockheed Martin Corporation (Defendant),* Case No. 6:20-cv-01770. (US District Court for the Middle District of Florida – Orlando Division.)

172. Expert Affidavit (July 2022) for Center for Environmental Rights in connection with the 2019 South Africa Integrated Resource Plan in *African Climate Alliance et. al. v. The Minister of Mineral Resources and Energy et. al.,* in the High Court of South Africa, Gauteng Division, Pretoria.

173. Expert Affidavit (July 2022) for Center for Environmental Rights in connection with the Limpopo Mine (Lephalale Coal Mines Ltd.) in *Earthlife Africa v. The Minister of Forestry, Fisheries and Environment et. al.,* in the High Court of South Africa, Gauteng Division, Pretoria, Case No. 9149/2022.

174. Pre-filed Testimony (July 2022) and Rebuttal Testimony (September 2020) on behalf of the Puyallup Tribe of Indians in the matter of *Washington Utilities and Transportation Commission (Complainant) v. Puget Sound Energy (Respondent)* before the Washington Utilities and Transportation Commission, Docket UE-220066 and UG-220067 (Consolidated).

175. Expert Report (September 2022) *Clean Air Council, Citizens for Pennsylvania's Future, Mountain Watershed Association (Appellants) v. Allegheny County Health Department (Appellee) and Allegheny Energy Center (*Intervenor*, Permittee),* Case No. 21-043 before the Hearing Officer of the Allegheny County Health Department.

176. Expert Affidavit (October 2022) for *Concerned Citizens of Cook County GA (Petitioner) v. Georgia Department of Natural Resources (Respondent) and Spectrum Energy Georgia, LLC (Respondent Intervenor)* before the Office of State Administrative Hearings, State of Georgia, Docket No: 2303405-OSAH-BNR-AQ-37-Barnes.

177. Expert Rebuttal Report (January 2023), Supplemental Rebuttal Expert Report (March 2023, May 2023, November 2023) for *Ann Jordan et. al., and Blake Darnell (Plaintiffs) v. Terumo BCT et. al., (Defendants)* before District Court, Jefferson County, Colorado Case Numbers: 2020CV031457, 2021CV030474 (consolidated with 2020CV031457) and 2020CV03148.

178. Expert Report (January 2023) and Rebuttal Expert Report (April 2023) for *Potomac Riverkeeper and Sierra Club (Plaintiffs) v. Virginia Electric and Power Company (Defendant)*, Civil Action No. 2:21-CV-23 (Kleeh) (US District Court for the Northern District of West Virginia, Elkins Division).

179. Affidavit (January 2023) for *Richard Dufour (Plaintiff), v. BP Exploration and Production Inc., et. al. (Defendant)*, Civil Action No. 1:19-cv-00591-HSO-BWR (Related to 12-968 BELO in MDL No. 2179). (US District Court for the Southern District of Mississippi).

180. Expert Report (January 2023) and Supplemental Expert Report (July 2023) on behalf of Plaintiffs in the matter of *Stephanie* Mackey *et. al., (Plaintiffs) v. Chemtool Inc. et. al., (Defendants) and Holian Insulation Company Inc. (Third-party Defendant)*, Case No.: 3:21-cv-50283, U.S. District Court, Northern District of Ilinois, Western Division.

181. Expert Report (February 2023) for *Vervicia Henderson, et al. (Plaintiff) v. Lockheed Martin Corporation (Defendant)*, Case No. 6:21-cv-01363, U.S. District Court, Middle District of Florida, Orlando Division.

182. Expert Report (February 2023) for *Carol Davis (Plaintiff) v. Lockheed Martin Corporation (*Defendant*)*, Case No. 6:22-cv-81-RBD-EJK, U.S. District Court, Middle District of Florida, Orlando Division.

183. Expert Report (February 2023) for Mark Letart (Plaintiff), et al. v. Union Carbide Corporation, et al. (Defendants), Case No. 2:19-cv-877, U.S. District Court, Southern District of West Virginia, Charleston Division.

184. Affidavit (March 2023) on behalf of plaintiffs in the matter of the *State of New Mexico, ex rel. Raul Torrez, Attorney General (Plaintiffs) v. Sterigenics US LLC, Sotera Health Holdings, LLC, Sotera Health LLC and Sotera Health Company (Defendants)*, Case No.: D-307-CV-2020-02629, State of New Mexico, Third Judicial District Court, County of Dona Ana

185. Pre-filed Direct Testimony (March 2023) in the matter of *Algonquin Gas Transmission LLC., on behalf of Community Residents (*Petitioners*)*, Commonwealth of Massachusetts Department of Environmental Protection, Office of Appeals and Dispute Resolution, OADR Docket Nos. 2017-011 and 012, Waterways Application License No. W16-4600, Weymouth Mass.

186. Declaration (April 2023) in the matter of Sierra Club (Plaintiff) v. Tennessee Valley Authority in the matter of the Johnsonville Aeroderivative Combustion Turbines Project, Case No.: 3:22-cv-1054, U.S>, District Court, Middle District of Tennessee, Nashville Division.

187. Expert Report (May 2023/June 2023), Affidavit (April 2023) and Declaration (July 2023) for *Ezequiel Caraballo-Pache (Plaintiff) v. BP Exploration and Production Inc., et. al. (Defendant)*, Civil Action No. 8:20-cv-00263-SCB-JSS (US District Court for the Middle District of Florida, Tampa Division).

188. Affidavit (May 2023) for *Lawrence Tucei (Plaintiff), v. BP Exploration and Production Inc., et. al. (Defendant)*, Civil Action No. 1:22-cv-00078-HSO-BWR (US District Court for the Southern District of Mississippi).

189. Expert Report (May 2023/June 2023) for *Vincent Culliver (Plaintiff), v. BP Exploration and Production Inc., et. al. (Defendant)*, Civil Action No. 3:21-cv-4942-MCR/HTC (US District Court for the Northern District of Florida).

190. Expert Report (June 2023) for *Matthew Williams (Plaintiff), v. BP Exploration and Production Inc., et. al. (Defendant)*, Civil Action No. 1:22-cv-00278-LG-BWR (US District Court for the Southern District of Mississippi).

191. Declaration (June 2023) in support of public commenters relating to the Michigan Department of Environment Great Lakes and Energy (EGLE)'s Annual Network Monitoring Plan 2024.

192. Expert Report (July 2023) and Rebuttal Expert Report (September 2023) relating to Greenhouse Gas and Energy Management (GEMM2) for Manufacturing in Colorado (September 2023) on behalf of Environmental Defense Fund.

193. Pre-filed Direct Testimony (July 2023) on behalf of Citizens for Environmental Justice in the matter of the permit Application of Valero Refining-Texas, LP for Modification to State and Prevention of Significant Deterioration Air Quality Permits No. 38754 and PSDTX324M15 before the Texas State Office of Administrative Hearings, SOAH Docket No. 582-23-14975, TCEQ Docket No. 2023-0203-AIR.

194. Declaration (August 2023) in support of comments by Environmental Defense Fund in connection with the "Good Neighbor Plan" for the 2015 Ozone National Ambient Air Quality Standards, published at 88 Fed. Reg. 36,654 (June 5, 2023) ("Final Rule"), Docket ID No. EPA-HQ-OAR-2021-0668.

195. Expert Report (August 2023) on behalf of Appellants in the matter of *PennEnvironment and Sierra Club (Appellants) v. Commonwealth of Pennsylvania, Department of Environmental Protection, (Appellee), and PPG Industries, Inc. (Permittee)*, EHB Docket No. 2022-032-B. Environmental Hearing Board, Department of Environmental Protection, State of Pennsylvania.

196. Pre-filed Testimony (September 2023) and Cross Answering Testimony (October 2023) on behalf of the Puyallup Tribe of Indians in the matter of *Washington Utilities and Transportation Commission (Complainant) v. Puget Sound Energy (Respondent)*, Docket: UG-230393. Before the Washington Utilities and Transportation Commission.

197. Expert Report (December 2023) on behalf of plaintiffs in the matter of *PennEnvironment and Sierra Club (Plaintiffs) v. PPG Industries, Inc. (Defendant).* Case No.: Civil Action Nos. 2:12-cv-00342, 2:12-cv-00527, 2:13-cv-01395, 1:13-cv-01396, 2:14cv-00229 (consolidated). U.S. District Court Western District of Pennsylvania.

C. Occasions where Dr. Sahu has provided oral testimony <u>in depositions, at trial or in similar proceedings</u> include the following:

198. Deposition on behalf of Rocky Mountain Steel Mills, Inc. located in Pueblo, Colorado – dealing with the manufacture of steel in mini-mills including methods of air pollution control and BACT in steel mini-mills and opacity issues at this steel mini-mill.

199. Trial Testimony (February 2002) on behalf of Rocky Mountain Steel Mills, Inc. in Denver District Court.

200. Trial Testimony (February 2003) on behalf of the United States in the Ohio Edison NSR Cases, *United States, et al. v. Ohio Edison Co., et al.*, C2-99-1181 (Southern District of Ohio).

201. Trial Testimony (June 2003) on behalf of the United States in the Illinois Power NSR Case, *United States v. Illinois Power Co., et al.*, 99-833-MJR (Southern District of Illinois).

202. Deposition (10/20/2005) on behalf of the United States in connection with the Cinergy NSR Case. *United States, et* al. *v. Cinergy Corp., et al.*, IP 99-1693-C-M/S (Southern District of Indiana).

203. Oral Testimony (August 2006) on behalf of the Appalachian Center for the Economy and the Environment re. the Western Greenbrier plant, WV before the West Virginia DEP.

204. Oral Testimony (May 2007) on behalf of various Montana petitioners (Citizens Awareness Network (CAN), Women's Voices for the Earth (WVE) and the Clark Fork Coalition (CFC)) re. the Thompson River Cogeneration plant before the Montana Board of Environmental Review.

205. Oral Testimony (October 2007) on behalf of the Sierra Club re. the Sevier Power Plant before the Utah Air Quality Board.

206. Oral Testimony (August 2008) on behalf of the Sierra Club and Clean Water re. Big Stone Unit II before the South Dakota Board of Minerals and the Environment.

207. Oral Testimony (February 2009) on behalf of the Sierra Club and the Southern Environmental Law Center re. Santee Cooper Pee Dee units before the South Carolina Board of Health and Environmental Control.

208. Oral Testimony (February 2009) on behalf of the Sierra Club and the Environmental Integrity Project re. NRG Limestone Unit 3 before the Texas State Office of Administrative Hearings (SOAH) Administrative Law Judges.

209. Deposition (July 2009) on behalf of MTD Products, Inc., in the matter of *Alice Holmes and Vernon Holmes v. Home Depot USA, Inc., et al*.

210. Deposition (October 2009) on behalf of Environmental Defense and others, in the matter of challenges to the proposed Coleto Creek coal fired power plant project at the Texas State Office of Administrative Hearings (SOAH).

211. Deposition (October 2009) on behalf of Environmental Defense, in the matter of permit challenges to the proposed Las Brisas coal fired power plant project at the Texas State Office of Administrative Hearings (SOAH).

212. Deposition (October 2009) on behalf of the Sierra Club, in the matter of challenges to the proposed Medicine Bow Fuel and Power IGL plant in Cheyenne, Wyoming.

213. Deposition (October 2009) on behalf of Environmental Defense and others, in the matter of challenges to the proposed Tenaska coal fired power plant project at the Texas State Office of Administrative Hearings (SOAH). (April 2010).

214. Oral Testimony (November 2009) on behalf of the Environmental Defense Fund re. the Las Brisas Energy Center before the Texas State Office of Administrative Hearings (SOAH) Administrative Law Judges.

215. Deposition (December 2009) on behalf of Environmental Defense and others, in the matter of challenges to the proposed White Stallion Energy Center coal fired power plant project at the Texas State Office of Administrative Hearings (SOAH).

216. Oral Testimony (February 2010) on behalf of the Environmental Defense Fund re. the White Stallion Energy Center before the Texas State Office of Administrative Hearings (SOAH) Administrative Law Judges.

217. Deposition (June 2010) on behalf of the United States in connection with the Alabama Power Company NSR Case. *United States v. Alabama Power Company*, CV-01-HS-152-S (Northern District of Alabama, Southern Division).

218. Trial Testimony (September 2010) on behalf of Commonwealth of Pennsylvania – Dept. of Environmental Protection, State of Connecticut, State of New York, State of Maryland, and State of New Jersey (Plaintiffs) in connection with the Allegheny Energy NSR Case in US District Court in the Western District of Pennsylvania. *Plaintiffs v. Allegheny Energy Inc., et al.,* 2:05cv0885 (Western District of Pennsylvania).

219. Oral Direct and Rebuttal Testimony (September 2010) on behalf of Fall-Line Alliance for a Clean Environment and others in the matter of the PSD Air Permit for Plant Washington issued by Georgia DNR at the Office of State Administrative Hearing, State of Georgia (OSAH-BNR-AQ-1031707-98-WALKER).

220. Oral Testimony (September 2010) on behalf of the State of New Mexico Environment Department in the matter of Proposed Regulation 20.2.350 NMAC – *Greenhouse Gas Cap and Trade Provisions,* No. EIB 10-04 (R), to the State of New Mexico, Environmental Improvement Board.

221. Oral Testimony (October 2010) on behalf of the Environmental Defense Fund re. the Las Brisas Energy Center before the Texas State Office of Administrative Hearings (SOAH) Administrative Law Judges.

222. Oral Testimony (November 2010) regarding BART for PSCo Hayden, CSU Martin Drake units before the Colorado Air Quality Commission on behalf of the Coalition of Environmental Organizations.

223. Oral Testimony (December 2010) regarding BART for TriState Craig Units, CSU Nixon Unit, and PRPA Rawhide Unit) before the Colorado Air Quality Commission on behalf of the Coalition of Environmental Organizations.

224. Deposition (December 2010) on behalf of the United States in connection with the Louisiana Generating NSR Case. *United States v. Louisiana Generating, LLC*, 09-CV100-RET-CN (Middle District of Louisiana).

225. Deposition (February 2011 and January 2012) on behalf of Wild Earth Guardians in the matter of opacity exceedances and monitor downtime at the Public Service Company of Colorado (Xcel)'s Cherokee power plant. No. 09-cv-1862 (D. Colo.).

226. Oral Testimony (February 2011) to the Georgia Office of State Administrative Hearings (OSAH) in the matter of Minor Source HAPs status for the proposed Longleaf Energy Associates power plant (OSAH-BNR-AQ-1115157-60-HOWELLS) on behalf of the Friends of the Chattahoochee and the Sierra Club).

227. Deposition (August 2011) on behalf of the United States in *United States of America v. Cemex, Inc.*, Civil Action No. 09-cv-00019-MSK-MEH (District of Colorado).

228. Deposition (July 2011) and Oral Testimony at Hearing (February 2012) on behalf of the Plaintiffs MYTAPN in the matter of Microsoft-Yes, Toxic Air Pollution-No (MYTAPN) v. State of Washington, Department of Ecology and Microsoft Corporation Columbia Data Center to the Pollution Control Hearings Board, State of Washington, Matter No. PCHB No. 10-162.

229. Oral Testimony at Hearing (March 2012) on behalf of the United States in connection with the Louisiana Generating NSR Case. *United States v. Louisiana Generating, LLC*, 09-CV100-RET-CN (Middle District of Louisiana).

230. Oral Testimony at Hearing (April 2012) on behalf of the New Hampshire Sierra Club at the State of New Hampshire Public Utilities Commission, Docket No. 10-261 – the 2010 Least Cost Integrated Resource Plan (LCIRP) submitted by the Public Service Company of New Hampshire (re. Merrimack Station Units 1 and 2).

231. Oral Testimony at Hearing (November 2012) on behalf of Clean Wisconsin in the matter of Application of Wisconsin Public Service Corporation for Authority to Construct and Place in Operation a New Multi-Pollutant Control Technology System (ReACT) for Unit 3 of the Weston Generating Station, before the Public Service Commission of Wisconsin, Docket No. 6690-CE-197.

232. Deposition (March 2013) in the matter of various Environmental Petitioners v. North Carolina DENR/DAQ and Carolinas Cement Company, before the Office of Administrative Hearings, State of North Carolina.

233. Deposition (August 2013) on behalf of the Sierra Club in connection with the Luminant Big Brown Case. *Sierra Club v. Energy Future Holdings Corporation and Luminant Generation Company LLC*, Civil Action No. 6:12-cv-00108-WSS (Western District of Texas, Waco Division).

234. Deposition (August 2013) on behalf of the Sierra Club in connection with the Luminant Martin Lake Case. *Sierra Club v. Energy Future Holdings Corporation and Luminant Generation*

Company LLC, Civil Action No. 5:10-cv-0156-MHS-CMC (Eastern District of Texas, Texarkana Division).

235. Deposition (February 2014) on behalf of the United States in *United States of America v. Ameren Missouri*, Civil Action No. 4:11-cv-00077-RWS (Eastern District of Missouri, Eastern Division).

236. Trial Testimony (February 2014) in the matter of *Environment Texas Citizen Lobby, Inc and Sierra Club v. ExxonMobil Corporation et al.*, Civil Action No. 4:10-cv-4969 (Southern District of Texas, Houston Division).

237. Trial Testimony (February 2014) on behalf of the Sierra Club in connection with the Luminant Big Brown Case. *Sierra Club v. Energy Future Holdings Corporation and Luminant Generation Company LLC*, Civil Action No. 6:12-cv-00108-WSS (Western District of Texas, Waco Division).

238. Deposition (June 2014) and Trial (August 2014) on behalf of ECM Biofilms in the matter of the *US Federal Trade Commission (FTC) v. ECM Biofilms* (FTC Docket #9358).

239. Deposition (February 2015) on behalf of Plaintiffs in the matter of *Sierra Club and Montana Environmental Information Center (Plaintiffs) v. PPL Montana LLC, Avista Corporation, Puget Sound Energy, Portland General Electric Company, Northwestern Corporation, and Pacificorp (Defendants)*, Civil Action No. CV 13-32-BLG-DLC-JCL (US District Court for the District of Montana, Billings Division).

240. Oral Testimony at Hearing (April 2015) on behalf of Niagara County, the Town of Lewiston, and the Villages of Lewiston and Youngstown in the matter of CWM Chemical Services, LLC New York State Department of Environmental Conservation (NYSDEC) Permit Application Nos.: 9-2934-00022/00225, 9-2934-00022/00231, 9-2934-00022/00232, and 9-2934-00022/00249 (pending).

241. Deposition (August 2015) on behalf of Plaintiff in the matter of *Conservation Law Foundation (Plaintiff) v. Broadrock Gas Services LLC, Rhode Island LFG GENCO LLC, and Rhode Island Resource Recovery Corporation (Defendants)*, Civil Action No. 1:13-cv-00777-M-PAS (US District Court for the District of Rhode Island).

242. Testimony at Hearing (August 2015) on behalf of the Sierra Club in the matter of *Amendments to 35 Illinois Administrative Code Parts 214, 217, and 225* before the Illinois Pollution Control Board, R15-21.

243. Deposition (May 2015) on behalf of Plaintiffs in the matter of *Northwest Environmental Defense Center et. al., (Plaintiffs) v. Cascade Kelly Holdings LLC, d/b/a Columbia Pacific Bio-Refinery, and Global Partners LP (Defendants)*, Civil Action No. 3:14-cv-01059-SI (US District Court for the District of Oregon, Portland Division).

244. Trial Testimony (October 2015) on behalf of Plaintiffs in the matter of *Northwest Environmental Defense Center et. al., (Plaintiffs) v. Cascade Kelly Holdings LLC, d/b/a Columbia Pacific Bio-Refinery, and Global Partners LP (Defendants)*, Civil Action No. 3:14-cv-01059-SI (US District Court for the District of Oregon, Portland Division).

245. Deposition (April 2016) on behalf of the Plaintiffs in *UNatural Resources Defense Council, Respiratory Health Association, and Sierra Club (Plaintiffs) v. Illinois Power Resources LLC and Illinois Power Resources Generation LLC (Defendants)*, Civil Action No. 1:13-cv-01181 (Central District of Illinois, Peoria Division).

246. Trial Testimony at Hearing (July 2016) in the matter of Tesoro Savage LLC Vancouver Energy Distribution Terminal, Case No. 15-001 before the State of Washington Energy Facility Site Evaluation Council.

247. Trial Testimony (December 2016) on behalf of the challengers in the matter of the Delaware Riverkeeper Network, Clean Air Council, et. al., vs. Commonwealth of Pennsylvania Department of Environmental Protection and R. E. Gas Development LLC regarding the Geyer well site before the Pennsylvania Environmental Hearing Board.

248. Trial Testimony (July-August 2016) on behalf of the United States in *United States of America v. Ameren Missouri*, Civil Action No. 4:11-cv-00077-RWS (Eastern District of Missouri, Eastern Division).

249. Trial Testimony (January 2017) on the Environmental Impacts Analysis associated with the Huntley and Huntley Poseidon Well Pad Hearing on behalf citizens in the matter of the special exception use Zoning Hearing Board of Penn Township, Westmoreland County, Pennsylvania.

250. Trial Testimony (January 2017) on the Environmental Impacts Analysis associated with the Apex energy Backus Well Pad Hearing on behalf citizens in the matter of the special exception use Zoning Hearing Board of Penn Township, Westmoreland County, Pennsylvania.

251. Trial Testimony (January 2017) on the Environmental Impacts Analysis associated with the Apex energy Drakulic Well Pad Hearing on behalf citizens in the matter of the special exception use Zoning Hearing Board of Penn Township, Westmoreland County, Pennsylvania.

252. Trial Testimony (January 2017) on the Environmental Impacts Analysis associated with the Apex energy Deutsch Well Pad Hearing on behalf citizens in the matter of the special exception use Zoning Hearing Board of Penn Township, Westmoreland County, Pennsylvania.

253. Deposition Testimony (July 2017) on behalf of Plaintiffs in the matter of *Casey Voight and Julie Voight v Coyote Creek Mining Company LLC (Defendant)* Civil Action No. 1:15-CV-00109 (US District Court for the District of North Dakota, Western Division).

254. Deposition Testimony (November 2017) on behalf of Defendant in the matter of *Oakland Bulk and Oversized Terminal (Plaintiff) v City of Oakland (Defendant,)* Civil Action No. 3:16-cv-07014-VC (US District Court for the Northern District of California, San Francisco Division).

255. Deposition Testimony (December 2017) on behalf of Plaintiff in the matter of *Wildearth Guardians (Plaintiff) v Colorado Springs Utility Board (Defendant)* Civil Action No. 1:15-cv-00357-CMA-CBS (US District Court for the District of Colorado).

256. Deposition Testimony (January 2018) in the matter of National Parks Conservation Association (NPCA) v. State of Washington Department of Ecology and British Petroleum (BP) before the Washington Pollution Control Hearing Board, Case No. 17-055.

257. Trial Testimony (January 2018) on behalf of Defendant in the matter of *Oakland Bulk and Oversized Terminal (Plaintiff) v City of Oakland (Defendant,)* Civil Action No. 3:16-cv-07014-VC (US District Court for the Northern District of California, San Francisco Division).

258. Trial Testimony (April 2018) on behalf of the National Parks Conservation Association (NPCA) in the matter of NPCA v State of Washington, Department of Ecology and BP West Coast Products, LLC, PCHB No. 17-055 (Pollution Control Hearings Board for the State of Washington.

259. Deposition (June 2018) (harm Phase) on behalf of Plaintiffs in the matter of *Natural Resources Defense Council, Inc., Sierra Club, Inc., and Respiratory Health Association v. Illinois Power Resources LLC, and Illinois Power Resources Generating LLC (Defendants)*, Civil Action No. 1:13-cv-01181 (US District Court for the Central District of Illinois, Peoria Division).

260. Trial Testimony (July 2018) on behalf of Petitioners in the matter of *Coosa River Basin Initiative and Sierra Club (Petitioners) v State of Georgia Environmental Protection Division, Georgia Department of Natural Resources (Respondent) and Georgia Power Company (Intervenor/Respondent)*, Docket Nos: 1825406-BNR-WW-57-Howells and 1826761-BNR-WW-57-Howells, Office of State Administrative Hearings, State of Georgia.

261. Deposition (January 2019) and Trial Testimony (January 2019) on behalf of Sierra Club and Texas Campaign for the Environment (Appellants) in the contested case hearing before the Texas State Office of Administrative Hearings in Docket Nos. 582-18-4846, 582-18-4847 (Application of GCGV Asset Holding, LLC for Air Quality Permit Nos. 146425/PSDTX1518 and 146459/PSDTX1520 in San Patricio County, Texas).

262. Deposition (February 2019) and Trial Testimony (March 2019) on behalf of Sierra Club in the State of Florida, Division of Administrative Hearings, Case No. 18-2124EPP, Tampa Electric

Company Big Bend Unit 1 Modernization Project Power Plant Siting Application No. PA79-12-A2.

263. Deposition (June 2019) relating to the appeal of air permits issued to PTTGCA on behalf of Appellants in the matter of *Sierra Club (Appellants) v. Craig Butler, Director, et. al., Ohio EPA (Appellees)* before the State of Ohio Environmental Review Appeals Commission (ERAC), Case Nos. ERAC-19-6988 through -6991.

264. Deposition (September 2019) on behalf of Appellants relating to the NPDES permit for the Cheswick power plant in the matter of *Three Rivers Waterkeeper and Sierra Club (Appellants) v. State of Pennsylvania Department of Environmental Protection (Appellee) and NRG Power Midwest (Permittee)*, before the Commonwealth of Pennsylvania Environmental Hearing Board, EHB Docket No. 2018-088-R.

265. Deposition (December 2019) on behalf of the Plaintiffs in the matter of David Kovac, individually and on behalf of wrongful death class of Irene Kovac v. BP Corporation North America Inc., Circuit Court of Jackson County, Missouri (Independence), Case No. 1816-CV12417.

266. Deposition (February 2020, virtual) and testimony at Hearing (August 2020, virtual) on behalf of Earthjustice in the matter of *Objection to the Issuance of PSD/NSR and Title V permits for Riverview Energy Corporation*, Dale, Indiana, before the Indiana Office of Environmental Adjudication, Cause No. 19-A-J-5073.

267. Hearing (July 14-15, 2020, virtual) on behalf of the Sierra Club in the matter of *the Application of the Ohio State University for a certificate of Environmental Compatibility and Public Need to Construct a Combined Heat and Power Facility in Franklin County, Ohio*, before the Ohio Power Siting Board, Case No. 19-1641-EL-BGN.

268. Hearing (September 2020, virtual) on behalf of WildEarth Guardians (petitioners) in the matter of *the Appeals of the Air Quality Permit No. 7482-M1 Issued to 3 Bear Delaware* Operating – *NM LLC (EIB No. 20-21(A) and Registrations Nos. 8729, 8730, and 8733 under General Construction Permit for Oil and Gas Facilities (EIB No. 20-33 (A)*, before the State of New Mexico, Environmental Improvement Board.

269. Deposition (December 2020, March 4-5, 2021, all virtual) and Hearing (April 2021, virtual) in support of Petitioner's Motion for Stay of PSCAA NOC Order of Approval No. 11386 in the matter of the *Puyallup Tribe of Indians v. Puget Sound Clean Air Agency (PSCAA) and Puget Sound Energy (PSE)*, before the State of Washington Pollution Control Hearings Board, PCHB No. P19-088.

270. Hearing (September 2020, virtual) on the *Initial Economic Impact Analysis (EIA) for A Proposal To* Regulate *NOx Emissions from Natural Gas Fired Rich-Burn Natural Gas Reciprocating Internal Combustion Engines (RICE) Greater Than 100 Horsepower* prepared on behalf of Earthjustice and the National Parks Conservation Association in the matter of Regulation Number 7, Alternate Rules before the Colorado Air Quality Control Commission.

271. Deposition (December 2020, virtual and Hearing February 2021, virtual) on behalf of the Plaintiffs (Shrimpers and Fishermen of the Rio Grande Valley represented by Texas RioGrande Legal Aid, Inc.) in the matter of the Appeal of Texas Commission on Environmental Quality (TCEQ) Permit Nos. 147681, PSDTX1522, GHGPSDTX172 for the Jupiter Brownsville Heavy Condensate Upgrader Facility, Cameron County, before the Texas State Office of Administrative Hearings, SOAH Docket No. 582-21-0111, TCEQ Docket No. 2020-1080-AIR.

272. Deposition (January 2021, virtual) on behalf of Plaintiffs in the matter of *PennEnvironment Inc., and Clean Air Council (Plaintiffs) and Allegheny County Health Department (Plaintiff-Intervenor) v. United States Steel Corporation (Defendant)*, Civil Action No. 2-19-cv-00484-MJH (US District Court for the Western District of Pennsylvania.)

273. Deposition (February 2021, virtual) on behalf of Plaintiffs in the matter of *Sierra Club Inc. (Plaintiff) v. GenOn Power Midwest LP (*Defendants*)*, Civil Action No. 2-19-cv-01284-WSS (US District Court for the Western District of Pennsylvania.)

274. Deposition (April 2021, virtual) on the Potential Remedies to Avoid Adverse Thermal Impacts from the Merrimack Station on behalf of Plaintiffs in the matter of *Sierra Club Inc. and the* Conservation *Law Foundation (Plaintiffs) v. Granite Shore Power, LLC et. al., (Defendants)*, Civil Action No. 19-cv-216-JL (US District Court for the District of New Hampshire.)

275. Deposition (June 2021, virtual) on behalf of Plaintiffs in the matter of *Sierra Club (Plaintiff) v. Woodville Pellets, LLC (Defendant)*, Civil Action No. 9:20-cv-00178-MJT (US District Court for the Eastern District of Texas, Lufkin Division).

276. Deposition (June 2021, virtual) on behalf of the Plaintiffs in the matter of *Modern Holdings, LLC, et al. (Plaintiffs) v. Corning Inc., et al. (Defendants)*, Civil Action No. 5:13-cv-00405-GFVT, (US District Court for the Eastern District of Kentucky, Central Division at Lexington).

277. Testimony (June 2021, virtual) regarding the Aries Newark LLC Sludge Processing Facility, Application No. CPB 20-74, (Central Planning Board, City of Newark, New Jersey).

278. Testimony at Hearing (October 2021) on behalf of Evraz Rocky Mountain Steel in the matter of Colorado's Proposed Revisions to Regulation 22, the Greenhouse Gas Emissions and Energy Management for the Manufacturing Sector in Colorado (GEMM Rule), before the Colorado Air Quality Control Commission.

279. Deposition (November 2021) for *Charles Johnson Jr. (Plaintiff) v. BP Exploration and Production Inc., et. al. (Defendant)*, Civil Action No. 2:20-CV-01329 (Related to 12-968 BELO in MDL No. 2179). (US District Court for the Eastern District of Louisiana).

280. Testimony at Hearing (November 2021) on behalf of *National Parks Conservation Association, et. al*., in the matter of the Proposed Revisions to Colorado's Regional Haze State Implementation Plan (SIP) and Colorado Regulation 23, before the Colorado Air Quality Control Commission.

281. Deposition (December 2021) on behalf of Plaintiffs in Re: Deepwater Horizon BELO Cases, Case No. 3:19cv963-MCR-GRJ (US District Court for the Northern District of Florida, Pensacola Division).

282. Deposition (December 2021) for *James Noel (Plaintiff) v. BP Exploration and Production Inc., et. al. (Defendant)*, Civil Action No. 1:19-CV-00694-JB-MU-C (US District Court for the Southern District of Alabama, Southern Division).

283. Testimony at Hearing (February 2022, virtual) in the matter of the *Appeal Petition for Hearing on Air Quality Permit No. 8585 on behalf of Earth Care New Mexico et. al., (Petitioners) v. New Mexico Environment Department and Associated Asphalt and Materials, LLC (Applicant)*, No. EIB 21-48 before the State of New Mexico Environmental Improvement Board.

284. Deposition (March 2022) and Rebuttal Deposition (July 2022) for *Kamuda (Plaintiff) v. Sterigenics U.S., LLC, et. al., (Defendant)*, Case No. 2018-L-010475 (Circuit Court of Cook County, Illinois.)

285. Deposition (April 2022, virtual) in the matter of Application of TPC Group LLC for New State and PSD Air Quality Permits (various), TCEQ Docket No. 2021-1422-AIR, SOAH Docket No. 582-22-0799, Before the Texas State Office of Administrative Hearings.

286. Deposition (May 2022, virtual) in the matter of the *Water Works and Sewer Board of the City of Gadsden (Plaintiff) v. 3M Company, et. al., (*Defendants*)*, Civil Action No.: 31 CV-2016-900676.00 (Circuit County of Etowah County, Alabama)

287. Deposition (June 2022 and September 2022, both virtual) for *Teresa* Fornek *(Plaintiff) v. Sterigenics U.S., LLC, et. al., (Defendant)*, Case No. 2018-L-010744 (Circuit Court of Cook County, Illinois.)

288. Deposition (June 2022, virtual) on behalf of the Plaintiffs in the matter of Toll Brothers, Inc., and Porter Ranch Development Company (Plaintiffs) v. Sempra Energy, Southern California Gas Company et. al., (Defendants), Southern California [Aliso Canyon] Gas Leak Cases, JCCP No.: 4861, Lead Case No.: BC674622, Superior Court of the State of California for the County of Los Angeles.

289. Deposition (July 2022) for *Richard Dufour (Plaintiff) v. BP Exploration and Production Inc., et. al. (Defendant)*, Civil Action No. 19-cv-00591 (US District Court for the Southern District of Mississippi).

290. Trial (August 2022) on behalf of the Plaintiffs in the matter of Modern *Holdings, LLC, et al. (Plaintiffs) v. Phillips (Defendants),* Civil Action No. 5:13-cv-00405-GFVT, (US District Court for the Eastern District of Kentucky, Central Division at Lexington).

291. Trial (August 2022, in person) for *Susan Kamuda (Plaintiff) v. Sterigenics U.S., LLC, et. al., (Defendant)*, Case No. 2018-L-010475 (Circuit Court of Cook County, Illinois).

292. Deposition (September 2022, virtual) for *Heather Schumacher (Plaintiff) v. Sterigenics U.S., LLC, et. al., (Defendant)*, Case No. 2018-L-010744 (Circuit Court of Cook County, Illinois.)

293. Deposition (September 2022) on behalf of Plaintiffs in *Phylliss Grayson et. al. (Plaintiffs), v Lockheed Martin Corporation (Defendant),* Case No. 6:20-cv-01770. (US District Court for the Middle District of Florida – Orlando Division.)

294. Deposition (September 2022) for *Teresa Fornek (Plaintiff) v. Sterigenics U.S., LLC, et. al., (Defendant)*, Case No. 2018-L-010475 (Circuit Court of Cook County, Illinois).

295. Hearing (October 2022) on behalf of the Puyallup Tribe of Indians in the matter of *Washington Utilities and Transportation Commission (Complainant) v. Puget Sound Energy (Respondent)* before the Washington Utilities and Transportation Commission, Docket UE-220066 and UG-220067 (Consolidated).

296. Trial (October 2022, in person) for *Teresa Fornek (Plaintiff) v. Sterigenics U.S., LLC, et. al., (Defendant)*, Case No. 2018-L-010475 (Circuit Court of Cook County, Illinois).

297. Depositions (March 2023, June 2023) for *Ann Jordan et. al., and Blake Darnell (Plaintiffs) v. Terumo BCT et. al., (Defendants)* before District Court, Jefferson County, Colorado Case Numbers: 2020CV031457, 2021CV030474 (consolidated with 2020CV031457) and 2020CV03148.

298. Depositions (March 2023, April 2023, May 2023) for Quinn Buczek (Plaintiff) v. Sterigenics US, LLC, Sotera Health, LLC, Prologis First US Properties, LP, et. al., (Defendants) before State Court of Gwinnett County, State of Georgia, Case No. Civil Action File No. 20-C-05918-S1.

299. Deposition (May 2023) for *Potomac Riverkeeper and Sierra Club (Plaintiffs) v. Virginia Electric and Power Company (Defendant),* Civil Action No. 2:21-CV-23 (Kleeh) (US District Court for the Northern District of West Virginia, Elkins Division).

300. Deposition (May 2023) for Mark Letart (Plaintiff), et al. v. Union Carbide Corporation, et al. (Defendants), Case No. 2:19-cv-877, U.S. District Court, Southern District of West Virginia, Charleston Division.

301. Testimony at Hearing on behalf of Evraz North America In the Matter of Colorado Air Quality Regulation Proposed Revisions to Regulation Number 3 to establish enhanced Modeling, monitoring and permitting requirements for Stationary sources in disproportionately impacted communities 5 CCR 1001-5, before the Air Quality Control Commission, State of Colorado.

302. Deposition (2023) for *Vervicia Henderson, et al. (Plaintiff) v. Lockheed Martin Corporation (Defendant)*, Case No. 6:21-cv-01363, U.S. District Court, Middle District of Florida, Orlando Division.

303. Testimony at Hearing (July 2023) *Clean Air Council, Citizens for Pennsylvania's Future, Mountain* Watershed *Association (Appellants) v. Allegheny County Health Department (Appellee) and Allegheny Energy Center (*Intervenor, *Permittee),* Case No. 21-043 before the Hearing Officer of the Allegheny County Health Department.

304. Deposition (July 2023) for *Ezequiel Caraballo-Pache (Plaintiff) v. BP Exploration and Production Inc., et. al. (Defendant)*, Civil Action No. 8:20-cv-00263-SCB-JSS (US District Court for the Middle District of Florida, Tampa Division).

305. Deposition (August 2023) for *Floyd Ruffin (Plaintiff), v. BP Exploration and Production Inc., et. al. (Defendant)*, Civil Action No. 2:20-cv-00334-CJB-JCW (US District Court for the Eastern District of Louisiana, New Orleans Division).

306. Deposition (August 2023) on behalf of petitioners in *Doreen Carey et; al., (Petitioners) v. Fulcrum Centerpoint LLC. (Permittee/Respondent) and Indiana Department of Environmental Management (Respondent)*, Permit Number 089-44042-00660, before the Indiana Office of Environmental Adjudication.

307. Deposition (August 2023) on behalf of the Plaintiff in the *Water Works and Sewer Board of the Town of Centre, Alabama v. 3M Company, et. al.*, Civil Action No.: CV-2017-900049. Circuit Court of Cherokee County, State of Georgia.

308. Deposition (August 2023) for *Matthew Williams (Plaintiff), v. BP Exploration and Production Inc., et. al. (Defendant)*, Civil Action No. 1:22-cv-00278-LG-BWR (US District Court for the Southern District of Mississippi).

309. Deposition (September 2023) for *Vincent Culliver (Plaintiff), v. BP Exploration and Production Inc., et. al. (Defendant)*, Civil Action No. 3:21-cv-4942-MCR/HTC (US District Court for the Northern District of Florida).

310. Testimony at Hearing for Greenhouse Gas and Energy Management (GEMM2) for Manufacturing in Colorado (September 2023) on behalf of Environmental Defense Fund.

311. Testimony at Hearing (October 2023) in the matter of *Algonquin Gas Transmission LLC., on behalf of Community Residents (*Petitioners*)*, Commonwealth of Massachusetts Department of Environmental Protection, Office of Appeals and Dispute Resolution, OADR Docket Nos. 2017-011 and 012, Waterways Application License No. W16-4600, Weymouth Mass.

312. Testimony at Hearing (August 2023) on behalf of Citizens for Environmental Justice in the matter of the permit Application of Valero Refining-Texas, LP for Modification to State and Prevention of Significant Deterioration Air Quality Permits No. 38754 and PSDTX324M15 before the Texas State Office of Administrative Hearings, SOAH Docket No. 582-23-14975, TCEQ Docket No. 2023-0203-AIR.

313. Testimony at Hearing (September 2023) on behalf of Appellants in the matter of *PennEnvironment and Sierra Club (Appellants) v. Commonwealth of Pennsylvania, Department of Environmental Protection, (Appellee), and PPG Industries, Inc. (Permittee)*, EHB Docket No. 2022-032-B. Environmental Hearing Board, Department of Environmental Protection, State of Pennsylvania.

314. Testimony at Hearing (November 2023) on behalf of the Puyallup Tribe of Indians in the matter of *Washington Utilities and Transportation Commission (Complainant) v. Puget Sound Energy (Respondent)*, Docket: UG-230393. Before the Washington Utilities and Transportation Commission.

ATTACHMENT B

Evaluation of Recirculated Draft Environmental Impact Report on Geological Storage of Carbon Dioxide at the Carbon TerraVault I Facility in Kern County, California

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About the Author: Dr. DiGiulio is a retired geoscientist from the U.S. Environmental Protection Agency's Office of Research and Development. He has conducted research on: emissions of volatile organic compounds from abandoned wells, leakage of produced water, condensate, and drilling fluids from impoundments to groundwater, contamination of groundwater from hydraulic fracturing, subsurface methane and carbon dioxide migration (stray gas), intrusion of subsurface vapors into indoor air (vapor intrusion), gas flow-based subsurface remediation (soil vacuum extraction, bioventing), groundwater sampling methodology, soil-gas sampling methodology, gas permeability testing, and solute transport of contaminants in soil. He assisted in the development of EPA's original guidance on vapor intrusion and the EPA's Class VI Rule on geologic sequestration of carbon dioxide (Tier II Committee). He has served as an expert witness in litigation relevant to oil and gas development, testified before State oil and gas commissions on proposed regulation, and testified before Congress on the impact of oil and gas development on water resources. His consulting services to non-government organizations have included reports on: stray methane gas migration, geological carbon storage in Louisiana, storage of natural gas liquids in solution mined caverns, proposed oil and gas regulations in Colorado, impact to groundwater resources from Class II disposal wells in Ohio, Idaho, and Florida, produced water transport in barges along the Ohio River, proposed EPA regulation on discharge of produced water to surface water, and Bureau of Land Management leases in Wyoming, Montana, and Colorado.

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Background

In December 2023, Volume I and Volume II of a Draft Environmental Impact Report (DEIR, 2023a, 2023b) was prepared by Kern County as the Lead Agency under the California Environmental Quality Act (CEQA). County staff has determined, following a review of the written comments and release of the EPA Class VI Permit for Reservoir 26R, that changes should be made in the previously circulated DEIR (DEIR, 2023a). In June 2024, Volume I and Volume II of a Draft Environmental Impact Report (RDEIR, 2024a, 2024b) was recirculated for comment.

This evaluation incorporates by reference and builds on the report I prepared on the December 2023 DEIR. The DEIR report is included as an attachment to comments submitted by Earthjustice on behalf of the Center for Biological Diversity et al. on March 1, 2024.

Carbon TerraVault 1 LLC (CTV), a wholly owned subsidiary of the California Resources Corporation, proposes to inject supercritical carbon dioxide (CO_2) at two locations (26R and A1-A2 reservoirs) in the Monterey Formation at the Elk Hills Oil Field in Kern County, California (RDEIR, 2024a). The source of CO_2 for injection is pre-combustion Elk Hills Oil Field gas, from which CO_2 is captured and processed at the existing cryogenic and fractionation natural gas plant facility and the Elk Hills Power Plant within the Elk Hills Oil Field (RDEIR, 2024a). Currently, the Elk Hills Power Plant provides electricity for both oilfield operations and the California wide power system (RDEIR, 2024a). The project would consist of six injection wells - four (one converted Class II well, three new) within the 26R reservoir and two converted Class II wells within the A1 - A2 reservoir.

At the 26R reservoir, the Monterey Formation is approximately 6,000 feet deep with oil and gas production from turbidite sands (RDEIR, 2024a). Turbidite deposited sands are interbedded with siliceous shale. Sand porosity and permeability averages 25% and 45 millidarcy (mD), respectively (RDEIR, 2024b). At the A1 - A2 reservoir, the Monterey Formation is approximately 8,500 feet deep with oil and gas production also from turbidite sands. Turbidite deposited sands are interbedded with and bound above and below by siliceous shale. Sand porosity and permeability averages 16% and 60 mD, respectively (RDEIR, 2024b).

The 26R reservoir was discovered in the 1940s while the A1 - A2 reservoir was discovered in the 1970s (RDEIR, 2024b). In addition to primary extraction, oil and gas wells have been used for enhanced recovery using water and gas injection over the past 40 years (RDEIR, 2024b).

The Reef Ridge Shale is present over the southern San Joaquin Basin and serves as the primary confining layer for both the 26R and A1 - A2 reservoirs (RDEIR, 2024a). The Reef Ridge Shale is dominated by gray to grayish-black silty or sandy shale with rare silty and clay beds. The Reef Ridge Shale is continuous and ranges from 750 to 1,600 feet thick and has a permeability of less than 0.01 mD and 7% porosity (RDEIR, 2024b).

At full operation, the project is designed to inject up to 1.46 million tons of CO_2 per year into the 26R reservoir (up to 26 years) and up to 0.75 million tons per year in the A1-A2 reservoir, for a total capacity of 2.21 million tons per year (RDEIR, 2024a). Additionally, 10 existing wells will be converted to monitoring wells, and six existing wells would be converted into seismic monitoring wells (RDEIR, 2024a).

Setbacks and Encroachment

Leakage of CO_2 from wellbores is widely considered to be one of the most significant leakage pathways for geologic storage of CO_2 (Jordan and Benson, 2009, Zhang and Bachu, 2011). There is interest in using depleted oil and gas reservoirs for geological storage of CO_2 due to extensive preexisting geological characterization and infrastructure but the presence of a large number of well penetrations increases the possibility of leakage (Celia et al., 2005).

From a health and safety perspective, if large-scale leakage were to occur at the surface, asphyxiation and suffocation are of concern. Continued exposure to CO_2 concentrations above 20–30% is associated with suffocation to humans and most air-breathing animals (Damen et al., 2006). Since CO_2 is denser than air, topography and prevailing meteorologic conditions would largely govern risk from a large-scale release with gas buildup being greater in valleys and low-lying areas.

As discussed in Volume II of the DEIR (RDEIR, 2024b), in 2008 in Mönchengladbach, Germany, over 100 residents suffered from respiratory problems due to a CO_2 release, of which 19 were hospitalized. The incident involved the release of about 15 metric tons of fire suppression CO_2 inside a factory, which leaked out of the building. At the time there was no wind, so the dense CO_2 cloud drifted down hill to the lowest lying region where there was a village about 1,500 feet away (RDEIR, 2024b).

Probably the best-known anthropogenic release of CO_2 occurred in February 2020 from a CO_2 pipeline rupture in proximity to Satartia, MS. The rupture followed heavy rains that resulted in a landslide, creating excessive axial strain on a pipeline weld (RDEIR, 2024b). Pipeline operators are required to establish atmospheric models to prepare for emergencies. Denbury's model did not contemplate a release that could affect the Village of Satartia (RDEIR, 2024b). Local emergency responders were not informed by Denbury of the rupture and the nature of the unique safety risks of the CO_2 pipeline. As a result, responders had to guess the nature of the risk, in part making assumptions based on reports of a "green gas" and "rotten egg smell" and had to contemplate appropriate mitigative actions (RDEIR, 2024b). Fortunately, responders decided to quickly isolate the affected area by shutting down local highways and evacuating people in proximity to the release (RDEIR, 2024b). Denbury reported that 200 residents surrounding the rupture location were evacuated, and forty-five people were taken to the hospital. No fatalities were reported (PHMSA, 2022).

Following this incident, a large release of CO_2 to the atmosphere occurred later in 2020 in Yazoo County, Mississippi due to a blowdown valve freezing open (RDEIR, 2024b). Work was being conducted to reconnect the pipeline that had ruptured near Satartia. An 8-inch valve froze in the open position due to internal dry-ice formation as CO_2 flashed across the valve (RDEIR, 2024b). A total of approximately 5,299 metric tons of CO_2 were released over about 24 hours until the pipeline segment pressure had reduced enough to allow the valve to thaw and be closed. A large CO_2 cloud formed, and the nearby highway closed. Air monitoring was conducted in the surrounding area (RDEIR, 2024b).

A clearly unacceptable release from a wellbore would be a CO_2 well blowout. A CO_2 well blowout is considered a low probability high consequence incident (Oldenburg and Budnitz, 2016) that could cause an immediate danger to public health in the vicinity of an abandoned well. The Sheep Mountain CO_2 blowout in March 1982 is a well-documented case in the literature (GEM Wiki, 2024). The leakage rate was estimated to be 13,000 metric tons CO_2 per day (GEM Wiki, 2024). 100% CO_2 flow was observed in the well with chunks of dry ice occasionally ejected hundreds of feet into the air. Other examples of CO_2

well blowouts include the Travale geothermal field, Italy in 1972 having a CO_2 release rate of 113 kg/s and the Torre Alfina geothermal field, Italy in 1973 (Lewicki et al., 2007) having a CO_2 leakage release rate of 76 kg/s (Lewicki et al., 2007; Aines et al., 2009).

Another example of CO_2 release via a wellbore is Crystal Geyser in Utah (the largest cold geyser in the world). The geyser was unintentionally created in the 1930s after a prospective oil well was drilled about 2,600-foot-deep into a fault zone above a natural CO_2 reservoir (RDEIR, 2024b). Shortly after drilling, the well was improperly abandoned allowing CO_2 to be released through the well (RDEIR, 2024b). Crystal Geyser eruptions last from 7 to 98 minutes with a release rate between 2.5 and 6 kg/s. Downwind CO_2 concentrations have been measured during eruptions, averaging about 4,000 parts per million (ppm) (0.4 percent) at 160 feet, and 800 ppm at 330 feet (RDEIR, 2024b).

In 2011, an improperly plugged and abandoned well failed at the Tinsley Field, Mississippi during CO_2 enhanced oil recovery (EOR) (RDEIR, 2024b). There were incomplete records of abandoned wells at the site (RDEIR, 2024b). A 2,000-foot-deep well failed when the reservoir pressure increased on injection of CO_2. The blowout took 37 days to bring under control, sickened one worker and suffocated deer and other animals (RDEIR, 2024b).

In 2013, an underground CO_2 blowout occurred at the CO_2-EOR Delhi field in Louisiana, when two or more plugged and abandoned wells failed underground (RDEIR, 2024b). Methane, CO_2, oil, water, brine and sands migrated to the surface in a sparsely populated, marshy area. The release lasted for more than six weeks and contaminated the air with CO_2 and methane (RDEIR, 2024b).

Comment: As evidenced in the Satartia, MS CO_2 pipeline release and other documented incidences of CO_2 release, including those from wellbores, release of CO_2 from an injection well or failed plugged or unplugged wellbores could be catastrophic depending on surface topography and meteorologic conditions. In Volume I of the recirculated DEIR (RDEIR, 2024a), CTV states that the closest sensitive receptor to the project site is McKittrick Elementary School, which is 4.47 miles southwest of the facility pipeline and injection well 357-7R. The nearest residence is approximately 4.4 miles southeast of the injection line and 4.4 miles from injection well 345-36R. Buttonwillow Recreation and Park District is approximately 7 miles northeast of injection well 355-7R and 6.9 miles from the injection pipeline. Based on project-specific and site-specific considerations, the County should determine safe distance(s) for injection wells, wellbores, and pipelines from human receptors and adopt setback(s) that prohibit development at unsafe distance(s).

Comment: Another issue of concern is future development encroaching near land used for CO_2 storage. The land area containing wellbores and vicinity of this land area (e.g., within 1 mile) could conceivably not be suitable for public use for hundreds of years if not longer. In generations to come, it is conceivable that buildings or homes could be constructed overlying plugged well penetrations which could leak highly pressurized CO_2 into indoor air. The recirculated DEIR does not address restrictions on future land use.

Mineralization of Injected CO_2

In Volume II of the recirculated DEIR (RDEIR, 2024b), CTV states that computational modeling indicates that CO_2 injected into the Monterey Formation 26R reservoir will be soluble in both water and oil. Due to remaining saturation of oil and water in the depleted reservoir, total dissolved CO_2 in oil and water is estimated to be 20% and 8% of the CO_2 injected, respectively. Hence, 72% of injected CO_2 is

expected to remain in a supercritical state for an extended period of time (e.g., thousands of years). In the A1 - A2 reservoir, CTV states that because of low water saturation within the Monterey Formation, greater than 98% of the CO_2 injectate will remain in a supercritical phase (RDEIR, 2024b). The phase (supercritical fluid, dissolved in water or oil) and form (mineralization) of CO_2 is important because storage as a supercritical fluid is the least secure phase of storage while formation of carbonates during mineralization is by far the most secure form of storage.

Comment: In Volume I of the original DEIR (DEIR, 2023a), CTV stated that full mineralization of CO_2 is expected to occur in two to five years - a gross misstatement. If this were true, there would be little concern with geological storage of CO_2 at the CTV facility. Research is ongoing in formations having high divalent cation concentrations (iron, calcium, magnesium) (e.g., basalt) where mineralization is much more rapid. In Volume II of the recirculated DEIR (RDEIR, 2024b), CTV appears to have revised its position and now states that based on previous studies on reactive transport modeling and geochemical reactions during geological storage, the amount of CO_2 predicted to be trapped by mineralization reactions at the TerraVault 1 Project is small over a 100-year post injection time frame. For this reason, CO_2 mineralization was not included as a part of the compositional simulation modeling. The importance of this discussion is the realization that at the TerraVault I facility, CO_2 will be stored primarily as a highly pressurized supercritical fluid (the least secure form of CO_2) and must be retained for hundreds if not thousands of years with little or no hope of transition of CO_2 to more stable forms of storage (e.g., dissolution, mineralization).

Lateral Confinement to Storage Areas

The Elk Hills Oil Field is a large WNW-ESE trending anticlinal structure, approximately 17 miles long and over seven miles wide (RDEIR, 2024b). With increasing depth, the structure subdivides into three distinct anticlines, separated at depth by inactive high-angle reverse faults (RDEIR, 2024b). The project would be developed in two phases. In Phase 1, three new wells and one modified existing well used for enhanced oil recovery will be used to inject CO_2 into the Monterey Formation in the 26R reservoir portion of 31S anticline (RDEIR, 2024a). In Phase 2, two modified wells used for enhanced oil recovery would be used to inject CO_2 into the Monterey Formation in the A1 - A2 reservoir portion of the Northwest Stevens anticline (RDEIR, 2024a). CTV states that it plans to maintain the reservoir pressure at or beneath the discovery pressure of the reservoir to ensure that CO_2 does not migrate beyond the edges of the anticline structure (RDEIR, 2024a).

Comment: The isolation of injected CO_2 in anticlinal structures is of concern. In Volume II of the recirculated DEIR (RDEIR, 2024b), CTV states that the Monterey Formation in the 26R and A1 - A2 storage reservoirs have "*minimal*" connection outside the Area of Review. The DEIR is vague about what this means for the project and lacks support for this assumption. Do anticlinal structures provide full containment or not? The 26R Reservoir is located within the 26R sands of the 31S anticline while the A1-A2 reservoir is located in the western portion of the Northwest Stevens (NWS) anticline. As discussed by Zumberge et al. (2005), the Northwest Stevens anticline and the 29R anticline share some of the same turbidite sand bodies (24Z and 26R sand bodies) (Figure 1). Also, the Northwest Stevens anticline shares the 26R sand body with the 31A anticline (Figure 1). After filling of the Northwest Stevens anticline reservoirs, oil appears to have spilled into and filled the 24Z trap (Figure 1). This same oil family may also have reached the 2B trap on the east nose of the 29R anticline and the 26R reservoir at the west end of the 31S anticline (Figure 1), again moving within turbidite sand bodies from the Northwest Stevens

(NWS) structure. It appears then that there is hydraulic communication between the Monterey Formation inside and outside of the 26R and A1 - A2 reservoirs and injection must be carefully managed to avoid migration of injected CO_2 outside of these reservoirs (exceedance of spill point). From schematics provided by CTV, there are a large number of wellbores screened in the Monterey Formation outside of storage areas (Figure 2). At least some of these wellbores should be converted to monitoring wells to monitor for both pressure perturbation and CO_2 leakage during injection.

Comment: In Volume II of the recirculated DEIR (RDEIR, 2024b), CTV states that the Area of Review will be reevaluated if unexpected changes in fluid constituents or pressure outside the Monterey Formation 26R reservoir that are not related to well integrity are detected. The recirculated DEIR also states the Area of Review will be reevaluated if unexpected changes in fluid constituents or pressure outside the A1 – A2 reservoir that are not related to well integrity are detected. These statements are meaningless since there is no planned monitoring outside the 26R and A1 – A2 reservoirs.

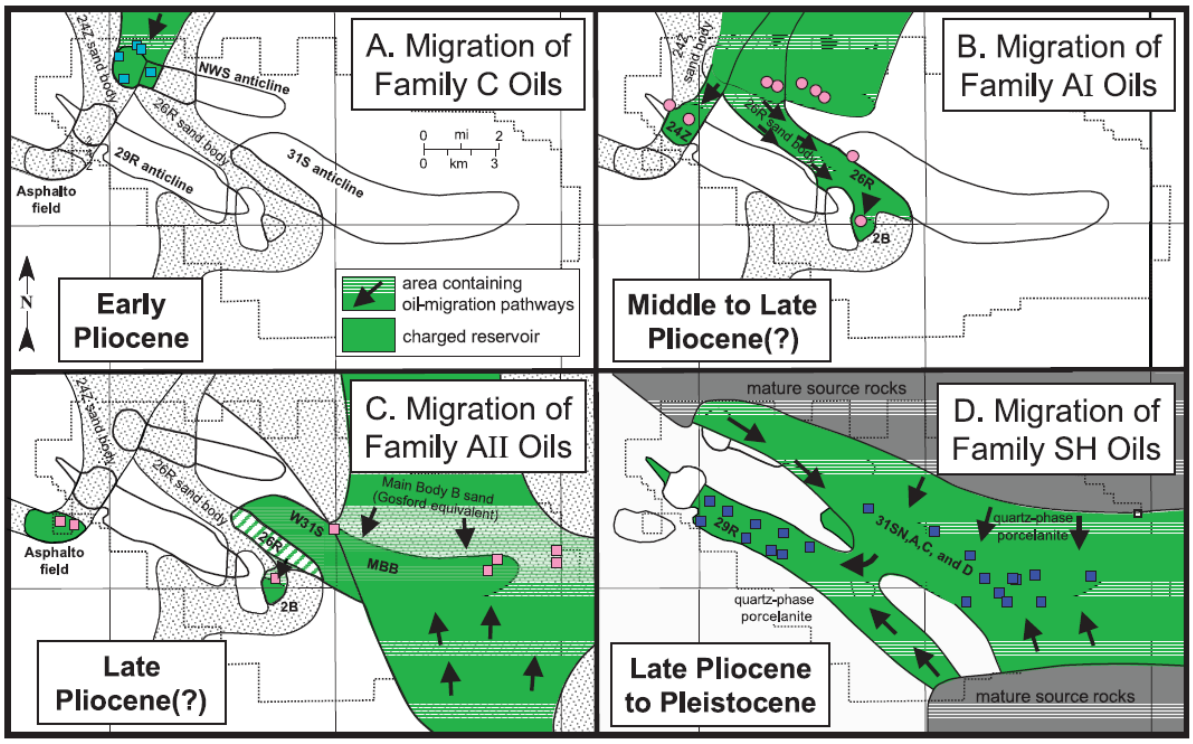

Figure 1. Migration of oil into major Stevens turbidite and porcelanite reservoirs at the Elk Hills Oil Field. (A) Family C oils are restricted to the western end of the Northwest Stevens anticline and are the least mature of the sampled oils. They may have migrated into the earliest formed traps in the Northwest Stevens anticline along turbidite sand bodies updip from the Buttonwillow subbasin. (B) Oils of family AI are likely derived from the Buttonwillow subbasin and filled reservoirs in the central and eastern Northwest Stevens anticline. Oil spilled from the Northwest Stevens traps and followed turbidite sand bodies updip into the 26R, 2B, and 24Z reservoirs. (C) Family AII oils probably are from both the Buttonwillow and Maricopa subbasins and migrated into the 31S reservoirs following the Main Body B submarine-fan complex. Oil possibly leaked into the 26R sand body and spilled into the 2B trap. The occurrence of family AII oil in the Asphalto field remains a dilemma. (D) Family SH oils occur in porcelanite reservoirs across the entire field and are sandwiched stratigraphically between families AI and

AII reservoirs. Migration likely occurred after filling of the turbidite reservoirs and after development of more favorable porosity because of transition of porcelanite from opal-CT to quartz phase. Figure from Zumberge et al. (2005).

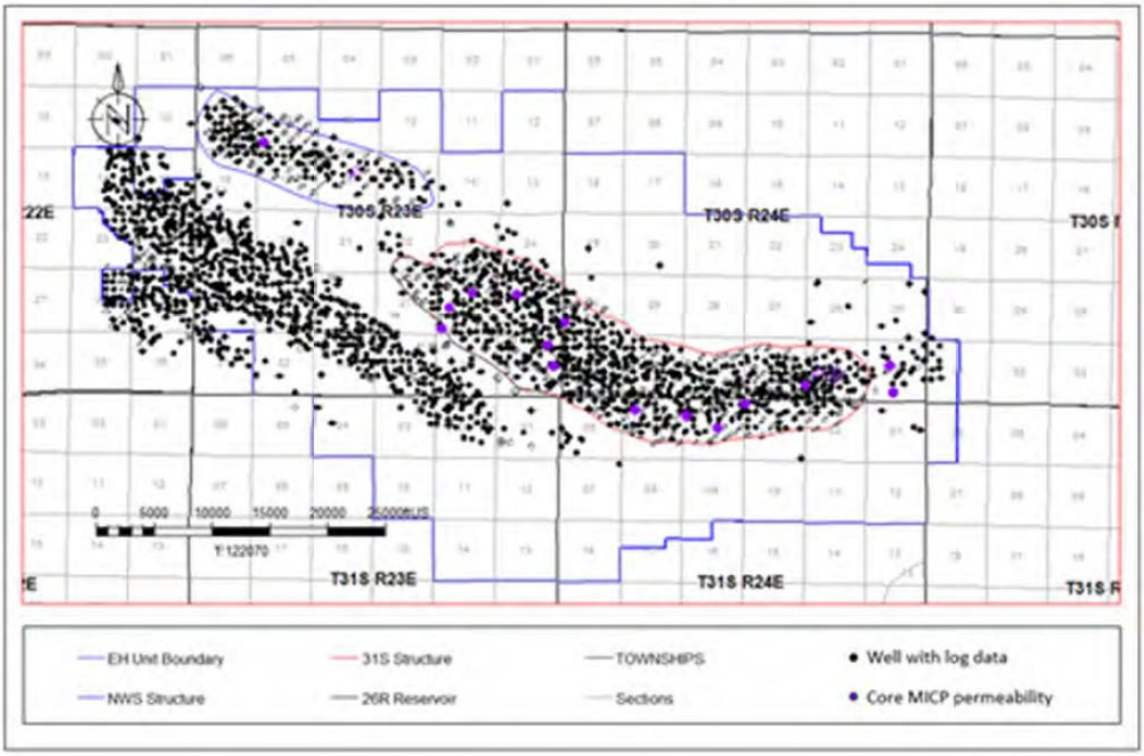

Figure 2. Wells drilled in the Elk Hills Oil Field (EHOF) that penetrate the confining Reef Ridge Shale. All wells shown have open-hole well logs. Wells with MICP core data from the Monterey Formation are shown in purple. Figure from Volume II of recirculated DEIR (RDEIR, 2024b). Note the poor resolution of the figure is due to poor resolution in the recirculated DEIR.

Comment: In Volume II of the recirculated DEIR (RDEIR, 2024b), CTV states that confinement of the Reef Ridge Shale has been demonstrated in the 26R reservoir by the injection of 841 billion cubic feet of gas and 114 million barrels of water with no leakage. CTV states that confinement of the Reef Ridge Shale has been demonstrated in the A1 - A2 reservoir by the injection of 175 billion cubic feet of gas and five million barrels of water with no leakage. Referring to the work by Zumberge et al. (2005), CTV further states that geochemical analysis of reservoirs confirms compartmentalization through several million years and effectiveness of the Reef Ridge Shale to contain the CO_2 injectate (RDEIR, 2024b). However, as discussed in the previous comment, this geochemical analysis also confirmed migration of oil between anticlinal traps, which the DEIR does not discuss. More importantly, there is no evidence of how and if leakage was monitored. It does not appear that CRC used monitoring wells in the Monterey Formation outside the 26R and A1 - A2 reservoir areas to evaluate migration of injected fluids beyond anticlinal structures associated with these formations. It also does not appear that CRC monitored oil and gas wells for gas leakage during enhanced oil recovery operations. Hence, the veracity of these claims cannot be independently verified, and they are not supported by arguments provided. Again, CTV should

convert several existing oil and gas wells screened in the Monterey Formation outside storage reservoirs into additional monitoring wells.

Permanence Criteria

The primary purpose of geological storage of CO_2 is mitigation of climate change. Leakage of CO_2 from a storage formation through wellbores will occur to at least some extent (Celia and Bachu, 2003). Hence, the important question is not whether there will be leakage, but whether the extent of leakage is acceptable (Celia and Bachu, 2003) and how leakage will be monitored and quantitated.

A leakage rate of less than 1% to the atmosphere over 1,000 years is necessary for geological storage of CO_2 to achieve the same climate benefits as renewable energy sources (Shaffer, 2010). This metric for effective storage is more stringent than that of Hepple and Benson (2005) who considered leakage over a shorter time frame and concluded that leak rates of 0.01% per year to the atmosphere, equivalent to 99% retention of the stored CO_2 after 100 years, may be adequate to ensure the effectiveness of CO_2 storage.

In a Special Report on Carbon Dioxide Capture and Storage, the Intergovernmental Panel on Climate Change (IPCC, 2005) stated that for a well selected, designed, operated and appropriately monitored system, the balance of available evidence suggests that it is very likely the fraction of stored CO_2 retained is more than 99% over the first 100 years and it is likely the fraction of stored CO_2 retained is more than 99% over the first 1,000 years.

To assess the risk of leakage of CO_2 through wellbores, Callas et al. (2022) used a storage security calculator developed by Alcalde et al. (2018) to estimate the percent of CO_2 leaked for different densities of wells per square kilometer (km) in a well-regulated environment. Callas et al. (2022) determined that a well density greater than 8 wells/km^2 would result in more than 1% cumulative CO_2 leaked in 1,000 years in a well-regulated environment. They categorize the density of existing or abandoned wells as >8 wells/km^2, 6–7 wells/km^2, 4–5 wells/km^2, 2–3 wells/km^2, and <1 well/km^2 as worst to best for wellbore leakage concerns. Given the presence of 354 well penetrations (204 in 26R reservoir and 150 in A1 - A2 reservoir) through the confining layer and a total storage area of 9,104 acres (36.85 km^2) (RDEIR, 2024a), a well penetration density of 9.6 wells/km^2 represents a worst-case scenario for permanence for geologic storage of CO_2. The presence of a large number of well penetrations necessitates a robust evaluation of wellbore integrity of both plugged and unplugged wells prior to injection and raises serious concerns about the permanence of storage in the 26R and A1- A2 reservoirs.

Comment: In Volume II of the recirculated DEIR (RDEIR, 2024b), CTV stated that computational modeling results calibrated with monitoring data (e.g., pressure) will be used to support that the plume has stabilized and that the pressure change is negligible (less than 10 psi per year) and poses no risk for potential vertical migration after cessation of injection in the A1 - A2 reservoir.

A pressure loss of 10 psi per year is not negligible. A simple back of the envelope calculation indicates that a pressure loss of 10 psi per year starting at 4000 psi (final target pressure) results in complete pressure loss in 400 years (Figure 3) resulting in appreciable CO_2 loss. In reality, the rate of pressure loss will decrease somewhat as pressure decreases in the formation (i.e., reduction in driving force) as illustrated in loss in percent per year (Figure 3). This metric of leakage verification is not sufficiently protective and should be rejected. A target of 0.01% pressure loss per year is more reasonable if permanent storage of CO_2 is actually the goal of this project.

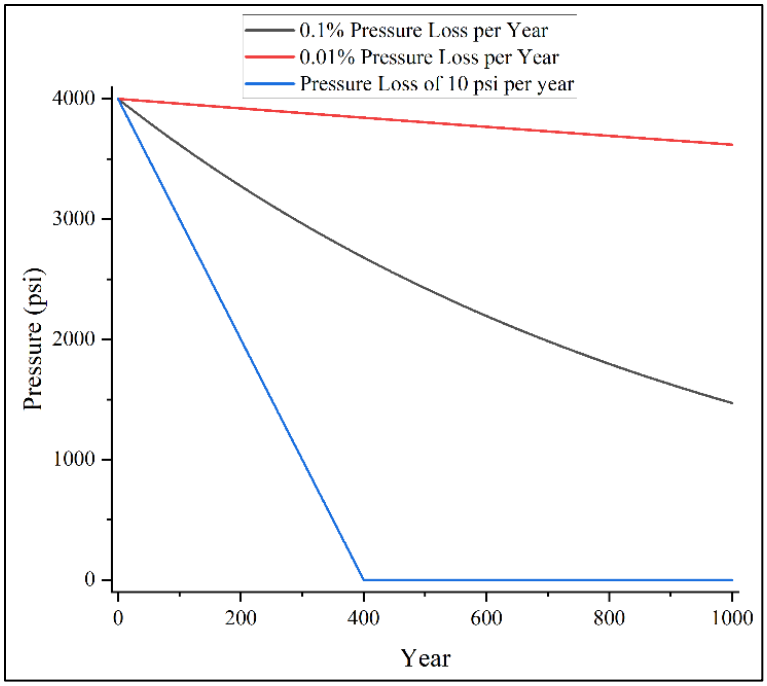

Figure 3. Simulation of 10% pressure loss per year, 0.1% pressure loss per year, and 0.01% pressure loss per year for 1000 years starting at 4000 psi.

Comment: A permanence standard should be established in the recirculated DEIR to determine the effectiveness and impact of the project. In the absence of a permanence standard, there is no metric to determine whether CO_2 is permanently retained. As part of an application for Sequestration Site Certification to receive tax credits, the California Air Resources Board (CARB) requires a greater than 90% probability of occurrence that 99% of CO_2 will be retained in the *"storage complex"* over 100 years post-injection to be eligible to receive Permanence Certification required for operation in California (CARB, 2018). CARB defines a *"storage complex"* as a *"three-dimensional subsurface volume that is characterized, modified by corrective actions, and monitored so that the CCS Project is able to meet the requirements for carbon sequestration under the Permanence requirements…For saline and depleted oil and gas reservoirs, the storage complex includes the injection zone (in which the CO_2 is emplaced), a sequestration volume, which is expected to contain the CO_2, and overlying and possibly underlying geologic formations that are required to provide assurance of storage. The storage complex must include a multilayered confining system that retards vertical migration of CO_2. The storage complex must extend laterally over (1) the volume from which CO_2 (as a free or dissolved phase) could escape from storage in the subsurface if a permeable pathway exists, and (2) the area over which the plume may migrate."* Hence, for the TerraVault I project, the storage complex would include the Etchegoin Formation. In Volume II of the recirculated DEIR (RDEIR, 2024b), CTV refers to the Etchegoin Formation as a *"dissipation interval."* or an allowable zone for migration from the storage formation. However, in the Class VI permit applications for the 26R Reservoir, EPA states that *"The objective of this permit is to prevent the movement of fluids into or between USDWs or into any unauthorized zones consistent with the requirements at 40 CFR 146.86(a)."* There is no allowance or tolerance for leakage outside the storage reservoirs and leakage into the Etchegoin Formation constitutes the movement of fluids into an unauthorized zone. Hence, in EPA regulations, there is no concept of a storage complex and a permanence

standard must be framed in terms of leakage from a storage formation. It is recommended for this project that a permanence criterion be specified as a 95% probability of occurrence that 99% of CO_2 will be retained in the 26R and A1 - A2 reservoirs over a period of 100 years. Based on the research of Shaffer (2010), a criterion for leakage to the atmosphere should be specified as a 95% probability of occurrence that 99% of CO_2 will be retained within all subsurface media over a period of 1,000 years.

Comment: Information presented in Volume II of the recirculated DEIR (RDEIR, 2024b) does not support a finding that the project will have greater than 95% probability that 99% of CO_2 will be retained in the storage reservoirs over a period of 100 years or even a 90% probability that 99% of CO_2 will be retained in a "*storage complex*" over a period of 100 years as required by CARB for tax credits. These retention findings are not credible because: (1) the large number of wellbores (354) penetrating the Reef Ridge Shale serving as primary pathways for leakage, (2) the high pressure (~4,000 psi) (the driving force for leakage) of storage, (3) storage occurring primarily as a separate phase of supercritical fluid resulting in direct contact of supercritical CO_2 with all 354 well penetrations, and (4) the high probability of elevated magnitude seismic activity in the vicinity of the project area capable of inducing levels of peak ground acceleration that would likely induce wellbore damage after plugging. These issues are discussed in more detail below.

Comment: In Volume I of the recirculated DEIR (RDEIR, 2024a), Impact statement 4.8-1 (Generate Greenhouse Gas Emissions, Either Directly or Indirectly, that may have a Significant Impact on the Environment), the level of significance before mitigation is categorized as potentially significant (RDEIR, 2024a). In mitigation measure MM 4.8-1, CTV states that "*Prior to any injection of CO_2 the owner/operator shall submit a monitoring plan that complies with all requirements of the EPA UIC permit issued for the project to demonstrate the retention of CO_2 in the injection/hydrocarbon reservoir zone. The plan shall be submitted to the Kern County Planning and Natural Resources Department concurrent with submittal to the EPA for review. A copy of the final approved plan from the EPA shall be provided to the Kern County Planning and Natural Resources Department"* (RDEIR, 2024a). The monitoring plan submitted in Volume II of the recirculated DEIR does not directly (e.g., soil-gas monitoring) consider leakage from well penetrations – the most likely source of loss of retention of CO_2. Hence, MM 4.8-1 is deficient and should be rejected. It will be necessary to combine continuous areal monitoring of leakage with periodic monitoring of individual well penetrations to ensure retention of CO_2 and to quantify leakage.

Emergency and Remedial Response Plans

Comment: In Volume II of the recirculated DEIR (RDEIR, 2024b) in the Emergency and Remedial Response Plan for the 26R and A1 - A2 reservoirs, CTV outlines emergency and remedial steps to be taken in the event of impact to an Underground Source of Drinking Water (USDW) but argues earlier in the document that no USDWs exist at the 26R and A1 - A2 reservoirs because of an aquifer exemption. In this section, CTV should substitute the term USDW with Lower Tulare Formation.

Comment: In Volume II of the recirculated DEIR (RDEIR, 2024b) in the Emergency and Remedial Response Plan for the 26R and A1 - A2 reservoirs, CTV outlines steps to be taken in the event of well integrity failure. These steps are limited to injection wells. The Emergency and Remedial Response Plan for both the 26R and A1 - A2 reservoirs should include consideration for well integrity loss in monitoring

wells and plugged abandoned wells. For the A1 - A2 reservoir, unplugged wells used for injection in the A3 - A11 reservoir should also be considered.

Comment: In Volume II of the recirculated DEIR (RDEIR, 2024b) in the Emergency and Remedial Response Plan for the 26R and A1 - A2 reservoirs, CTV discussed venting CO_2 from surface facilities in the event of an emergency. There is no discussion how loss of CO_2 will be quantified during venting.

Comment: In Volume II of the recirculated DEIR (RDEIR, 2024b) in the Emergency and Remedial Response Plan for the 26R and A1- A2 reservoirs, CTV does not directly address steps to be taken in the event of leakage into the Lower Etchegoin Formation. Instead, when addressing release into the overlying USDW, CTV states that *"Monitoring of the Lower Etchegoin dissipation interval that overlies the confining Reef Ridge Shale [will be used] to establish leakage before migration to USDW."* At a minimum, leakage into the Lower Etchegoin Formation as determined by pressure perturbation or sample analysis should trigger installation of additional monitoring wells in this formation to evaluate the magnitude and spatial extent of leakage. As previously discussed, in the Class VI permit applications for the 26R Reservoir, EPA states that *"The objective of this permit is to prevent the movement of fluids into or between USDWs or into any unauthorized zones consistent with the requirements at 40 CFR 146.86(a)."* The Etchegoin Formation is not purposeful "*dissipation interval*." Leakage into the Etchegoin Formation constitutes the movement of fluids into an unauthorized zone. Hence, detection of leakage into this zone should necessitate installation of additional monitoring wells and development of a separate monitoring plan for this formation.

Comment: In Volume II of the recirculated DEIR (RDEIR, 2024b) for the A1 - A2 reservoir, CTV states that in case of an induced seismic event having **M** > 2.0, it will initiate gradual shutdown of the injection wells if it is determined "*appropriate.*" The word "*appropriate*" is vague and does not provide a measurable performance criterion per CEQA requirements. After initially using the word *"appropriate"* in Volume II of the original DEIR for the 26R reservoir (DEIR, 2023b), in Volume II of the recirculated DEIR (RDEIR, 2024b), CTV now states that for induced seismic events having **M** > 2.0, that it will initiate a "rate reduction plan" in the 26R reservoir. Why is there an inconsistency here? A rate reduction plan is clearly more appropriate.

Comment: In Volume II of the recirculated DEIR (RDEIR, 2024b) for both the 26R and the A1 - A2 reservoirs, CTV states that shutdown will not be initiated unless a seismic event greater than **M** 3.5 has occurred or a seismic event having **M** > 2.0 accompanied by local observation or report of damage. CTV defines the onset of damage as cosmetic damage to structures, such as bricks dislodged from chimneys and parapet walls, broken windows, and fallen objects from walls, shelves, and cabinets. CTV states that it will monitor well pressure, temperature, and annulus pressure of injection wells to verify well status and determine the cause and extent of any failure, and identify and implement appropriate remedial actions in consultation with the UIC Program Director. There is no mention of evaluation of any other wellbores - a critical oversight. This response action is also inconsistent with CARB requirements. The CARB protocol for CO_2 sequestration requires that the operator continuously monitor for indication of an earthquake of **M** 2.7 or greater occurring within a radius of one-mile of injection operations. If an earthquake of **M** 2.7 or greater is identified, CARB, in consultation with the project operator and the California Geological Survey, or local geological survey or equivalent, must conduct an evaluation of the following: (a) whether there is indication of a causal connection between the injection activity and the earthquake; (b) whether there is a pattern of seismic activity in the area that correlates with nearby injection activity; and (c)

whether the mechanical integrity of any well, facility, or pipeline within the radius specified in subsection C.4.3.2.3(b) has been compromised (CARB, 2018). Hence, if induced seismicity having a magnitude of **M** 2.7 or larger occurs, the operator must conduct an evaluation of the integrity of all wellbores including those plugged and abandoned.

Evaluation of Well Penetrations from Legacy Oil and Gas Wells

As EPA states in the Class VI permit applications for the injection wells for the 26R reservoir, *"the permittee shall not construct, operate, maintain, convert, plug, abandon, or conduct any other injection activity in a manner that allows the movement of injection, annulus or formation fluids into underground sources of drinking water (USDWs) or any unauthorized zones. The objective of this permit is to prevent the movement of fluids into or between USDWs or into any unauthorized zones consistent with the requirements at 40 CFR 146.86(a)"* (EPA, 2024). Hence, even in the absence of a USDW in the 26R and A1 - A2 reservoirs, as a result of an aquifer exemption, the permittee cannot allow migration of CO_2 or other fluids (brine, oil) into overlying or underlying formations.

In 40 CFR 146.84(c)(2), EPA states, *"Using methods approved by the Director, identify all penetrations, including active and abandoned wells and underground mines, in the area of review that may penetrate the confining zone(s). Provide a description of each well's type, construction, date drilled, location, depth, record of plugging and/or completion, and any additional information the Director may require."* In 40 CFR 146.84(c)(3), EPA states *"Determine which abandoned wells in the area of review have been plugged in a manner that prevents the movement of carbon dioxide or other fluids that may endanger USDWs, including use of materials compatible with the carbon dioxide stream."* In 40 CFR 146.84(d), EPA states, *"Owners or operators of Class VI wells must perform corrective action on all wells in the area of review that are determined to need corrective action, using methods designed to prevent the movement of fluid into or between USDWs, including use of materials compatible with the carbon dioxide stream, where appropriate."*

Federal requirements for evaluation of legacy oil and gas wells essentially consist of providing a tabulation of wells penetrating the primary confining layer and a subjective evaluation that plugged legacy wells and wells that will be plugged will not provide a conduit for leakage. These minimal requirements are in sharp contrast to specific internal and external mechanical integrity tests required for injection wells even though legacy wells will be directly exposed to supercritical CO_2 similar to injection wells.

However, in its guidance document on Area of Review and Corrective Action, EPA (EPA, 2013) provides an extensive set of recommendations for evaluation of artificial penetrations. Evaluation commences with review of available information including drilling logs, well completion and plugging reports, casing and cementing records, records on internal and external mechanical integrity tests, cement bond/variable density logs, information on well deviation, and wellbore diagrams (EPA, 2013). EPA states that if available records cannot establish wellbore integrity prior to plugging (e.g., corrosion in well casing and competent cement outside casing at critical locations such as at the interface of the injection zone and confining layer), additional testing is recommended (EPA, 2013). Additional testing could include multi-finger caliper logging, cement evaluation logging, internal and external mechanical integrity testing, and sidewall coring (EPA, 2013).

Logically, additional testing should include testing for sustained casing pressure and surface casing vent flows which are indicators of wellbore integrity failures and increase the potential for gas emissions and groundwater contamination (Ingraffea et al., 2014, 2020; Lackey and Rajaram, 2019; Soares et al., 2021). Leak testing using procedures developed by Kang et al. (2016) could also be utilized to evaluate well integrity.

Wellbore integrity failure is common. Rates of wellbore integrity failure range from 2 to 75% (Davies et al., 2014). Recent analysis of state and provincial databases show that wellbore integrity issues are widespread in oil and gas well populations in Canada and the U.S. and are likely under-reported or not reported at all depending on the jurisdiction (Wisen et al., 2020; Lackey et al., 2021; Ingraffea et al., 2014, 2020; Abboud et al., 2021).

Wellbore integrity failures are not necessarily addressed through well plugging and can persist after the well is "properly" plugged (Bowman et al., 2023; Kang et al., 2021; Wisen et al., 2020). Surface casing vent flow or sustained casing pressure in an oil or gas well may be due to annular gas flow which may not have been properly addressed during plugging. Importantly, regulations for plugging oil and gas wells in California do not require assessment of the cement sheath outside casing. Hence, gas flow in the annulus outside casing will persist after plugging.

For instance, DiGiulio et al. (2023) found that approximately 9 of 27 (33%) of plugged oil and gas wells were leaking gas through vent pipes at the surface and 3 of 26 (10%) of plugged wells examined were leaking gas through soil at the surface in western Pennsylvania, clearly demonstrating that oil and gas wells can and do leak gas after plugging. Kang et al. (2016, 2017) and DiGiulio et al. (2023) found mean emission rates of leakage of methane from plugged wells in western Pennsylvania were 360 and 390 g/d, respectively. However, the computation of the mean emission rate from plugged wells in the dataset from DiGiulio et al. (2023) excluded an outlier, a plugged well leaking at a rate of 83 kg/d. It is important to realize that these rates are from depleted oil and gas fields. Higher emission rates of gas (in this case CO_2) would be expected if reservoirs were repressurized as is the case for geological storage of CO_2 in depleted oil and gas fields such as at the TerraVault I Project. DiGiulio et al. (2023) and other investigators have found that emission rates from both unplugged and plugged oil and gas wells follow a distribution whereby leakage from a relatively small number of wells accounts for the majority of total leakage. It is plausible, if not likely, that leakage of CO_2 from abandoned wells will follow a similar distribution.

Addressing gas migration via the annulus outside casing requires treatments such as cement squeezes and casing repair (Hachem et al., 2023; Ingraffea et al., 2014; Yousuf et al., 2021). However, the process of investigation and then remediating annular gas leakage is more complex and expensive than the average plugging procedure (Raimi et al., 2021) whereby plugs are simply placed inside casing, as will be the case at the TerraVault I project.

Comment: Neither the State of California nor EPA in its Class VI regulations require investigation or remediation of the cement sheath outside casing prior to plugging legacy oil and gas wells within the Area of Review to support geological sequestration of CO_2. Because these plugged wells at TerraVault I are expected to contain highly pressurized supercritical CO_2 for hundreds if not thousands of years, the County should not ignore the serious gaps in the existing regulatory framework and must require full investigation and remediation.

Comment: In Volume II of the recirculated DEIR (RDEIR, 2024b), CTV states that there are 150 wellbores in the A1 - A2 storage reservoir penetrating the Reef Ridge shale. There are 41 active, 70 idle, and 39 plugged and abandoned wells. Of active and idle wells, 79 wellbores produce oil and gas while 32 wellbores are used for gas or water injection. CTV states further that 33 wells in the A1 - A2 have been identified for abandonment. Since there are 79 currently unplugged wellbores, 3 wellbores that will be reconfigured for injection, and 3 wellbores that will be reconfigured as monitoring wells, what is the status of the remaining 40 wellbores? How many of these wellbores will be used for continued production in the underlying A3 - A11 reservoir? The RDEIR should account for these wells.

Comment: The recirculated DEIR is replete with vague terms that lack definitions and measurable standards. In Volume II of the recirculated DEIR (RDEIR, 2024b), CTV states that in the A1 - A2 reservoir, all wells within the Area of Review are protective of the USDW because there is *"sufficient"* annular cement within the confining Reef Ridge Shale. What precisely does *"sufficient"* mean? The word *"sufficient"* is vague and does not provide a measurable performance criteria per CEQA requirements. Does cement in the annulus cover the entire extent of the Reef Ridge Shale? How was the integrity of the cement evaluated? What standards were utilized?

Comment: In Volume II of the recirculated DEIR (RDEIR, 2024b), Appendix 1 for the A1 - A2 reservoir (page 3421) does not have a column on evaluation of annular cement in the 20-foot A2 shale between the A1- A2 reservoir and A3 - A11 reservoir. CTV states that all wellbores in the A1 - A2 reservoir that are not planned for abandonment have been determined to be "*adequately*" isolated from A1-A2 sands. What precisely does *"adequate"* mean? The word *"adequate"* is vague and does not provide a measurable performance criteria per CEQA requirements. Does annular cement extend completely through the A2 shale? How was the integrity of the cement evaluated?

Comment: In Volume II of the recirculated DEIR (RDEIR, 2024b), appendices (page 3221 for the 26R reservoir and page 3421 for the A1 – A2 reservoir) provide a tabulation of wells by well name, API number, wellbore type (producer, injector, abandoned), wellbore status (active, idle, plugged), date drilled, surface latitude, surface longitude, wellbore total measured depth, wellbore total vertical depth, well construction method (vertical cased cemented, directional cased cemented, original hole cased cemented with sidetrack, sidetrack - open hole with sidetrack, sidetrack - directional cased cemented), completion record within injection zone (open, not opened, abandoned, isolated), USDW isolation (no USDW), annular isolation within injection zone (adequate, adequate with P&A, no annulus, not drilled to injection zone, plug/isolation within the injection zone (adequate, adequate with P&A, unplugged), plug/isolation within the upper confining layer (adequate, adequate with P&A, unplugged), pre-operational testing requirement (none, abandon, convert to monitoring well), corrective action requirement (none). A number of descriptors in this appendix are confusing. For instance, while the term sidetrack is generally understood, what does "sidetrack - open hole with sidetrack" and "sidetrack - directional cased cemented" mean? Example diagrams of each well construction method should be provided to facilitate transparent review and full participation by the public and expert agencies. For completion record within the injection zone, it is not clear what "not opened and isolated" means. Again, each descriptor should have some sort of explanation.

Comment: In these appendices, what does *"adequate"* annular isolation within the injection zone mean? The word *"adequate"* is vague and does not provide a measurable performance criteria per CEQA

requirements. Does this mean that there is cement outside casing at these locations? It is unclear how this could be the case for wells completed in the 26R reservoir.

Comment: In these appendices, what does *"adequate"* with P&A mean for these wellbores? Again, the word *"adequate"* is vague and does not provide a measurable performance criteria per CEQA requirements. Importantly, for plug/isolation within the injection, for plugged wells, does *"adequate"* mean that a cement is placed across the entire production interval and > 100 feet into the Reef Ridge Shale by CalGEM regulations? If this is not the case, plugs within these wellbores should not be considered *"adequate"* and at least potentially necessitate corrective action. For plug/isolation within upper confining layer, does *"adequate"* mean that a competent cement sheath outside casing extends entirely through the Reef Ridge Shale? How would "competent" be defined? Use of cement bond/variable density logs conducted shortly after well completion are not representative of current conditions, especially in injection wells with countless pressure cycles which are known to debond cement from casing and cause microannuli.

Comment: Wellbore schematics are absolutely vital in understanding the need or potential need for corrective action. In Volume II of the recirculated DEIR (RDEIR, 2024b), CTV states that the corrective action assessment included the generation of detailed wellbore/casing diagrams for each wellbore. The wellbore diagrams include depths and dimensions of all hole sections, casing strings, cement plugs and other wellbore equipment that isolates portions of the wellbore or otherwise establishes plugback depth. Perforated intervals are apparently described with depth and status of perforations. Top of Cement determination results were apparently provided to support review for annular isolation. Depths to relevant geologic features such as formation tops and injection zone are provided in both measured and true vertical depths. CTV states further that the depth of the confining zone in each of the wells penetrating the Reef Ridge shale was determined through open hole well logs and utilized the deviation survey to convert measured depth along the borehole to true vertical depth from surface. CTV then states that CTV can demonstrate that the USDW is protected and that, with well abandonment and monitoring, the CO_2 injected will be confined to the Monterey Formation 26R reservoir. CTV has claimed that these wellbore schematics are business confidential information. Unfortunately, the EPA agreed with CTV that disclosing the wellbore diagrams *"would result in reasonably foreseeable harm to the Company's commercial interests"* (EPA, 2024b). It is difficult to reconcile this statement with the fact that wellbore diagrams are commonly publicly posted on state oil and gas internet sites (e.g., Wyoming Oil and Gas Commission). This unjustified lack of transparency can and indeed should erode public confidence in this project. In addition to wellbore diagrams, CTV should make all information associated with wellbores relevant to wellbore integrity publicly available (e.g., internal and external mechanical integrity tests, drilling and cementing records, cement bond/variable density logs, cement squeeze operations, etc.). Information on plugging locations now provided in Appendix 2 in the recirculated DEIR is not a substitute for wellbore schematics.

Comment: In the recirculated DEIR, CTV identified 204 wellbores in the 26R reservoir and 150 wellbores in the A1 - A2 reservoirs (RDEIR, 2024b). No wellbores were deemed deficient in either reservoir and none require corrective action, according to the document. This 0.0% wellbore barrier failure rate for 354 wellbores is at odds with the published rates of wellbore failure rates ranging from 2 - 75% in the literature. Since no information (sustained casing pressure, surface casing vent flow, gas migration in soil, internal and external mechanical integrity testing, cement evaluation logs, wellbore diagrams, drilling logs, etc.) was provided, it is impossible to verify the accuracy of this statement, which

should be regarded with a considerable degree of skepticism. Did Kern County or EPA actually conduct an independent evaluation of wellbore integrity of each well penetration? A statement of no wellbore barrier failure cannot be accepted without supporting information. Again, all supporting information (wellbore diagrams, cement evaluation logs, internal and external mechanical integrity tests, etc.) should immediately be made available to the public to enable an independent evaluation of wellbore integrity.

Comment: In Volume II of the recirculated DEIR, CTV states that, "all wellbores within the AoR will, *if necessary*, be mechanically pressure tested, abandoned, reabandoned, monitored or have a technical demonstration showing *adequate* zonal confinement prior to the commencement of CO_2 injection or based on an agreed upon phased scheduled post CO_2 injection if conditions allow." Again, the words *"if necessary"* and *"adequate"* are vague and do not provide a measurable performance criteria per CEQA requirements. It is unclear what conditions would preclude pressure testing. Since all wellbores penetrating the confining layer will be in direct contact with supercritical CO_2 at high pressure, prior to plugging, all wellbores should have a standard annular pressure test (SAPT) in casing above and between screened intervals to evaluate the integrity of casing as will be conducted for injection and monitoring wells. All testing factors should be similar to what is specified for monitoring wells: Testing surface pressure should be 1000 psi, isolation of pressure should be maintained for no less than one hour, and if the change (gain or loss) in pressure is greater than 3% of test pressure, the well has failed to demonstrate internal mechanical integrity. It is unclear what happens if a well fails a SAPT. Will the well be entered to investigate parted or corroded casing? Also, what is a demonstration of *"adequate zonal confinement"?* To evaluate the cement sheath outside casing, a cement evaluation log should be conducted on all wellbores prior to plugging. Statements in the Corrective Action Plan are too vague to be of any use. Hence, the Corrective Action Plan is unacceptable. Under CEQA, all feasible mitigation is required. The terms of the Corrective Action Plan do not constitute all feasible mitigation.

Comment: In Volume II of the recirculated DEIR, CTV states that the Etchegoin Formation consists of a lower silty shale member and an upper sandy interval. The sand dominated sequences consist of multiple sands that are 10 feet in thickness, 29 – 37% porosity, 32 – 826 mD permeability and can contain oil. Between sand reservoirs are laterally continuous shales that are sealing and prevent hydraulic communication from above and below. The Etchegoin Formation is dominated by laterally continuous shales which limit hydraulic communication between sand lenses. In the recirculated DEIR, CTV states that the Etchegoin Formation will dissipate CO_2 injectate that may migrate upward from the injection zone. According to the recirculated DEIR, in both the 26R and A1 - A2 reservoirs, the Etchegoin will be monitored continuously for pressure and temperature changes using one monitoring well to provide confirmation of the confinement of CO_2 to the injection zone by also continuously measuring temperature changes in the Etchegoin (via DTS). In both areas, CTV states that a monitoring well in the Etchegoin Formation will continuously measure pressure and temperature providing continuous direct measurements to assess the confinement of the injected CO_2 and provide adequate spatial coverage across the Area of Review to evaluate confinement of CO_2 in the storage reservoir. One monitoring well in each reservoir cannot provide adequate coverage. Heterogeneity as described above will affect detection of increase in pressure during leakage. The presence of shale lenses will likely dramatically affect measurement of pressure in the Etchegoin Formation. CTV needs to stipulate the minimum magnitude of leakage that would be detected from pressure perturbation from the injection well located at the greatest distance from each monitoring well. CTV needs to justify the existence of only one monitoring well in the Etchegoin Formation.

Comment: In Volume II of the recirculated DEIR (RDEIR, 2023b), CTV states that a laterally continuous 20-foot thick A2 shale having an average permeability of 0.05 millidarcies separates the A1 - A2 and underlying A3 - A11 reservoirs. This is in comparison to the Reef Ridge shale overlying the A1 - A2 reservoir having an average thickness of 1,555 feet and an average permeability of 0.0084 millidarcies. The A3 - A11 reservoir is currently undergoing waterflooding which will continue during injection of CO_2 into the A1 - A2 reservoir. CTV states that the A1 - A2 reservoir is hydraulically isolated from the A3 - A11 reservoir because: (1) the A1-A2 reservoir was previously pressure supported by gas injection (175 billion cubic feet injected) while the A3-A11 reservoir is currently pressure supported by waterflood (449 million barrels of water injected) and (2) the Monterey Formation A1 - A2 reservoir is at 200-300 PSI and the A3-A11 reservoir is much higher at approximately 1,700 PSI. CTV states that it will monitor the Monterey Formation A3 - A11 reservoir and wellbores for CO_2 migration from the A1 - A2 reservoir. Waterflood producers will be monitored via fluid sampling once per quarter for changes in composition. In addition, Monterey Formation A3 - A11 waterflood injectors will have mechanical integrity tests (MIT) and standard annular pressure tests to ensure internal and external mechanical integrity. Additionally, in one portion of the recirculated DEIR, CTV states that due to its waterflood infrastructure and high reservoir pressure, the A3 - A6 reservoir is considered a viable future target for CO_2 miscible enhanced oil recovery. In another portion of the recirculated DEIR, CTV states that due to its waterflood infrastructure and high reservoir pressure, the A3 - A11 reservoir is considered a viable future target for CO_2 miscible enhanced oil recovery. It is not clear where the A3 - A6 reservoir is located or if it even exists. Since pressure in the overlying A1 - A2 reservoir will have a much higher pressure during CO_2 injection, migration through the thin A2 shale and wellbores penetrating the A2 shale constitute a major potential leakage pathway. Leakage into the A3 - A11 reservoir would constitute loss of containment.

Comment: In Volume II of the recirculated DEIR (RDEIR, 2024b), CTV states that surface air monitoring, including broad aerial monitoring and targeted monitoring at wells and pipelines, will be conducted using eddy covariance towers. In regard to leakage to the atmosphere, under 40 CFR Part 98 Subpart RR, an operator must submit a proposed monitoring, reporting, and verification (MRV) plan to EPA within 180 days of receiving a final Class VI permit (§98.448(b)(2)). As part of the MRV plan, the operator must: (1) "identify potential surface leakage pathways for CO_2 in the maximum monitoring area and the likelihood, magnitude, and timing, of surface leakage of CO_2 through these pathways" (§98.448(b)(2)); (2) develop "a strategy for detecting and quantifying any surface leakage of CO_2" (§98.448(b)(3)); and (3) develop "a strategy for establishing the expected baselines for monitoring CO_2 surface leakage" (§98.448(b)(4)). Hence, leakage to the atmosphere will be considered at some point. However, a monitoring program should be specific to evaluating leakage from plugged well penetrations as general air monitoring may not be sufficiently sensitive to determine leakage. It is unclear what the magnitude of leak detection from plugged and unplugged wells would be from eddy covariance towers and whether eddy covariance towers would provide comprehensive coverage of all well penetrations. MM 4.8-1 needs to include specific monitoring for leakage from plugged and unplugged well penetrations. Methods employed by Kang et al. (2016) can be used for CO_2 monitoring at both plugged and unplugged wells.

Seismic Risk Evaluation

Of particular concern at the TerraVault I project is the effect of natural or induced seismicity on wellbores. After a well is permanently plugged and abandoned, natural or induced seismicity can damage wellbores. For example, hundreds of oil well casings were sheared in the Wilmington oil field in Los Angeles during

five or six earthquakes of relatively low seismic moment magnitude (**M** 2 to **M** 4) during a period of maximum subsidence in the 1950s (Dusseault et al., 2001). The seismic moment magnitude is the product of the area of rupture, the average displacement on the fault (a fracture or zone of fracture between two blocks of rock), and the shear modulus, a parameter related to the rigidity of rocks in the fault zone measured on a logarithmic scale (GWPC, 2021). Recently, Pozzobon et al. (2023) documented increased leakage of gas from plugged oil and gas wells resulting from seismic activity due to injection of produced water into disposal wells and hydraulic fracturing.

Impacts of earthquakes on buildings and pipelines, including those that are buried, have long been an active area of civil engineering research. There are empirical estimates of pipeline damage that relate the number of repairs to peak ground acceleration, peak ground velocity, maximum ground strain, and other factors. There is a need to extend this existing body of research to subsurface wellbore leakage caused by earthquakes (Kang et al., 2019), especially in regard to geological storage of CO_2.

USEPA's Class VI regulations require permit applicants to provide a determination that seismic activity will not compromise subsurface containment of injected carbon dioxide (40 CFR 146.82(a)(3)(v)). The Class VI rule provisions do not address potential damage to buildings and infrastructure (including wellbore cement sheaths of active and abandoned wells) associated with geologic storage of CO_2. However, as part of its permanence requirements for geologic sequestration, the California Air Resources Board (CARB) has developed requirements which include consideration of natural and induced seismicity (CARB, 2018). In the California Carbon Capture and Sequestration Protocol under the Low Carbon Fuel Standard (CARB, 2018), if an earthquake of $\mathbf{M} \geq 2.7$ is detected within a radius of one mile of CO_2 injection operations, a determination must be made whether the mechanical integrity of any well, facility, or pipeline within this radius has been compromised. This protocol however does not consider a naturally occurring major seismic event at distance from an injection well which could induce ground movement damaging wellbores. In addition, the California Energy Commission has developed guidelines to evaluate the potential for induced seismicity during geological storage of CO_2 (CEC, 2017).

Given uncertainty in potential impact due to natural and induced seismicity during geological storage of CO_2, protocols developed by U.S. Department of Energy's (DOE) Recommended Practices for Managing Induced Seismicity Risk Associated with Geologic Carbon Storage (Templeton et al., 2021, 2023) should be used when permitting a facility for geological storage of CO_2. This integrated and risk-based protocol is a product of the DOE's National Risk Assessment Partnership, a multi-year collaborative research effort of Los Alamos National Laboratory, Lawrence Berkeley National Laboratory, Lawrence Livermore National Laboratory, National Energy Technology Laboratory, and Pacific Northwest National Laboratory. This protocol specifically addresses the risk of seismicity at a geologic carbon storage facility and is relevant to CO_2 injection at Carbon TerraVault I. Recommendations by Templeton et al. (2021, 2023) and regulatory requirements and guidelines by EPA and the State of California are used here as the basis of evaluation for the seismicity portion of the permit application.

Review of Applicable Local, State, and Federal Laws and Requirements on Seismicity

Relevant local, state, and federal laws and regulations should be reviewed to determine how induced seismicity, however minor or unlikely, is regulated and its effects prevented or mitigated (Templeton et al., 2021). In California, the Alquist-Priolo Earthquake Fault Zoning Act (1972) and the Seismic Hazards Mapping Act (1990) direct the State Geologist to delineate regulatory "Zones of Required Investigation"

to reduce the threat to public health and safety and to minimize the loss of life and property posed by earthquake-triggered ground failures and other hazards. Cities and counties affected by the zones must regulate certain development projects within them, based on the CA CGS Information Warehouse: Regulatory Map Portal (https://maps.conservation.ca.gov/cgs/informationwarehouse/regulatorymaps/). As stated in the recirculated DEIR, the Carbon TerraVault I project does not appear to be within a Zone of Required Investigation. Kern County reviewed compliance with other applicable laws and regulations for this project in the document.

Review of Naturally Occurring Seismic Events and Delineation of a Region of Concern

To support a Class VI rule application, an owner/operator is required to submit a narrative description and information on the seismic history of the area, including the presence and depths of seismic sources, and a determination that seismicity will not interfere with containment of injected carbon dioxide (40 CFR 146.82(a)(3)(v)).

CARB requires an evaluation of the seismic history of the proposed sequestration site, including the date, magnitude, depth, and location of the epicenter of seismic sources and a determination that the seismicity would not cause a catastrophic loss of containment, either by breaching the integrity of the well or the sequestration formation (CARB 2018).

To evaluate the impact of a major naturally occurring seismic event distant from a site on a site, it is necessary to define a Region of Concern (ROC). The ROC is defined as the area in which a ground motion threshold over the lifetime of a project could be exceeded causing impact to infrastructure (Templeton et al., 2021), which in this case includes wellbores. An assessment or literature search should identify any tectonic events that may have occurred in the region and a map and catalog should be created for seismic events which have occurred within at least 200 km from the reservoir (Templeton et al., 2021).

Previous seismic activity should be characterized within a region of at least 200 km radius around planned injection operations to ensure that wider regional trends are considered in the seismic hazard assessment (Templeton et al., 2021, 2023). This consideration reduces the possibility of overlooking infrequent but possibly large events that could impact the local hazard. Elements of the seismicity characterization should include:

- Catalogs of instrumentally recorded earthquakes from national, state, or regional agencies.
- Historical records of earthquakes and observed fault ruptures, including but not limited to, historical earthquake catalogs, and newspaper and other contemporary records, and published reports of field geological investigations. Historic reports of significant earthquakes can provide important information on time periods that predate instrumental recording. For rare events that occur once every few hundred to thousands of years, this may be the only evidence of seismic activity.
- Fault maps and fault characterizations, including but not limited to, scientific maps and publications.
- Paleoseismic fault displacement data, including but not limited to, published trenching studies.
- Previous induced earthquake activity, including but not limited to, earthquake catalogs and scientific publications investigating possible induced activity. If the targeted region has a history of induced seismicity, this would be a strong indication of a critically stressed crust.

In Volume II of the original DEIR (2023b) and recirculated DEIR (RDEIR, 2024b), Soils Engineering Inc. conducted a review of naturally occurring seismic events since 1852. Their identified Region of Concern however was limited to 100 km from the Carbon TerraVault I project. Major faults within this area are illustrated in Figure 4.

From 1852 through 2020, southern California has experienced at least 20 major earthquakes with estimated Richter scale magnitudes ranging from 5.9 to 8.0. As Soils Engineering Inc. discuss, the nearest major active faults in the western portion of the CTV Project are the San Andreas Fault located approximately 23.0 to 23.3 km to the southwest, the Kern Front Fault located approximately 39.7 to 39.9 km to the northeast, the Pleito Fault located approximately 48.3 to 48.7 km to the southeast, the White Fault located approximately 48.6 to 48.9 km to the east-southeast, and the Buena Vista Fault (minor active fault) located approximately 15.42 km to the southeast. The nearest major active faults in the eastern portion of the CTV Project are the San Andreas Fault located approximately 23.9 to 24.6 km to the southwest, the Kern Front Fault located approximately 35.5 to 36.8 km to the northeast, the White Fault located approximately 39.2 to 42.5 km to the east-southeast, the Pleito Fault located approximately 40.0 to 42.9 km southeast, and the Buena Vista Fault located approximately 9.41 km to the southeast.

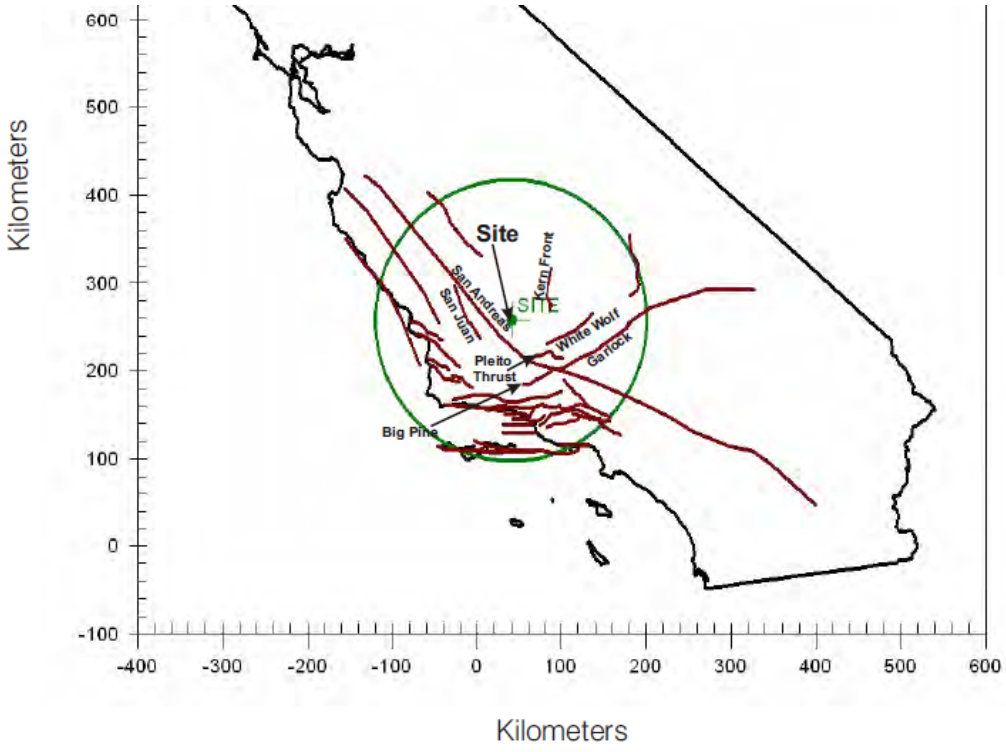

Figure 4. Identification of major faults in the vicinity of the TerraVault 1 Project. Figure from Soils Engineering, Inc. in Volume II of the recirculated DEIR (RDEIR, 2024b).

Some of these faults have produced earthquakes in excess of seismic moment magnitude **M** 7 (Figure 5). The San Andreas fault is a strike-slip fault (two blocks slide horizontally past each other). The 1857 **M** 7.9 Fort Tejon earthquake along the San Andreas fault, with an epicenter (the surface location directly

above the depth or hypocenter where rupture is initiated) in Parkfield, CA (Figure 6) was one of the greatest earthquakes ever recorded in the United States. The San Andreas fault broke the surface continuously for at least 350 km (220 miles), possibly as much as 400 km (250 miles). In Figure 6, the estimated earthquake intensity using the Modified Mercalli (MM) scale (Table 1) is estimated with distance from the epicenter. Intensity is a qualitative measure of the strength of shaking at a specific place and is characterized in terms of impact of shaking on individuals as well as on objects and structures. It is not a measure of the size of the earthquake.

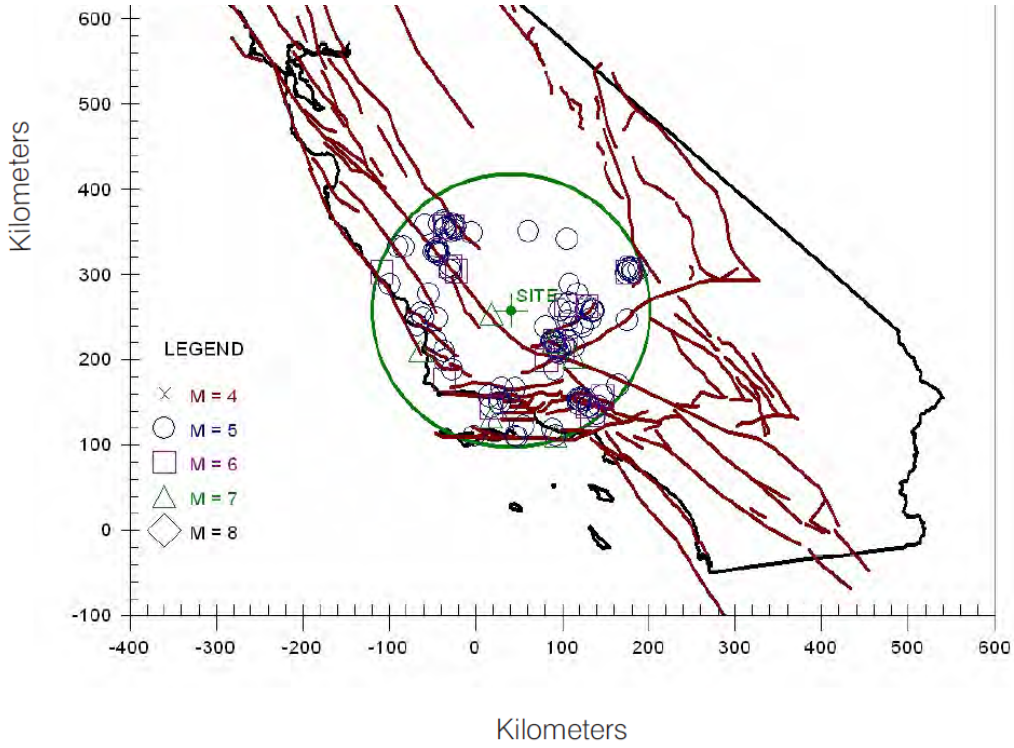

Figure 5. Magnitude of earthquakes along major faults in the vicinity of the CTV project. Figure from Soils Engineering, Inc. in Volume II of the recirculated DEIR (RDEIR, 2024b).

During the Fort Tejon earthquake, horizontal displacement as much as 9 meters was observed on the Carrizo Plain. As a result of the shaking, the current of the Kern River was turned upstream, and water ran four feet deep over its banks. The waters of Tulare Lake were thrown upon its shores, stranding fish miles from the original lake bed. The waters of the Mokelumne River were thrown upon its banks, reportedly leaving the bed dry in places. The Los Angeles River was reportedly flung out of its bed, too. Some of the artesian wells in Santa Clara Valley ceased to flow, and others increased in output. New springs were formed near Santa Barbara and San Fernando (USGS, 2023).

At the time of the earthquake, California was sparsely populated, especially in the regions of strongest shaking. Were the Fort Tejon shock to happen today, the damage would easily run into billions of dollars, and the loss of life would likely be substantial (USGS, 2023). Strong shaking was reported to have lasted for at least one minute but possibly lasted two or three minutes. The portion of the fault that ruptured in 1857 has settled into a period of dormancy and this has given rise to suggestions that future slip along that zone may be characterized by a very large 1857-type event followed by another period of inactivity (Sieh, 1978).

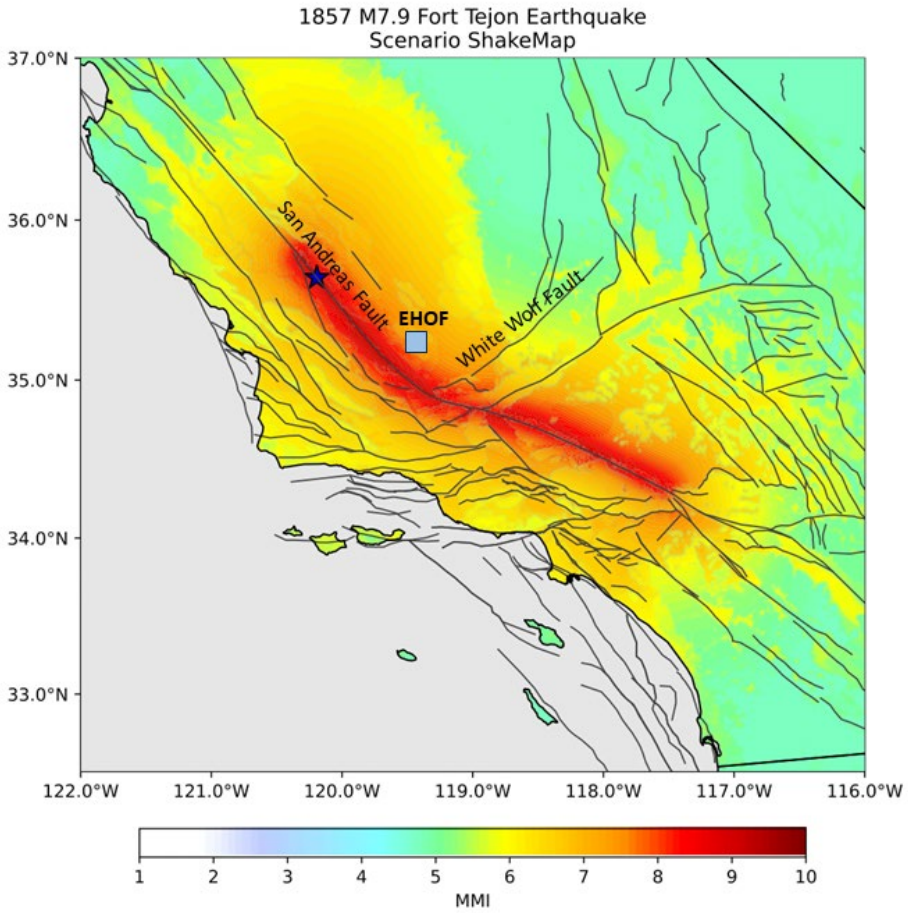

Figure 6. Location of faults in southern California and of the 1857 Tejon earthquake on the San Andreas Fault and estimated Modified Mercalli Intensity. The Epicenter illustrated by dark blue star. Approximate location of EHOF illustrated by light blue box. San Andreas and White Wolf Faults identified. Figure modified from Southern California Earthquake Data Center.

The Elkhorn Thrust, a thrust fault (reverse fault having a shallow or low angle dip) near the San Andreas fault, may have slipped simultaneously in the 1857 Fort Tejon quake indicating that future movements along the San Andreas fault zone might produce simultaneous rupture on thrust faults causing a "double earthquake" (Southern California Earthquake Center). Reverse faults (hanging wall moves up and over the foot wall) are common in southern California and other areas experiencing tectonic compression (GWPC, 2021).

As discussed by Soils Engineering, Inc. in Volume 2 of the recirculated DEIR (RDEIR, 2024b), an earthquake of **M** 8.0 has been estimated for this segment of the San Andreas Fault having a conditional probability of occurrence of 0.1 (10%) over the 30-year period of 1988 to 2018. Other segments of the San Andreas fault include the Cholame (north) and Mojave (south) segments. Their respective distances from the site and characteristic magnitudes are 58 miles and **M** 7.3 (Cholame) and 78 miles and **M** 7.8 (Mojave). The associated conditional probabilities of occurrence, for the 30-year period of 1988 to 2018 were 0.3 (30%) for both segments.

Table 1. Modified Mercalli Intensity, peak ground acceleration (PGA), and peak ground velocity (PGV) for the central United States. Source: GWPC (2021).

MMI	Description	PGA (g)	PGV (cm/sec)	Observations (Richter 1958)
I	Not felt	< 0.00007	< 0.003	Not felt except by a few under especially favorable circumstances.
II to III	Weak	0.0008	0.04	Felt by only a few people, often indoors. Hanging objects swing. May not be recognized as an earthquake.
IV	Light	0.01	0.5	Hanging objects swing. Vibration like passing of heavy trucks; or sensation of a jolt like a heavy ball striking the walls. Standing motor cars rock. Windows, dishes, doors rattle. Glasses clink. Crockery clashes. In the upper range of IV, wooden walls and frames creak.
V	Moderate	0.05	3.0	Felt outdoors; direction estimated. Sleepers awakened, liquids disturbed, some spilled. Small unstable objects displaced or upset. Doors swing, close, open. Shutters, pictures move. Pendulum clocks stop, start, change rate.
VI	Strong	0.09	6.5	Felt by all. Many frightened and run outdoors. Persons walk unsteadily. Windows, dishes, glassware broken. Knickknacks, books, etc., off shelves. Pictures off walls. Furniture moved or overturned. Weak plaster and masonry cracked. Small bells ring (church, school). Trees, bushes shaken.
VII	Very strong	0.15	14	Difficult to stand. Noticed by drivers of motor cars. Hanging objects quiver. Furniture broken. Damage to masonry D, including cracks. Weak chimneys broken at roofline. Fall of plaster, loose bricks, stones, tiles, cornices, un-braced parapets, and architectural ornaments. Some cracks in masonry. Waves on ponds; water turbid with mud. Small slides and caving in along sand or gravel banks. Large bells ring. Concrete irrigation ditches damaged.
VIII	Severe	0.27	30	Steering of motor cars affected. Damage to masonry; partial collapse. Some damage to masonry B; none to masonry A. Fall of stucco and some masonry walls. Twisting, fall of chimneys, factory stacks, monuments, towers, elevated tanks. Frame houses moved on foundations if not bolted down; loose panel walls thrown out. Decayed piling broken off. Branches broken from trees. Changes in flow or temperature of springs and wells. Cracks in wet ground and on steep slopes.

The White Wolf Fault is a high-angle reverse fault with a small component of left-lateral slip. Movement along this fault was the cause of the **M** 7.5 1952 Bakersfield Earthquake, which most consider to be the third largest historic quake in California, after the 1857 Tejon and 1906 San Francisco quakes. The White Wolf fault is traceable for only about 48 km (34 miles), much less than the fault length typically thought necessary to produce such a major earthquake. The earthquake caused severe damage as far away as Las Vegas. In addition, there were at least 20 aftershocks of **M** 5 or greater associated with the initial **M** 7.5 event (San Joaquin Valley Geology).

Ground motion can cause structural and nonstructural damage to buildings as well as to civil structures, such as dams, bridges, highways, railroads, tunnels, pipelines, tanks, and airport runways. It is commonly accepted that structural damage to modern engineered structures generally happens for earthquakes larger than **M** 5.0 (GWPC, 2021). For example, for the National Seismic Hazard Maps, which are the basis for the building codes in the U.S. (International Building Code), the U.S. Geological Survey (USGS) uses a minimum magnitude of **M** 5.0 in the western U.S. and **M** 4.75 in the central and eastern U.S. in their hazard calculations (Petersen et al. 2014). Poorly designed or constructed buildings, such as unreinforced masonry, for example, brick and adobe, and buildings built before modern building codes can be subject to nonstructural damage at magnitudes as low as **M** 4.0 and, in some rare cases, as low as **M** 3.0 (GWPC, 2021). It is unclear what magnitude seismic event would be sufficient to cause damage to wellbores.

However, as previously stated, seismic events below **M** 3 or 4 can damage wellbores. Hence, the California Carbon Capture and Sequestration Protocol requirement for a determination of integrity of any well, facility, or pipeline when an earthquake of **M** ≥ 2.7 has been detected within a radius of one mile of CO_2 injection operations is reasonable.

Comment: In Volume II of the recirculated DEIR (RDEIR, 2024b) for both the 26R and A1 - A2 reservoirs, CTV states that during the 1952 Kern County earthquake, there were no reservoir containment issues associated with oil and gas operations at the Elk Hills Oil Field. However, as stated in both the DEIR and recirculated DEIR, while the 26R reservoir was discovered in the 1940s, it was not developed until the 1970's. Also, the A1-A2 reservoir was not discovered until the 1970s. Hence, CTV's statement in this regard is misleading and should be removed from the recirculated DEIR.

Comment: In Volume II of the recirculated DEIR (RDEIR, 2024b) for both the 26R and A1 - A2 reservoirs, CTV states that the Area of Review will be reevaluated if seismic "events reasonably associated with CO_2 injection that are greater than **M** 3.5." The document fails to properly explain the basis of this determination. In the California Carbon Capture and Sequestration Protocol under the Low Carbon Fuel Standard (CARB, 2018), if an earthquake of **M** ≥ 2.7 is detected within a radius of one mile of CO_2 injection operations, a determination must be made whether the mechanical integrity of any well, facility, or pipeline within this radius has been compromised. The County should consider this measure in its analysis.

Comment: Seismic risk is calculated from four main contributing factors. The first factor is seismic hazard, which is the probability of exceedance of a specified ground motion intensity. The second factor is exposure, which is the infrastructure or population potentially affected by seismicity. The third factor is fragility, which is the susceptibility of each element of exposure to damage from ground motion intensity. The fourth factor is consequence, which is the metric chosen to quantify the risk (e.g., economic impact, loss of CO_2 containment) (Mitchell and Green, 2017). The seismic risk analysis conducted in the recirculated DEIR is deficient because it fails to consider all four factors, especially for legacy wells which were not considered at all. In the document, hazard curves were generated, however, legacy wells were not identified as part of exposure to seismicity. Fragility functions were not identified for any infrastructure including legacy wells and the consequences of leakage through legacy wells were not quantified. Hence, a comprehensive seismic risk analysis was not conducted in the recirculated DEIR.

Hazard Evaluation of Natural Seismic Events

Hazard curves can be generated to evaluate a given percent probability of exceedance of a peak ground acceleration or spectral acceleration level over a period of time (e.g., 10% probability of exceedance in 50 years). Peak ground acceleration is a measure of the maximum force experienced by a small mass located at the surface of the ground during an earthquake. It is an index to hazard for short stiff structures. Spectral acceleration is a measure of the maximum force experienced by a mass on top of a rod having a particular natural vibration period. Short buildings (e.g., less than 7 stories) have short natural periods (e.g., 0.2-0.6 sec). Tall buildings have long natural periods (e.g., 0.7 sec or longer) (USGS). Peak ground acceleration appears to be the appropriate metric to evaluate potential to wellbores.

Templeton et al. (2021) state that a site-specific probabilistic seismic hazard analysis should be conducted in accordance with current practice of earthquake hazard estimation to evaluate the baseline hazard from

natural tectonic seismicity. Input into the site-specific probabilistic seismic hazard analysis should include the following:

- A database of potentially damaging earthquake sources that may impact the ROC, that experienced activity during the Quaternary Period (past 1.6 million years), including fault-specific sources and areal sources where appropriate. Areal seismic sources are distinct volumes within the Earth's crust that encompass concentrated zones of seismicity,
- Spatial, temporal, and frequency-magnitude distribution models for each seismic source.
- Region appropriate ground motion models for tectonic earthquakes as a function of at least earthquake magnitude and travel path. A ground motion model relates a ground motion parameter such as peak ground acceleration or peak ground velocity to magnitude, distance, and site condition. There are numerous models for tectonically active regions, such as the western U.S. (GWPC, 2021). The models for the western U.S. rely on empirical motion data obtained from instrumental records of earthquakes or numerical modeling in the absence of adequate strong motion data. Empirical models are often developed by performing a statistical regression on a ground motion parameter from the recorded data to find the best fitting model. Current ground motion models do not extend below **M** 3.0 (GWPC, 2021). Common inputs into a ground motion model include magnitude, distance, and site condition. For small earthquakes generally less than **M** 4, hypocentral distance is an adequate distance metric. For larger events, a distance metric that accounts for the finite dimensions of the fault rupture area is desirable. For most models, rupture distance (the shortest distance to the fault plane) is used (GWPC, 2021). Site condition inputs also are required to accurately predict ground shaking, particularly at a soil site (GWPC, 2021).
- Information from geological, geophysical, and topographical studies within the ROC should be included to incorporate local site responses.

Templeton et al. (2021) state a seismic hazard report should be prepared by a licensed professional having demonstrated competence in the field of seismic hazard assessment. The seismic hazard report should contain site-specific assessments of the seismic hazard affecting the project and relevant sites within the ROC. The report should identify any known seismic hazards that could adversely affect relevant sites within the ROC in the event of an earthquake. Results from the probabilistic seismic hazard analysis should include multiple hazard curves and hazard maps to report the results from the baseline seismic hazard analysis due to natural seismicity before injection operations commence. Federal and state permitting agencies should then independently review the seismic hazard report to determine the adequacy of the hazard evaluation. The reviews should be conducted by licensed professionals having demonstrated competence in the field of seismic hazard assessment.

Volume II of the recirculated DEIR (RDEIR, 2024b) contains a report entitled "Preliminary Soil and Geologic Evaluation Terra Vault 1 Carbon Capture Project Elk Hills" completed by Soil Engineering Inc. that contains a probabilistic seismic hazard analysis for the facility. Soils Engineering Inc. used the computer modeling program EQSEARCHWIN version 3.0 (Thomas Blake) to evaluate historical earthquakes in the area of the site over the last 200 years. The largest estimated site accelerations are 0.221g (Section 36) to 0.295g (Section 7/18) from a 7.9 magnitude earthquake on January 9, 1857.

A number of active faults are located within a 50-mile radius of the subject site. Soils Engineering Inc. used the computer modeling program EQFaultwin vers. 3.0 (Thomas Blake) to evaluate the effect that a major earthquake within a 50-mile radius might have on the site. The program computed the maximum

peak site ground accelerations resulting from an earthquake. Results of this analysis are presented in Table 2.

Table 2. Identification of faults near the site and associated maximum earthquake magnitude, estimated maximum peak ground acceleration at the site, and associated site intensity. Table from Soils Engineering, Inc. in Volume II of the recirculated DEIR (RDEIR, 2024b).

FAULT	Approximate Distance (Km)	Maximum Earthquake Magnitude (Mw)	Maximum Peak Ground Acceleration	Estimated Site Intensity (MM)
San Andreas (Other Segments)	**23 to 24.6**	7.4 to **8.0**	0.128 to **0.258**	VIII to **IX**
Kern Front	35.5 to 39.9	6.3	0.085 to 0.093	VII
White Wolf	39.2 to 48.9	7.3	0.123 to 0.146	VIII
Pleito Thrust	40.0 to 48.7	7.0	0.105 to 0.122	VII
San Juan	42.6 to 47.6	7.1	0.093 to 0.101	VII
San Luis Range	72.8 to 76.2	7.2	0.083 to 0.086	VII
Big Pine	64.9 to 73.4	6.9	0.060 to 0.066	VI
Great Valley 14	79.6 to 85.7	6.4	0.050 to 0.052	VI
Garlock (west)	70.3 to 73.6	7.3	0.069 to 0.076	VI to VII

This analysis estimates that a maximum peak ground acceleration of up to 0.258g would be felt at the site as a result of a maximum earthquake of **M** 8.0 on the San Andreas Fault approximately 23 to 24.6 kilometers away (Table 2). A maximum probable earthquake of **M** 7.3 on the White Wolf Fault approximately 39.2 to 39.9 kilometers away would create a peak site ground acceleration of up to 0.146g at the site.

Soils Engineering Inc. then utilized USGS's Unified Hazard Tool (USGS, 2024) to generate hazard curves for the site which was re-produced for this report in Figure 7. The USGS program calculates peak ground and spectral acceleration at a site for all the earthquake locations and magnitudes believed possible in the vicinity of the site. Each of these magnitude-location pairs is believed to happen at some average probability per year. Small ground motions are relatively likely, large ground motions are very unlikely. Beginning with the largest ground motions and proceeding to smaller, probabilities are summed to calculate a total probability for a particular period of time (USGS).

For the project location, a peak ground acceleration rate of 0.4363g was estimated having a 5% probability of exceedance in 50 years with an annual rate of exceedance = 1.025E-03 or a return period of 475 years (RDEIR, 2024b). The return period or time horizon is the inverse of the annual rate of exceedance. Using the USGS "rule of thumb" for calculating return period, this is approximately equivalent to a 9.8% probability of exceedance in 100 years, a 42% probability of exceedance in 500 years, and a 69% probability of exceedance in 900 years. A further examination of the hazard curves

(Figure 8) (not included in the recirculated DEIR) indicates a peak ground acceleration of 0.3175g having a 10% probability of exceedance in 50 years, 19% probability in 100 years and a 64% probability of exceedance in 400 years. Care was taken in these calculations to ensure that r* ≤ 1 where r* = r(1+0.5r) and r = probability as recommended by USGS (USGS, 2024).

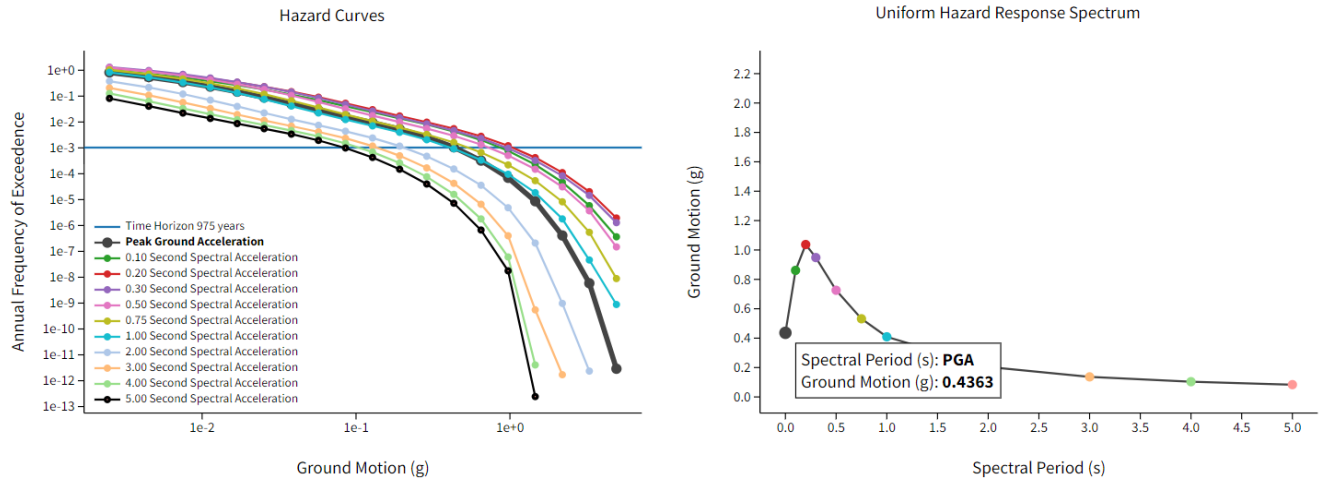

Figure 7. Generation of hazard curves for the site location (latitude 35.325027, longitude, -119.544935) using the USGS Unified Hazard Tool for a probability of exceedance of 5% in 50 years. For an annual frequency of exceedance of 1.025E-03 or return period (inverse of frequency of exceedance) of 975 years, peak ground acceleration = 0.4363g (43.63% of the gravitational constant).

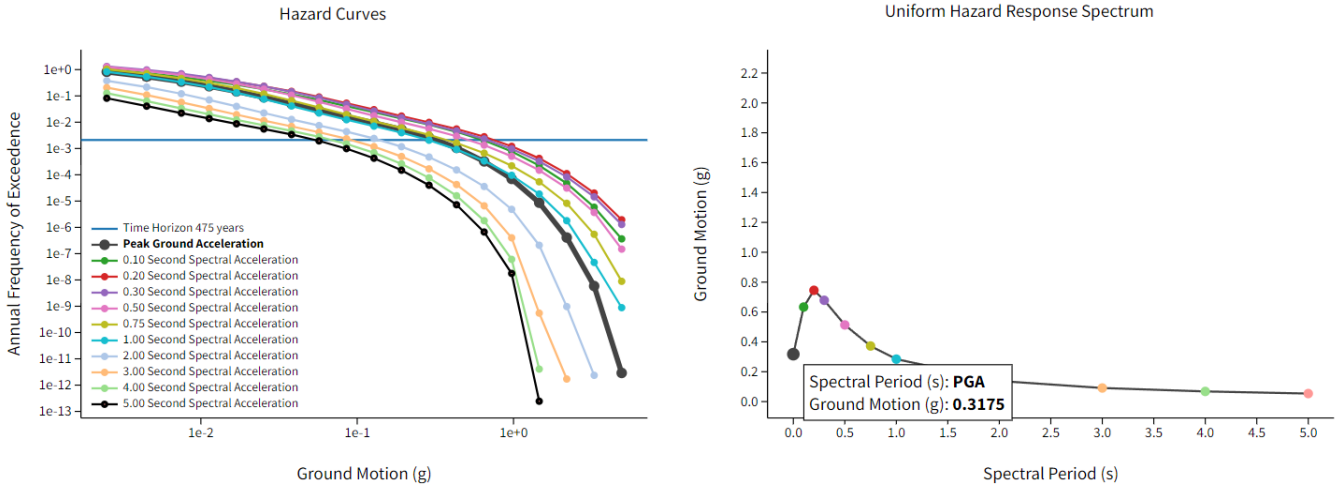

Figure 8. Generation of hazard curves for the site location (latitude 35.325027, longitude, -119.544935) using the USGS Unified Hazard Tool for a probability of exceedance of 10% in 50 years. For an annual frequency of exceedance of 2.105E-03 or return period (inverse of frequency of exceedance) of 475 years, peak ground acceleration = 0.3175g (31.75% of the gravitational constant).

Comment: In Volume 1 of the recirculated DEIR (RDEIR, 2024a), in Impact 4.7-1, it is stated that an earthquake may, *"Directly or Indirectly Cause Substantial Adverse Effects, Including the Risk of Loss,*

Injury, or Death Involving the Rupture of a Known Earthquake Fault, as delineated on the most recent Alquist-Priolo earthquake fault zoning map issued by the state geologist for the area based on other substantial evidence of a known fault." This impact is considered potentially significant. Mitigation measure 4.7-1 consists of preparing *"a comprehensive seismic activity monitoring plan that includes, but is not limited to, connection to the Statewide seismic monitoring program of California Seismic Network (CISN)… The final plan shall be approved by the California Air Resources Board and include all requirements of State law including but not limited to: Appropriate subsurface monitoring to ensure geologic sequestration of injected carbon dioxide; Identification of hazards and conditions that may require the suspension of carbon dioxide injections; notification protocols for all applicable agencies and emergency procedures. All requirements for seismic monitoring adopted by the California Air Resources Board – "Carbon Capture, Removal, Utilization and Storage Program" shall be implemented."*

While a seismic monitoring plan would be able to detect an earthquake, a seismic monitoring program would not reduce damage to surface and subsurface facilities (e.g., wellbores). Unlike induced seismicity as a result of injection of CO_2, monitoring of natural seismicity is not mitigation. Cement used outside of well casing is a brittle material susceptible to damage from ground motion. Hence, a seismic monitoring program would not mitigate damage from a natural major earthquake within 100 km of the Carbon TerraVault I project to a less-than-significant level. In the presence of moderate seismic activity at the project area (e.g., MMI ≥ 5, PGA ≥ 0.05g, PGV ≥ 3.0 cm/s), mitigation should include assessment of leakage at wellbores and reentry and replugging of wellbores in the event of increased leakage from wellbores. The Level of Significance for Impact 4.7-1 should be changed from Less than Significant to Significant and Unavoidable.

Comment: In Volume II of the recirculated DEIR (RDEIR, 2024b), Soils Engineering Inc. states, that *"Project proponent will design structures in accordance with state and county code requirements for seismic ground shaking and geotechnical and geohazard constraints. Designs shall comply with seismic, soil response at the site, and structural dynamic characteristics contained in the Kern County Code of Building Regulations and the California Building Code and State of California design standards Chapter 16 and 18. These design standards are required by law for all new structures in Kern County and were established to reduce the potential impact to structures from strong seismic shaking to a less than significant level."*

These regulations do not address wellbore integrity. It is not clear whether wellbores can withstand a peak ground acceleration of 0.258g, let alone peak ground accelerations of 0.3175g or 0.4363g. A peak ground acceleration of 0.27 g is associated with a Modified Mercalli Intensity of VIII with observations including: steering of motor cars affected; damage to masonry and some masonry walls; twisting, fall of chimneys, factory stacks, monuments, towers, elevated tanks; frame houses moved on foundations if not bolted down; loose panel walls thrown out; changes in flow or temperature of springs and wells; and cracks in wet ground and on steep slopes. Hence, this mitigation measure is not appropriate, at least for wellbores like those that would be impacted at Elk Hills. Also, Templeton et al. (2021) state that an evaluation of the anticipated losses as a function of ground motion intensity can be achieved either directly by using vulnerability functions or indirectly through the use of fragility functions. Vulnerability functions directly relate ground motion intensity to anticipated losses. Fragility functions relate ground motion intensity to the probability of damage and are often expressed as either loss ratio curves, damage probability matrices, or fragility curves (Templeton et al., 2021). There does not appear to be vulnerability and fragility functions associated with oil and gas wellbores. However, based on a Modified Mercalli

Intensity of at least VIII, wellbore damage would reasonably be expected from a major seismic event within 100 km of the Carbon TerraVault I project. The Level of Significance for Impact 4.7-2 should be changed from Less than Significant to Significant and Unavoidable. In the presence of moderate seismic activity at the project area (e.g., MMI ≥ 5, PGA ≥ 0.05g, PGV ≥ 3.0 cm/s), mitigation should include assessment of leakage at wellbores and reentry and replugging of wellbores in the event of increased leakage from wellbores.

Comment: CARB requires that an operator use appropriate tools to characterize potential risks of adverse impacts on the environment, health, or safety, by combining the assessment of the probability of occurrence and the magnitude of the adverse impacts of identified project risk scenarios. Risk scenarios identified as part of this assessment must be classified high risk, medium risk, or low risk, according to the combination of probability of occurrence during a 100-year period and the severity of potential consequences (Table 3). Given an approximately 10% and 20% probability of a major seismic event inducing a peak ground acceleration of 0.44 g and 0.32 g, respectively, at the TerraVault I Project area, risk should be classified as high. At a minimum, this high-risk classification should mandate robust evaluation and monitoring of wellbore integrity.

Table 3. CARB Risk scenario classification.

	Insubstantial[2]	**Substantial**[2]	**Catastrophic**[2]
> 5%[1]	Medium risk	High risk	High risk
1-5%[1]	Low risk	Medium risk	High risk
< 1%[1]	Low risk	Medium risk	Medium risk

1 Probability of occurrence over 100 years
2 Severity of potential consequences

Additional Hazard from Induced Seismicity

Induced seismicity is of concern for faults that are optimally oriented, critically stressed, and of sufficient size to cause damage sufficient to induce leakage of sequestered CO_2. Leakage of CO_2 could occur through a damaged confining layer, from activation of faults penetrating a confining layer, or through wellbore damage.

Induced seismicity considerations in the Class VI regulations are largely limited to CO_2 migration through faults penetrating the confining layer. EPA (2013) states that use of seismic hazard maps to demonstrate the reasonable expectation that no induced seismic events would occur during the course of a CCS project may fulfill the requirements at 40 CFR 146.82(a)(3)(v). However, if such maps indicate a substantial likelihood of seismic activity, other required geologic information, such as geomechanical data, depth to confining zones, and fault stability analysis may be needed to demonstrate that seismic activity will not compromise subsurface containment (EPA, 2013). An owner/operator is required to determine the

“location, orientation, and properties of known or suspected faults and fractures that may transect the confining zone(s) in the Area of Review, along with a determination that they will not interfere with containment” (40 CFR 146.82(a)(3)(ii)). The owner/operator is also required to demonstrate the presence of a “confining zone(s) free of transmissive faults or fractures and of sufficient areal extent and integrity to contain the injected carbon dioxide stream and displaced fluids” (40 CFR 146.83(a)(2)).

It is stated in the Class VI permit applications that in 2019 three-dimensional (3D) seismic survey data was re-processed to allow a more focused structural image around tight folds and faults (EPA, 2024). Offsetting the 31S anticline are high-angle reverse faults that are oriented NW-SE. It is stated that these inactive faults penetrate the lowest portions of the Monterey Formation but not the lower Reef Ridge Shale above the Monterey Formation in the 26R reservoir. It is also stated the 26R reservoir is continuous across the Area of Review and the sands pinch-out up-dip and on the channel edges. As such, the 26R reservoir has minimal connection outside the Area of Review creating a reservoir with no connection to regional saline aquifers (EPA, 2024). The emphasis of EPA regulations are on upward migration of brine and CO_2 as opposed to downward propagation of pressure. The concern with faults in the Monterey Formation may be uncertainty associated with potential propagation of pressure below the storage formation, such as has occurred during disposal of produced water in Class II disposal wells and during hydraulic fracturing.

Increased subsurface fluid injection activity has led to increased seismicity at some sites, including near oil and gas wastewater (produced water) disposal sites, hydraulic fracturing sites, and engineered geothermal systems (Ellsworth, 2013; Keranen and Weingarten, 2018; Templeton et al., 2020). Induced seismicity has raised concerns about the scalability of geologic storage of CO_2 considering the seismic hazard and risk associated with far-reaching subsurface pressurization and adjacent basement rocks (Zoback and Gorelick, 2012; White and Foxall, 2016). Even in areas of low to moderate natural seismic activity, fluid injection may induce earthquakes in excess of **M** 4 (Templeton et al., 2023).

Seismogenic response to fluid injection may vary strongly from site to site and between different injection intervals (Templeton et al., 2023). Weingarten et al. (2015) and Schultz et al. (2018) show that the potential for inducing earthquakes in wastewater disposal and hydraulic fracturing, respectively, correlates positively with the total injected fluid volume and the rate of injection. However, the causative mechanisms of induced seismicity and geomechanical conditions at injection sites are diverse and involve many poorly constrained or unknown parameters. Significant uncertainties on the likelihood of inducing seismicity can persist even after careful characterization. It is not fully understood why some operations can cause significant induced seismicity while others do not (Templeton et al., 2021).

Before 2011, the **M** 4.8 event in 1967 near Denver, Colorado, was the largest event widely accepted in the scientific community as having been induced by fluid injection. The Rocky Mountain Arsenal earthquakes demonstrated how the diffusion of pore pressure within an ancient fault system can initiate earthquakes many kilometers from the injection point, delayed by months or even years after injection ceased (Hermann et al. 1981). The **M** 5.7 event in November 2011 in central Oklahoma is now the largest known induced seismic event (Kerenan et al., 2013). This earthquake damaged homes and unreinforced masonry buildings in the epicentral area and was felt as far as 1000 km away in Chicago, Illinois.

Seismicity may be induced tens of kilometers away from large-scale injection. The occurrence of seismicity farther away from injection implies that stress changes much smaller than 1 MPa may be

sufficient to trigger seismicity even in naturally quiescent areas. Recent studies indicate that effective stress changes on the order of 100 kPa (14.5 psig) or less can found near earthquake hypocenters (Keranen et al., 2014; Barbour et al., 2017; Norbeck and Rubinstein, 2018; Zhai et al., 2020).

Even faults capable of **M** 5 earthquakes may be previously unknown. In many of the induced seismicity cases, faults that hosted even the largest events > **M** 5 were not known beforehand (Templeton et al., 2023). Even natural events, such as the 2014 Napa, California earthquake, often occur on blind faults (Brocher et al., 2015). This can be related to the difficulty of imaging faults in basement rocks or the lack of vertical offset in the sedimentary overburden from subvertical strike-slip faults.

The largest injection-induced events have all involved faulting that is considerably deeper than the injection interval (Horton, 2012), suggesting that transmission of increased pressure into the basement elevates the potential for inducing earthquakes. Hence, during geologic storage of CO_2, it is important that pressure perturbation from injection not be transmitted below depths of injection.

Few commercial scale geologic CO_2 storage sites exist that can be used as prototypes to study induced seismic response. The Cogdell CO_2 enhanced oil recovery project has been associated with felt earthquakes. The seismicity in the Cogdell project has been attributed to the very high injection rates and the presence of faults in the reservoir (Gan and Frohlich 2013). At the Illinois basin–Decatur project and the associated Illinois Industrial Carbon Capture and Sequestration Sources project, as of 2022, 2.8 million metric tons of CO_2 have been injected into the Mt. Simon saline sandstone reservoir with detection of nearly 20,000 seismic events with **M** up to 1.2, although none have been felt at the surface (Williams-Stroud et al., 2020). As a result of seismic activity, injection was moved to a shallower zone within the Mt. Simon sandstone resulting in fewer seismic events (Williams-Stroud et al., 2020).

Dvory and Zoback (2021) state that since depleted oil and gas fields have decreased pore pressure compared to initial conditions, it is plausible that the risk of induced seismicity in depleted oil and gas fields may be less than that associated with other storage configurations (e.g., saline aquifers) because increased pore pressure beyond initial conditions is one of the main causes of injection-induced seismic events.

One study of particular relevance to the Carbon TerraVault I project is a potentially injection-induced earthquake swarm in 2005 associated with the WhiteWolf Fault (Goebel et al., 2016). It was comprised of a **M** 4.5 event on 22 September, followed by two **M** 4.7 and **M** 4.3 events the same day. The White Wolf swarm is suspected to be connected to fluid-injection activity at the Tejon Oil Field based on a statistical assessment of injection and seismicity rate changes (Goebel et al., 2015). Injection wells at the Tejon Oil Field targeted a 25–30 m thin, highly permeable stratigraphic zone within the Monterey formation composed of turbiditic sand lenses with maximum lateral extents of 1 to 2 km (Goebel et al., 2016). Recall that turbiditic sand lenses are targeted for CO_2 storage at the Carbon TerraVault I project.

Based on geological mapping, seismicity, and well-log data, Goebel et al. (2016) identified a seismically active normal fault referred to as “Tejon Fault” in proximity to the Tejon Oil Field which deepened (7.7 km) toward the northwest below the Wheeler Ridge fault before intersecting with the White Wolf Fault 8 km from injection wells (Figure 9). Pressure diffusion was likely influenced by an 11 km high permeability pathway along the seismically active part of the Tejon fault (Goebel et al., 2016). Numerical modeling indicated that for a fault zone permeability above ~300 mD and fault width below ~800 m, a pressure increase of just 0.01 MPa (1.5 psi) was sufficient to induce seismicity on a fault favorably

oriented to slip (Goebel et al., 2016) as also observed by Keranen et al. (2014) and Hornbach et al. (2015). Given the discussion here, the primary concern at the Carbon TerraVault I project is pressure transmission below the Monterey Formation, not above it. Investigative studies have demonstrated that pressure propagation can occur over large distances and depths during injection of fluids and that a very small pressure differential can induce seismicity. Hence, analysis conducted by CTV in the recirculated DEIR and Class VI permit applications does not eliminate the potential for inducted seismicity at the Carbon TerraVault I project.

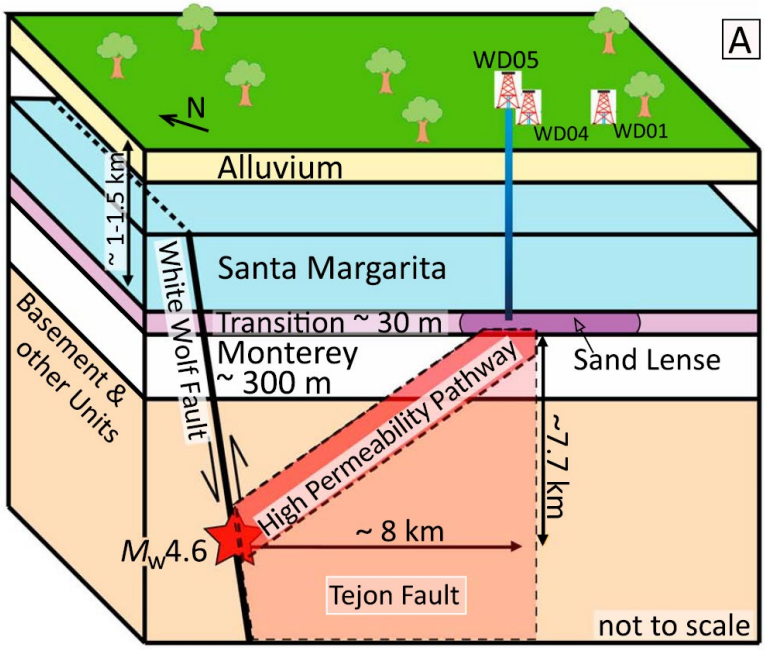

Figure 9. Schematic representation of pressure migration along a high-permeability fault between the Tejon Oil Field and a M 4.6 seismic event along the White Wolf Fault.

Comment: For induced seismicity, the primary concern here is pressure transmission below the Monterey Formation, not above it. In the Class VI regulations, the primary concern is leakage through faults in the confining layer, not transmission of pressure and induced seismicity below the storage formation. Hence, neither EPA regulations nor the recirculated DEIR adequately consider induced seismicity. Callas et al. (2022) state that lack of a lower confining seal (permeability > 100 nanodarcy) is a disqualifying threshold for geologic storage of CO_2 because of potential pressure propagation to basement rock capable of producing seismic activity. According to schematics provided in Volume II of the recirculated DEIR (RDEIR, 2024b), the Reef Ridge Shale bounds both the upper lower Monterey Formation and has an average permeability of 0.01 millidarcy or 10,000 nanodarcy. As discussed, in the 26R and A1 - A2 Storage Areas, CTV states that final pressure will target the initial reservoir pressure at the time of discovery. Hence, this would decrease but not eliminate the possibility of induced seismicity.

Seismic Monitoring Network Design

The Class VI regulations do not include an explicit requirement for a seismic monitoring plan. However, in its Class VI Implementation manual for UIC Program Directors, EPA states that concerns about

seismicity or uncertainties about the seismic history of the site raised during site characterization may necessitate the inclusion of passive seismic monitoring (EPA, 2013).

Seismic data needs to be gathered, analyzed, and archived during the lifetime of a project for geologic storage of CO_2. These data are needed to accurately assess and periodically reassess the natural and induced seismic hazard and risk associated with the project and to aid in the rapid and effective detection and characterization of the seismicity at the site. This data is especially needed as input into induced seismicity mitigation plan protocols (e.g., traffic light systems). In general, the National Earthquake Information Center (NEIC) and other national or state monitoring systems are not sufficient for monitoring induced seismicity at a facility for geologic storage of CO_2 (Templeton et al., 2021). Routine detection of small events in the immediate vicinity of the injection site is necessary to detect problematic developments as early as possible.

The California Carbon Capture and Storage Review Panel recommended that seismic risks be considered during the operation and monitoring of CO_2 storage projects and stated that specialized seismic monitoring may be warranted (California Institute for Energy and Environment, 2010). The CARB protocol for CO_2 sequestration requires that the operator deploy and maintain a permanent, downhole seismic monitoring system to determine the presence or absence of any induced micro-seismic activity associated with all wells and near any discontinuities, faults, or fractures in the subsurface (CARB, 2018). Templeton et al. (2023) state that to record seismicity within the ROC, it is expected that the footprint of the seismic network would need to extend beyond the ROC. In the 26R Reservoir and A1 - A2 Area of Review areas, CTV will monitor seismicity with a network of surface and shallow borehole seismometers. Specifically, CTV will deploy 6 sensor locations (borehole and near surface) most of which are outside the Area of Review. CTV states that this data will help establish historical natural seismic event depth, magnitude, and frequency in order to distinguish between naturally occurring seismicity and induced seismicity resulting from CO_2 injection.

The Technical Advisory Committee to the California Carbon Capture and Storage Review Panel recommended that monitoring for induced seismicity should begin during the site selection and assessment phase to establish a baseline record of the natural background seismicity in the region encompassed by the project using the state's existing seismometer network augmented by a local network. Templeton et al. (2023) recommend that prior to commencing injection operations, a seismic monitoring network should be operated for at least 6 months but preferably 1 year or longer and be designed to detect and characterize seismicity occurring in the ROC down to at least **M** 1. CTV states in the Class VI permit application that a seismic monitoring network will establish an understanding of baseline seismic activity within the area of the project and that historical seismicity data from the Southern California Seismic Network will be reviewed to assist in establishing the baseline.

Comment: Templeton et al. (2023) state that a local seismic monitoring network should include a combination of high-gain sensors, which can optimally record weak ground motions from small local earthquakes, and low-gain accelerometers, which can optimally record strong ground motions from nearby larger earthquakes. Templeton et al. (2023) also state that each seismic station should measure ground motion in three orthogonal directions (e.g., up-down, north-south, and east-west) to fully capture the movement of the seismic waves as they travel through the earth. In Volume II of the recirculated

DEIR (RDEIR, 2024b), CTV states that high-sensitivity 3-component geophones will be utilized for seismic monitoring. The system will be designed with the capability of detecting and locating events > 0.0 **M** within the project area. Additionally, CTV will monitor data from nearby (~5-8mi) existing broadband seismometers and strong motion accelerometers of the Southern California Seismic Network. The California Geological Survey should ensure that the seismic monitoring network is of sufficient robustness.

Comment: Templeton et al. (2023) state that the seismic monitoring network should be able to record and locate seismicity in the ROC with at least a 2-sigma location accuracy of 0.5 km in the horizontal direction and 1.0 km in the vertical direction. In Volume II of the recirculated DEIR (RDEIR, 2024b), CTV states that the seismic monitoring network will be sufficient to resolve events greater than 0 magnitude, with a 1,000 ft. vertical resolution at the injection depths and above. The California Geological Survey should ensure that the seismic monitoring network is of sufficient resolution.

Comment: Templeton et al. (2023) state that seismic monitoring networks should be designed, and stations located, such that ground velocities of 600 nm/s can be recorded with a signal-to-noise ratio of at least 6 in the frequency range 5–40 Hz within the ROC. In Volume II of the recirculated DEIR (RDEIR, 2024b), CTV also states that borehole sensors have been deployed to ensure a good quality signal to minimize noise and that a velocity model will be derived from vertical seismic profiles, sonic well logs, and check shots. Information on the signal-to-noise ratio in the seismic network should be provided in the recirculated DEIR.

Comment: Templeton et al. (2023) state that the data should be recorded using at least a 24-bit digital data acquisition system and a global positioning system-based field timing system to achieve the required timing accuracy of at least 1 ms. In Volume II of the recirculated DEIR (DEIR, 2024b), CTV states that waveform data is to be transmitted near real-time via cellular modem or other wireless means and archived in a database. Timing accuracy was not specified in the recirculated DEIR, but should be.

Seismicity Mitigation Plan

If the project operator obtains evidence that an earthquake has caused a failure of the mechanical integrity of wells, facilities, or pipelines, which may cause potential CO_2 emissions to the atmosphere, the project operator must implement an Emergency Remedial Response Plan (CARB, 2018). The operator should create a site-specific induced seismicity mitigation plan for the DEIR based on a Traffic Light System (TLS) framework (Templeton et al., 2023). Templeton et al. (2023) state that the TLS framework should include at least three response levels, indicating operation as usual (green), heightened awareness and reassessing and modifying as appropriate of injection operations (yellow), and stopping injection (red). In the Class VI permit application, CTV created a five-response level (green, yellow, orange, magenta, red) seismicity mitigation plan.

Comment: The preliminary results of the seismic evaluation must be reported to CARB within 30 days following the earthquake, with a final report submitted within 120 days (CARB, 2018). The report must include, at a minimum: (1) the date, time, and magnitude of the earthquake; (2) the location and distance of the epicenter from the CCS project; (3) the results of the investigation into the link between the

injection activity and the earthquake or pattern of seismicity; (4) any emergency and remedial actions taken; (5) a description of any investigations and tests conducted to assess the mechanical integrity of wells and other surface equipment, and a demonstration that the well and equipment were either not damaged by the earthquake or that mechanical integrity was restored prior to the re-initiation of injection; and (6) any identified changes necessary to the CCS project Testing and Monitoring Plan (CARB, 2018). There is no mention of reporting of seismic events to CARB in the seismicity mitigation plan in Volume II of the recirculated DEIR

Comment: Of perhaps greater concern are naturally occurring seismic events at distance from the facility. In these cases, a seismic mitigation plan specified in terms of peak ground velocity or ground acceleration would be more useful in the DEIR.

Conclusions and Recommendations

There is interest in using depleted oil and gas reservoirs, such as the Carbon TerraVault I project for geological storage of CO_2 due to extensive preexisting geological characterization and infrastructure. Also, since depleted oil and gas fields have decreased pore pressure compared to initial conditions, it is plausible that the risk of induced seismicity in depleted oil and gas fields may be less than that associated with other storage configurations (e.g., saline aquifers) because increased pore pressure beyond initial conditions is one of the main causes of injection-induced seismic events.

However, well penetrations are widely recognized as a primary pathway for leakage during geologic storage of CO_2. There are an extraordinarily large number of wellbores (354) penetrating the primary confining layer (Reef Ridge Shale) at the Carbon TerraVault I project. Leakage through wellbores will be facilitated by the high pressure of storage (~4,000 psi) and storage occurring primarily as a separate phase supercritical fluid. All 354 wellbores will eventually be in direct contact with highly pressurized supercritical CO_2 – a highly corrosive medium.

Complicating matters further is the fact that that the Carbon TerraVault I project is located in an area of high natural seismicity. The probability of a natural seismic event capable of causing wellbore damage in the project area is quite high (~20% within 100 years). Given the large number of well penetrations, high pressure during storage, storage primarily as a supercritical fluid, and natural seismicity, leakage through well penetrations is a major concern. The success or failure of geologic storage of CO_2 at the Carbon TerraVault I project will largely depend on minimizing leakage from well penetrations.

The importance of properly evaluating wellbores prior to plugging to determine the need for corrective action and evaluating wellbores that have been plugged sometime in the past cannot be stressed enough. Unfortunately, tables provided for the 26R and A1- A2 reservoirs in Volume II of the recirculated DEIR do not provide sufficient information on wellbore integrity. CTV claims that no wellbores require corrective action – a claim that must be viewed with considerable skepticism since wellbore integrity failure rates published from oil and gas sites in the literature range from 2 to 75%.

In one column of the tables provided in the recirculated DEIR, annular isolation of wellbores within the upper confining later is subjectively described as "*adequate.*" No proof of adequacy of any wellbore beyond those used for injection was provided in the DEIR or Class VI permit applications. CTV should immediately submit all supporting information (drilling logs, well completion and plugging reports,

casing and cementing records, records on internal and external mechanical integrity testing, cement bond/variable density logs, and wellbore diagrams) to the public record.

In the absence of a robust investigation of wellbore integrity at the Carbon TerraVault I project, the recirculated DEIR should not be approved.

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Attachment A
to Technical Comments of Dominic DiGiulio, PhD:
Qualifications and Experience

Dominic DiGiulio

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Background

I am a retired geoscientist from the U.S. Environmental Protection Agency. I have conducted research on: emissions of volatile organic compounds from abandoned wells, leakage of produced water, condensate, and drilling fluids from impoundments to groundwater, contamination of groundwater from hydraulic fracturing, subsurface methane and carbon dioxide migration (stray gas), intrusion of subsurface vapors into indoor air (vapor intrusion), gas flow-based subsurface remediation (soil vacuum extraction, bioventing), groundwater sampling methodology, soil-gas sampling methodology, gas permeability testing, and solute transport of contaminants in soil. I assisted in the development of EPA's original guidance on vapor intrusion and the EPA's Class VI Rule on geologic sequestration of carbon dioxide. I have served as an expert witness in litigation relevant to oil and gas development, testified before State oil and gas commissions on proposed regulation, and testified before Congress on the impact of oil and gas development on water resources. My consulting services have included reports on: stray methane gas migration, geological carbon storage in Louisiana, storage of natural gas liquids in solution mined caverns, proposed oil and gas regulations in Colorado, impact to groundwater resources from Class II disposal wells in Ohio, Idaho, and Florida, produced water transport in barges along the Ohio River, proposed EPA regulation on discharge of produced water to surface water, and Bureau of Land Management leases in Wyoming, Montana, and Colorado.

Education

B.S., Environmental Engineering, Temple University, Philadelphia, PA (1982)
M.S., Environmental Science, Drexel University, Philadelphia, PA (1988)
Ph.D., Soil, Water, and Environmental Science, University of Arizona, Tucson, AZ (2000)

Employment

Independent Consultant: Feb 2023 - present

Research Affiliate: University of Colorado, Boulder, CO: October 2020 - present. I conduct research on the impact of abandoned wells on air, surface water, and groundwater quality.

Senior Research Scientist: PSE Healthy Energy, Oakland, CA: Jan 2017 – Feb 2023. My research focused on evaluating the impact of oil and gas development on water resources and air quality. In addition to publishing findings of my research in peer-reviewed journals and reports, I provided testimony on oil and gas development rule-making, served as an expert witness in litigation against oil and gas corporations, and have testified before Congress on the impact of oil and gas development on water resources.

Research Associate: Stanford University, Stanford, CA: Apr 2014 – May 2019. I conducted research on the impact of oil and gas development to groundwater.

Environmental Engineer: U.S. Environmental Protection Agency, Office of Research and Development, Ada, OK: Sep 1988 – Mar 2014 (retired). Duties included providing regulatory oversight assistance to

EPA remedial project managers and conducting research related to subsurface gas flow and vapor transport. Research included: (1) Development of methods to improve the effectiveness of soil vapor extraction, bioventing, and air sparging subsurface remediation systems including lead authorship of EPA's primary technical resource document in these areas; (2) Co-development of analytical solutions and associated codes for estimation of gas permeability and gas flow in soil; (3) Development of analytical solutions to simulate combined solute and vapor transport in soil including lead authorship of the model *VFLUX;* (4) Development of field methods to improve active soil-gas sampling especially pertaining to leak and purge testing; (5) Development of forensic techniques (use of hydrocarbon degradation products and radon) and assistance in development of EPA guidance to evaluate vapor intrusion (migration of organic compounds from ground water to indoor air); (6) Development of ground water and soil gas monitoring strategies including assistance in development of EPA's Class VI rule on geologic sequestration of carbon dioxide; (7) Development of methods to evaluate impact to Underground Sources of Drinking Water (USDWs) under the Safe Drinking Water Act and stray gas migration due to hydraulic fracturing. Research activities included conducting seminars, workshops, and short courses to States.

Environmental Engineer (Remedial Project Manager: U.S. Environmental Protection Agency, Region III, Philadelphia, PA: Jun 1980 – Dec. 1981 and Sep 1982 – Jan 1988. Duties included: conducting investigations (e.g., remedial investigations, risk assessments, feasibility studies, sample collection) under the Comprehensive Environmental Response and Liability Act (CERCLA) and Resource Conservation and Recovery Act (RCRA), federal contractor oversight, preparation of consent orders and initiation of enforcement actions.

Military Service: U.S. Marine Corps: Active duty 1975-1978, Camp Pendleton, CA, Honorable Discharge in 1981.

Scientific Awards

5 EPA Bronze Medals: (1) Development of EPA Guidance Document on Soil Vacuum Extraction, (2) Technical Support to EPA's Program and Regional offices on Subsurface Gas Flow and Vapor Transport, (3) Development of EPA Guidance on Vapor Intrusion, (4) Research on Vapor Intrusion, (5) Development of Class VI Rule on Geologic Sequestration of Carbon Dioxide

3 EPA Honor Awards: (1) Development of a National Risk Management Research Laboratory Strategic Research Plan, (2) Development of a Protocol to Assess Vapor Intrusion; (3) Technical support at Leaking Underground Storage Tank Sites

3 EPA Scientific and Technological Achievement Awards: (1) Innovative Design of Soil Vacuum Extraction Systems, (2) Development of Analytical Model to Simulate Transient Flux of Volatile Organic Compounds in Soil to Ground Water and the Atmosphere, (3) Simulation of Geochemical Impacts to Ground Water from Leakage of Carbon Dioxide

Peer-Reviewed Journal Publications, Reports, and Book Chapters

Tisherman, R.; Rossi, R.J.; Shonkoff, S.B.C., DiGiulio, D.C. **2023**. Groundwater Uranium Contamination from Produced Water Disposal to Unlined Ponds in the San Joaquin Valley. *Science of the Total Environment*, Vol. 904, 15 December 2023, 166937

Kang, M.; Boutot, J.; McVay, R.; Roberts, K.; Jasechko, S.; Perrone, D.; Tao T.; Lackey, G.; Raimi, D.; DiGiulio, D.C.; Shonkoff, S.B.C.; Carey, J.W.; Elliott, E.G.; Vorhees, D.J.; Peltz, A.S. **2023.** Environmental risks and opportunities of orphaned oil and gas wells in the United States. *Environmental Research Letters*, 18, 7, 074012.

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Ruybal C.J.; Wilkin R.T.; Rue K.D., McCray J.E., DiGiulio, D.C. **2018**. A New Equilibrator Design for Rapid Detection of Methane in Groundwater during Purging. *Environmental Engineering Science* 35(9)

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Rossi, R.J.; DiGiulio, D.C. **2023**. Documenting Known Abandoned Wells in Proximity to Potential Carbon Storage Formations in Louisiana.

DiGiulio, D.C. **2023**. Evaluation of Stray Natural Gas in the Amber Norrid Domestic Water Well Near Abandoned Oil Wells in Hanover Township, Washington County, Pennsylvania. September 3, 2023

Rossi, R.J.; Tisherman, R.; DiGiulio, D.C. **2022**. Review of Methane Oxidation in Landfill Covers. November 2022.

DiGiulio, D.C. **2022.** Evaluation of Protection of Groundwater Resources in Environmental Impact Assessment (EIA) for Drilling Stratigraphic Wells in Kavango West and East Regions, Northern Namibia

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DiGiulio, D.C. **2023**. Federal Regulation and Technical Requirements for Onshore Geologic Storage of Carbon Dioxide. Presented at: Webinar on Carbon Capture and Storage (CCS): Risks of CO2 Leakage from Geological Reservoirs and Pipelines, Center for Applied Environmental Science, June 1, 2023

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ATTACHMENT C

Accufacts Inc.
"Clear Knowledge in the Over Information Age"

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July 17, 2024

Attn: Earthjustice
Michelle Ghafar
50 California Street, Suite 500
San Francisco, CA 94111

Re: Observations concerning Kern County's Recent Recirculated Draft Environmental Impact Report ("RDEIR") on the TerraVault I Carbon Capture and Storage Project ("Project").

Accufacts Inc. ("Accufacts") has reviewed the latest Kern County submission for the above Project, retitled Recirculated Draft Environmental Impact Report.[1] Accufacts has the following brief major observations that are by no means an inclusive listing of the many deficiencies concerning the RDEIR:

1. **As with the original DEIR, the RDEIR is vague and misleading throughout the document and does not properly address the major shortcomings provided in previous comments submitted on the original DEIR. (See attached report submitted on the original DEIR on March 1, 2024.)**

2. **The RDEIR lists possible new sources to supply CO_2 to the Elk Hills reservior without identifying how such sources will be transported to the Elk Hill facilities—a critical omission.[2]**

3. **The addition of the CPUC process in the RDEIR should be raising serious concerns about possible efforts to move CO_2 in converted existing pipelines as a gas to circumvent the moratorium on development of intrastate gas pipelines within the state.[3]**

How additional CO_2 sources will be transported to the Elk Hills facilities, and in what phase (i.e., gas or liquid), is an important safety jurisdiction matter for such pipelines. Severe deficiencies in current CO_2 pipeline safety regulations, both at the federal and state level, leave major regulatory safety gaps needed to protect the public from this mode of CO_2 pipeline transportation, liquid or gas. Pipeline safety regulations are even weaker for CO_2 gas phase pipelines (new or converted

[1] Kern County Planning and Natural Resources Department, "Recirculated Draft Environmental Impact Report, Volumes 1 and 2," June 2024.
[2] *Ibid.,* Volume 1, p. 4.11-53 & 4.11-54.
[3] *Ibid.,* Volume 1, p. 4 – 11 to 54.

existing) than that for liquid CO_2 pipelines. The RDEIR remains incomplete regarding these important details.

As in the original DEIR, the Project continues to disregard badly needed safety regulatory efforts, either at the state or federal level, before prudent safety regulations can be developed and implemented.

Richard B. Kuprewicz

Richard B. Kuprewicz,
President,
Accufacts Inc.

Attachment A
to Technical Comments of Richard Kuprewicz:
February 26, 2024 Technical Comments of
Richard Kuprewicz

Accufacts Inc.
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February 26, 2024

Attn: Earthjustice
Michelle Ghafar
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San Francisco, CA 94111

Re: Observations concerning Kern County's Draft Environmental Impact Report ("DEIR") on the TerraVault I Carbon Capture and Storage Project ("Project").

A. Summary of DEIR.

The above referenced DEIR makes many statements that are confusing or misleading, lacking critical information to allow decision makers, including the public, to make an informed evaluation and decision about the proposed Project from this document. It appears that many of these statements relate to safety jurisdiction of various agencies, which based on my extensive experience, are confusing, if not misleading. It appears that the Project is getting ahead of badly needed safety regulatory efforts, either at the state or federal level before prudent safety regulations can be developed and implemented. Section 3 below identifies eight areas where the DEIR needs to be supplemented with important details before this Project is allowed to proceed. Lack of such detail has served to be a recurring problem across the U.S. as states and local governments wrestle with serious gaps in pipeline safety regulations for CO_2 pipelines as a result of an onslaught of multibillion dollar proposals incentivized by recent federal tax credits. A 2022 paper identifies at least eight serious deficiencies in current federal minimum pipeline safety regulations concerning liquid CO_2 pipelines summarized as follows:[1]

1. The definition of carbon dioxide needs to be updated.
2. Scientifically based regulation on impact areas for CO_2 pipeline ruptures needs to be promulgated.
3. Regulatory reference to industry recommended practices should be avoided.
4. Fracture propagation protection on CO_2 pipelines needs to be codified.
5. The use of odorant in CO_2 pipelines should be mandated.
6. Pipeline operations and maintenance manuals should require specific coordination with local emergency response personnel.
7. Maximum contaminant impurities for CO_2 pipelines should be specified.
8. Regulations for conversion of existing pipelines to CO_2 service should be developed.

[1] Richard B. Kuprewicz, President of Accufacts Inc., prepared for the Pipeline Safety Trust, "Accufacts' Perspectives on the State of Federal Carbon Dioxide Transmission Pipeline Safety Regulations as it Relates to Carbon Capture, Utilization, and Sequestration within the U.S.," March 23, 2022, pp. 12 &13.

B. The TerraVault 1 Carbon Capture and Storage Project DEIR - a simple synopsis.

The TerraVault 1 Project proposes to capture CO_2 from the existing Elk Hills oil field, produced by separating a portion of the pre-combustion field gas production into "high-purity" CO_2 streams at two existing or relocated cryogenic and fractionation natural gas plant facilities identified as "CGP-1." The term high purity is not defined in the DEIR, but is a critical parameter given that existing federal minimum pipeline safety jurisdiction currently establishes a CO_2 purity of more than 90% in a poorly worded definition of carbon dioxide.[2]

The high-purity CO_2 streams will then be transported from the two CGP-1 processing/treating locations by "Facility Pipelines" which will be newly constructed pipelines.[3] The DEIR also uses the term Injection Pipelines. The definition of both Facility Pipelines and Injection Pipelines needs to be clarified as well as their transition boundaries as these terms have specific meaning in the industry and affect regulatory safety jurisdictions, if any, of various federal and state agencies that might become involved.

The DEIR indicates that new pipelines of up to 16-inches in diameter, approximately 5.61 miles long for phase 1, and approximately 7.59 miles long for phase 2, will transport CO_2 to six injection wells at two sequestration reservoir sites within the site plan (to 26R Monterey Formation Reservoir at an approximate depth of 6,000 feet for phase 1's four injection well sites, and to A1-A2 Monterey Formation Reservoir, approximately 8,500 feet deep for phase 2's two injector well sites).[4]

C. Critically important and needed pipeline information is missing in the DEIR.

Important pipeline information is missing in the DEIR that will not permit decisionmakers to make an informed decision about this Project. For example, some of the many major shortcomings in the DEIR related to pipeline issues are:

1. The purity of the claimed "high-purity" CO_2 stream has not been provided.

The CO_2 purity sets a simple bar as to whether the Pipeline and Hazardous Materials Safety Administration, or PHMSA, the federal agency chartered with transportation pipeline safety regulations, or for that matter the California Office of the State Fire Marshal, or OSFM, the state agency chartered with intrastate liquid transportation pipeline safety oversight in California, has any pipeline safety jurisdiction under current transportation pipeline safety regulations. The DEIR needs to provide the minimum purity of the CO_2 stream for reinjection and how this minimum will be controlled/maintained and assured. If the CO_2 purity is not above 90 %, the pipeline facilities are not regulated as transportation pipelines under current federal pipeline safety regulations.

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[2] 49CFR§195.2 Definitions - *Carbon Dioxide*.
[3] DEIR, Volume 1, pp. 3-18 & 3-19.
[4] DEIR, Volume 1, pp. 3-21 & 3-22.

Since the CO_2 will be produced from the oil/gas field, the DEIR also needs to present how possible impurities in the CO_2 stream will be limited and controlled. This is especially important for water as water in CO_2 pipelines is not tolerated well in carbon steel pipeline systems. Water in such CO_2 systems can experience extremely unpredictable and high corrosion rates that can quickly result in pipeline rupture failure.

2. **The DEIR discussion of Facility Pipelines and Injection Pipelines is not clear.**

   Facility Pipelines and Injection Pipelines usually have special meaning/distinction within the industry and whether any pipeline safety agency has any jurisdiction. The DEIR is very confusing on this important issue, labeling for example Injection Pipelines under the heading Facility Pipelines in the figures' legends.[5] PHMSA, or for that matter the OSFM, may not have any jurisdiction on this Project or parts of this Project.

3. **The DEIR indicates that the Facility Pipelines will operate at pressures roughly 1,700 to 2,100 psig for "dense phase" transport.[6]**

   Psig, or pounds per square inch gauge, is a pressure measurement used in the industry. The pressure range for this system, while higher than conventional liquid transportation pipelines, is not unusual for dense phase CO_2 pipelines. Dense phase is a term used to mean either liquid **or** supercritical CO_2 phase for a liquid pipeline, and is not defined in either Federal or California pipeline safety regulations.[7] What phase a specific CO_2 liquid pipeline segment is in (liquid or supercritical) at the time of a pipeline rupture can have a significant impact on rupture release dynamics, the tonnage of pipeline inventory that will be vented even after mainline valves are closed, and associated attempts to model possible rupture impact zones and attempts at establishing realistic safety buffer zones.

4. **The DEIR does not provide important pipeline parameters.**

   At this stage of the Project, the pipeline operator should be able to provide the pipeline specifics such as: pipe grade, thickness, diameter, and maximum operating pressure, or MOP, a term defined in federal pipeline safety regulation having a specific meaning related to pipeline safety. As previously mentioned, the DEIR should also clearly delineate the general pipeline route, possible pipeline safety jurisdictional boundaries, and approximate location of main equipment such as pump/compressor stations. The lack of such basic information makes it difficult to determine a simple process flow scheme for the Project. This lack of such basic information also prevents decisionmakers from assessing impacts and to develop feasible mitigations for the Project. Not only does the DEIR lack such critical basic pipeline information, what information is supplied is also confusing. It appears the Project is being rushed and

[5] DEIR, Volume 1, p. 3-20, Figures 3-8 and 3-9, Location of Phase 1 Wells: 373-35R, 353X-35R, 345-36R, and 363-27R, and Location of the Phase 2 Wells: 357-7R and 355-7R, respectively.
[6] DEIR, Volume 1, p. 3-16.
[7] 49CFR§195 and California Code, Chapter 5.5. The Elder California Pipeline Safety Act of 1981.

missing basic information to permit independent evaluation and verification of the Project.

5. The location of compressor equipment is not well defined.

The DEIR states "Two new CO_2 compressor packages are proposed for installation at the facility. Compressors would be of the reciprocating type and driven by electric motors."[8] The general location and specific phase of the CO_2 feeding into such equipment is very important to the safe operation of the system and, more importantly, the compressors. One way to blow up a reciprocating compressor is to inadvertently introduce liquid into the compressor. I cannot determine from the limited and confusing information provided in the DEIR whether the location of the proposed compressors will be safely placed within the system to assure liquid CO_2 cannot be inadvertently introduced into the compressors.

6. The placement of mainline valves along the pipelines are not defined.

The DEIR states: "New valves would be installed based on regulatory and owner requirements."[9] As should become obvious from reading this report, such important valve determinations have not been clearly defined, so this DEIR citation is meaningless. Also, the DEIR does not identify whether mainline valves will be manually operated or remotely operated. Manually operated valves can take considerable time to reach and then close (especially for larger diameter pipelines such as a 16-inch mainline valve) increasing the tonnage of CO_2 released upon pipeline rupture.

As a point of reference, a 16-inch diameter CO_2 pipeline, depending on whether the CO_2 inventory is in a supercritical or liquid phase and its associated density, will release approximately 110 to 200 tons per mile of CO_2 upon a pipeline rupture once pipeline mainlines have been closed. What makes transportation pipelines unique, especially for CO_2, is the amount of tonnage undergoing phase change from cooling, that can be de-inventoried from a ruptured pipeline, releasing tons of CO_2 between mainline valves once such valves have been closed. The lack of timely closure of valves was a significant contributing factor for the Satartia, MS rupture CO_2 release as discussed later in this report.

7. The CO_2 temperature along the pipelines is not provided.

An important variable in the DEIR, approximate CO_2 temperature along the pipelines, dictates the CO_2, whether liquid or supercritical phase (which can change) along the pipelines as temperature changes at the expected pipeline operating pressure. This important temperature parameter is not mentioned nor discussed anywhere in the DEIR. What phase a segment of a pipeline is transporting CO_2 in can have serious significance on issues such as safety jurisdiction, design/operation, and pipeline rupture

[8] DEIR, Volume 1, p. 3-17.
[9] DEIR, Volume 1, p. 3-18.

release dynamics and safety buffer zones. For example, current federal minimum pipeline safety regulations do not regulate pipelines operating in liquid CO_2 phase. I have previously mentioned the importance of assuring that reciprocating compressors do not inadvertently receive liquid. Without understanding the initial phase CO_2 will most likely be in in a specific pipeline segment, attempts to establish safe buffer or impact zones are meaningless. Two temperature extreme boundary cases for CO_2 are usually necessary; a high temperature season and a low temperature season to assist in defining the range of CO_2 phases (liquid or supercritical), and associated release modeling/pipeline buffer safety margins for the operation.

8. The DEIR misses the importance of CO_2 phase.

The DEIR also misses the important differences associated with varying phases of CO_2 in a liquid pipeline operation that are not properly addressed in current pipeline safety regulations, leaving such pipelines basically unregulated in many critically important areas. While the DEIR attempts to address certain environmental impacts related to the Project, the real issue relates to pipeline safety and the possible impact to public safety. The DEIR is incomplete in this important area and needs to be supplemented with this missing information before this Project can move forward.

While not mentioned in the DEIR, at the expected pressures and temperatures of the proposed Project's pipelines, I would anticipate the Project's pipelines to be operated in either liquid CO_2 or supercritical CO_2 phases, with the phases changing somewhat with time depending on the temperature of the buried pipelines. Whether a pipeline segment is liquid or supercritical phase at the time of rupture affects the expected phase change occurring at the rupture site, the rate of release, the tonnage that will be released between closed valves, and expected buffer impact zones.

D. The California OSFM is limited in what pipeline safety regulations it can enforce for intrastate liquid carbon dioxide transportation pipelines.

Despite the best of recent intentions to enact improvements in carbon dioxide pipeline safety regulations within California, the California Legislature has failed to pass meaningful improvements in pipeline safety regulations as it applies to intrastate carbon dioxide pipelines. Without such new legislation, the California OSFM can only implement and enforce pipeline safety regulations for intrastate CO_2 liquid pipelines within the state as codified in federal minimum pipeline safety regulations (49CFR§195) intended for liquid transportation pipelines. Based on my extensive experience in California liquid pipeline operation and many pipeline investigations within the state, it is my understanding that the OSFM can only enforce federal pipeline safety regulations for CO_2 liquid pipelines codified in current federal regulations.

Federal regulations for carbon dioxide pipelines are currently woefully inadequate as discussed in more detail in my recently referenced March 23, 2022 CO_2 public paper. In addition, announcements by PHMSA to move forward with carbon dioxide safety regulations may miss many of the safety issues and concerns related to carbon dioxide liquid pipelines

which can take some time to properly address, given the highly unusual restrictive regulatory process imposed on PHMSA.[10]

E. The DEIR attempts to minimize the impact of the Satartia rupture on the public.

Some additional information might be helpful to add to the February 22, 2020 Satartia, MS 24-inch pipeline rupture discussion in the DEIR.[11] Depending on the density one assumes in the pipeline, the rupture released 3,000 to 5,000 tons of carbon dioxide after the mainline valves were eventually closed on the 24-inch pipeline, which took considerable time to isolate the ruptured segment**.** The CO_2 plume went beyond the Town of Satartia, crossing the Yazoo River, extending well over a mile from the pipeline release site which was basically downhill from the rupture releasing heavier than air CO_2. The DEIR fails to mention that the Town of Satartia was not identified as a high consequence area in the pipeline operator's integrity management program and the air dispersion model was unfit for the 24-inch pipeline. The high rain situations and steep terrain should not come as a surprise in this challenging location, and the wording in the DEIR appears to try to downplay that the rupture threat was a unique situation in that area of Mississippi. PHMSA's corrective action order requiring review of geohazard potential along the pipeline should dispel any illusion that breakaway landslide was an unusual threat. Despite the release of a PHMSA Advisory following the Satartia rupture, PHMSA knows that there have been pipeline regulations in effect for many decades that place the responsibility on the pipeline operator to monitor their pipeline right-of-way for signs of possible abnormal loading such as massive landslide potential (what is known in the industry as a breakaway landslide threat) that can easily result in pipeline rupture.[12]

F. Well Blowout prevention and Aliso Canyon similarities.

While not a specific pipeline associated matter, I have an ethical responsibility to note that the DEIR does not address the possibility of a CO_2 injection well blowout on any of the six proposed CO_2 injection wells. In late 2015, California was associated with an underground natural gas storage well blowout, the Aliso Canyon failure, that released well over 100,000 tons of natural gas which is normally lighter than air as compared to CO_2 which is heavier than air. The Aliso Canyon failure demonstrated to the public some of the risk of large high pressure underground storage reservoirs. I would advise that the Project incorporate some form of well blowout prevention design to prevent release of massive quantities of heavier than air CO_2 from the underground reservoirs should an injection well experience a blowout. The safety design should incorporate an approach with prudent independent safeties to assure that the installation will actually work and stop the release of CO_2 from the high-pressure reservoir if a well blowout occurs. Without getting into specific design issues, there are various ways to approach this possible threat, such as incorporating an automatic subservice safety valve as a blowout preventor on each injection well. The tonnage of CO_2 released from a well blowout

[10] "PHMSA Announces New Safety Measures to Protect Americans From Carbon Dioxide Pipeline Failures After Satartia, MS Leak," May 26, 2022 at PHMSA website: https://www.phmsa.dot.gov/news/phmsa-announces-new-safety-measures-protect-americans-carbon-dioxide-pipeline-failures.
[11] DEIR, Volume 1, pp. 4.9-8 & 4.9-9.
[12] PHMSA updated ADB-2022-01, "Pipeline Safety: Potential for Damage to Pipeline Facilities Caused by Earth Movement and Other Geological Hazards," June 2, 2022.

can easily exceed, by many orders of magnitude, the tonnage of CO_2 released from a pipeline rupture. As history has often demonstrated, well blowouts can release many thousands of tons from essentially an infinite supple of CO_2 in the reservoir, easily surpassing pipeline rupture releases.

G. Background/Experience.

Accufacts was asked to review the DEIR for the Project recently released in December 2023.[13] I have over fifty years of experience in the energy industry, including almost 25 years as president of Accufacts Inc. ("Accufacts"). Accufacts provides independent expert consulting services to assist decision makers in making informed decisions concerning pipelines. Pipeline safety expertise is provided in areas including, but not limited to; pipeline failure investigation, risk management, siting, construction, design, operation, maintenance, training, control room management including Supervisory Control and Data Acquisition ("SCADA") approaches, leak/rupture detection, integrity management, emergency response, and pipeline safety regulatory development and compliance. Much of my background is grounded in pipeline incident investigations following numerous pipeline rupture tragedies spanning several decades.

For the past two decades I have been involved as a representative of the public, which carries special obligations to avoid a conflict of interest, in advancing pipeline safety regulations at the federal and various state levels as demonstrated by my CV. For example, I played a significant role representing the public in developing integrity management federal pipeline safety regulations in the early 2000s for both liquid and gas transmission pipelines. These regulatory approaches emulated a safety process approach that I instituted and developed for the City of Bellingham, WA. This process, identified as the Safety Immediate Action Plan, or SIAP, identified steps that the pipeline operator was to complete following the Bellingham rupture tragedy of June 10, 1999, before that pipeline could be permitted to be returned to service.

H. Conclusion.

The DEIR is seriously incomplete and deficient in many areas as discussed above. These deficiencies need to be properly addressed before a DEIR can be deemed complete and sufficient for the Project to move forward. It is my understanding that the County can require that such critical information related to pipeline safety and CO_2 pipelines can be ordered to be provided, or supplemented, before this Project can be allowed to move forward.

Richard B. Kuprewicz, President, Accufacts Inc. *Richard B. Kuprewicz*

[13] Draft Environmental Impact Report – SCH# 2022030180 Volume 1, Chapters 1 through 12, CARBON TERRAVAULT I (KERN COUNTY) by California Resources Corporation (PP22405) at: https://psbweb.kerncounty.com/planning/pdfs/eirs/ctv1/CTV1_DEIR_Vol_1_Ch_1-12_upd.pdf, and Draft Environmental Impact Report – SCH# 2022030180 Volume 2, Appendices A-K, CARBON TERRAVAULT I (KERN COUNTY) by California Resources Corporation (PP22405) at: https://psbweb.kerncounty.com/planning/pdfs/eirs/ctv1/CTV1_DEIR_Vol2.pdf, December 2023.

Attachment B
to Technical Comments of Richard Kuprewicz:
Qualifications and Experience

Curriculum Vitae.

Richard B. Kuprewicz

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Profile:

As president of Accufacts Inc., I specialize in gas and liquid pipeline investigation, auditing, risk management, siting, construction, design, operation, maintenance, training, SCADA, leak detection, management review, emergency response, and regulatory development and compliance. I have consulted for various local, state and federal agencies, NGOs, the public, and pipeline industry members on pipeline regulation, operation and design, with particular emphasis on operation in unusually sensitive areas of high population density or environmental sensitivity.

Employment:

Accufacts Inc. **1999 – Present**

Pipeline regulatory advisor, incident investigator, and expert witness on all matters related to gas and liquid pipeline siting, design, operation, maintenance, risk analysis, and management.

Position: President
Duties:
> Full business responsibility
> Technical Expert

Alaska Anvil Inc. **1993 – 1999**

Engineering, procurement, and construction (EPC) oversight for various clients on oil production facilities, refining, and transportation pipeline design/operations in Alaska.

Position: Process Team Leader
Duties:
> Led process engineers group
> Review process designs
> Perform hazard analysis
> HAZOP Team leader
> Assure regulatory compliance in pipeline and process safety management

ARCO Transportation Alaska, Inc. **1991 - 1993**

Oversight of Trans Alaska Pipeline System (TAPS) and other Alaska pipeline assets for Arco after the Exxon Valdez event.

Position: Senior Technical Advisor
Duties:
> Access to all Alaska operations with partial Arco ownership
> Review, analysis of major Alaska pipeline projects

ARCO Transportation Co. **1989 – 1991**

Responsible for strategic planning, design, government interface, and construction of new gas pipeline projects, as well as gas pipeline acquisition/conversions.

Position: Manager Gas Pipeline Projects
Duties:
> Project management
> Oil pipeline conversion to gas transmission
> New distribution pipeline installation
> Full turnkey responsibility for new gas transmission pipeline, including FERC filing

Four Corners Pipeline Co. **1985 – 1989**

Managed operations of crude oil and product pipelines/terminals/berths/tank farms operating in western U.S., including regulatory compliance, emergency and spill response, and telecommunications and SCADA organizations supporting operations.

Position: Vice President and Manager of Operations
Duties:
> Full operational responsibility
> Major ship berth operations
> New acquisitions
> Several thousand miles of common carrier and private pipelines

Arco Product CQC Kiln **1985**

Operations manager of new plant acquisition, including major cogeneration power generation, with full profit center responsibility.

Position: Plant Manager
Duties:
> Team building of new facility that had been failing
> Plant design modifications and troubleshooting
> Setting expense and capital budgets, including key gas supply negotiations
> Modification of steam plant, power generation, and environmental controls

Arco Products Co. **1981 - 1985**

Operated Refined Product Blending, Storage and Handling Tank Farms, as well as Utility and Waste Water Treatment Operations for the third largest refinery on the west coast.

Position: Operations Manager of Process Services
Duties:
> Modernize refinery utilities and storage/blending operations
> Develop hydrocarbon product blends, including RFGs
> Modification of steam plants, power generation, and environmental controls
> Coordinate new major cogeneration installation, 400 MW plus

Arco Products Co. **1977 - 1981**

Coordinated short and long-range operational and capital planning, and major expansion for two west coast refineries.

Position: Manager of Refinery Planning and Evaluation
Duties:
> Establish monthly refinery volumetric plans
> Develop 5-year refinery long range plans
> Perform economic analysis for refinery enhancements
> Issue authorization for capital/expense major expenditures

Arco Products Co. **1973 - 1977**

Operating Supervisor and Process Engineer for various major refinery complexes.

Position: Operations Supervisor/Process Engineer
Duties:
> FCC Complex Supervisor
> Hydrocracker Complex Supervisor
> Process engineer throughout major integrated refinery improving process yield and energy efficiency

Qualifications:

Served for over fifteen years as a member representing the public on the federal Technical Hazardous Liquid Pipeline Safety Standards Committee (THLPSSC), a technical committee established by Congress to advise PHMSA on pipeline safety regulations.

Committee members are appointed by the Secretary of Transportation.

Served seven years, including position as its chairman, on the Washington State Citizens Committee on Pipeline Safety (CCOPS).

Positions are appointed by the governor of the state to advise federal, state, and local governments on regulatory matters related to pipeline safety, routing, construction, operation and maintenance.

Served on Executive subcommittee advising Congress and PHMSA on a report that culminated in new federal rules concerning Distribution Integrity Management Program (DIMP) gas distribution pipeline safety regulations.

As a representative of the public, advised the Office of Pipeline Safety on proposed new liquid and gas transmission pipeline integrity management rulemaking following the pipeline tragedies in Bellingham, Washington (1999) and Carlsbad, New Mexico (2000).

Member of Control Room Management committee assisting PHMSA on development of pipeline safety Control Room Management (CRM) regulations.

Certified and experienced HAZOP Team Leader associated with process safety management and application.

Education:

MBA (1976)	Pepperdine University, Los Angeles, CA
BS Chemical Engineering (1973)	University of California, Davis, CA
BS Chemistry (1973)	University of California, Davis, CA

Publications in the Public Domain:

1. "An Assessment of First Responder Readiness for Pipeline Emergencies in the State of Washington," prepared for the Office of the State Fire Marshall, by Hanson Engineers Inc., Elway Research Inc., and Accufacts Inc., and dated June 26, 2001.

2. "Preventing Pipeline Failures," prepared for the State of Washington Joint Legislative Audit and Review Committee ("JLARC"), by Richard B. Kuprewicz, President of Accufacts Inc., dated December 30, 2002.

3. "Pipelines - National Security and the Public's Right-to-Know," prepared for the Washington City and County Pipeline Safety Consortium, by Richard B. Kuprewicz, dated May 14, 2003.

4. "Preventing Pipeline Releases," prepared for the Washington City and County Pipeline Safety Consortium, by Richard B. Kuprewicz, dated July 22, 2003.

5. "Pipeline Integrity and Direct Assessment, A Layman's Perspective," prepared for the Pipeline Safety Trust by Richard B. Kuprewicz, dated November 18, 2004.

6. "Public Safety and FERC's LNG Spin, What Citizens Aren't Being Told," jointly authored by Richard B. Kuprewicz, President of Accufacts Inc., Clifford A. Goudey, Outreach Coordinator MIT Sea Grant College Program, and Carl M. Weimer, Executive Director Pipeline Safety Trust, dated May 14, 2005.

7. "A Simple Perspective on Excess Flow Valve Effectiveness in Gas Distribution System Service Lines," prepared for the Pipeline Safety Trust by Richard B. Kuprewicz, dated July 18, 2005.

8. "Observations on the Application of Smart Pigging on Transmission Pipelines," prepared for the Pipeline Safety Trust by Richard B. Kuprewicz, dated September 5, 2005.

9. "The Proposed Corrib Onshore System - An Independent Analysis," prepared for the Centre for Public Inquiry by Richard B. Kuprewicz, dated October 24, 2005.

10. "Observations on Sakhalin II Transmission Pipelines," prepared for The Wild Salmon Center by Richard B. Kuprewicz, dated February 24, 2006.

11. "Increasing MAOP on U.S. Gas Transmission Pipelines," prepared for the Pipeline Safety Trust by Richard B. Kuprewicz, dated March 31, 2006. This paper was also published in the June 26 and July 1, 2006 issues of the Oil & Gas Journal and in the December 2006 issue of the UK Global Pipeline Monthly magazines.

12. "An Independent Analysis of the Proposed Brunswick Pipeline Routes in Saint John, New Brunswick," prepared for the Friends of Rockwood Park, by Richard B. Kuprewicz, dated September 16, 2006.

13. "Commentary on the Risk Analysis for the Proposed Emera Brunswick Pipeline Through Saint John, NB," by Richard B. Kuprewicz, dated October 18, 2006.

14. "General Observations On the Myth of a Best International Pipeline Standard," prepared for the Pipeline Safety Trust by Richard B. Kuprewicz, dated March 31, 2007.

15. "Observations on Practical Leak Detection for Transmission Pipelines – An Experienced Perspective," prepared for the Pipeline Safety Trust by Richard B. Kuprewicz, dated August 30, 2007.

16. "Recommended Leak Detection Methods for the Keystone Pipeline in the Vicinity of the Fordville Aquifer," prepared for TransCanada Keystone L.P. by Richard B. Kuprewicz, President of Accufacts Inc., dated September 26, 2007.

17. "Increasing MOP on the Proposed Keystone XL 36-Inch Liquid Transmission Pipeline," prepared for the Pipeline Safety Trust by Richard B. Kuprewicz, dated February 6, 2009.

18. "Observations on Unified Command Drift River Fact Sheet No 1: Water Usage Options for the current Mt. Redoubt Volcano threat to the Drift River Oil Terminal," prepared for Cook Inletkeeper by Richard B. Kuprewicz, dated April 3, 2009.

19. “Observations on the Keystone XL Oil Pipeline DEIS,” prepared for Plains Justice by Richard B. Kuprewicz, dated April 10, 2010.

20. “PADD III & PADD II Refinery Options for Canadian Bitumen Oil and the Keystone XL Pipeline,” prepared for the Natural Resources Defense Council (NRDC), by Richard B. Kuprewicz, dated June 29, 2010.

21. “The State of Natural Gas Pipelines in Fort Worth,” prepared for the Fort Worth League of Neighborhoods by Richard B. Kuprewicz, President of Accufacts Inc., and Carl M. Weimer, Executive Director Pipeline Safety Trust, dated October, 2010.

22. “Accufacts’ Independent Observations on the Chevron No. 2 Crude Oil Pipeline,” prepared for the City of Salt Lake, Utah, by Richard B. Kuprewicz, dated January 30, 2011.

23. “Accufacts’ Independent Analysis of New Proposed School Sites and Risks Associated with a Nearby HVL Pipeline,” prepared for the Sylvania, Ohio School District, by Richard B. Kuprewicz, dated February 9, 2011.

24. “Accufacts’ Report Concerning Issues Related to the 36-inch Natural Gas Pipeline and the Application of Appleview, LLC Premises: 7009 and 7010 River Road, North Bergen, NJ,” prepared for the Galaxy Towers Condominium Association Inc., by Richard B. Kuprewicz, dated February 28, 2011.

25. “Prepared Testimony of Richard B. Kuprewicz Evaluating PG&E’s Pipeline Safety Enhancement Plan,” submitted on behalf of The Utility Reform Network (TURN), by Richard B. Kuprewicz, Accufacts Inc., dated January 31, 2012.

26. “Evaluation of the Valve Automation Component of PG&E’s Safety Enhancement Plan,” extracted from full testimony submitted on behalf of The Utility Reform Network (TURN), by Richard B.Kuprewicz, Accufacts Inc., dated January 31, 2012, Extracted Report issued February 20, 2012.

27. “Accufacts’ Perspective on Enbridge Filing to NEB for Modifications on Line 9 Reversal Phase I Project,” prepared for Equiterre Canada, by Richard B. Kuprewicz, Accufacts Inc., dated April 23, 2012.

28. “Accufacts’ Evaluation of Tennessee Gas Pipeline 300 Line Expansion Projects in PA & NJ,” prepared for the Delaware RiverKeeper Network, by Richard B. Kuprewicz, Accufacts Inc., dated June 27, 2012.

29. “Impact of an ONEOK NGL Pipeline Release in At-Risk Landslide and/or Sinkhole Karst Areas of Crook County, Wyoming,” prepared for landowners, by Richard B. Kuprewicz, Accufacts Inc., and submitted to Crook County Commissioners, dated July 16, 2012.

30. “Impact of Processing Dilbit on the Proposed NPDES Permit for the BP Cherry Point Washington Refinery,” prepared for the Puget Soundkeeper Alliance, by Richard B. Kuprewicz, Accufacts Inc., dated July 31, 2012.

31. “Analysis of SWG’s Proposed Accelerated EVPP and P70VSP Replacement Plans, Public Utilities Commission of Nevada Docket Nos. 12-02019 and 12-04005,” prepared for the State of Nevada Bureau of Consumer Protection, by Richard B. Kuprewicz, Accufacts Inc., dated August 17, 2012.

32. “Accufacts Inc. Most Probable Cause Findings of Three Oil Spills in Nigeria,” prepared for Bohler Advocaten, by Richard B. Kuprewicz, Accufacts Inc., dated September 3, 2012.

33. “Observations on Proposed 12-inch NGL ONEOK Pipeline Route in Crook County Sensitive or Unstable Land Areas,” prepared by Richard B. Kuprewicz, Accufacts Inc., dated September 13, 2012.

34. “Findings from Analysis of CEII Confidential Data Supplied to Accufacts Concerning the Millennium Pipeline Company L.L.C. Minisink Compressor Project Application to FERC, Docket No. CP11-515-000,” prepared by Richard B. Kuprewicz, Accufacts Inc., for Minisink Residents for Environmental Preservation and Safety (MREPS), dated November 25, 2012.

35. “Supplemental Observations from Analysis of CEII Confidential Data Supplied to Accufacts Concerning Tennessee Gas Pipeline’s Northeast Upgrade Project,” prepared by Richard B. Kuprewicz, Accufacts Inc., for Delaware RiverKeeper Network, dated December 19, 2012.

36. “Report on Pipeline Safety for Enbridge’s Line 9B Application to NEB,” prepared by Richard B. Kuprewicz, Accufacts Inc., for Equiterre, dated August 5, 2013.

37. “Accufacts’ Evaluation of Oil Spill Joint Investigation Visit Field Reporting Process for the Niger Delta Region of Nigeria,” prepared by Richard B. Kuprewicz for Amnesty International, September 30, 2013.

38. “Accufacts’ Expert Report on ExxonMobil Pipeline Company Silvertip Pipeline Rupture of July 1, 2011 into the Yellowstone River at the Laurel Crossing,” prepared by Richard B. Kuprewicz, November 25, 2013.

39. “Accufacts Inc. Evaluation of Transco’s 42-inch Skillman Loop submissions to FERC concerning the Princeton Ridge, NJ segment,” prepared by Richard B. Kuprewicz for the Princeton Ridge Coalition, dated June 26, 2014, and submitted to FERC Docket No. CP13-551.

40. Accufacts report “DTI Myersville Compressor Station and Dominion Cove Point Project Interlinks,” prepared by Richard B. Kuprewicz for Earthjustice, dated August 13, 2014, and submitted to FERC Docket No. CP13-113-000.

41. “Accufacts Inc. Report on EA Concerning the Princeton Ridge, NJ Segment of Transco’s Leidy Southeast Expansion Project,” prepared by Richard B. Kuprewicz for the Princeton Ridge Coalition, dated September 3, 2014, and submitted to FERC Docket No. CP13-551.

42. Accufacts’ “Evaluation of Actual Velocity Critical Issues Related to Transco’s Leidy Expansion Project,” prepared by Richard B. Kuprewicz for Delaware Riverkeeper Network, dated September 8, 2014, and submitted to FERC Docket No. CP13-551.

43. “Accufacts’ Report to Portland Water District on the Portland – Montreal Pipeline,” with Appendix, prepared by Richard B. Kuprewicz for the Portland, ME Water District, dated July 28, 1014.

44. “Accufacts Inc. Report on EA Concerning the Princeton Ridge, NJ Segment of Transco’s Leidy Southeast Expansion Project,” prepared by Richard B. Kuprewicz and submitted to FERC Docket No. CP13-551.

45. Review of Algonquin Gas Transmission LLC’s Algonquin Incremental Market (“AIM Project”), Impacting the Town of Cortlandt, NY, FERC Docket No. CP14-96-0000, Increasing System Capacity from 2.6 Billion Cubic Feet (Bcf/d) to 2.93 Bcf/d,” prepared by Richard B. Kuprewicz, and dated Nov. 3, 2014.

46. Accufacts’ Key Observations dated January 6, 2015 on Spectra’s Recent Responses to FERC Staff’s Data Request on the Algonquin Gas Transmission Proposal (aka “AIM Project”), FERC Docket No. CP 14-96-000) related to Accufacts’ Nov. 3, 2014 Report and prepared by Richard B. Kuprewicz.

47. Accufacts’ Report on Mariner East Project Affecting West Goshen Township, dated March 6, 2015, to Township Manager of West Goshen Township, PA, and prepared by Richard B. Kuprewicz.

48. Accufacts’ Report on Atmos Energy Corporation (“Atmos”) filing on the Proposed System Integrity Projects (“SIP”) to the Mississippi Public Service Commission (“MPSC”) under Docket No. 15-UN-049 (“Docket”), prepared by Richard B. Kuprewicz, dated June 12, 2015.

49. Accufacts’ Report to the Shwx’owhamel First Nations and the Peters Band (”First Nations”) on the Trans Mountain Expansion Project (“TMEP”) filing to the Canadian NEB, prepared by Richard B. Kuprewicz, dated April 24, 2015.

50. Accufacts Report Concerning Review of Siting of Transco New Compressor and Metering Station, and Possible New Jersey Intrastate Transmission Pipeline Within the Township of Chesterfield, NJ (“Township”), to the Township of Chesterfield, NJ, dated February 18, 2016.

51. Accufacts Report, “Accufacts Expert Analysis of Humberplex Developments Inc. v. TransCanada Pipelines Limited and Enbridge Gas Distribution Inc.; Application under Section 112 of the National Energy Board Act, R.S.C. 1985, c. N-7,” dated April 26, 2016, filed with the Canadian Nation Energy Board (NEB).

52. Accufacts Report, “ A Review, Analysis and Comments on Engineering Critical Assessments as proposed in

PHMSA's Proposed Rule on Safety of Gas Transmission and Gathering Pipelines," prepared for Pipeline Safety Trust by Richard B. Kuprewicz, dated May 16, 2016.

53. Accufacts' Report on Atmos Energy Corporation ("Atmos") filing to the Mississippi Public Utilities Staff, "Accufacts Review of Atmos Spending Proposal 2017 – 2021 (Docket N. 2015-UN-049)," prepared by Richard B. Kuprewicz, dated August 15, 2016.

54. Accufacts Report, "Accufacts Review of the U.S. Army Corps of Engineers (USACE) Environmental Assessment (EA) for the Dakota Access Pipeline ("DAPL")," prepared for Earthjustice by Richard B. Kuprewicz, dated October 28, 2016.

55. Accufacts' Report on Mariner East 2 Expansion Project Affecting West Goshen Township, dated January 6, 2017, to Township Manager of West Goshen Township, PA, and prepared by Richard B. Kuprewicz.

56. Accufacts Review of Puget Sound Energy's Energize Eastside Transmission project along Olympic Pipe Line's two petroleum pipelines crossing the City of Newcastle, for the City of Newcastle, WA, June 20, 2017.

57. Accufacts Review of the Draft Environmental Impact Statement for the Line 3 Pipeline Project Prepared for the Minnesota Department of Commerce, July 9, 2017, filed on behalf of Friends of the Headwaters, to Minnesota State Department of Commerce for Docket Nos. CN-14-916 & PPL-15-137.

58. Testimony of Richard B. Kuprewicz, president of Accufacts Inc., in the matter West Goshen Township and Concerned Citizens of West Goshen Township v. Sunoco Pipelines, L.P. before the Pennsylvania Public Utilities Commission, Docket No. C-2017-2589346, on July 18, 2017, on Behalf of West Goshen Township and Concerned Citizens of West Goshen Township.

59. Direct Testimony of Richard B. Kuprewicz, president of Accufacts Inc., on Behalf of Friends of the Headwaters regarding Enbridge Energy, Limited Partnership proposal to replace and reroute an existing Line 3 to the Minnesota Office of Administrative Hearings for the Minnesota Public Utilities Commission (MPUC PL-9/CN-14-916 and MPUC PL-9/PPL-15-137), September 11, 2017 and October 23, 2017.

60. Direct Testimony of Richard B. Kuprewicz On Behalf of The District of Columbia Government, before the Public Service Commission of the District of Columbia, in the matter of the merger of AltaGas Ltd. and WGL Holdings, Inc., Formal Case No. 1142, September 29, 2017.

61. Report to Mississippi Public Utilities Staff ("MPUS"), "Accufacts Review on Atmos Energy Corporation's Proposed Capital Budget for Fiscal Year 2018 related to System Integrity Program Spending (Docket N. 2015-UN-049)," prepared by Richard B. Kuprewicz, dated December 4, 2017.

62. Report to Hugh A. Donaghue, Esquire, Concord Township Solicitor, "Accufacts Comments on Adelphia Project Application to FERC (Docket No. CP18-46-000) as it might impact Concord Township," dated May 30, 2018.

63. Report to Mississippi Public Utilities Staff ("MPUS"), "Accufacts Review on Atmos Energy Corporation's Proposed Capital Budget for Fiscal Year 2019 related to System Integrity Program Spending (Docket N. 2015-UN-049)," prepared by Richard B. Kuprewicz, dated August 20, 2018.

64. Report to West Goshen Township Manager, PA, "Accufacts report on the repurposing of an existing 12-inch Sunoco pipeline segment to interconnect with the Mariner East 2 and Mariner East 2X crossing West Goshen Township," dated November 8, 2018.

65. Report to West Whiteland Township Manager, PA, "Accufacts Observations on Possible Pennsylvania State Pipeline Safety Regulations," prepared by Richard B. Kuprewicz, dated March 22, 2019.

66. Accufacts Public Comments on the Proposed Joint Settlement, BI&E v. Sunoco Pipeline L.P. ("SPLP"), Docket No. C-2018-3006534 ("Proposed Settlement"), submitted on August 15, 2019 to the Pennsylvania Public Utility Commission on the behalf of West Goshen Township as an intervener.

67. Report to West Whiteland Township Manager, Ms. Mimi Gleason, "Accufacts Perspective on Two Questions from West Whiteland's Board of Supervisors on Proposed Changes to ME 2 and ME 2X Construction/Operational Activities within West Whiteland," dated September 5, 2019."

68. Report to West Goshen Township Manager, Mr. Casey LaLonde, “Accufacts Report on the episode on the evening of 8-5-19 at the Mariner East Boot Road Pump Station (“Event”), Boot Road, West Goshen Township, PA,” dated September 16, 2019.

69. Provided direct testimony before the Arizona Corporation Commission, In the Matter of the Application of Southwest Gas Corporation for the Establishment of Just and Reasonable Rates and Charges Designed to Realize a Reasonable Rate of Return on Fair Value of the Properties of Southwest Gas Corporation Devoted to its Arizona Operations (Docket No. G-01551A-19-0055), testified on behalf of Utilities Division Arizona Corporation Commission, February 19, 2020.

70. Report to West Goshen Township Manager, Mr. Casey LaLonde, “Accufacts Report on the Mariner East 2X Pipeline Affecting West Goshen Township,” dated July 23, 2020.

71. Assisted the Commonwealth of Massachusetts, Office of the Attorney General in developing pipeline safety processes to be incorporated into the settlement agreement related to Columbia Gas’ sale of Assets to Eversource following the Merrimack Valley, Massachusetts overpressure event of September 13, 2018.

72. Report to Natural Resources Defense Council, Inc., “Accufacts’ Observations on the Use of Keystone XL Pipeline Pipe Exhibiting External Coating Deterioration Issues from Long Term Storage Exposure to the Elements,” October 1, 2020.

73. Report to Pennsylvania Public Utilities Commission (“PAPUC”), “Accufacts Comments on Proposed Pennsylvania Intrastate Liquid Pipeline Safety Regulations,” dated October 29, 2021, prepared for West Whiteland Township Board of Supervisors, West Whiteland Township, PA. Filed to PAPUC public web docket November 5, 2021 by West Whiteland Township under Reference Docket Number L-2019-3010267. Addresses suggested improvements in proposed pipeline safety rules for PA intrastate liquid transmission pipelines.

74. Submitted written testimony of Richard B. Kuprewicz on Behalf of Bay Mills Indian Community to ALJ Dennis Mack, dated December 14, 2021, in the matter of the Application of Enbridge Energy, Limited Partnership for Authority to Replace and Relocate the Segment of Line 5 Crossing the Straits of Mackinac into a Tunnel Beneath the Straits of Mackinac, before the State of Michigan Public Service Commission, U-20763.

75. Public presentation to New York State Indian Point Nuclear Facility Decommissioning Oversight Board on Holtec removal activities in proximity to Enbridge three Natural Gas Transmission Pipelines, March 17, 2022.

76. Report to Pipeline Safety Trust and Bold Alliance, “Accufacts’ Perspectives on the State of Federal Carbon Dioxide Transmission Pipeline Safety Regulations as it Relates to Carbon Capture, Utilization, and Sequestration within the U.S.,” March 23, 2022.

77. Accufacts Inc., Public Presentation For the National Academies of Science Engineering Medicine and The Transportation Research Board, “To Committee on Criteria for Installing Automatic and Remote-Controlled Shutoff Valves on Existing Gas and Hazardous Liquid Transmission Pipelines,” 4/27/22.

78. Accufacts Inc, “6/13/22 Webinar to Illinois Emergency Responders, Healthcare Providers, & Local Officials on Responses to CO_2 Transmission Pipeline Releases,“ 6/13/22.

79. Accufacts Report for Pipeline Safety Trust, “Safety of Hydrogen Transportation by Gas Pipelines,” 11/28/22.

80. Completed a series of testimonies related to Enbridge’s Line 5 proposal to replace 2 – 20-inch diameter existing submerged pipelines currently lying across the bottom of the Straits of Mackinac with a 30-inch diameter grade X-70 pipeline, proposed to be installed in a 21-foot diameter concrete tunnel to be installed across the approximate 4 mile span of the Straits of Mackinac. Testified on Behalf of the Bay Mill Indian Community before the State of Michigan Public Service Commission, Docket U-20763, in opposition to this very poorly designed proposal/installation allowing for movement of the pipeline on rollers within the tunnel. Final testimony to the docket submitted May 19, 2023. This is the only pipeline proposal I am aware of in the world that would place a crude oil and liquid propane pipeline, especially a 30-inch diameter pipeline, within a tunnel.

81. Issued to Ms. Niroop Srivatsa, City Manager, “Accufacts Report for the City of Lafayette on the Status of the Tree Assessment Process with PG&E,” indicating most of the trees identified for removal by PG&E risk management

approach have nothing to do with gas pipeline safety, June 15, 2023.

82. Issued Direct Testimony to Illinois Commerce Commission (“ICC”) on the Navigator Heartland Greenway LLC Application for a Carbon Dioxide Transportation and Sequestration pipeline, under Docket 23-0161, on behalf of Citizens Against Heartland Pipeline (“CAHGP”), McDonough County, Christian County and Hancock County (the “Counties”) (jointly, “Citizen and County Intervenors” of “CCI”), raising serious questions as to PHMSA’s recent assertions of pipeline safety jurisdiction, and underscoring the ICC’s authority for pipeline siting jurisdiction of said pipeline proposal in the State of Illinois, filed June15, 2023.

Comment 3
Earthjustice & Group

3-001

Thank you for your comment and participation in the public process. This comment does not state a specific concern related to the adequacy of the DREIR and therefore does not require a detailed response. This comment is noted for the record and will be provided to the Planning Commission and Board of Supervisors for consideration. Please see Global Response GR-2 Extending the Life of Fossil Fuel Facilities.

3-002

The commenter states that the EIR is missing critical details about the CTV I Project and is vague throughout; however, the commenter does not specify what information is missing. The Project Description, Chapter 3 of the DREIR, includes quantitative and geographical detail relative to each operational and construction component of the project consistent with the County's requirements for a Conditional Use Permit. This comment is noted for the record as opposition to the project and will be provided to the Planning Commission and Board of Supervisors for consideration.

3-003

The commenter states that the EIR is missing critical details about the CTV I Project and is vague throughout; however, the commenter does not specify what information is missing. The Project Description, Chapter 3 of the DREIR, includes quantitative and geographical detail relative to each operational and construction component of the project consistent with the County's requirements for a Conditional Use Permit. This comment is noted for the record as opposition to the project and will be provided to the Planning Commission and Board of Supervisors for consideration.

3-004

The commenter states that EIR project description fails to comply with CEQA. The commenter does not however provide specific examples of what information they believe is missing. The project has now been circulated twice for public comment and the details of the project description in Chapter 3 - Pages 3-1 through 3-47 contain a full and sufficient description and details of all components of this project. The mitigation measures imposed establish standards for the Carbon Capture and Storage project and integrate all requirements of State and Federal Law. The RDEIR full complies with all requirements of CEQA; This comment is noted for the record and will be provided to the Planning Commission and Board of Supervisors for consideration.

3-005

The commenter states that the EIR is missing critical details about the CTV I Project including reasonable foreseeable consequences. Please refer to response 3-003 and Global Response (GR) 1 - Source Identification, GR 9 – Alternatives, and GR 10- Cumulative Impacts.

3-006

The commenter states that the EIR's scope is too narrow because it fails to address critical components of the CTV I Project, including the Project's effect on the development of industries in Kern County that will send CO_2 for sequestration to the Elk Hills oil field. Please see GR 1-Source Identification and refer to pages 3-13 through 3-15 on the matter of additional future sources for the project. Section 4.11 Land Use and Planning pages 4.11-50 through 4.11-54 include a description of the mitigation measures that apply to future sources and limits the type and geographic area for such sources.

3-007

The commenter states that the EIR only analyzes the first among several future carbon sources. This comment does not state a specific concern related to the adequacy of the DREIR and therefore does not require a detailed response. This comment is noted for the record and will be provided to the Planning Commission and Board of Supervisors for consideration.

3-008

This comment voices concern that the project will require a significant input of CO_2 from external sources on a yearly basis in order for the project to be successful, which the commenter states may proliferate the continuation of fossil fuel dependence. Please refer to Global Response GR-1 Source Identification.

3-009

This comment states that the EIR fails to properly disclose and analyze the CO_2 emissions sources' potential impacts. Please see Global Response GR-1 Source Identification.

3-010

This comment states that the Recirculated DEIR fails to properly disclose and analyze the CO_2 emissions sources' potential impacts. Please see Global Response GR-1 Source Identification.

3-011

This commenter states that the EIR fails to properly disclose and analyze the CO_2 emissions sources' potential impacts. Please see Global Response GR-1 Source Identification.

3-012

The commenter states that the project description fails to analyze CO_2 sources. Please refer to Please refer to GR-1 Source Identification and GR-10 Cumulative Impacts.

3-013

This commenter states that the Recirculated Draft EIR fails to address the financial dependency of CTV I on future CO_2 sources. Please see Global Response GR-1 Source Identification.

3-014

This commenter states that the Recirculated Draft EIR's project description is inadequate in describing the sources for the CO_2 that will be injected into the CTV I storage facility. Please see Global Response GR-1 Source Identification.

3-015

This commenter says that the Recirculated Draft EIR fails to adequately address the methods and facilities that will be used to store CO_2 into the terra vault. Please see Global Response GR-4 CO_2 Pipelines.

3-016

The comment requests to include an explanation for the 40 heavy duty trucks trips per day and an analysis of these truck trips in the transportation or air quality sections. In response, the project description was revised to be consistent with the Transportation Impact Study and Transportation and Air Quality sections of the Draft Recirculated EIR as follows:

> "It is anticipated that ~~diesel heavy heavy-duty trucks~~ the operation and maintenance phase of the CO_2 Compression and Pumping Facility would generate approximately ~~would make 40~~ 20 trips per day following the access routes designated for travel."

Furthermore, these daily trips were analyzed and discussed in Section 4.3, Air Quality, on page 4.3-66, and in Section 4.17, *Transportation and Traffic*, on page 4.17-15.

3-017

This comment states that the CTV I project will incentivize new pollutant emitting industries to further contribute to greenhouse gases and localized criteria pollutant emissions. Additionally, the commenter adds that the project would impact the community by only permitting specific industries to send CO_2 to the project. Please see Global Response GR-1 Source Identification.

3-018

The commenter suggests that limiting CO_2 source facilities to Kern County would create an incentive for new potentially polluting development where it is not actually needed. The statement is incorrect. MM 4.11-17 (2) specifically provides that any source in Kern County sending CO_2 to the facility must have fully complied with CEQA with Kern County as a Responsible Agency. Under that review the potential for a new source to increase pollutant will be fully reviewed by staff and comments provided on the criteria pollutants produced. Further MM 4.11-17 (3) requires all CO_2 pipelines for transport from that source to obtain a CUP and EIR which will include the source analysis. This comment is noted for the record and will be provided to the Planning Commission and Board of Supervisors for consideration.

3-019

The comment states that the EIR does not guarantee that future sources would mitigation for their criteria pollutant emissions, and therefore, there is no guarantee that the project would not me incentivizing more pollution and CO_2 emissions. Please refer to Response 3-006.

3-020

This commenter states that the project description of the Recirculated Draft EIR fails to address the life extension of the largest pollutant groups that the project may cause. Please see Global Response GR-2 Extending the Life of Fossil Fuel Facilities.

3-021

This commenter states that the EIR fails to properly disclose and analyze the CO_2 emissions sources' potential impacts. Please see Global Response GR-1 Source Identification. Please see Global Response GR-1 Source Identification.

3-022

This commenter states that the Recirculated Draft EIR fails to adequately define which industries the CO_2 sources will come from. Additionally, the comment states that the Recirculated Draft EIR does not provide a coherent analysis of future CO_2 sources. Please see Global Response GR-1 Source Identification.

3-023

The comment states that the Draft Recirculated EIR removed three figures showing the site layout and the potential locations for the Project's amine units. The comment states that the project description is now missing important information and requests the document be revised to provide sufficient details.

In response, the referenced figures represented conceptual layouts and locations are sufficiently described in Chapter 3, *Project Description*, on page 3-17. The Draft Recirculated EIR's Project Description provided sufficient information about the Project and its major characteristics. The described project components were considered in the analysis and provides sufficient information to allow the public and reviewing agencies to evaluate and review its environmental impacts.

3-024

The commenter express the concern that the failing to address the merger violates CEQA. The merger, while in the news, was still under review by various regulatory agencies when the EIR was circulated June 4, 2024 - July 18, 2024. An announced merger or acquisition is not guaranteed to be completed and was completed on July 1, 2024. The following text has been added to Chapter 3.0, *Project Description* on Page 3-10.

> "The applicant for the Carbon TerraVault (Kern County) Project is California Resources Corporation. On February 7, 2024, California Resources Corporation (CRC) announced the signing of a definitive merger agreement with Aera Energy, LLC which was completed on July 1, 2024. CRC is the applicant for the Carbon TerraVault 1 (Kern County) CCS Project in the Elk Hills oilfield, which is approximately 9 miles southeast from the CarbonFrontier CCS by Aera Energy Surface Land use boundary, also in unincorporated Kern County. The Carbon TerraVault 1 (Kern County) CCS Project is in process of consideration for various land use permits, EPA permits, and a Draft Recirculated EIR (SCH # 2022030180) Carbon TerraVault I (Kern County) CCS Project by California Resources Corporation - Kern County Planning & Natural Resources Department. The Carbon Frontier CCS Project by Aera Energy is int he process of consideration of various land use permits, EPA permits and a Draft

Environmental impact Report (SCH 2023060293) Both projects are being processed separately, have no shared facilities and are not dependent on the other for operations. They are both included in the respective cumulative impact list in each individual EIR. Common ownership of the projects, if the merger is finalized, is not sufficient evidence under the California Environmental Quality Act (CEQA) for a determination the projects are connected. There is no evidence or permitting on record that changes either project based on the finalized merger."

3-025

The commentor states that the project ignores the requirement to discuss the ways in which a proposed project could foster economic growth and that the CTV I Project is just the first step in a much larger development for which CTV has already signed multiple CDMAs. As discussed in Chapter 5 of the DREIR, the project would source construction staff from the local County workforce. On-going project operations for carbon capture and storage facilities have a very low requirement for operational employment above and beyond existing staff presently working within the source facility. The CTV I project would only require five new full-time employees throughout the life of operations beyond those already employed within Elk Hills. Similarly, most of the future sources, identified in Section 3.4.1 of the EIR, are already existing operating facilities within the County, which would therefore, also require little incremental operational staffing for the implementation of CCS projects. The overall cumulative employment increase, and by extension population and housing growth, is insubstantial compared to the overall workforce and population in the County. The Project Objectives clearly articulate what the intent of the project is. While the objectives mention "economic development," this would be accomplished through the 0 to $400 per acre pore space fee being paid by the Applicant to the County, and not through a greater economic impact, as implied by the comment. Finally, Carbon Capture and Storage facilities are driven by regulatory and policy at the State level. CCS is identified as a core strategy in CARB's 2022 Scoping Plan.

3-026

The commentor relays that a report prepared for the carbon management park and related offsite activities projected the potential volume ("output") to range from $4.5 billion to $6.9 billion per year. The Carbon Management Business Park, as described in Appendix K-2, is a conceptual, master planned business park, entirely separate from the Elk Hills Oil Field or its carbon storage program. Facilities conceptually contemplated in the Carbon Management Business Park do not currently exist within Kern County. Therefore, the employment necessary to construct, maintain and operate business park facilities is substantially greater than a CCS facility in conjunction with an existing operational source of CO_2.

3-027

The commenter asserts that the EIR does not provide an adequate set of objectives. CEQA Guidelines Section 15124 states that an EIR project description shall contain: "A statement of the objectives sought by the proposed project. A clearly written statement of objectives will help the lead agency develop a reasonable range of alternatives to evaluate in the EIR and will aid the decision makers in preparing findings or a statement of overriding considerations, if necessary. The statement of objectives should include the underlying purpose of the project and may discuss the project benefits." The objectives included in Section 3.2.2 meet the requirements under CEQA.

3-028

This commenter states that the project will incentivize the construction of new CO_2 generating facilities and extend the life of fossil fuel infrastructure. Please see Global Response GR-1 Source Identification, and Global Response GR-2 Extending the Life of Fossil Fuel Facilities.

3-029

The commenter asserts that the EIR does not provide an adequate set of objectives. CEQA Guidelines Section 15124 states that an EIR project description shall contain: "A statement of the objectives sought by the proposed project. A clearly written statement of objectives will help the lead agency develop a reasonable range of alternatives to evaluate in the EIR and will aid the decision makers in preparing findings or a statement of overriding considerations, if necessary. The statement of objectives should include the underlying purpose of the project and may discuss the project benefits." The objectives included in Section 3.2.2 meet the requirements under CEQA.

3-030

This commenter states that the project will incentivize the construction of new CO_2 generating facilities and work against state carbon neutrality goals. Please see Global Response GR-2 Extending the Life of Fossil Fuel Facilities.

3-031

The commenter asserts that the EIR does not contain a reasonable range of alternatives and cites the CEQA Guidelines' requirements relative to Alternatives. Please see Global Response GR - 9 Alternatives.

3-032

The commenter states that EIR's alternatives discussion fails to comply with CEQA and is flawed. Please see Global Response 9: Alternatives and Response 3-003. The analysis of project alternatives is supported by an adequate project description, set of project objectives, and impact analysis.

3-033

This commenter describes that the Recirculated Draft EIR’s project description, project objectives, project impacts, no-project alternative, and comparison of alternatives do not provide sufficient detail to comply with the California Environmental Quality Act. Please see Global Response GR-9 Alternatives.

3-034

The commenter describes that the EIR is not accompanied by a set of project objectives that can adequately assess CEQA-compliant project alternatives.

Commenters assert that project objectives must be identified by the lead agency rather than by a private project applicant to provide a public purpose and need independent of the applicant. As authority for this requirement, commenters cite CEQA Guidelines 15124(b) and *North Coast Rivers Alliance v. Kawamura* (2015) 243 Cal.App.4th 647, 666, 668.

CEQA Guidelines §15124(b) states that an EIR must include a "statement of the objectives sought by the proposed project." On its face, the Guideline language does not make the lead agency responsible for identifying objectives which are "sought by the proposed project." The Guideline language refers to "objectives sought by the proposed project", not to "objectives determined by the lead agency." By referring to "objectives sought by the proposed project", CEQA Guidelines §15124(b) allows both for applicants to identify objectives for the private projects they propose, and for lead agencies to develop objectives for their own public projects.

Notwithstanding a perfunctory reference to "establishment of project objectives by the lead agency" in *North Coast* (243 Cal.App.4th at 666, quoting *In re Bay–Delta Programmatic Environmental Impact Report Coordinated Proceedings* (2008) 43 Cal.4th 1143, 1163), the N*orth Coast* case does not hold that a public agency, not the applicant, is responsible for setting project objectives for a private project and cannot adopt objectives in an EIR that were identified by a private applicant. In *North Coast*, the project objectives were necessarily framed by the lead agency because there was no one else to frame them. The case concerned objectives and alternatives in the EIR for a pest control program proposed by the California Department of Food and Agriculture, i.e., a public agency's public project. The California Supreme Court's decision in *Bay-Delta*, quoted in *North Coast*, also concerned the EIR for a public project, the multi-agency CALFED water management program administered by the state Natural Resources Agency. *Bay-Delta* and *North Coast* did not rule on, and do not stand for, the proposition that an EIR's objectives for a private project cannot be developed by the private applicant, because there were no private applicants and no applicant-developed project objectives in those cases.

This project is proposed by a private applicant and has no county funding or other involvement. Therefore, no objectives from the county are required. Please also see Global Response GR-9 Alternatives.

3-035

This comment states that the EIR is deficient in comparing the project's impacts to the impacts of the alternatives because insufficient evidence is supplied. Please see Global Response GR-9 Alternatives.

3-036

This comment states that the EIR is deficient because the Project presents significant and unavoidable impacts, whereas a no-project alternative would have less than significant impacts, and therefore, that the EIR consists of fundamental deficiencies. Please see Global Response GR-5 Greenhouse Gas Impacts.

3-037

This comment states that the EIR rejects several alternatives that satisfy the project objectives and meet CEQA criteria. Please see Global Response GR-9 Alternatives.

3-038

This comment states that the EIR fails to consider alternatives for keeping CO_2 out of the atmosphere. Please see Global Response GR-9 Alternatives.

3-039

This commentor describes that the EIR's "no project" alternative and Alternative 1 are not supported by efficient evidence or analysis. Please see Global Response GR-9 Alternatives.

3-040

This commentor describes that the comparison of the no-project alternative and the proposed project is inconsistent as the EIR fails to coherently analyze the alternative's impacts. Please see Global Response GR-9 Alternatives.

3-041

The commenter describes that the EIR neglects to analyze how the project may justify the continued burning of fossil fuels. Please see Global Response GR-1 Source Identification, and Global Response GR-2 Extending the Life of Fossil Fuel Facilities.

3-042

The commenter states that the Recirculated Draft EIR fails to adequately describe or analyze Alternative 2 and Alternative 3, citing that it fails to discuss the projected impacts of either alternative. Please see Global Response GR-9 Alternatives.

3-043

The commenter states that Alternative 3 lacks description, citing that it is not analyzed with sufficient specificity for how the alternative would be configured, or what technology would be used for its installation. Please see Global Response GR-9 Alternatives.

3-044

This comment states that the EIR's mitigation measures are insufficient and are not able to satisfy CEQA's legal requirements. Please see Global Response GR-8 Mitigation Effectiveness.

3-045

The commenter requests revising the EIR to thoroughly explain the truck trips required for project operations. The comment also references a statement from the NOP/IS that summarizes how CO_2 would be transported.

As noted in response number 3-016 above, Chapter 3, *Project Description*, was revised to be consistent with the Transportation Impact Study as follows:

> "It is anticipated that ~~diesel heavy heavy-duty trucks~~ the operation and maintenance phase of the CO_2 Compression and Pumping Facility would generate approximately ~~would make 40~~ 20 trips per day following the access routes designated for travel."

Furthermore, since the release of the NOP/IS, the project and its components have been refined. As described in Section 3.4.2, Transport of CO_2, the project proposes to transport the CO_2 through a 16-inch underground facility pipeline to the four injection wells within Section 26R.

3-046

The comment further requests to fully explain the nature and purpose of the operational heavy-duty truck trips in the project description and analyze these trips consistent with CEQA requirements. Please refer to response 3-016.

3-047

This comment states that the Air Quality section of the EIR must reflect the EPA's issuance of a new national ambient air quality standard for fine particulate matter, per new standards developed on February 7, 2024. Please see Global Response GR-6 Air Quality Impacts.

3-048

This comment states that the Air Quality section of the EIR must reflect the EPA's issuance of a new national ambient air quality standard for fine particulate matter, per new standards developed on February 7, 2024. Please see Global Response GR-6 Air Quality Impacts.

3-049

This comment suggests that the Recirculated Draft EIR should update its discussion of the $PM_{2.5}$ health effects to reflect the latest standards put forth by the EPA. Please see Global Response GR-6 Air Quality Impacts.

3-050

This comment states that the EIR does not adequately differentiate between the health effects of $PM_{2.5}$ and DPM (Diesel Particulate Matter). Please see Global Response GR-7 Geological and Induced Seismicity Risk.

3-051

Section 4.3, *Air Quality* pages 4.3-5 and 4.3-30 details the significant health risks from all criteria and other pollutants. The comment is noted for the record and will be provided to the decision makers. The inclusion of risk statements in mitigation measures is not required by CEQA and is not a practice or policy of Kern County documents. At present there is no COVID emergency declaration by the State of California and the flu, RSV and the common cold have the same relationship to $PM_{2.5}$ exposure. Appropriate mitigation measures for management and reduction of all emissions, including PM_{10} and $PM_{2.5}$ are included in MM 4.3-1 through 4.3-9 and are adequate and sufficient under CEQA.

3-052

The commenter describes a difference in distance to the closest sensitive receptor from the NOP/IS and the Recirculated Draft EIR. Since the Notice of Preparation was circulated for public review, the project, including the locations of project components, have been refined. The analysis and mitigation measures are

reflective of all changes in location since circulation of the NOP/IS. This comment is noted for the record and will be provided to the Planning Commission and Board of Supervisors for consideration.

3-053

The commenter states that the EIR fails to provide adequate, timely, and certain emissions estimates. Please see Global Response GR-6 Air Quality Impacts.

3-054

The comment states that Alternative 1 of the CTV project would contribute to significant air quality impacts and argues that the EIR should address how the environmental burdens of the project would specifically affect certain communities. Please see Global Response GR-6 Air Quality Impacts.

3-055

This comment acknowledges that the project has been proposed in a census tract that is majority Hispanic and faces one of the highest pollution burdens in the state, in addition to challenges of unemployment, poverty, and linguistic isolation. Please see Global Response GR-6 Air Quality Impacts.

3-056

The commenter states the DREIR must address probable future projects. Please refer to Global Response GR 1- Source Identification and Global Response GR-10 Cumulative Impacts.

3-057

The commenter states that the EIR should address ways that the county should work with affected communities to develop mitigation measures that adequately address the project's impacts. Please see Global Response GR-3 Environmental Justice and Public Participation.

3-058

This comment states that the EIR fails to adequately address MM 4.3-2 for mitigating and controlling fugitive dust through the implementation of a Fugitive Dust Control Plan. Please see Global Response GR-6 Air Quality Impacts.

3-059

The commentor states that the DREIR does not explain how the 4,000-foot setback for injection wells from sensitive receptors was selected. The 4,000-foot setback between injection wells and sensitive receptors, as included in MM 4.3-6, was chosen based on the maximum impact area of the project to sensitive receptors, which was found through the analysis in the EIR to be noise (as detailed in Section 4.13). The distance for noise impacts well exceed the safety threshold distance of CO_2 dispersion, as detailed in Appendix F, the CRC CO_2 Consequence Analysis (ABS Consulting, 2023), included with the Draft Recirculated EIR. Appendix F includes a consequence assessment for leak conditions in a potential CO_2 transportation pipeline. This study evaluated the dispersion of CO_2 for various leak parameters and weather cases to determine the impact zones for all leaks. Each leak was considered at a gas phase and at a dense phase at increasing pressures and constant temperatures. The concentration of interest was considered at

40,000 ppm (4%) CO_2 due to the potential health hazards when exposed for short-term or acute exposure. The study modeled 12 scenarios, from which it was found that the maximum downwind distance of plume travel would be 867 feet. Therefore, the setback in MM 4.3-6 accounts for a very conservative setback relative to the issue of CO_2 dispersion.

3-060

This commenter responds that the Recirculated Draft ER does not adequately demonstrate how pipeline rupture risks will be mitigated in the project. Please see Global Response GR-4 CO_2 Pipelines.

3-061

This comment states that the EIR does not adequately respond to air pollution, citing that MM 4.3-8 does not identify any performance standards to be used in developing a monitoring plan for pollutants. Please see Global Response GR-8 Mitigation Effectiveness.

3-062

This comment states that the court rejected a mitigation measure requiring the replacement of water lost from existing wells on the properties near the Project. Please see Global Response GR-8 Mitigation Effectiveness.

3-063

This comment states that MM 4.3-8 is insufficient because it does not identify performance standards to be used in developing the monitoring plan for pollutants. Please see Global Response GR-6 Air Quality Impacts.

3-064

MM 4.3-7 which addresses actions to take to protect workers and others in the construction are from Valley Fever is adequate and has been included in all our certified EIRs for all projects, including commercial scale solar on thousands of acres. The referenced Draft EIR project 99 Houghton Industrial Park project was never considered at a public hearing and never certified. It is, therefore, not an adopted MM language. Further the referenced project was a 258 acres industrial park that would involve extensive grading of the entire site. This project is not comparable as only the limited pipeline width and injection well sites will be graded. The proposed changes would be infeasible to implement as they are all related to mass grading not this specific project. MM 4.3-7 is sufficient for mitigation of potential Valley Fever impacts and incorporates all feasible and reasonable mitigation as it is not possible to definitively ensure that no workers or operators are exposed to Valley Fever.

3-065

This commenter argues that MM 4.3-5 does not comply with Health and Safety Codes, which state that that projects must minimize pollutant emissions to ensure that carbon storage technologies don't adversely affect low income and disadvantaged communities. Please see Global Response GR-8 Mitigation Effectiveness.

3-066

The commenter states that the requirements in the (Developer Mitigation Agreement) DMA must be particular and enforceable and address both construction and operational emissions. Please see Global Responses GR-8 and GR-6. The requirements of the DMA will be fully enforceable and address all project emissions not covered by other regulatory programs, such as Stationary Sources, to ensure no net increase in emissions. As the regulatory agency, the San Joaquin Air Pollution Control District has full authority to review all air analysis submitted for the DMA to enforce the no net increase standard they support. Mitigation measures will be incorporated as conditions of approval in the CUPs following this EIR. The commenter suggests further provisions to be included in the DMA approved by the SJVAPCD, requiring further reporting and modification if Project emissions differ from projections. Please see Global Response 8. The RDEIR contains examples of SJVAPCD reporting to ensure the emissions are reduced commensurate with covered activities. The District has an established track record of successfully funding emission reduction projects in order to offset the emissions from projects in its jurisdiction. However, in the event later evidence demonstrates that the emissions of the Project are not being fully offset as required by Mitigation Measure 4.3-5, the County retains all enforcement authority pursuant to its general police powers and Zoning Ordinance to require corrective action or abate activities.

3-067

This comment states that the EIR does not adequately address the mitigation required under MM 4.3-5. Please see Global Response GR-8 Mitigation Effectiveness.

3-068

This comment states that the EIR neglects to address the effects of significant increases in particular air pollutants, such as $PM_{2.5}$ and PM_{10}. Please see Global Response GR-8 Mitigation Effectiveness.

3-069

The commenter suggests further changes to Mitigation Measure 4.3-5 to increase public participation in the Eligible CCS Air Funding Communities. Mitigation Measure 4.3-5 requires the owner/operator to fund a county-managed community liaison position for technical support to expedite the use of funding for air mitigation projects in Eligible CCS Air Funding Communities. The commenter's proposed modifications would not result in any further reduction in the Project's air quality emissions impacts, and instead concern public participation. Please see Global Response GR-3. Mitigation Measure 4.3-5 as formulated in the final EIR provides enforceable and legally adequate mitigation. Please see Global Response GR-8 Mitigation Effectiveness.

3-070

This commenter states that the EIR's GHG analysis violates CEQA requirements, citing that it claims to analyze future CO_2 sources while arguing that the same sources are impossible to analyze. Please see Global Response GR-1 Source Identification.

3-071

This comment states that the EIR fails to mention the extension of fossil fuel facilities' useful life, resulting from carbon storage. Please see Global Response GR-2 Extending the Life of Fossil Fuel Facilities.

3-072

This comment states that the EIR does not identify performance standards to show how it will prevent CO_2 leakage. Please see Global Response GR-7 Geological and Induced Seismicity Risk.

3-073

This comment claims that the EIR does not provide analysis or evidence to support how the project will keep the CO_2 underground, guaranteeing no leakages. Please see Global Response GR-5 Greenhouse Gas Impacts.

3-074

This comment states that the EIR does not adequately assess how it intends to remain consistent with statewide greenhouse gas plans and standards. Please see Global Response GR-5 Greenhouse Gas Impacts.

3-075

Thank you for your comment and participation in the public process. This comment does not state a specific concern related to the adequacy of the DREIR and therefore does not require a detailed response. This comment is noted for the record and will be provided to the Planning Commission and Board of Supervisors for consideration.

3-076

This comment states that the EIR mitigation measures are deferred without adequate standards. Please see Global Response GR-8 Mitigation Effectiveness.

3-077

This comment states that the EIR's projections for CO_2 injection are misrepresented and contradictory. Please see Global Response GR-1 Source Identification, and GR-5 Greenhouse Gas Impacts.

3-078

This comment states that the greenhouse gas analysis is not supported by sufficient evidence, citing that it fails to define what "essential but hard to decarbonize" industries entails. Please see Global Response GR-1 Source Identification.

3-079

This comment describes that the EIR's greenhouse gas emissions analysis is inadequate and lacks sufficient evidence to support its conclusions. Please see Global Response GR-1 Source Identification.

3-080

This comment states that the EIR fails to address greenhouse gas emissions due to the project's operation and only considers external sources of reduction. Please see Global Response GR-5 Greenhouse Gas Impacts.

3-081

This commenter describes that the greenhouse gas analysis does not accurately reflect the useful life of the project's operation. Please see Global Response GR-5 Greenhouse Gas Impacts.

3-082

This comment states that the EIR fails to acknowledge the life span of nearby carbon sources that would be filling up the project with carbon storage. Please see Global Response GR-2 Extending the Life of Fossil Fuel Facilities.

3-083

This comment states that the EIR is misleading in that it does not discuss whether the project operation would receive credit for offsetting the level of carbon in the atmosphere. Please see Global Response GR-5 Greenhouse Gas Impacts.

3-084

This comment states that the EIR does not rely on sufficient analysis to support the conclusion that CO_2 will permanently remain in storage by the project. Please see Global Response GR-5 Greenhouse Gas Impacts.

3-085

This commenter states that the EIR's mention of significant environmental impacts from greenhouse gases are not supported by sufficient evidence. Please see Global Response GR-7 Geological and Induced Seismicity Risk.

3-086

This commenter states that the EIR does not properly handle its discussion of greenhouse gas emissions, citing that there are contradictions in the project's impacts from greenhouse gas emissions remaining significant and unavoidable. Please see Global Response GR-5 Greenhouse Gas Impacts.

3-087

This comment states that the EIR fails to adequately present the risks of leakages and seismic fault movement. Please see Global Response GR-7 Geological and Induced Seismicity Risk.

3-088

This comment states that the EIR's consistency analysis is not adequately focused on how the project would be consistent with scoping, citing that the project doesn't provide sufficient information on future emissions sources. Please see Global Response GR-5 Greenhouse Gas Impacts.

3-089

This comment states that the EIR fails to address the CO_2 sources with regard to consistency with the CARB 2022 Scoping Plan as a result of the project's execution and operation. Please see Global Response GR-5 Greenhouse Gas Impacts.

3-090

This comment states that the EIR does not comply with the requirement for all onsite greenhouse gas emissions to be offset during project operation. Please see Global Response GR-5 Greenhouse Gas Impacts.

3-091

The comment points out that the analysis provides references to incorrect tables and data. In response, the following paragraph will be revised as follows to correct table references and the total GHG reduction:

> Emissions of GHGs and their contribution to global climate change are considered a cumulative impact by definition. As shown in Table 4.8-3, the project's total construction GHG emissions would be 4,456 MT CO_2e. Table 4.8-4 shows the project's operational GHG emissions of 85 MT CO_2e per year, or 1,700 MT CO_2e over the 20-year operational lifetime of the project. Additionally, Table 4.8-4 shows total GHG reductions of 31,217,430 MT CO_2e over 20 years from implementation of the project, resulting in a net reduction in emissions from the existing sources associated with Elk Hills oilfield gas operations baseline. Since the project individually results in a net reduction in GHG emissions, the project would also contribute to reductions in cumulative GHG emissions.

3-092

This comment states that the EIR contains contradictory statements of greenhouse gas emission reductions whereas the EIR finds that the project will contribute to considerable emissions. Please see Global Response GR-5 Greenhouse Gas Impacts.

3-093

This comment describes that the EIR fails to identify the greenhouse gas impacts of future probable projects to be completed in relation to the project. Please see Global Response GR-5 Greenhouse Gas Impacts.

3-094

This comment states that the EIR fails to provide adequate explanation of greenhouse gas impacts, citing that it is not supported by substantial evidence. Please see Global Response GR-5 Greenhouse Gas Impacts.

3-095

The comment states the DREIR identified measures that are vague, unenforceable, ineffective, and include differing mitigation; however, the comment does not specify how the mitigation measures are insufficient. The implementation of mitigation measures is accomplished through the Mitigation Measure and Reporting Program (MMRP) which is not required to be circulated with the EIR. If the project is recommended for approval by staff, then a full MMRP (Mitigation Monitoring and Reporting Program) will be provided for review and comment in the staff report for the Planning Commission and Board of Supervisors along with the 15091 Findings of Fact and 15093 Statement of Overriding Considerations. Please see Global Response GR 8 - Mitigation Effectiveness.

3-096

This comment states that the EIR fails to comply with CEQA's requirement for effective mitigation, citing a lack of outlined performance standards throughout project construction and operation. Please see Global Response GR-5 Greenhouse Gas Impacts, GR-7 Geological and Induced Seismicity Risk, and GR-8 Mitigation Effectiveness.

3-097

This comment voices concern that greenhouse gas mitigation measures must include an action plan to address accidental leakages or project storage system malfunctions. Please see Global Response GR-5 Greenhouse Gas Impacts, and GR-7 Geological and Induced Seismicity Risk.

3-098

This comment states that the EIR's finding of no net increase in greenhouse gas emissions is misleading due to greenhouse gas emissions that would occur as a result of the project itself. Please see Global Response GR-5 Greenhouse Gas Impacts.

3-099

This comment voices concern over the project receiving credit to offset any emissions associated with the capture facility, arguing that an effective sequestration project wouldn't result in any emissions outputs. Please see Global Response GR-5 Greenhouse Gas Impacts.

3-100

This comment states that the EIR fails to provide evidence showing that there are offset programs capable of ensuring that the origin of carbon is able to be verified. Furthermore, the comment states that the volume of emissions needing to be mitigated and offset is not adequately quantified in the EIR analysis. Please see Global Response GR-5 Greenhouse Gas Impacts.

3-101

The commenter states that MM 4.8-6 is inadequate as CEQA mitigation as there are no performance standards for offsets, and no requirement they will be real, permanent, additional, verifiable, and

enforceable.. Please see Global Response GR-5 Greenhouse Gas Impacts, and GR-8 Mitigation Effectiveness.

3-102

The commenter states that the Mitigation Measure to offset emissions through inclusion in an Emission Reduction Agreement is also invalid under CEQA. The commenter also states that MM 4.8-6 is unenforceable, as fails to specify in any detail how the Air District will quantify the emissions reductions it needs to achieve the process by which the offsets will be purchased, and proof of their purchase filed, or any enforcement mechanism to ensure implementation. Please see Global Response GR-5 Greenhouse Gas Impacts, and GR-8 Mitigation Effectiveness.

3-103

The commenter expresses concerns with MM 4.8-6, such as failure to explain what type of certification can be used and under what conditions and to address the carbon generated by trucks that will bring CO_2 for injection. Please see Global Response GR-1 Source Identification, GR-5 Greenhouse Gas Impacts, and GR-8 Mitigation Effectiveness.

3-104

The commenter notes that MM 4.8-2 through 4.8-5 do not succeed in mitigating GHG impacts. Please see Global Response GR-5 Greenhouse Gas Impacts, and GR-8 Mitigation Effectiveness.

3-105

The commenter states that the DREIR fails to adequately disclose, analyze, and mitigate the CTV I Project's impacts to energy resources. The comment further incorrectly cites the CEQA guidelines to appear to assert that the project must be " above average" in energy efficient. There no such mandate or requirement in CEQA.

Section 15126.2 of the CEQA Guidelines state that "If the project's energy use reveals that the project may result in significant environmental effects due to wasteful, inefficient, or unnecessary consumption use of energy, or wasteful use of energy resources, the EIR shall mitigate that energy use.... This analysis is subject to the rule of reason and shall focus on energy use that is caused by the project. This analysis may be included in related analyses of air quality, greenhouse gas emissions, transportation or utilities in the discretion of the lead agency."

Furthermore, as described in CEQA Guidelines, Appendix F, environmental impacts related to energy may include:

1. The project's energy requirements and its energy use efficiencies by amount and fuel type for each stage of the project including construction, operation, maintenance and/or removal. If appropriate, the energy intensiveness of materials maybe discussed.
2. The effects of the project on local and regional energy supplies and on requirements for additional capacity.
3. The effects of the project on peak and base period demands for electricity and other forms of energy.

4. The degree to which the project complies with existing energy standards.
5. The effects of the project on energy resources.
6. The project's projected transportation energy use requirements and its overall use of efficient transportation alternatives.

As described in Section 4.6, Energy, of the Draft Recirculated EIR, estimates for energy requirements for the project were determined using the construction and operational estimates generated from the calculation worksheets for energy consumption. Based on the estimates, it was determined that the amount of electricity used during construction would not be excessive, wasteful or inefficient. Additionally, operational energy demand is estimated to increase annual electricity demand by approximately 31 MW/year total. Carbon capture and sequestration projects, such as the proposed project, are essential to achieve the State's climate goals (CARB 2022); as a result, any energy consumed by the project is not considered to be wasteful or unnecessary. Furthermore, the project would not require a new source of electricity to serve the project. As there are functioning carbon capture facilities in California for a comparison on electricity consumption, MM 4.6-1 has been included requiring an annual report of the amount of electricity consumed by the carbon capture facility be provided to the State and Federal Agencies to create a baseline for other such projects.

3-106

The commenter states the EIR should require the use of electricity-powered construction equipment and vehicles, where feasible. Please refer to response 3-105.

3-107

This comment is noted for the record and will be provided to the Planning Commission and Board of Supervisors for consideration. The comment regarding " CO_2 storage projects will often tend to substitute for, rather than facilitate, decreasing reliance on fossil fuels such as coal, natural gas, and oil. " is a general statement that can not apply to this project. This project is prohibited from using the CO_2 for Enhanced Oil Recovery by California law and MM 4.11-7 limits sources to Kern County. There is no coal use in Kern County as California also has policies that restrict its use. As for reducing the reliance on fossil fuels, while that is a California policy is not a Kern County policy and therefore the project does not have to comply with as such requirement for consideration of the Conditional Use Permit.

3-108

The comment states that an analysis that includes information about the relationship between Project CO_2 storage operations and Project CO_2 sources is necessary to disclose and analyze how the Project may facilitate development and use of fossil fuel infrastructure or extend the life of existing fossil fuel CO_2-emitting industries. Please see Global Response GR-1 Source Identification, and GR-2 Extending the Life of Fossil Fuel Facilities.

3-109

The commenter references the DiGiulio Report, which highlights the risk of CO_2 leaks from the storage reservoirs as well as seismic hazards on wellbores in the Elk Hills oil field. Please see Global Response GR-7 Geological and Induced Seismicity Risk.

3-110

The commenter states that the RDEIR fails to fully account for the geologic setting at the Elk Hills oil field. The commenter notes that the RDEIR does not acknowledge wellbore integrity failure and leaks from plugged wells. Please see Global Response GR-7 Geological and Induced Seismicity Risk.

3-111

The commenter notes that the RDEIR's analysis of geologic impacts is missing details, such as information needed to assess wellbore integrity, vague references to appendices, and undefined descriptors. Please see Global Response GR-7 Geological and Induced Seismicity Risk.

3-112

The commenter states that the RDEIR does not accurately describe and consider the full environmental context related to seismic activity in the region and fails to capture potentially significant adverse geologic and safety impacts in the broader region. The commenter refers to the DiGiulio Report for concerns relating to seismicity. Please see Global Response GR-7 Geological and Induced Seismicity Risk.

3-113

The commenter states that the RDEIR fails to conduct further analysis on the nature and magnitude of the significant risks of induced seismic activity. The commenter also states that the RDEIR must address "probable future projects," including other CO_2 sources being prepared for the Project as well as further industrial development that is expected in the region. Please see Global Response GR-7 Geological and Induced Seismicity Risk.

3-114

The commenter states that the RDEIR sets forth inadequate mitigation measures to address the geologic impacts of the Project. The commenter states that MM 4.7-1 is inadequate and does not represent all feasible mitigation for the impacts of earthquakes and ground shaking. Please see Global Response GR-7 Geological and Induced Seismicity Risk.

3-115

The commenter states that the RDEIR cannot rely on compliance with the Building Code for its conclusions without describing the requirements and how they would reduce the Project's geologic impacts to less than significant. The commenter states that MM 4.7-3 is inadequate and notes that the RDEIR must specify that no permits shall be issued, and no activities expected to cause landslides, subsidence, liquefaction, or collapse may begin until the County and other relevant agencies approve the report. Please see Global Response GR-7 Geological and Induced Seismicity Risk, and GR-8 Mitigation Effectiveness.

3-116

The commenter states that the RDEIR does not adopt feasible mitigation in relation to geologic impacts. The commenter references the DiGiulio Report and notes that it recommends additional feasible mitigation measures. Please see Global Response GR-7 Geological and Induced Seismicity Risk.

3-117

The commenter states that the RDEIR fails to adequately disclose, analyze, and mitigate carbon dioxide pipeline safety hazards. The commenter states that the RDEIR does not identify how potential sources will be transported to the Elk Hill facilities and that the RDEIR fails to address the possibility of a CO_2 injection well blowout. Please see Global Response GR-4 CO_2 Pipelines.

3-118

The commenter expresses concern regarding the history of pipeline incidents. Please see Global Response GR-4 CO_2 Pipelines.

3-119

The commenter notes that the RDEIR does not address exposure to large amounts of CO_2, which could lead to harmful impacts if a pipeline were to fail. The commenter expresses that the RDEIR's conclusions regarding pipeline-related impacts, including cumulative impacts, is not supported by substantial evidence. Please see Global Response GR-4 CO_2 Pipelines.

3-120

The commenter states that the RDEIR contains missing and inaccurate information regarding CO_2 pipeline safety issues and notes that the proposed measures are also ineffective, unenforceable, and vague, and illegally defer mitigation. Please see Global Response GR-4 CO_2 Pipelines.

3-121

The commenter expresses concern with mitigation measures set forth by the Project, noting that requiring compliance with existing regulations or other requirements without further review or analysis does not conclusively indicate that the Project would not have significant and adverse impacts. The commenter also notes that MM 4.11-7 does not explain the nature of the offsite sources or relevant details about the connecting pipelines or potential common carrier companies and is vague, indefinite, and does not represent all feasible mitigation. Please see Global Response GR-4 CO_2 Pipelines, and GR-8 Mitigation Effectiveness.

3-122

The commenter states that the RDEIR fails to analyze and adopt all feasible CO_2 pipeline safety mitigations for the Project. Please see Global Response GR-4 CO_2 Pipelines.

3-123

The comment states that the Draft Recirculated EIR fails to adequately disclose and analyze water supply impacts and correspondingly fails to adopt all feasible mitigation. However, the comment does not specify which mitigation measures require revisions. All mitigation measures have been adopted based on substantial evidence and agency recommendations. This comment is noted for the record and will be provided to the Planning Commission and Board of Supervisors for consideration.

3-124

The comment states that the Utilities and Service Systems section header is mislabeled. The Section is labeled properly in the Table of Content as 4.19 Utilities and Service Systems with the sections properly labeled as 4.19.1 Introduction, 4.19.2 Environmental Setting, 4.19.3 Regulatory Setting, 4.19.4 Impacts and Mitigation Measures and 4.19-5 Cumulative Setting, Impacts and Mitigation Measures. The title page is labeled correctly Section 4.19 Utilities and Services Systems, and the pages are numbered correctly from 4.19 - 1 to 4.19 - 28. The Mitigation Measures are numbered properly MM 4.19-1 through 4.19-2. The only error is at the top right-hand side of each page which says "4.17 Utilities and Service Systems." This error is a typo that changes no analysis and as all other parts of the chapter is labeled properly does not impact the sufficiency of the document. It will be fixed in the final EIR as part of formatting.

3-125

The comment states that the Draft Recirculated EIR should disclose that there is no "surplus water " available in the County. The project applicant CRC has an existing contract with the West Kern Water District and further has no restrictions on the water supply rights under their property. Section 4.10, Hydrology and Water Quality, of the Draft REIR has a full description of the Sustainable Groundwater Management Act of 2014 (SGMA) (pg. 4.10-15 - 4.10-17) and Appendix G-2 Water Supply Assessment fully complies with Water Code Section 10910 and Kern County policy. While the project is located in the Tulare Lake Hydrological Basin, it is not an adjudicated basin and groundwater pumping as determined by water rights is not restricted. The Water Supply Assessment (Appendix G-2) states that the water budget for Elk Hills is 3,000 acre feet per year (AFY) and another 2,200 AFY for use by the CRC totals over 5,200 AFY available for CRC projects. This is not "surplus water" but water CRC is entitled to utilize for a beneficial use through their water rights. Table 4.19-2 Water Supply Availability calculates the total project demand is a first year total of 94.49 AF until construction is completed in 18 months with subsequent years of operation being 19.49 AFY for the life of the project. As a backup, produced water from existing oilfield activities could be utilized for some activities and that water is not subject to the SGMA or other restrictions. While the Tulare Basin is projected to be overdrafted by 1 million AFY out of a total usage of over 2.8 million AF of water, primarily for agricultural use, the project's use of 94.49 AF of water for the first phase of construction and operation (18 months) and 19.49 AF of water for each subsequent year cannot be considered significant in the regional discussion. No other users are being deprived of water as CRC has a legal water right to utilize this water.

3-126

See response to comment 3-125 and Appendix G-1 – Hydrology and Water Quality Technical Documentation.

3-127

See response to comment 3-125 and Appendix G-1 – Hydrology and Water Quality Technical Documentation.

3-128

The comment states that the EIR should include details explaining that SGMA applies to Kern County and the Project Area. Comment also states the EIR should address the expected consequences of the GSPs on the project. See response to comment 3-125.

Section 4.10, Hydrology and Water Quality, of the Draft Recirculated EIR describes the current status of the SGMA and its regulatory requirements. On page 4.10-16, the DREIR states "The WKWD GSA was created June 28, 2016, when WKWD's Board of Directors adopted Resolution 16.03, electing to become a GSA in the Subbasin and included the WKWD service area. The WKWD is a member of the Kern Groundwater Authority (KGA) and has a Management Area Plan within the KGA's GSP for the project area."

As noted in the Draft Recirculated EIR, although the GSPs were deemed inadequate, Groundwater Authorities are still required to implement the plans while working to amend the plans and address the deficiencies. An analysis of expected consequences from an amended plan that has not been made publicly available would be speculative and thus unwarranted under CEQA. CEQA requires analysis of reasonably foreseeable direct and indirect impacts from a project; CEQA, however, discourages speculation. See CEQA Guidelines § 15064(d)(3) ("An indirect physical change is to be considered only if that change is a reasonably foreseeable impact which may be caused by the project. A change which is speculative or unlikely to occur is not reasonably foreseeable.")

3-129

See response to comment 3-125 and Appendix G-1 – Hydrology and Water Quality Technical Documentation.

3-130

The comment states that table 4.19-2 incorrectly combines a one-time water demand for construction with an annual operational demand. The commenter states the EIR should remove Table 4.19-2 and disclose how much water the project will use over its full operational lifetime. Water demand for the region over the next 25 years is speculative even in the proposed plans prepared by the State of California. The project will utilize 19.29 acre feet (a.f) of water every year over the next 25 years for a total of 488 a.f of water. As the current demand and use of water in these basin exceeds 2 million AFY, even this 25 year project use projection is not significant in a finding that the project will affect the regions ability to achieve a sustainable groundwater balance. CEQA allows a responsible determination on impacts and does not mandate a "one drop of water used " standard. Mitigation is only required to reduce an impact that is found to be significant and unavoidable. As the impact of the use over 25 years of 488 a.f out of a potential regional budget of over 2 million a.f of usage is not significant, no additional mitigation is required and no requirement to reduce groundwater water use is required.

3-131

See response to comment 3-125 and Appendix G-1 – Hydrology and Water Quality Technical Documentation.

3-132

See response to comment 3-125 and 3-130.

3-133

See response to comment 3-125 and 3-130.

3-134

See response to comment 3-125 and 3-130.

3-135

See response to comment 3-125 and 3-130.

3-136

Thank you for your comment and participation in the public process. This comment does not state a specific concern related to the adequacy of the DREIR and therefore does not require a detailed response. This comment is noted for the record and will be provided to the Planning Commission and Board of Supervisors for consideration.

3-137

This comment does not state a specific concern related to the adequacy of the DREIR and therefore does not require a detailed response. This comment is noted for the record and will be provided to the Planning Commission and Board of Supervisors for consideration.

3-138

The commenter summarizes CDFW's NOP comment letter, which recommended additional surveys for special status plant species and also noted the potential for San Joaquin pocket mouse. The comment also notes the species CDFW identified with potentially suitable habitat in the Elk Hills Oil Field. Although the comment does not state a specific concern related to the adequacy of the DREIR, discussion on these species can be found in Section 4.4 of the DREIR.

3-139

The comment states that the recommendations provided by CDFW in their Draft EIR comment letter was not implemented by the County. However, this is not true. The Draft Recirculated EIR was revised based on CDFW's comment letter to include historical monitoring and observation data for the blunt-nosed lizard, giant kangaroo rat, and San Joaquin Fox, and field survey results for the San Joaquin Antelope Squirrel. Furthermore, Mitigation Measure 4.4-16 and 4.4-17 were included to avoid and minimize potential significant impacts to temblor legless lizard and crotch's bumble bee per CDFW's comment letter. As described in these two new mitigation measures, pre-disturbance surveys are required; if the species are present, an avoidance plan shall be prepared and submitted to CDFW for approval. If complete avoidance of the species is not feasible, incidental take authorization is required by applicable state and federal wildlife agencies.

As described in Appendix A of the Biological Assessment Report, the project area is outside of the known geographic range (east of the California aqueduct) of the Tipton kangaroo rat and has no potential to occur. Furthermore, CDFW did not request additional information or mitigation measures specifically for this species.

The comment states CDFW made specific requests and the Recirculated Draft EIR did not without explanation, take up these requests. In response, per CEQA Guidelines Section 15088.5, the Lead Agency recirculated the entire document and required reviewers to submit new comments, and, in such cases, need not respond to those comments received during the earlier circulation period. Furthermore, the CDFW Comment Letter states these are "editorial comments and/or suggestions", which do not state a specific concern related to the adequacy of the DREIR. Therefore, these comments were noted for the record. However, in response to CDFW's new comment letter on the RDEIR please refer to Responses 1-014 through 1-018.

The commenter states that the lead agency fails to reflect CDFW's recommendations; however, the commenter does not specify in what ways. As previously described, CDFW's recommendations for additional species information and mitigation measures have been included, and additional responses to their new comment letter can be found in Response to Comment Letter 1.

3-140

The comment states the DREIR fails to account for the evidence showing that operating CCS project can have significant impacts to biological resources, specifically from CO_2 asphyxiation, leaks and blowouts.

Section 4.9, Hazards and Hazardous Materials, discusses risks regarding CO_2 leakage (Impact 4.9-1). The analysis is based on findings in CARB LCFS Report #1 Site Based Risk Assessment (Appendix F). The Assessment states: “CRC conducted a comprehensive Risk Assessment for the CTVI Project. The assessment considered the potential for CO_2 releases during pipeline/well operation, an injection/monitoring well failure, and through existing or induced faults with eventual releases to the surface consistent with the Carbon Capture and Sequestration Protocol under the Low Carbon Fuel Standard (see https://ww2.arb.ca.gov/sites/default/files/2020-03/CCS_Protocol_Under_LCFS_8-13-18_ada.pdf). CRC’s assessment used a risk ratio to compare the concentration of a CO_2 release with health impact criteria. A risk ratio is the estimated exposure level of CO_2 predicted by modeling divided by the most appropriate health impact criterion. The modeling of the concentration of a CO_2 release considered the type of release, the quantity released, ambient conditions (such as wind direction and speed) at the time of the release, and constructed features. Probability of occurrence over 100 years, all activities show 1% probability or frequencies of occurrence for potential leakage of CO_2 and the majority of scenarios show low risk.”

The applicant would take measures to prevent unexpected and abnormal conditions that could result in an accidental release of CO_2 through the methods discussed below.

PHMSA regulates the safety of pipelines that transport hazardous liquids, including CO_2, in accordance with the regulations in 49 CFR Part 195. It develops safety regulations and other approaches to risk management to ensure safety for emergency response associated with a leak or rupture of pipeline facilities. As required by PHMSA and noted in Section, the applicant must develop a plan to respond to an accidental

release of CO_2 that follows federal guidelines. As stated in Section 3.6.4, Emergency Management, the project would be governed by an Emergency and Remedial Response Plan, which is included in Appendix E-2, Attachment F. The applicant would work with the local police departments, ambulance districts, and local and rural fire departments to develop response plans in case of a rupture included in the emergency response plan, per MM 4.9-18.

Furthermore, the Applicant will implement MM 4.9-7, which would require routine equipment inspections and maintenance to prevent leaks or emissions. MM 4.8-1 requires the submittal of a monitoring plan to demonstrate the retention of CO_2 in the reservoir per requirements of EPA UIC permit.

3-141

The comment expresses specific concern regarding CO_2 leakage impacts to burrowing owl and other burrowing species. Please refer to Response 3-140. The applicant would take measures to prevent unexpected and abnormal conditions that could result in an accidental release of CO_2 through the methods discussed below.

3-142

The comment questions why the Draft REIR removed reference to the BSA and replaced the term with project area. For the purposes of this biological resources section, the project area includes the survey area for all project features plus a 250-foot buffer, which is formally known as the biological study area.

3-143

The comment states that the DREIR relies on reconnaissance-level surveys rather than protocol surveys and does not support the decision to do reconnaissance-level surveys. Further, the comment states that the initial database review and reconnaissance surveys were insufficient to identify all sensitive species, including the TKR and several plants species identified in following comments.

As described the Biological Assessment Report (Appendix C-1), reconnaissance surveys of the BSA were conducted from September 20 to December 15, 2022. The surveys consisted of walking transects spaced 50 to 100 feet apart throughout the BSA. One hundred percent survey coverage of the BSA was achieved. Tasks completed during the survey included developing an inventory of plant and wildlife species observed, characterizing vegetation associations and habitat conditions, assessing the potential for federally and State listed special-status plant and wildlife species to occur, assessing potential for bat usage habitat, and assessing the potential for migratory bird and raptor nesting within the BSA. All locational data were recorded using ESRI Collector for ArcGIS software installed on an iPad, and site conditions were documented with representative photographs. The reconnaissance surveys conducted for the project are sufficient to establish baseline conditions. Furthermore, protocol surveys as identified in MM 4.4-1 will be required prior to construction.

Specific responses to address Tipton Kangaroo rat and special status plant species are addressed in the following responses.

3-144

The comment notes the DREIR fails to acknowledge the Tipton kangaroo rat, does not include a trapping plan, and did not conduct a reconnaissance survey within the recommended timeframe.

As described in Appendix A of the Biological Assessment Report (Appendix C-1 of the Draft REIR), the project area is outside of the known geographic range (east of the California aqueduct) of the species and has no potential to occur. The Final REIR was revised to include the following information on pg. 4.4-21:

> "The project area is outside of the known geographic range (east of the California aqueduct) of the species and has no potential to occur."

3-145

The commenter expresses concern that the Recirculated Draft EIR primarily used reconnaissance level surveys to determine the presence or absence of BNLL in the Project area. The commenter further states concern that the Recirculated Draft EIR did not disclose probability densities, monitoring routes, or detections of BNLL. This species is well known to occur in high densities throughout the Elk Hills and has been studied in the Elk Hills for over 20 years. Therefore, additional protocol-level surveys are not needed to determine if this species is present/absent within the project site. This species is considered present and as it is a state listed fully protected species, there is no incidental take authorization allowed. It should also be noted that the estimate 9-acres of suitable habitat is primarily associated with an underground pipeline with a temporary impact area that stretches over 5-miles. Therefore, the incremental loss of a narrow swath of suitable habitat is not considered a significant impact as the vegetation following construction will return to pre-existing conditions over time. The only option for this project regarding impacts to blunt-nosed leopard lizard is complete avoidance. This can be completed with the proposed best management practices identified in MM 4.4-1, MM 4.4-3, MM 4.4-9, MM 4.4-11, and MM 4.4-13 listed the EIR.

3-146

The commenter expresses concern that the EIR did not disclose OXY/CRC ongoing SJAS monitoring and detections to better inform the CEQA analysis and mitigation. While this disclosure is not required by CEQA, the evidence was considered as evidentiary support for the analysis and determination that SJAS is likely to occur throughout the project site. Mitigation measures MM 4.4-1, MM 4.4-3, MM 4.4-8, MM 4.4-11, and MM 4.4-13 would reduce impacts to the SJAS. As described in Section 4.4.3 of the Draft REIR, the proposed project is covered under the Elk Hills Oil and Gas Field Incidental Take Permit (2081-2014-019-04). The ITP contains species specific monitoring, avoidance, and relocation plans to further minimize incidental take of SJAS. These mitigation measures will be incorporated into this EIR and implemented to reduce impacts to SJAS to a less than significant level. In addition, participation in the ITP's habitat management land acquisition provides compensatory mitigation for project related impacts to this species.

3-147

The commenter expresses concern that the EIR did not disclose OXY/CRC ongoing GKR monitoring, detection, and historical observations to inform the CEQA analysis and mitigation. While this disclosure is not required by CEQA, the evidence was considered as evidentiary support for the determination that GKR is likely to occur throughout the project site. Mitigation Measures MM 4.4-1, MM 4.4-3, MM 4.4-8,

MM 4.4-11, and MM 4.4-13 would reduce impacts to the species. Furthermore, the Incidental Take Permit contains specie specific monitoring, avoidance, and relocation plans to further minimize incidental take of GKR. These mitigation measures will be incorporated into this EIR and implemented to reduce impacts to GKR to a less than significant level. In addition, participation in the ITP's habitat management land acquisition provides compensatory mitigation for project related impacts to this species.

3-148

This comment states that in order to assess potential impacts to plant species, focused biological surveys are advised to be conducted by a qualified biologist during the appropriate bloom time. The commenter states concern over the integrity of the reconnaissance survey and methodology and further suggests focused biological surveys to determine presence of special status species.

Protocol-level biological surveys will be conducted as required by the mitigation measures outlined in the Draft EIR. Specifically, MM 4.4-1 would require protocol surveys be conducted in accordance with the most current standard protocol to confirm the presence or absence of any listed threatened or endangered species under the federal Endangered Species Act. Furthermore, MM 4.4-10 requires a qualified biologist to conduct plant surveys, which would inform proper avoidance measures per species.

3-149

The comment states a large number of species-specific measures lack support, evidence, and expert/agency recommendations and must be substantially revised. However, the comment does not specify which mitigation measures require revisions. All mitigation measures have been adopted based on substantial evidence and agency recommendations. This comment is noted for the record and will be provided to the Planning Commission and Board of Supervisors for consideration.

3-150

The commenter states the Recirculated Draft EIR fails to provide sufficient mitigation measures to detect and avoid take of BNLL. However, focused surveys for BNLL are required to follow current CDFW and USFW protocols for BNLL detection, per MM 4.4-9. Based on the CDFW NOP letter, CDFW recommends the "Approved Survey Methodology for the Blunt-nosed Leopard Lizard", which, based on CDFW, is "designed to optimize BNLL detectability" which would reasonably assure CDFW that BNLL would be detected, if present. Furthermore, the comment incorrectly suggests the MM 4.4-9 protocol surveys to be synonymous with pre-construction surveys. Focused surveys, as required by MM 4.4-9, are required to align with CDFW and USFW specie detection for BNLL. Protocol surveys are required for all protected species per MM 4.4-1, which are not to be confused with pre-construction or focused surveys for BNLL (MM 4.4-9).

The commenter suggests mitigation measure for BNLL (MM 4.4-9) survey timing is indeterminate and unresponsive to the BNLL life-cycle. Focused surveys prohibit survey commencement greater than a year prior to ground disturbing activities and it is accurate that there is flexibility in timing within the year. Based on the CDFW response letter to the NOP, there is an unavoidable level of uncertainty in predicting the locations of BNLL, due to reasons posed by the commenter. However, focused surveys will be current with CDFW and USFW protocols for specie detection, which would ensure the greatest extent feasible. Protocol-level surveys will be conducted by authorized biologists approved by CDFW. The biologist will be familiar

with the BNLL life cycle and will conduct surveys during the period of time that provides the highest probability of detection.

3-151

Mitigation Measure 4.4-9(c) contains a qualitative performance standard for the avoidance plan: it must result in no unauthorized incidental take. It also provides a minimum list of the components of such a plan in order to meet the performance standard. Mitigation Measure 4.4-9(c) thus does not constitute deferred mitigation. Please see also Global Response GR-8 Mitigation Effectiveness.

3-152

The commenter states the cumulative analysis for BNLL is not reflected in the analysis. However, the cumulative analysis concludes an impact that is significant and unavoidable, which warrants mitigation measure to avoid BNLL to the greatest extent feasible. Please refer to response 3-145.

3-153

The commenter states the avoidance buffer for suitable BNLL burrows is inconsistent with CDFW recommendations. Based on the CDFW NOP letter, CDFW recommends using the "Approved Survey Methodology for the Blunt-nosed Leopard Lizard" which is "designed to optimize BNLL detectability" which would reasonably assure CDFW that BNLL would be detected, if present.

The mitigation measures identified in the DREIR are sufficient in avoiding BNLL occupied burrows and potentially occupied burrows. MM 4.4-9(a) states that all potentially occupied burrows will be avoided. Suitable burrows, which are those that are not likely to be occupied, should by avoided by a minimum distance of 50-feet. Additionally, MM4.4-9(c)(6) requires all potential burrows to be identified prior to any construction activities and construction activities will avoid burrows. CDFW and USFWS shall be notified to determine additional measures if BNLL are detected during monitoring, as stated in MM 4.4-9(c)(7).

Furthermore, the comment incorrectly suggests the MM 4.4-9(b) prescribes a 250-foot buffer if the species is detected. Protocol surveys are required for all protected species per MM 4.4-1, which are not to be confused with pre-construction or focused surveys for BNLL (MM 4.4-9). MM 4.4-9(b) states that focused surveys shall be conducted in all potential BNLL habitat within the work site and a 250-foot buffer area.

3-154

The commenter suggests that mitigation measure (MM 4.4-6) is insufficient in protecting the San Joaquin kit fox, and further states the mitigation is deficient in legal requirements. The comment is unclear to which legal requirements are not being met by MM 4.4-6. The SJKF is a covered specie under the ITP and the Project is covered by the ITP. Furthermore, MM 4.4-6 is current with CDFW avoidance guidance (Standardized Recommendations for Protections of the Endangered San Joaquin Kit Fox) and requires a 50' marked buffer for potential SJKF dens, 100' buffer on known dens, and 500' on natal dens. This comment does not otherwise raise a substantive issue on the content of the Recirculated Draft EIR.

3-155

The commenter raises concerns over MM 4.4-6 and den protection for SJKF. Mitigation requires any excavation protocols to be concurrent with the U.S. Fish and Wildlife standardized recommendations for protection of SJKF on ground disturbance. Per the USFW, it is likely a take authorization/permit is required, which the determination would be made by the Service during the Survey Protocol. Furthermore, the comment suggests the steps for den removal is likely to fail, however, the ITP provides protocol for SJKF den avoidance, and if they cannot be avoided, shall be excavated with appropriate and approved protocol from CDFW. The ITP does state that if the excavation process reveals evidence of current use, then den destruction shall cease immediately and tracking or camera monitoring shall be conducted until it is certain no individual SJKF are inside prior to collapsing of any burrow.

3-156

The commenter concludes that the SJKF mitigation (MM 4.4-6) points to incorrect additional measures. The commenter is correct in catching this clerical error. The Final Recirculated EIR has been updated to reflect, as follows:

> "...Other standard measures to protect San Joaquin kit fox, including capping pipes, covering trenches, adding exit ramps to excavated areas, shall be implemented in accordance with ~~MM 4.4-15~~ 4.4-13."

Additionally, the commenter states the CDFW recommends all perimeter fencing be raised 5 to 7 inches above ground level to allow SJKF movement through the Project site and to minimize impacts to SJKF habitat connectivity. Per *U.S. Fish and Wildlife Service Standardized Recommendations for Protection of the Endangered San Joaquin Kit Fox Prior to or During Ground Disturbance* (2011), USFWS states "... fencing as approved by the Service as long as it has openings for kit fox ingress/egress and keeps humans and equipment out." MM 4.4-13(h) concludes "a 4 to 8 inch opening between the fence mesh and the ground" would be implemented. Therefore, the MM would be in compliance with USFWS recommendations and provides a greater opening than the 5-7 inches above ground level.

3-157

The comment states that the Draft EIR is missing information on the TKR. Please refer to Response 3-144.

3-158

The commenter raises concerns that there were no trapping plans developed for determining the presence of GKR, TKR, and SNKR. However, through recommendation by CDFW, and evidenced by the ITP, GKR and SNKR are identified as having potential or present on site. These species are covered species in the ITP which further protects the specie to help minimize and fully mitigate or avoid the incidental take and disturbance of habitat. The ITP is concurrent with CDFW recommendation of 50-foot minimum no-disturbance buffer around GKR and SNKR burrow entrances.

As described in Response 3-144 above, the Tipton kangaroo rat was excluded from discussion because the project site is 2-miles west of the current known range of this species, the two recorded occurrences were over two-miles away, and the project was determined that suitable habitat is not present.

3-159

The commenter raises concerns that proposed buffers would not allow species to freely disperse to and from burrows, and the EIR should be revised to include 180-degree protection.

As found in Section 4.4 of the Draft REIR, MM 4.4-13 (h) states " To enable San Joaquin kit foxes and other wildlife to pass through the project site, any perimeter fencing shall include a 4- to 8-inch opening between the fence mesh and the ground, or the fence shall be raised 4 inches above the ground except blunt-nosed leopard lizard exclusion fencing." Therefore, SJKF and other wildlife species would be able to freely disperse and would not require a 180-degree limitation.

Although CDFW's NOP Comment letter (Appendix A-2) included these recommendations, as presented in Section 7.4.2 of the Final REIR, CDFW's comment letter on the Draft Recirculated EIR did not include the request for these mitigation measures. The proposed project is linear in nature and therefore would not include a significant development footprint that would require the 180-degree limitation.

3-160

The commenter states that the DREIR does not include CDFW recommended measures for SJAS and that there should be a separate ITP for SJAS.

As stated in Response 3-159 above, perimeter fencing shall include a 4- to 8-inch opening between the fence mesh and the ground, or the fence shall be raised 4 inches above the ground except blunt-nosed leopard lizard exclusion fencing. Therefore, SJAS would be able to freely disperse and would not require a 180 degree limitation. Additionally, SJAS is a covered species under the ITP applicable to the project and measures will be adhered to accordingly.

3-161

The commenter raises concern that the DREIR lacks mitigation measures for Swainson's hawk and that current mitigation measures do not fully address the species and potential impacts.

There is marginally suitable nesting habitat for Swainson's hawk in the Elk Hills oilfield. Per the Biological Assessment Report (Appendix C-1), habitat within the project site is characterized as valley saltbrush scrub and urban. Swainson's hawks are more likely to use the surrounding agricultural fields and typically nest adjacent to riparian habitat, which is absent from the project site. Additionally, the pipeline alignment disturbance acreage is negligible to the surrounding foraging habitat for Swainson's hawk and therefore significant habitat loss would not occur.

As shown in Table 4.4-6, a buffer zone from disturbance for active nests for listed bird species is 0.5 miles, which is consistent with CDFW's "CDFW’s Conservation Measures for Biological Resources That May Be Affected by Program-level Actions". Therefore, a buffer will be established around any active nests.

Furthermore, as stated in MM 4.4-8, "If behavioral changes are observed, the work causing that change shall cease until the Owner/operator qualified biologist consults with the California Department of Fish and Wildlife and the United States Fish and Wildlife and the qualified biologist used by the Owner/operator implements the recommended measures." This clearly states that a qualified biologist will monitor the nest. MM 4.4-8 focuses on surveys for active bird nests conducted no more than 10 days prior to disturbance.

These surveys would be conducted prior to any tree removal to identify if any nests are active. If any nests are identified, they will be monitored to determine species use and activity, if any. Trees will only be removed once it is determined that Swainson's hawk do not utilize the trees for nesting activity.

3-162

The commenter raises concern that the Project has the potential to have a significant impact on burrowing owl and the current project mitigation measures for burrowing owl are insufficient to reduce impacts.

As stated in MM 4.4-1 (B), protocol level surveys would be conducted in accordance with guidelines established by USFWS and CDFW. Protocol surveys would follow the guidelines established in the CDFW Staff Report on Burrowing Owl Mitigation (Staff Report) (2012). The Staff Report recommends three or more surveys for burrowing owls during peak breeding season (April 15 to July 15).

If no owls or evidence of owls was observed within the project footprint plus a 500-foot buffer, then no additional monitoring will be required for burrowing owl. However, if species habitat is present within the project area, a qualified biologist shall be present during ground-disturbing activities, as stated in MM 4.4-1. Furthermore, if a burrowing owl or a burrow is identified within the project area during pre-construction surveys, a qualified biologist will determine if the burrow or species can be avoided during construction (see MM 4.4-8). MM 4.4-8 states if a burrowing owl is identified and cannot be avoided, consultation with CDFW will be required and a burrowing owl relocation plan will be prepared and approved by CDFW.

All listed mitigation measures for burrowing owl would be implemented in accordance with the Staffing Report (2012) and in consultation with CDFW as necessary.

3-163

The commenter raises concerns that MM 4.4-1 lacks adequate survey measures for burrowing owl, specifically three or more surveillance surveys for owls.

As stated in MM 4.4-1 (B), focused/protocol level surveys would be conducted in accordance with all currently applicable presence and absence survey and/or species protocols established by the United States Fish and Wildlife Service and the California Department of Fish and Wildlife (“Species Protocols”).

The FREIR was revised to state the following:

> "Focused/protocol level surveys for Burrowing Owl will be conducted in accordance with all currently applicable presence and absence survey and/or species protocols established by the United States Fish and Wildlife Service and the California Department of Fish and Wildlife (“Species Protocols”) (MM 4.4-1(b). Such surveys would be consistent with guidelines stablished in the CDFW Staff Report on Burrowing Owl Mitigation (Staff Report) (2012). Appendix D of the Staff Report describes species survey guidance, which states a minimum of three or more survey visits, at least three weeks apart between April 15 and July 15.

3-164

The comment states that the Final REIR must analyze displacing burrowing owls as a potentially significant impact.

The primary intent of MM 4.4-4 is to avoid occupied burrowing owl burrows, if the species is found present within the project area. The measure states that occupied burrows shall not be disturbed during the species nesting season. Due to the linear nature of the project, impacts to burrowing owl and/or burrowing owl burrows is not anticipated. However, the measure also states that if the species is present within the project area outside of the breeding season and cannot be avoided, they may be moved away from the disturbance area using passive relocation techniques in accordance with the Staff Report and approved by CDFW. As part of the approval by CDFW, it is expected that the resumes of all biologists will be reviewed and approved prior to beginning any relocation activity. Finally, MM 4.4-4 requires that prior to burrow exclusion or eviction, a burrowing owl management plan shall be prepared and approved by the California Department of Fish and Wildlife. Destruction of burrows shall occur only pursuant to a management plan for the species approved by the California Department of Fish and Wildlife. Therefore, the project analysis is sufficient in analyzing and disclosing potential impacts to the species.

3-165

The commenter states that the RDEIR does not address the correlation between impacts to burrowing owl and associated mitigated measures. There is also concern that the mitigation measures to not address impacts that include noise, vibration, etc.

MM 4.4-3 and 4.4-4 include protective buffers, which are included in the CDFW Staff Report (2012). As stated in MM 4.4-1 (C), if project locations have special-status species habitat, a qualified biological monitors will be present during ground disturbing activities. To avoid direct and indirect impacts to special status species, protective buffers will be implemented and can be increased or decreased at the discretion of the biological monitor, based on burrowing owl behavior, and in accordance with CDFW and USFWS. Implementation of avoidance buffers are sufficient to minimize disturbance impacts on the species during construction, including impacts associated with noise, vibration, and increased human activity.

3-166

Commenter states nighttime project activities are not mitigated fully for nocturnal species.

As described in Section 4.1 of the Draft REIR, most construction activities would primarily occur during daytime hours. Operational activities that are likely to create new sources of light include nighttime safety and security lighting of facilities. Mitigation Measure 4.1-5 would be implemented to minimize nighttime lighting to the greatest extent feasible. In addition, MM 4.4-13 restricts vehicle speed limit to 20-miles-per-hour, prohibits off-road traffic outside of designated access routes, and restricts disturbance activities to daylight hours to the greatest extent feasible.

3-167

The commenter states the Worker Environmental Awareness Program mitigation measure is being deferred and requests that materials for the Worker Environmental Awareness Program be provided prior to

Recirculated DREIR. The comment also provides additional recommendations for information to be included in the training.

The purpose of the WEAP is to provide sufficient training to construction crews and project members relevant and sufficient information to recognize, avoid and report any biological resources to applicable qualified biologists. It is standard practice for WEAP training material to include contact information for biological monitors, construction foreman, and County officials responsible for the project. For this reason, the information prepared for the WEAP is not submitted for public review. The recommendations for information to be included in the training will be provided to the Planning Commission and Board of Supervisors for consideration.

3-168

Please see Global Response GR-8 Mitigation Effectiveness.

3-169

The commenter expresses concern that the Project would rely solely on previously issued plans for Endangered Species Act. The comment is incorrect in that the Project would not rely solely on the ITP for covered species for species protection. Mitigation measures listed in Section 4.4, Biological Resources, would protect species listed as threatened or endangered under federal and state law through focused surveys, avoidance buffers, monitoring, and the prohibition of incidental take (unless authorized by applicable state and federal agency). Furthermore, there are species specific mitigation concurrent with CDFW protocols.

3-170

The Elk Hills Incidental Take Permit (2018-2014-019-04) is included now in the record as the attachment to the Earthjustice & Group comment letter and can be found in Appendix D-3.

3-171

The commenter states the ITP is not sufficient in covering the Project. As described in the ITP, the permit covers activities that span the extent raised by the commenter and is confirmed to cover all aspects of the proposed project. The ITP was issued for oil field activities that would result in ground description and displacement of species. This specific CCS project has very limited ground disturbance for only the injection wells, pipelines and carbon capture facility, abandonment of wells are listed in the ITP and no new drilling can occur on the CUP boundary. There is no science-based evidence in the record that the permanent storage of CO_2 more than a mile underground can impact any species known to utilize the site.

3-172

The comment states that the ITP only covers four species and not the full range of species that could be impacted by the proposed project. The comment also states the DREIR excludes the Tipton Kangaroo rat from surveys and consideration of mitigation measures. In response, the ITP covers the state listed species that potentially occur within the greater Elk Hills Oil Field Project Site. The occurrence of TKR in the ITP does not provide evidence that the species is located within the CTV I project footprint. The exclusion of this species was primarily based on a lack of suitable habitat and distance from the current known range for

the species. There are other avoidance and minimization measures implemented in the EIR that would result in no take of additional state listed threatened and endangered species; therefore, an additional ITP is not required. If it is determined that state listed species on-site will be impacted by project implementation, then an ITP will be required. The purpose of an ITP is for incidental take of state listed threatened, endangered, or candidate species that could be impacted by project related activities. Not all sensitive species should be included in the ITP as recommended by the comment.

3-173

The commenter incorrectly states the lack of mitigation for Temblor legless lizard and Crotch's bumble bee. TLL mitigation was added as MM 4.4-14, and includes CDFW recommendations including surveys, avoidance, and take authorization protocols. Similarly, mitigation for Crotch's bumble bee was added as MM 4.4-15 and includes CDFW recommendations to require focused surveys, notification and consultation with CDFW if identified during surveys, and take authorization.

3-174

The commenter states concern over the specificity of mitigation measure for the Crotch's bumble bee (CBB).

The comment incorrectly states the mitigation measures do not address CDFW suggestions for Crotch's bumble bee. Specifically, MM 4.4-15 (a), on page 4.4-62 of Section 4.4, *Biological Resources*, requires focused surveys during blooming period following the methodology outlined in the *Survey Considerations for California Endangered Species Act Candidate Bumble Bee Species* (CDFW 2023).

MM 4.4-15 (b) requires that CDFW and USFWS will be notified to determine additional measures to prevent take. Additionally, a 50-foot disturbance buffer shall be used for CBB as detailed in Table 4.4-5 on page 4.4-52 of Section 4.4, Biological Resources.

Furthermore, the recommended incidental take authorization suggested by CDFW is addressed in MM 4.4-2, page 4.4-51, Section 4.4, Biological Resources, which requires authorization by applicable state or federal agency prior to incidental take, as advised by CDFW.

3-175

The commenter states that the Recirculated Draft EIR MM 4.11-7 does not disclose the associated impacts. Please refer to response 3-176, Global Response GR 1- Source Identification, Global Response GR 10 - Cumulative Impacts and Chapter 3, *Project Description*, Future Sources - Identification (pg 3-13 through 3-15)

The comment requests the EIR describe what impacts could potentially occur that requires implementation of MM 4.11-7, and without that discussion, the public and decisionmakers cannot address the measures effectiveness or understand why the measure is being proposed. The comment also questions why the measure was placed under the land use section rather than GHG emissions or Air Quality.

MM 4.11-7 is intended to provide the reader with information on the following issue: 1) the geographic area from which the sources of CO_2 could be brought, 2) the specific types of sources that would be allowed to be considered for injection 3) the county's process for determining if a source qualified and the 4)

environmental review requirements. Comments have been raised in the media where companies, without discussing with Kern County, have made statements they will be sending their CO_2 to Carbon TerraVault (Kern County) for storage from as far away as Northern California. As at this time, Carbon TerraVault (Kern County) is the only CCS project that has released a DEIR and is undergoing public land use hearings in California, companies may consider this project a viable solution and thereby lead the public to believe that hundreds of miles of CO_2 pipelines are being planned if this project is approved. MM 4.11-7 is clear that is not the case. The commentors believe that air is the only issue relevant to a CCS project is not accurate. Multiple land use issues for use of the surface land area as well as many other issues are described in the RDEIR. As the MM deals with sources and locations it is appropriate for inclusion in land use and conformance with Kern County policies. The assertion that all project sources in Kern County comply with the Kern County General Plan is also inaccurate. A source could be in an incorporated City that has its own distinct General Plan and there is no requirement in State Law that they be compatible or the same as the county's. Therefore, the MM requires that the source, if in an incorporated city, be reviewed for that conformity with Kern County's General Plan policies not the City's. Through that process it will be demonstrated and ensured how each source complies with all applicable land use plans, policies, or regulations adopted for the purpose of avoiding or mitigating an environmental effect. Thereby, this measure provides additional layer of protections to ensure indirect conflicts with applicable plans would not result from implementation of the Project.

3-176

Please see response to comment 3-175, and Global Response GR 8 - Mitigation Effectiveness.

3-177

The commenter describes the requirements of an adequate cumulative impacts analysis and discussion. Please see Global Response GR-10 Cumulative Impacts.

3-178

The commenter states that the RDEIR fails to consider the full range of projects that are required in a cumulative impact analysis and ignores "probable future projects" that must be analyzed in a proper cumulative impacts analysis. Please see Global Response GR-10 Cumulative Impacts.

3-179

The commenter states that the RDEIR fails to analyze all the projects included in the "cumulative projects" list in a proper cumulative impacts analysis and properly assess their potential significant impacts. The commenter states that the CarbonFrontier Project is not discussed in the RDEIR beyond its listing as a cumulative project. Please see Global Response GR-10 Cumulative Impacts.

3-180

The commenter states that an analysis of a carbon sequestration project's sources of CO_2 is an essential element of review of cumulative project impacts. The commenter states that the potential source of Hydrogen Plant is absent from the analysis. Please see Global Response GR-1 Source Identification, and GR-10 Cumulative Impacts.

3-181

The commenter expresses concern regarding the Project's reliance on sources beyond the oil field gas initial source to send CO_2 to the Project. Please see Global Response GR-1 Source Identification, and GR-10 Cumulative Impacts.

3-182

The commenter states that CRC is contemplating the development of blue hydrogen plants as part of its operation. Please see Global Response GR-1 Source Identification, and GR-10 Cumulative Impacts.

3-183

The commenter expresses concern regarding the Avnos DAC project, stating that its impacts must be analyzed cumulatively in order for the RDEIR to be legally and informationally sufficient. Please see Global Response GR-1 Source Identification, and GR-10 Cumulative Impacts.

3-184

The commenter states that the Project's cumulative analysis is lacking any analysis of the environmental impacts expected to be produced by probable future projects and of whether the impacts are cumulatively considerable. Please see Global Response GR-1 Source Identification, and GR-10 Cumulative Impacts.

4: Earthjustice

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EARTHJUSTICE

June 21, 2024

VIA ELECTRONIC SUBMISSION

Kern County Planning and Natural Resources Department
Attn: Lorelei Oviatt, Keith Alvidrez
2700 "M" Street, Suite 100
Bakersfield, CA 93301
Loreleio@kerncounty.com
AlvidrezK@kerncounty.com
CTV1EIRComments@kerncounty.com
planning@kerncounty.com

Re: Public Participation for the Carbon TerraVault 1 (CTV 1) Carbon Capture and Storage Project

Dear Ms. Oviatt and Mr. Alvidrez:

We are writing to provide feedback and recommendations on the public participation process for the Carbon TerraVault 1 Project (the CTV I Project) for carbon capture and storage (CCS) in the Elk Hills oil field. Our organizations advocate on behalf of frontline communities throughout Kern County who have long been overburdened by the oil and gas operations and polluting industries that CTV I now threatens to prolong. As the County moves to the next stages of its CEQA review for the Project, we urge the County to build on the positive steps it has taken to facilitate public participation, address problems in the process thus far, and provide meaningful opportunities for community engagement going forward that takes residents' concerns and input seriously. 4-001

Indeed, this Project is expected to be the first facility-level deployment of CCS technology in California and involves a range of complex environmental and public health issues that could impact nearby community members, other Kern County residents, and the broader San Joaquin Valley for decades to come. The public, and frontline communities in particular, must be given sufficient time and space to fully review and vet this Project.

We want to acknowledge at the outset that the County's efforts to make its CEQA process for this Project more accessible are a step in the right direction. Namely, the County provided notices for the joint public workshops it convened with U.S. EPA in English and Spanish, along with separate instructions in both languages on how to participate virtually. The County also provided Spanish interpretation during the workshops, and the agencies' respective PowerPoint presentations were posted in both English and Spanish. Community members appreciated that the workshops were conducted in-person and virtually, and that the in-person workshops took place in the communities surrounding the Project. 4-002

These efforts go a long way toward making it easier for residents to access information and participate in the CEQA process. We hope to see the County adopt similar measures in other proposed projects to facilitate more effective and equitable public participation. 4-002 Cont'd

Despite these positive steps, the County's CEQA process has still presented obstacles that have impaired community members' full participation and engagement so far. Most critically, the County's collaboration with EPA during the joint workshops, while helpful in some respects, also created ongoing confusion for community members who wished to participate in the process. It was often unclear which agency was accepting public comments at each workshop, whether the County or EPA or both, and whether those comments would be accepted by the relevant agency in writing or verbally. For example, many residents intended to share verbal comments to the County regarding the Draft EIR for the Project during the joint workshop on February 28, 2024, but were confused to learn at the workshop that only EPA was accepting comments. To the extent the County and EPA intend to continue to coordinate going forward, we urge both agencies to clearly notify the public who will be taking public comments, when, and in what form. 4-003

Another obstacle to public access includes the fact that the County did not provide a Spanish-language version of any portion of the Draft EIR or Recirculated Draft EIR, which prevents many residents from meaningfully participating. This is critical for a project of this novelty and complexity. Kern County has a significant opportunity to rebuild trust with community members who would be impacted by CTV I and its associated polluting facilities via the CEQA process for this Project. Ensuring that environmental documents are accessible, and that residents feel safe and comfortable sharing their concerns and input throughout the process is a necessary baseline. 4-004

As a result, the County should take additional steps to address the flaws in its public participation process and ensure better community engagement going forward. Both the Draft EIR and Recirculated Draft EIR for the Project reveal the magnitude of impacts facing County residents. Indeed, in addition to "significant and unavoidable" impacts from the Project on Air Quality, Greenhouses Gases, and Mineral Resources in the County, the County found cumulatively significant impacts on Aesthetics and Visual Resources, Agricultural Resources, Air Quality, Biological Resources, Cultural Resources, Energy, Geology and Soils, Greenhouse Gases, Hydrology and Water Quality (Groundwater Supply), Mineral Resources, Noise, and Utilities and Service Systems (Groundwater Supply).[1] 4-005

In light of the scope, novelty, and highly technical nature of the Project, and the extensive public comments submitted on the Draft EIR, the County has decided to take additional time before it proceeds with its CEQA process. On June 4, 2024, the County also published a Recirculated Draft EIR, and announced a new comment period ending on July 18, 2024. It is our understanding that the County does not intend to conduct additional public workshops on the Recirculated Draft EIR, however, there are still concrete measures available to ensure local residents can engage meaningfully in the process moving forward. We urge the County to take the following steps as soon as possible to address the problems in its public participation thus far:

[1] CTV I RDEIR at 1-11 to 1-16.

4-005 Cont'd

- Publish in Spanish all notices related to the Project, including any notice of availability, notices of public workshops, meetings, and hearings, and any notices of determination (if applicable), in recognition of the significant number of linguistically isolated residents in Kern County and the fact that roughly 20% of County households are designated as Spanish speaking with limited English proficiency.[2]

- Translate into Spanish and post, at a minimum, the Executive Summary of the Recirculated Draft EIR and the text of all mitigation measures as soon as possible and at least 45 days before the Kern County Planning Commission hearing on the Project.

- Provide, at a minimum, a summary in Spanish of all the changes made in the Recirculated Draft EIR following the new comment period and publish the summary concurrently with the Final EIR.

- Ensure that any future workshops the County may schedule related to the Project are easily accessible to Spanish-speaking and low-income community members by: (a) inviting residents to ask questions or offer comments in Spanish; (b) providing two-way, simultaneous Spanish and English interpretation services for any oral presentations and all verbal comments; and (c) providing a Spanish-language version of any slides or other written materials.

- Postpone the Kern County Planning Commission hearing on the Project scheduled for August 22, 2024, and make the Final EIR publicly available well in advance of the hearing, so the public has an opportunity to review the document and provide comments before the Commission votes on it.

- Schedule the Kern County Board of Supervisors hearing for the Project a minimum of 28 days after the Planning Commission hearing, so that the County and the public will have sufficient time to respond and consider any issues and comments that arise during the Planning Commission hearing.

- Ensure that hearings before the Kern County Planning Commission and Board of Supervisors are easily accessible to Spanish-speaking and low-income community members by: (a) inviting residents to ask questions or offer comments in Spanish; (b) providing two-way, simultaneous Spanish and English interpretation services for any oral presentations and all verbal comments; (c) providing a Spanish-language version of any slides; and (d) allowing residents to join the hearings by phone, computer, or in person.

- Clarify for any County meetings, workshops, and hearings conducted jointly with other agencies which agencies will be accepting public comments, whether those comments will be accepted verbally and/or in writing, and which agency is in charge of receiving and responding to comments.

[2] U.S. Census Bureau, *Limited English Speaking Households, Kern County, California*, https://data.census.gov/table/ACSST5Y2022.S1602?t=Language%20Spoken%20at%20Home&g=050XX00US06029 (as of May 30, 2024).

As our State's bedrock environmental protection and community right-to-know law, the California Environmental Quality Act was intended to allow the public to gain full information about proposed projects and to participate meaningfully in government decisions. Allowing sufficient time to review the EIR for this Project and taking steps to include Spanish-speaking residents would allow members of the public to provide relevant input to the County on this important matter and can lead to better, more equitable results. 4-006

Thank you for considering this request. We welcome the opportunity to work with you moving forward.

Grecia Orozco (gorozco@crpe-ej.org)
Center on Race, Poverty & the Environment

Nayamin Martinez (nayamin.martinez@ccejn.org)
Central California Environmental Justice Network

Jasmin Martinez (jasmin@calcleanair.org)
Central Valley Air Quality Coalition

Nirit Lotan (nlotan@earthjustice.org)
Michelle Ghafar (mghafar@earthjustice.org)
Earthjustice

Gordon Nipp (gnipp@bak.rr.com)
Sierra Club

Comment 4
Earthjustice

4-001

Thank you for your comment and participation in the public process. This comment does not state a specific concern related to the adequacy of the DREIR and therefore does not require a detailed response. This comment is noted for the record and will be provided to the Planning Commission and Board of Supervisors for consideration.

4-002

Thank you for your comment and participation in the public process. This comment does not state a specific concern related to the adequacy of the DREIR and therefore does not require a detailed response. This comment is noted for the record and will be provided to the Planning Commission and Board of Supervisors for consideration.

4-003

The comment requests that going forward the County and EPA improve their collective communication regarding workshops and which agency will be accepting comments at which workshops, when and in what form. Extensive public communication in both the English and Spanish powerpoints as well as verbal presentations clearly communicated how to make comments on these two different permit processes. If commentors wanted their comments on the EPA permit to be submitted on this RDEIR then they must send them directly to Kern County. If the comments on this RDEIR were intended for the EPA, then they must be submitted through the EPA process during that comment period. As noted in various communications, Kern County is only responsible for the CEQA process and land use applications. The Federal US EPA Region 9 joint workshops were a courtesy at the request of US EPA and are not required by CEQA. As the US EPA permit does not requirement compliance with CEQA and has no requirement for a full environmental review under NEPA, a joint CEQA/NEPA document was not required by law. Further the EPA permit is an implementation measure of the CCS project. If the Kern County Board of Supervisors does not approve the project, the EPA permit is moot and cannot be implemented. If the Board of Supervisor approves the project, numerous mitigation measures and conditions of approval will require a final EPA permit before any construction or operations can occur. The process is transparent and fully compliant with all provisions of CEQA and the Government Code. Please refer to Global Response 3 - Environmental Justice and Public Participation.

4-004

Thank you for your comment and participation in the public process. This comment does not state a specific concern related to the adequacy of the DREIR and therefore does not require a detailed response. This comment is noted for the record and will be provided to the Planning Commission and Board of Supervisors for consideration. Please see Global Response GR 3 - Environmental Justice and Public Participation.

4-005

The comment suggests that the County take additional steps to address the flaws in its public participation process and ensure better community engagement going forward. Please see Global Response GR 3 - Environmental Justice and Public Participation.

4-006

Thank you for your comment and participation in the public process. This comment does not state a specific concern related to the adequacy of the DREIR and therefore does not require a detailed response. This comment is noted for the record and will be provided to the Planning Commission and Board of Supervisors for consideration.

5: Center for Biological Diversity

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July 18, 2024

Kern County Planning and Natural Resources Department
Attn: Keith Alvidrez
AlvidrezK@kerncounty.com

Re: Recirculated Draft EIR Carbon TerraVault I (Kern County) by California Resources Corporation (CRC) (SCH 2022030180)

Mr. Alvidrez:

Kern County's Notice of Availability for the Recirculated Draft EIR (Recirculated DEIR) for the Carbon TerraVault I project (Project) states that the county will respond "to only comments submitted during this comment period." While we understand that the March 1, 2024 letter we submitted on behalf of 77 organizations will appear in the Project's record, we are re-submitting that letter (attached) so that the County will respond to the comments contained therein. 5-001

Thank you,

Victoria Bogdan Tejeda
Attorney, Center for Biological Diversity
vbogdantejeda@biologicaldiversity.org

March 1, 2024

Kern County Planning and Natural Resources Department
ATTN: Keith Alvidrez, Planner II
2700 "M" Street, Suite 100
Bakersfield, CA 93301

U.S. Environmental Protection Agency, Region 9
ATTN: Martha Guzman, Regional Administrator
75 Hawthorne Street
San Francisco, CA 94105

Re: Carbon TerraVault I Carbon Capture and Storage Project at Elk Hills Oil Field

To the Attention of the Kern County Planning and Natural Resources Department and EPA Region 9 Administrator Guzman:

5-002

The undersigned 77 organizations write to express our strong opposition to the Carbon TerraVault I carbon capture and storage (CCS) project at the Elk Hills oil field in Kern County.[1] We are deeply concerned that Carbon TerraVault I will deploy expensive, dangerous, and ultimately failed CCS technology to extend the life of dirty fossil fuel facilities in frontline communities that cannot afford any more pollution. Kern County already experiences the worst pollution in the nation due to intensive oil and gas activity and this project threatens to prolong that activity for decades longer–at the expense of local residents and California's transition to clean energy. As the first CCS project to undergo environmental review in the state, the inadequate analysis of potential impacts and appropriate mitigation measures for the project sets an unacceptable precedent that must not be rubber stamped. **We urge you to reject this project and invest in <u>real</u> clean energy solutions that advance California's air, climate, public health, and environmental justice goals.**

5-003

The Carbon TerraVault I project will derail California's transition away from fossil fuels: The project intends to capture millions of metric tons of carbon dioxide from numerous polluting sources for injection underground in a depleted oil and gas field over 26 years. While Kern County has stated the project will capture CO_2 from the Elk Hills field's operations, including the gas-fired plant that powers drilling activity at the field, EPA has indicated the project could also source carbon from a new blue hydrogen facility (or hydrogen derived from fossil gas) at the field.[2] The project will therefore extend the life of existing fossil fuel facilities and lead to the build-out of new facilities that will exacerbate the climate crisis and create more pollution in nearby Kern County communities including Buttonwillow, Taft, Tupman, and Bakersfield. By keeping the oil field and gas plant operating decades longer, this project flies in the face of California's climate goal of 85% direct emissions reductions by 2045.

Real world examples prove that CCS technology has not worked as promised despite decades of development and billions of dollars of investment. Carbon capture projects have repeatedly over-

[1] CEQA Project 2022030180 / Kern County PP22405; EPA docket number EPA-R09-OW-2023-0623.
[2] https://www.regulations.gov/docket/EPA-R09-OW-2023-0623

promised and under-delivered[3] on their capture rates while providing cover for polluting industries.[4] In addition to its repeated failures, carbon capture is *not necessary* as a climate solution, according to the Intergovernmental Panel on Climate Change.[5] Frontline communities in Kern County should not be used as a testing ground for flawed and unnecessary techno-fixes like carbon capture. In order to rapidly reduce greenhouse gas emissions and actually decarbonize–first and foremost in historically overburdened areas like Kern County–California must stop permitting projects that further entrench fossil fuels that are driving the climate crisis.

5-003 Cont'd

The Carbon TerraVault I project poses serious risks to public health, safety, and the environment in Kern County: The project will lead to a host of harmful impacts to the region, including impacts to air, climate, water, health and safety, seismicity, pipeline safety, and animal and plant species.

To name just a few examples, Elk Hills is one of the oldest and largest oil and gas fields in the state, with a large number of old wells that increase the potential for dangerous leaks from the storage site. The project's total air emissions would also exceed the San Joaquin Valley Air Pollution Control District's limits for nitrogen oxides, particulate matter with a diameter of 10 micrometers or less, and particulate matter with a diameter of 2.5 micrometers or less, for which the region is in nonattainment under an applicable federal or State ambient air quality standard. The project would also threaten local groundwater supplies by drawing groundwater from the Kern County subbasin for its operational needs, despite the fact water levels are already compromised in the subbasin and throughout the Central Valley.[6] And by relying on 13.2 miles of pipelines that will be as close as a few miles of sensitive locations like a local elementary school for transportation of the CO_2, the project is increasing the risk of dangerous leaks and ruptures that could harm nearby residents. These impacts have not been fully considered and mitigated.

5-004

The public and decisionmakers are still missing critical details about the Carbon TerraVault I project, which prevents a full accounting of potential impacts: Despite multiple requests from the public, neither the oil company or Kern County have clarified all the sources of CO_2 for the project. In addition to the Elk Hills field's operations, the gas plant that

5-005

[3] IEEFA, "The Carbon Capture Crux" (Sept. 2022), https://ieefa.org/resources/carbon-capture-crux-lessons-learned.

[4] *See, e.g.*, The Guardian, "Carbon capture project is 'Band-Aid' to greenwash $10bn LNG plant, locals say" (Feb. 3, 2023), https://www.theguardian.com/environment/2023/feb/03/carbon-capture-gas-exports-rio-grande-lng-nextdecade. For example, in July 2021, Chevron admitted that its commercial-scale carbon capture project in Australia failed to meet its five-year capture target of 80% CO_2, and instead only captured 30%. IEFFA, "If Chevron, Exxon and Shell Can't Get Gorgon's Carbon Capture and Storage to Work, Who Can?" (April, 2022), https://ieefa.org/articles/if-chevron-exxon-and-shell-cant-get-gorgons-carbon-capture-and-storage-work-who-can.

[5] The IPCC-modeled pathway with the best chance of keeping warming at or below the target of 1.5°C makes no use of fossil fuels with carbon capture and storage (CCS) or bioenergy with carbon capture and storage (BECCS). IPCC, Summary for Policymakers in Global Warming of 1.5°C: An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty (2018) at 14, Section C.1.1., Figure SPM 3b (Pathway 1); *see also id.* at Ch. 2.3.3 and Table 2.SM.12. *See also* Center for International Environmental Law, Confronting the Myth of Carbon Free Fossil Fuels at 2, https://www.ciel.org/wp-content/uploads/2021/07/Confronting-the-Myth-of-Carbon-Free-Fossil-Fuels.pdf.

[6] According to the draft EIR, the subbasin, as a whole, has an overdraft of 324,326 acre-feet per year. Draft EIR at 4.19-2.

5-005 Cont'd

powers the field, and the new blue hydrogen facility, the oil company and County are moving forward with plans to build additional new sources of CO_2 for capture and storage at Elk Hills, including a renewable dimethyl ether production facility, a gasoline plant, and a waste-to-energy production facility.[7] Additional sources may further include CO_2 captured from a new hydrogen facility in Tulare County and transported via tanker trucks 65 miles south to Elk Hills.[8] While the list of potential sources continues to grow, none of these facilities are disclosed or analyzed in the environmental review documents available to the public.

Other important missing details include the state of the CO_2 during transport (e.g. liquid or supercritical), the location of compressor equipment, and wellbore data including well plugging information for the hundreds of existing wells in the Elk Hills field. Without these basic details, it is impossible to support key assumptions and conclusions underlying the project.

Conclusion

5-007

The Carbon TerraVault I CCS project would prolong the life of dirty fossil fuel facilities, threaten California's progress toward its climate and clean energy goals, and put frontline communities at risk in order to benefit one of the largest oil and gas companies in the state with a history of financial failures. This project sets the wrong precedent for our state. We urge you to reject this dangerous project.

Sincerely,

1. Central California Environmental Justice Network
2. The Center on Race, Poverty, and the Environment
3. Central Valley Air Quality Coalition
4. Building Healthy Communities Kern
5. Dolores Huerta Foundation
6. Leadership Counsel for Justice and Accountability
7. Greenaction for Health and Environmental Justice
8. Little Manila Rising
9. Valley Improvement Projects
10. VISIÓN (Voices in Solidarity Against Oil in Neighborhoods)
11. Earthjustice
12. Center for Biological Diversity
13. The Climate Center
14. Clean Water Action
15. California Environmental Voters
16. San Joaquin Valley Democratic Club
17. Fresnans against Fracking
18. Presente.org
19. Labor Network for Sustainability
20. Friends of the Earth
21. Food & Water Watch
22. Consumer Watchdog
23. Center for Community Action and Environmental Justice
24. Oil Change International
25. Physicians for Social Responsibility - Los Angeles
26. Elected Officials to Protect America
27. Azul

[7] https://www.crc.com/carbon-terravault/vaults/default.aspx

[8] Padre Associates, Inc., *Operating Statement: Golden State Hydrogen Plant Project, Pixley, Tulare County, California*, prepared for Proteum Energy (Oct. 2023) at 9.

28. 350 Bay Area
29. 350 Conejo / San Fernando Valley
30. 350 Humboldt
31. 350 Sacramento
32. 350Marin
33. Active San Gabriel Valley
34. Bay Area-System Change not Climate Change
35. Biodiversity First!
36. Biofuelwatch
37. CleanEarth4Kids.org
38. Climate Action California
39. Climate Action Team of the Unitarian Universalist Fellowship of Corvallis
40. Climate First: Replacing Oil & Gas (CFROG)
41. Climate Hawks Vote
42. Climate Health Now
43. Community Energy reSource
44. Elders Climate Action
45. Elders Climate Action (ECA) Northern California (NorCal) Chapter
46. Elders Climate Action (ECA) Southern California (SoCal) Chapter
47. Extinction Rebellion San Francisco Bay Area
48. Food Empowerment Project
49. Fossil Free California
50. Glendale Environmental Coalition
51. Good Neighbor Steering Committee of Benicia
52. Indivisible California, GREEN TEAM
53. Indivisible Marin
54. Indivisible San Jose
55. Interfaith Climate Action Network of Contra Costa County
56. Manhattan Beach Huddle
57. Oil and Gas Action Network
58. Planning and Conservation League
59. Queers X Climate
60. San Benito County Democratic Central Committee
61. San Francisco Bay Physicians for Social Responsibility
62. San Francisco Baykeeper
63. SanDiego350
64. Santa Barbara Standing Rock Coalition
65. Santa Cruz Climate Action Network
66. Science and Environmental Health Network
67. SEE (Social Eco Education)
68. SoCal 350 Climate Action
69. Society of Native Nations
70. SolidarityINFOService
71. Stand.earth
72. Sunflower Alliance
73. Sustainable Mill Valley
74. The Climate Alliance of Santa Cruz County
75. USC Environmental Student Assembly
76. Vote Solar
77. West Berkeley Alliance for Clean Air and Safe Jobs

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Comment 5
Center for Biological Diversity

5-001

Thank you for your comment and participation in the public process.

5-002

The commenter notes that they are concerned that the project will deploy expensive, dangerous, and ultimately failed CCS technology to extend the life of dirty fossil fuel facilities in frontline communities that cannot afford any more pollution. Please see Global Response GR-2: Extending the Life of Fossil Fuel Facilities, GR-6: Air Quality Impacts, GR-7: Geological and Induced Seismicity Risk, and GR-8: Mitigation Effectiveness.

5-003

The commenter describes why the project will derail California's transition away from fossil fuels. Please refer to Global Response 2 - Extending the Life of Fossil Fuel Facilities and Global Response 5 - Greenhouse Gas Impacts.

5-004

Commenter notes that the project would increase the potential for dangerous leaks from the storage site harming nearby residents, exceeding the SJVAPCD's air quality standards, and drawing groundwater from the Kern County subbasin when water levels are already compromised. Please refer to Global Response 7 - Geological and Induced Seismicity Risk , Global Response 4 CO 2 Pipelines and Global Response 6 - Air Quality Impacts.

5-005

Commenter notes that there are still missing details around all of the sources of CO_2 for the project. Commenter notes that there are missing details regarding state of CO_2 during transport, location of compressor equipment, and wellbore data for the hundreds of existing wells in the Elk Hills Field. Please see Global Responses GR 1- Source Identification, GR 4- CO_2 Pipelines, GR 5 Greenhouse Gas Impacts, GR 6 Air Quality GR 7 - Geological and Induced Seismicity Risk and GR 10n- Cumulative Impacts.

5-005

Thank you for your comment and participation in the public process. This comment does not state a specific concern related to the adequacy of the DREIR and therefore does not require a detailed response. This comment is noted for the record and will be provided to the Planning Commission and Board of Supervisors for consideration.

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6: Pacific Gas and Electric

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Pacific Gas and Electric Company

Plan Review Team
Land Management

PGEPlanReview@pge.com

July 9, 2024

Keith Alvidrez
Planner II
Kern County Planning and
Natural Resources Dept.
2700 "M" Street, Ste. 100
Bakersfield, CA 93301

Re: Draft Recirculated EIR Carbon TerraVault I (Kern County) by California Resources Corporation (CRC) (PP22405); ZCC 5, Map 119; ZCC 4, Map 120; CUP 13, Map 118; CUP 14, Map 118; CUP, Map 119; CUP 6, Map 119; CUP 3, Map 120; CUP 2, Map 138
APN's: 157-070-03, 157-060-02, 158-040-07, 158-070-02, 158-070-03, 158-070-01, 158-070-05, 158-080-06, 158-090-03, 158-090-02, 158-090-01, 158-090-07, 158-090-07, 158-090-16, 158-090-18, 158-090-19, 158-090-04, 159-280-01, 159-280-07, 298-010-07, 158-070-04

Dear Keith:

Thank you for giving us the opportunity to review the subject plans. The proposed Carbon TerraVault I project is within the same vicinity of PG&E's existing electric transmission facilities that impact this property. 6-001

PG&E's electric transmission tower line, Midway-Taft 115kV, is located on APN's 158-090-02 and 158-090-19 on an 80-foot wide easement strip (unrecorded easement from the U.S.A., Feb 14, 1980). According to the applicant's supplied drawings the Phase 1 – CO2 Injection Line will be constructed through PG&E's tower line easement. Once the applicant's construction plans are finalized, they should be submitted to PG&E for review. Attached below are some guidelines that need be followed when working near PG&E's transmission lines. 6-002

Please contact the Building and Renovation Center (BRSC) for facility map requests by calling 1-877-743-7782 and PG&E's Service Planning department at www.pge.com/cco for any modification or relocation requests, or for any additional services you may require. 6-003

As a reminder, before any digging or excavation occurs, please contact Underground Service Alert (USA) by dialing 811 a minimum of 2 working days prior to commencing any work. This free and independent service will ensure that all existing underground utilities are identified and marked on-site.

If you have any questions regarding our response, please contact me at vincent.fazzi@pge.com

Sincerely,

Pacific Gas and Electric Company

Vince Fazzi

Vince Fazzi
Land Agent
Land Management Dept.
(916) 217-1057

General information regarding Electric Transmission Easement Areas

The information is as follows:

6-004

1. Heavy equipment access to PG&E facilities must be maintained at all times.
2. Short-term parking of moveable passenger vehicles and light trucks (pickups, vans, etc.) is typically allowed, provided heavy equipment access to PG&E facilities is maintained at all times.
3. Vehicles must not be parked closer than 10 ft. to structures. Protection of PG&E facilities from vehicular traffic must be provided.
4. Vehicles on blocks and carports, canopies, or awnings are not allowed.
5. Buildings or similar structures, including but not limited to sound walls, trash enclosures and retaining walls, are not permitted.
6. Cuts, trenches, or excavations (examples: storm drainage, water pipelines, etc.) are not allowed within 25 ft. of any tower structure.
7. Pipelines should be located as close to a right angle to transmission lines as possible.
8. Proposed grade changes in the vicinity of towers must be reviewed by PG&E engineers.
9. Fills that impair conductor-to-ground clearances are not allowed.
10. Fills to clearance of less than 32 ft. under lines and near structures must be reviewed to ensure there is no clearance impairments.
11. Towers must not be left in mounds without adequate road access to the base of the tower or structure.
12. Trenches installed for conduit must be at least 30 inches below the grade, and the edges of the trenches must be at least 48 inches away from the surface of PG&E structures at grade level. Excavations that are proposed to be within 25 ft. of structures or structure footings are subject to review from PG&E's Civil Design Dept.
13. Metal fences must be grounded, and any fence located within the footprint of tower footings must be at least 10 ft. from the exterior edge of any of the footings and fences must be grounded.
14. Landscaping is allowed in areas of overhead electric facilities if it does not compromise line clearance or impede access or inspection. Please refer to the attached Guide to Landscaping within and along Electric Transmission Corridors.
15. Nothing that has the capability of growing taller than 15 ft. in height at maturity may be planted. Low shrubbery is preferred.
16. For protection, barricades must be placed around PG&E facilities during construction.
17. Adequate electrical clearances between transmission line conductors and streetlight fixtures (typically limited to 15 ft. in height) must be maintained.
18. No Bio-Retention Basins

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Comment 6
Pacific Gas and Electric

6-001

The comment states that the project area is within the same vicinity of PG&E's existing electric transmission facilities that impact this property. As described in Chapter 3.0 of the REIR, *Project Description*, the project site is crossed by public utilities, including several PG&E electric transmission lines over the eastern portion of the project site.

6-002

The comment states that PG&E's electric transmission tower line, Midway-Taft 115kV, is located on APN's 158-090-02 and 158-090-19, where Phase 1 – CO_2 Injection Line will be constructed through PG&E's 80-foot wide tower line easement strip. The project design and construction would conform to industry accepted best practices as well as all local, state, and federal requirements. As described in Chapter 3.0 of the RDEIR, *Project Description*, design consideration would include: Consultation with the jurisdictional state and federal regulatory agencies; Adherence to CFR Title 49 Part 192 "Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards," appropriate sections of the American Petroleum Institute (API), American National Standards Institute (ANSI), American Society of Mechanical Engineers (ASME), National Association of Corrosion Engineers (NACE), and other applicable codes; and Continued incorporation of the use of in-line inspection tools as noted in the Company Integrity Management Program, as described under Pipeline Design, Construction, Maintenance, Operation, and Safety. Written approval from PG&E before construction may be necessary on properties that overlap with PG&E's right-of-way. This approval is often done as an encroachment agreement which outlines the permitted uses within the PG&E right-of-way and is issued after review of detailed plans. Additionally, the project would be in compliance with CAL-OSHA and/or the rules for Overhead Electric Line Construction, General Order No. 95 and Underground Electric Line Construction General Order No. 128 CPUC, during construction and maintenance facilities. This comment is noted and will be considered by County decisionmakers in regards to working near electric transmission lines.

6-003

Thank you for your comment and participation in the public process. This comment does not state a specific concern related to the adequacy of the DREIR and therefore does not require a detailed response. This comment is noted for the record and will be provided to the Planning Commission and Board of Supervisors for consideration.

6-004

Thank you for your comment and participation in the public process. This comment does not state a specific concern related to the adequacy of the DREIR and therefore does not require a detailed response. This comment is noted for the record and will be provided to the Planning Commission and Board of Supervisors for consideration.

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7: Yuhaaviatam of San Manuel Nation

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Keith Alvidrez

From: Eunice Ambriz <Eunice.Ambriz@sanmanuel-nsn.gov>
Sent: Monday, June 10, 2024 12:58 PM
To: Keith Alvidrez
Subject: Carbon TerraVault I (Kern County) by California Resources Corporation (PP22405); ZCC 5, Map 119; ZCC 4, Map 120; CUP 13, Map 118; CUP 14, Map 118; CUP 5, Map 119; CUP 6, Map 119; CUP 3, Map 120; CUP 2, Map 138) [COU-KERN-2023-15]

CAUTION: This email originated from outside of the organization. Do not click links, open attachments, or provide information unless you recognize the sender and know the content is safe.

Dear Keith,

Thank you for contacting the Yuhaaviatam of San Manuel Nation (formerly the San Manuel Band of Mission Indians) regarding the above-referenced project. YSMN appreciates the opportunity to review the project documentation, which was received by the Cultural Resources Management Department on June 6, 2024. The proposed project is located outside of Serrano ancestral territory and, as such, YSMN will not be requesting to receive consulting party status with the lead agency or to participate in the scoping, development, or review of documents created pursuant to legal and regulatory mandates. 7-001

Regards,
Eunice

Eunice Ambriz
Cultural Resources Technician
Eunice.Ambriz@sanmanuel-nsn.gov
O:(909) 864-8933 x 50-2033
M:(909) 649-4867
26569 Community Center Dr Highland, California 92346

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Comment 7
Yuhaaviatam of San Manuel Nation

7-001

Thank you for your comment and participation in the public process.

The comment states that the project area is located outside Serrano ancestral territory. Per California Public Resources Code (PRC) Section 21080.3.1, Assembly Bill (AB) 52 requires that within 14 days of a lead agency determining that an application for a project is complete, or a decision by a public agency to undertake a project, the lead agency must provide formal notification to the designated contact, or a tribal representative, of California Native American Tribes that are traditionally and culturally affiliated with the geographic area of the project. It is noted that the Yuhaaviatam of San Manuel Band of Mission Indians is not requesting consultation for the project.

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8: Twenty-Nine Palms Band of Mission Indians

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TWENTY-NINE PALMS BAND OF MISSION INDIANS

46-200 Harrison Place. Coachella, CA. 92236. Ph. 760.863.2444. Fax: 760.863.2449

July 12,2024

Kern County
Lorelei Oviatt,
AICP, Director
2700 M Street, Suite 100

Bakersfield, CA 93301

RE: Recirculated: Notice of Availability for Public Review and Hearing on the Draft Recirculated Environmental Impact Report for the Carbon TerraVault 1 Project

Dear Ms. Ovaitt,

This letter is in regards to an informal consultation and in compliance with CEQA and Recirculated: Notice of Availability for Public Review and Hearing on the Draft Recirculated Environmental Impact Report for the Carbon TerraVault 1 Project. 8-001

After reviewing the proposed project, the Twenty-Nine Palms Band of Mission Indians has determined: The project is outside of the known Chemehuevi Traditional Use Area. The other tribes who do have cultural affiliation with the project area should be contacted.

If you have any questions, please do not hesitate to contact the Tribal Historic Preservation Office at (760) 775-3259 or by email at Christopher.Nicosia@29palmsbomi-nsn.gov.

Sincerely,

Christopher Nicosia
Cultural Resources Manager, Twenty-Nine Palms Band of Mission Indians

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Comment 8
Twenty-Nine Palms Band of Mission Indians

8-001

Thank you for your comment and participation in the public process.

Per California Public Resources Code (PRC) Section 21080.3.1, Assembly Bill (AB) 52 requires that within 14 days of a lead agency determining that an application for a project is complete, or a decision by a public agency to undertake a project, the lead agency must provide formal notification to the designated contact, or a tribal representative, of California Native American Tribes that are traditionally and culturally affiliated with the geographic area of the project. As such, the County sent outreach letters to appropriate contacts of California Native American Tribes affiliated with the geographic area of the project in accordance with PRC Section 21070 on February 25, 2022. Those contacted and their responses are available in Section 4.18 of the REIR, Tribal Cultural Resources. It is noted that the Twenty-Nine Palms Band of Mission Indians is not requesting consultation for the project.

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9: Alissa Reed

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From: Alissa Reed
To: CTV1EIRComments
Subject: Carbon TerraVault I EIR Comments - Strong Support
Date: Thursday, July 18, 2024 3:03:41 PM

CAUTION: This email originated from outside of the organization. Do not click links, open attachments, or provide information unless you recognize the sender and know the content is safe.

Good Afternoon

9-001

On behalf of the Building & Construction Trade Unions and the more than 6,000 Kern County members and their families we represent, I want to express my strong support for the Carbon TerraVault I Project. This project will be a significant first step in helping the State meet their ambitious climate goals while contributing to the economy of Kern County and the prosperity of our community.

Not only is this project good for Kern County, California Resources Corporation and Carbon TerraVault are invested in the well-being of our communities. While this project contributes to a better environment, CRC/CTV are making significant contributions to advancing some of the most disinvested communities where they do business. It's responsible businesses like this that we need to support.

We strongly urge support of this project.

Thank you for your time and consideration.
Alissa

--
Alissa Reed
Executive Secretary
Kern, Inyo, Mono Counties
Building and Construction Trades Council
1730 18th Street, Box 1197
Bakersfield, CA 93302
Cell: (661) 401-0475
Email: areedbtc@gmail.com

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Comment 9
Alissa Reed

9-001

Thank you for your comment and participation in the public process. This comment does not state a specific concern related to the adequacy of the DREIR and therefore does not require a detailed response. This comment is noted for the record and will be provided to the Planning Commission and Board of Supervisors for consideration.

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10: Diane Marks

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RECEIVED
JUL 17 2024
Kern County Planning &
Natural Resources Dept.

728 Caroline St.
Port Angeles WA 98362
July 9, 2024

Kern Co. Planning & NRD
2700 M Street, Suite 100
Bakersfield CA 93301

Re: Carbon TerraVault 1 (Kern Co.) CCS Project

Dear Planning Dept:

10-001

I received your second Notice of Public Hearing and Opportunity to Comment on this project from Kern Co. in the mail here in WA. Since I now live out of CA, I checked with the State Clearing House of the CA Governor's Office to confirm that I could submit comments on the EIR on the above project. The employee read the CEQA regs and asked some questions and called me back to tell me that I could submit comments on this potential environmental disaster in CA because I am "a member of the public". I lived in CA for 80 years before I moved up here, so I have submitted comments on many EIRs in several counties in CA during that time, including your county. Please include my comments in the EIR documents on this project now.

ENVIRONMENTAL ARGUMENTS AGAINST PROJECTS

10-002

Carbon capture trades off with other critical climate solutions

Carbon capture extends the fossil fuel era instead of ending it. By now, everyone who reads knows that fossil fuel pollution in the atmosphere is the major cause of this planet's current climate crisis. Therefore, stopping the use of fossil fuels and building up alternative environmental sources actually will be the causes for stopping global warming. KEEP ALL FOSSIL FUELS IN THE GROUND!!

10-003

Carbon capture is energy intensive

Such systems require building a new power plant to run the system, creating yet another source of air and carbon pollution. That undermines the whole goal of capturing carbon in the first place. Please include in your EIR on this project exactly what studies and data you have done that refutes this specific argument against CCS. Do you have any that are not funded or provided by CA Resources Corp. or Aera Energy or Chevron or Occidental Petroleum? Show them.

10-004

Carbon capture actually increases emissions

Environmental organizations report that, due to the larger amount of energy required to power carbon capture, plus the life cycle of fossil fuel, carbon capture in this country has actually put more CO2 into the atmosphere than it has removed. Please include this argument against CCS in your EIR evaluations and, if any, what facts and arguments have been published to refute it. These published refutations are there; your planning dept. needs to include them in a fair EIR.

10-005

Storage presents significant risks

Health risks to populations is a serious safety concern. Leaks from wells and pipes can contaminate the surrounding air (depending on direction of wind) and create serious health problems for residents (or visitors) – such as asphyxiation, seizures, loss of consciousness, and potentially death. A section of the 13 miles of CO2 pipeline to transport carbon dioxide passes dangerously close to McKittrick Elementary School. Kern Co. already has permitted many fossil fuel projects that have caused documented health problems for its residents, i.e. oil wells & drilling and "produced water", particularly near small town areas like McKittrick. How many Notices of Public Hearing on this project have been sent to the families living in McKittrick? Indicate your compliance with notice of this serious notification of potential health problems and what the McKittrick population said.

Well failure during injection or a blowout could result in a release of large amounts of CO2. Storage locations can leak CO2 when they are located near fossil fuel reservoirs which can and do provide ways for CO2 to escape to the surface and contaminate air, water, and ground. Drilling and injections can cause earthquakes. Kern Co. has a history of severe earthquakes already.

10-006

Carbon capture is an expensive failure

Environmental organizations report that in public and private investments over decades, there are no carbon capture successful projects – only huge failures. This is a reason for not starting yet another likely carbon capture project failure. Two of these failures are Petra Nova plant in TX and the San Juan Generating Station in NM. Include comparisons in the EIR that would show how this project could more likely be profitable (both in being cheaper and decreasing climate change).

10-007

PROCEDURAL ERRORS IN EIR REVIEW

It is procedure that spells much of the difference between rule of law and rule by whim.
Supreme Court Justice William O. Douglas, 1951

Apparently, Kern Co. Planning Dept. has chosen/hired? CA Resources Corp. to produce the county's EIR analysis for its (CRC) own Project. This does not appear to be appropriate independent scientific review for the Carbon TerraVault Project (CTV).

CA Resources Corp. is the company which was previously part of the Chevron Oil Co. that developed "produced water" in the Cawelo/North Kern Water Districts for irrigation and drinking water purposes. It has not yet been proved that this "produced water" is environmentally non-toxic for food products and drinking water because Chevron/CRC will not disclose all the chemicals used in their oil well drilling liquids. Will they use the same devious methods here also?

CRC should not be allowed to be the investigating body for the CTV Project; an independent, scientific company should have been hired to do this Chevron-related environmental study. It appears Chevron/CRC is only once again going to bias their analysis in favor of what is most profitable for Chevron/CRC instead of what is in favor of optimum cleaning up of the environment and decreasing climate warming/climate change. (June 2024 was the hottest month ever registered on this planet.)

10-007 Cont'd

I certainly hope that Alternative 3, Nature Based Carbon Storage Alternative/Environmentally Superior Alternative, will be chosen at the end of this process as it actually would help to diminish the climate crisis instead of adding to it.

10-008

Sincerely yours,

Diane Marks

Diane Marks

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Comment 10
Diane Marks

10-001

Thank you for your comment and participation in the public process. This comment does not state a specific concern related to the adequacy of the DREIR and therefore does not require a detailed response. This comment is noted for the record and will be provided to the Planning Commission and Board of Supervisors for consideration.

10-002

The comment states that stopping the use of fossil fuels and building up alternative environmental resources will be the causes for stopping global warming. Please refer to Global Response GR-2: Extending the Life of Fossil Fuel Facilities.

10-003

The comment states that carbon capture systems require building a new power plant to run the system, creating another source of air and carbon pollution. The comment also requests that studies/data that refute this argument against CCS be included in the report. As described in Section 4.6.4, Energy, the annual amount of electricity required to operate the carbon capture facility and associated equipment is 15.432 MW/year for each phase or 30.864 (rounded to 31) MW/year total. Electricity would be sourced from the Elk Hills Power Plant. No new sources of electricity would be required to serve the project.

10-004

The comment states that environmental organizations report that carbon capture puts more CO_2 into the atmosphere than it removes. The comment requests that this argument and arguments to refute it be included in the report. Section 4.8 Greenhouse Gas Emissions provides a complete analysis of all the CO_2 components of the project including any additional CO_2 created by the capture facility. Please see Global Response GR-5: Greenhouse Gas Impacts.

10-005

The comment asks how many Notices of Public Hearing for the project were sent to those living in McKittrick. Please see page 4 of the Draft Recirculated EIR for a list of individuals that were notified of the project. In addition, please see GR-4: CO_2 Pipelines, GR-5: Greenhouse Gas Impacts, GR-6: Air Quality Impacts, GR-7: Geological and Induced Seismicity Risk.

10-006

This is not a comment on the adequacy of the analysis in the EIR. CEQA does not require a lead agency to evaluate economic impacts or fiscal matters concerning a project. Section 15131 of the CEQA Guidelines state that economic or social information may be included in an EIR and used to determine the significance

of physical changes caused by the project. This comment is noted for the record and will be provided to the Planning Commission and Board of Supervisors for consideration.

10-007

The comment states that the Kern County Planning Department chose/hired CRC to produce the County's EIR analysis for their own project and expresses that this is not appropriate for an independent scientific review. The purposes of the California Environmental Quality Act (CEQA) is to provide an informational document for the public and decision makers. It is not classified as a " scientific review " but does include science based facts and reports as well as public opinions, theories and concerns. Kern County Planning and Natural Resources is the designated CEQA expert for the county and is the Lead Agency representative for this project. CRC was not " hired" by the county but is an applicant. Under the Government Code, Kern County has adopted fees to recover all costs for the processing of applications and CRC is paying all staff, county consultant and other costs for the project. CEQA Guidelines allow the applicant to submit any information or reports they wish regarding the project and permits the Lead Agency to request information from the applicant. It then requires the Lead Agency to exercise independent judgement on the validity of all materials submitted by any party on the project for the EIR. The county has retained an experience environmental consulting firm, WSP, who has no contact with applicant. All costs are borne by CRC through the County. As indicated in Chapter 1, Executive Summary, the DREIR was prepared by Kern County as the Lead Agency under CEQA. As described under Section 1.2.1, Discretionary Entitlements Required, the Kern County Planning and Natural Resources Department as the Lead Agency for the proposed project has staff responsibility for the preparation of the EIR and recommendations to the decision makers on the proposed project. The final EIR , which include all analysis, comments, this Response to comments is presented to the Planning Commission and Board of Supervisors and provides further opportunities for comments and additional information which will be independently reviewed by the county before the final vote by the Board of Supervisors

Furthermore, as described in Chapter 3, *Project Description*, under Section 3.4.1, CO_2 Capture Sites, each site of the process utilizes approximately 8,700 gallons of clean produced water per day, treated with reverse osmosis to meet required specifications needed in the process. Produced water is managed in a number of ways, including reinjection for disposal or reuse for other purposes, such as steam generation, to support oil and gas production operations. In standard reinjection operations, injection wells may be located within the oilfield. The oil is separated from the water and the water is reinjected into the same formation from which it was originally recovered. In other instances, the produced water may be trucked from treatment tanks on site to commercial injection facilities located apart from the oilfield operations. Produced water may also be transported, via truck or pipeline to existing wastewater treatment facilities permitted to receive production water for disposal. Produced water collected in tanks is typically re-used for further extraction purposes, stored in surface impoundments where it percolates into groundwater and/or evaporates, or disposed of by injection well. Produced water is not potable and would not be used for consumption.

10-008

Please refer to response 10-007 above.

10-009

The comment states that CRC should not be allowed to be the investigating body for the project, rather an independent company should be hired to do so. See response to Comment 11-007. As noted in that comment CRC is not an " investigating body " but the applicant for the project and has necessary information and materials to provide for the analysis of the project in the RDEIR. All reports submitted by the applicant and used in the RDEIR were completed by consultants with the appropriate professional credentials and background for the specific discipline.

10-010

Thank you for your comment and participation in the public process. This comment does not state a specific concern related to the adequacy of the DREIR and therefore does not require a detailed response. This comment is noted for the record and will be provided to the Planning Commission and Board of Supervisors for consideration.

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11: Emmanuel Campos

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From: Emmanuel Campos
To: CTV1EIRComments
Subject: Support Email for Carbon Sequestration Project at Elk Hills
Date: Wednesday, July 17, 2024 8:29:01 AM

CAUTION: This email originated from outside of the organization. Do not click links, open attachments, or provide information unless you recognize the sender and know the content is safe.

11-001

Good morning, Kern County Planning Commission Hearing on Carbon TerraVault,

This email aims to state my support for the Carbon Sequestration and Storage Project at Elk Hills and ensure that this support goes on the record. I have attended various community events and listened to the subject matter experts and community members on both sides of this project. While I recognize our state climate goals are attainable, we can responsibly and realistically meet them only with these types of projects within a reasonable time frame. I am a community member, and business owner and reside in Taft CA with my wife and six children ages 18-7. This project will materially improve the quality of life in our community via its community benefit plan and will serve as a primary investment in our County, City and State. Our residents deserve affordable, clean energy, cleaner air quality, and an improved quality of life. As our legacy energy sector continues to support our economy responsibly, as they have done for decades, projects like this will only enhance and support our energy independence from foreign interest and go a long way in improving our national security.

I support the approval of this project and look forward to seeing yours. I thank you in advance for your due diligence and fiduciary responsibility in the proper allocation of resources to study this proposal.

Emmanuel V. Campos, MBA

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Comment 11
Emmanuel Campos

11-001

Thank you for your comment and participation in the public process. This comment does not state a specific concern related to the adequacy of the DREIR and therefore does not require a detailed response. This comment is noted for the record and will be provided to the Planning Commission and Board of Supervisors for consideration.

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12: Erika Sanchez

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From: Sanchez, Erika (AppleOne)
To: CTV1EIRComments
Subject: Support for Carbon Project
Date: Monday, July 15, 2024 10:22:53 AM

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12-001

Dear Members of the Kern County Planning Commission,

My name is Erika Sanchez, and I am a student at Taft Union High School in the Taft Oil Technology Academy. I am writing to show my strong support for the Carbon TerraVault I (CTV I) project. I live in Taft, California, near the Elk Hills location where the permits are being requested.

Carbon capture and storage (CCS) technology is really important for helping California transition to cleaner energy and achieve our climate goals. The CTV I project is a key part of this effort, demonstrating our dedication to environmental protection.

As a high school student and community member, I feel personally involved in the development of the CTV I project. This initiative not only aims to reduce carbon emissions but also represents an investment in the future of Kern County. It will help our local economy grow, create new jobs, and make our area a leader in clean energy projects.

I believe that approving the CTV I project will bring many benefits to our community and the state of California. It's a proactive approach to addressing climate change and highlights the importance of innovative solutions for environmental sustainability.

Thank you for considering my perspective. I fully support the approval of the Carbon TerraVault I project and believe it will significantly contribute to the sustainability and prosperity of Kern County.

Sincerely,

Erika Sanchez
Student, Taft Oil Technology Academy
Taft Union High School
Taft, California

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Comment 12
Erika Sanchez

12-001

Thank you for your comment and participation in the public process. This comment does not state a specific concern related to the adequacy of the DREIR and therefore does not require a detailed response. This comment is noted for the record and will be provided to the Planning Commission and Board of Supervisors for consideration.

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13: George Harmer

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GENERAL PRODUCTION SERVICE, INC.
P.O. BOX 344 TAFT, CA 93268
(661) 765-5330 phone (661) 765-4860 fax

Kern County Planning Commission
2700 M Street, Suite 100
Bakersfield, CA 93301

13-001

Dear Members of the Kern County Planning Commission,

I am writing to express my strong support for the Carbon TerraVault I (CTV I) project and to urge the commission to approve this important initiative. As a lifelong resident and Director of Health and Safety in Kern County, I believe that carbon capture and storage (CCS) technology is crucial for advancing the energy transition in California and helping the state meet its ambitious climate goals.

The CTV I project represents a significant investment in Kern County's future. By supporting CCS technology, we can reduce greenhouse gas emissions and make substantial progress towards a cleaner, more sustainable energy landscape. This project is an essential first step in helping our state reach its climate objectives, and its approval would signal Kern County's commitment to innovative and environmentally responsible solutions.

As someone who feels deeply involved in Kern County, the development of the CTV I project, I recognize its potential to bring economic benefits and job opportunities to our community. The project will not only contribute to the state's clean energy goals but also enhance Kern County's reputation as a leader in the energy sector.

I wholeheartedly support the approval of the Carbon TerraVault I project. It aligns with our shared vision of a sustainable future and represents a critical advancement in clean energy technology.

Thank you for considering my perspective. I am confident that the CTV I project will positively impact our community and state.

Sincerely,

George Harmer

George Harmer
Director HSE
General Production Service of Ca Inc.

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Comment 13
George Harmer

13-001

Thank you for your comment and participation in the public process. This comment does not state a specific concern related to the adequacy of the DREIR and therefore does not require a detailed response. This comment is noted for the record and will be provided to the Planning Commission and Board of Supervisors for consideration.

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14: Int Brotherhood Electrical Workers

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Local Union No. 428

INTERNATIONAL BROTHERHOOD of ELECTRICAL WORKERS

July 12, 2024

Kern County Planning and Natural Resources Department

Attn: Keith Alvarez, Planner II
2700 M Street, Suite 100
Bakersfield, CA 93301
Email: CTV1EIRComments@kerncounty.com

14-001

On behalf of IBEW 428 and the nearly 1,300 Kern County families we represent, I write to express our strong support for the Carbon TerraVault I project. Not only is this project a good first step in helping our State meet its climate goals, but it is also a huge investment in the future of Kern County and its residents.

Please approve this project.

Sincerely,

Brian Holt
Business Manager/ Financial Secretary

BRIAN HOLT
BUSINESS MANAGER/FINANCIAL SEC.

3921 SILLECT AVENUE
BAKERSFIELD, CALIFORNIA 93308

PHONE (661) 323-2979
FAX (661) 323-1834

AFL-CIO

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Comment 14
Int Brotherhood Electrical Workers

14-001

Thank you for your comment and participation in the public process. This comment does not state a specific concern related to the adequacy of the DREIR and therefore does not require a detailed response. This comment is noted for the record and will be provided to the Planning Commission and Board of Supervisors for consideration.

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15: Ironworkers Local 434

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Ironworkers Local 433

International Association of Bridge, Structural &
Ornamental Iron Workers A.F.L.-C.I.O.
Established 1929

17495 HURLEY STREET EAST CITY OF INDUSTRY, CALIFORNIA 91744 PHONE: (626) 964-2500
FAX: (626) 964-1745

July 17, 2024

Kern County Planning and Natural Resources Department

Attn: Keith Alvidrez, Planner II
2700 M Street, Suite 100
Bakersfield, CA 93301

15-001

Hello Mr. Alvidrez,

I am writing today in support of the Carbon Terra Vault project.

Kern County is situated to become a model for the state, country, and the entire world in terms of transitioning from traditional fossil fuels to more desirable energy sources.

The project in question is a positive step toward building a prosperous and healthier future for everyone.

Ironworkers Local 433 has a training center for Apprentices and Journeypersons who are directly impacted by the decisions you and others will soon make at the upcoming meetings.

Approximately 500 Kern County residents and their families work in our organization, relying on Kern County's natural resources to provide for their families.

The piping industry is critical to the infrastructure of our future here locally.

I support the approval of this project. Please consider these residents and their families when making this critical decision regarding the Carbon Terra Vault project.

Sincerely,

Rene Palacios
Business Agent
Ironworkers Local 433

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Comment 15
Ironworkers Local 434

15-001

Thank you for your comment and participation in the public process. This comment does not state a specific concern related to the adequacy of the DREIR and therefore does not require a detailed response. This comment is noted for the record and will be provided to the Planning Commission and Board of Supervisors for consideration.

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16: Jason Hodgson

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From: Jason Hodgson
To: CTV1EIRComments
Subject: Support for Carbon TerraVault I Project
Date: Monday, July 15, 2024 3:13:29 PM

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16-001

Dear Kern County Planning Commission,

I am writing to express my support for the Carbon TerraVault I (CTV I) project. Having attended the public input meeting a few months ago, as well as several community information events related to CTV1, I believe this project and others like it will provide needed investment using existing local expertise for our community and the state's future.

I would like to highlight the following points:

- Carbon capture and storage (CCS) technology is vital to help advance energy transition in California and to help the state meet its climate goals.
- CCS in Kern County will directly benefit our students and families both environmentally and economically.
- As a community member, I feel involved in the development of the CTV I project.
- This project is a good first step to helping our state reach its climate goals.
- This project is an investment in Kern County's future and will help advance clean energy projects in the state.
- I support the approval of this project.

Thank you for considering my comments. I believe that the Carbon TerraVault I project will be a significant step forward for our community and for California's environmental goals.

Sincerely,

This is a staff email account managed by Taft Union High School District. This email and any files transmitted with it are confidential and intended solely for the use of the individual or entity to whom they are addressed. If you have received this email in error please notify the sender.

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Comment 16
Jason Hodgson

16-001

Thank you for your comment and participation in the public process. This comment does not state a specific concern related to the adequacy of the DREIR and therefore does not require a detailed response. This comment is noted for the record and will be provided to the Planning Commission and Board of Supervisors for consideration.

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17: John Newmann

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From: John Neumann
To: CTV1EIRComments
Subject: CRC Carbon Capture Initiative
Date: Wednesday, July 17, 2024 11:49:43 AM

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17-001

Dear Kern County Planning Commission,

I am writing to express my strong support for the carbon capture initiatives being implemented by California Resources Corporation (CRC) in Kern County, California. As someone deeply concerned about the environmental and economic well-being of our state, I believe that carbon capture technology represents a vital step forward in our efforts to combat climate change while maintaining energy production and economic stability.

CRC's leadership in advancing carbon capture and storage (CCS) projects is commendable and sets a positive example for the industry. By capturing carbon dioxide emissions and preventing them from entering the atmosphere, CRC is not only helping to reduce greenhouse gas emissions but also contributing to the development of a more sustainable energy future.

The benefits of CCS extend beyond environmental preservation. These projects provide significant economic opportunities for Kern County, including job creation, technological innovation, and the attraction of investment. In a region where the energy sector plays a crucial role in the local economy, the implementation of carbon capture technology helps ensure that Kern County remains a leader in energy production while transitioning to cleaner practices.

Furthermore, the successful deployment of CCS technology by CRC can serve as a model for other regions and industries, demonstrating that it is possible to achieve substantial emissions reductions without compromising economic growth. This balance is essential as we work towards a more sustainable and resilient future.

I appreciate CRC's commitment to environmental stewardship and innovation, and I am confident that your efforts in Kern County will yield positive results for both the environment and the community. Thank you for your dedication to advancing carbon capture technology and for leading the way in addressing one of the most critical challenges of our time.

Sincerely, John Neumann
Accelerated Environmental Services
Taft Ca

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Comment 17
John Newmann

17-001

Thank you for your comment and participation in the public process. This comment does not state a specific concern related to the adequacy of the DREIR and therefore does not require a detailed response. This comment is noted for the record and will be provided to the Planning Commission and Board of Supervisors for consideration.

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18: Les Clark

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From:	Les Clark
To:	CTV1EIRComments
Cc:	Teena Crabtree
Subject:	CRC Permits for the Carbon Terra Vault I project
Date:	Monday, July 15, 2024 11:14:27 AM
Attachments:	image001.png

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18-001

Dear Kern County Planning Commission,

My name is Les Clark III, and I am the District Administrator at West Side Recreation & Park District. As a long-time resident of Taft, California, near the Elk Hills location where the permits for the Carbon Terra Vault I project are being requested, I am writing to express my strong support for this initiative.

For 75 years, our district has been supported by the oil industry, and in turn, we have steadfastly supported oil production. Our district works closely with local energy companies to ensure that our community remains resilient and thriving, especially during these challenging times. The integration of carbon capture and storage (CCS) technology is vital for advancing the clean energy initiative in California and achieving the state's ambitious climate goals.

As a community member, I feel actively involved in the development of the Carbon Terra Vault I project. This project represents a significant first step in helping our state reach its climate objectives. Moreover, it is an investment in Kern County's future, poised to stimulate the advancement of clean energy projects across the state.

Therefore, I wholeheartedly support the approval of the Carbon Terra Vault I project. It is crucial for our community that organizations like West Side Recreation & Park District stay afloat, and projects like this will allow us to continue to thrive due to the community benefits and economic stimulation they bring. We look forward to working with CRC for the next 75 years.

Thank you for considering my perspective.

Sincerely,

Les Clark III
District Admnistrator
West Side Recreation & Park District
Office: 661.763.7013
Website | Online Registration | Facebook

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Comment 18
Les Clark

18-001

Thank you for your comment and participation in the public process. This comment does not state a specific concern related to the adequacy of the DREIR and therefore does not require a detailed response. This comment is noted for the record and will be provided to the Planning Commission and Board of Supervisors for consideration.

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19: Samantha Harp

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From: Harp, Samantha R (AppleOne)
To: CTV1EIRComments
Subject: Support for Carbon TerraVault I Project
Date: Monday, July 15, 2024 10:20:43 AM

CAUTION: This email originated from outside of the organization. Do not click links, open attachments, or provide information unless you recognize the sender and know the content is safe.

19-001

Dear Members of the Kern County Planning Commission,

My name is Samantha Harp, and I am a student at Taft Union High School, in the Taft Oil Technology Academy. I am writing to show my support for the Carbon TerraVault I (CTV I) project. I live in Taft, California, near the Elk Hills location where the permits are being requested.

Carbon capture and storage (CCS) technology is really important for helping California move towards cleaner energy and meeting our climate goals. The CTV I project is a big part of this, showing that we care about our environment and want to protect it.

As a young person in this community, I feel connected to the CTV I project. It's not only about reducing carbon emissions but also about investing in Kern County's future. This project will help our local economy, create jobs, and make our region a leader in clean energy.

I believe that approving the CTV I project will bring great benefits to our community and the whole state of California. It's a smart step in fighting climate change and finding new, better ways to protect our environment.

Thank you for listening to my thoughts. I fully support the approval of the Carbon TerraVault I project and believe it will help make Kern County more sustainable and prosperous.

Sincerely,

Samantha Harp
Student, Taft Oil Technology Academy
Taft Union High School
Taft, California

Terra O'Neill

Regional Community Affairs Advisor

California Resources Corporation

& Carbon TerraVault

Cell: 661.820.0733

Comment 19
Samantha Harp

19-001

Thank you for your comment and participation in the public process. This comment does not state a specific concern related to the adequacy of the DREIR and therefore does not require a detailed response. This comment is noted for the record and will be provided to the Planning Commission and Board of Supervisors for consideration.

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20: Teena Crabtree

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From: Teena Crabtree
To: CTV1EIRComments
Subject: Support Email for CRC Carbon TerraVault I Project at Elk Hills
Date: Monday, July 15, 2024 2:44:35 PM
Attachments: image001.png

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20-001

Dear Kern County Planning Commission,

I am writing to express my support for the Carbon TerraVault I (CTV I) project at Elks Hills.

Carbon capture and storage (CCS) technology is vital for advancing the energy transition in California and achieving the state's climate goals. The CTV I project is a critical first step in this direction.

As a resident and business owner, I am involved in the development of the CTV I project. This initiative aligns with our community's values and is a significant investment in Kern County's future. Supporting this project promotes clean energy projects and ensures a sustainable future for our region.

I urge the Kern County Planning Commission to approve the Carbon TerraVault I project. It will benefit our local community and the state in our collective effort to combat climate change.

Thank you for considering my comments.

Sincerely,

Teena Crabtree
District Administrative Assistant - West Side Recreation & Park District
Family Advocate - West Side Outreach & Learning Center
Reservation Specialist- West Side Recreation & Park District
Office: 661.770.9574

Website | Online Registration | Facebook

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Comment 20
Teena Crabtree

20-001

Thank you for your comment and participation in the public process. This comment does not state a specific concern related to the adequacy of the DREIR and therefore does not require a detailed response. This comment is noted for the record and will be provided to the Planning Commission and Board of Supervisors for consideration.

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21: SoCalGas

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From: SoCalGasTransmissionUtilityRequest
To: Keith Alvidrez
Subject: DCF: 0547-22-85N Carbon TerraVault I
Date: Thursday, June 27, 2024 11:51:19 AM
Attachments: 1195-24-.pdf
DCF 0547-22-85N Carbon TerraVault.msg
DCF 0008-24NC Carbon TerraVault I (Kern County) by California Resources Corporation (CRC).msg
Carbon TerraVault I MAP.pdf

CAUTION: This email originated from outside of the organization. Do not click links, open attachments, or provide information unless you recognize the sender and know the content is safe.

Good morning Keith,
I am reaching out to you on behalf of SCG Transmission Dept regarding the above referenced project. We recently received the Draft Recurculated EIR Notice (1st attachment). I would like to clarify some things as we have received multiple documents related to this over the years and I have noticed a potential error. The first notice I have found record of receiving was in 2022 (2nd attachment titled DCF:0547-22-85N). The attachment is our response at that time confirming we may have a potential conflict with the outlined project area.

21-001

I also have a notice from earlier this year for the same project (3rd attachment) in which we responded with a letter of No Conflict in error. PLEASE DISREGARD that response. After reviewing the area further I found that our Transmission line 85N still falls within the proposed work area and therefore an engineering review would be required once plans/drawings are available to assure there are no concerns.

To prevent confusion in the future we ask that you reference the DCF# 0547-22-85N that was provided upon the initial request. This will help us file documents acocrdingly so future notices are not treated as a new request. I have also atatched a GIS Map with the sections from project area highlighted for you. If can confirm that the correct area is highlighted I will make a note in our records indicating as such and file everthing under the initial request folder.

21-002

Our response to the initial request (2nd attachment) would still apply and the General Requirments letter included in that response is still what we ask you keep in mind as plans are developed near SCG Transmission facilties. Once plans/drawings are available for review please send a copy for an engineer to be assigned and review for potential concerns.
Please let me know if you have any questions.

21-003

Thank you,
Nerses Papazyan
Pipeline Planning Assistant
SoCalGas Transmission Department

PLEASE VISIT OUR INTERACTIVE WEBSITE TO VIEW OUR HIGH PRESSURE DISTRIBUTION AND TRANSMISSION LINES: SOCALGAS - NATURAL GAS PIPELINE MAP.

TO HELP THE ENVIRONMENT AND TO EXPEDITE RESPONSES, PLEASE SEND FUTURE PROJECTS AND CORRESPONDING ATTACHMENTS VIA EMAIL: SoCalGasTransmissionUtilityRequest@semprautilities.com

Please allow up to 60 days to receive a response to all future utility requests

NOTICE: This message is covered by the Electronic Communications Privacy Act, Title 18, United States Code, Sections 2510-2521. This e-mail and any attached files are the exclusive property of Sempra Energy and the sender, are deemed privileged and confidential, and are intended solely for the use of the individual(s) or entity to whom this e-mail is addressed. If you are not one of the named recipient(s) or believe that you have received this message in error, please delete this e-mail and any attachments and notify the sender immediately. Any other use, re-creation, dissemination, forwarding or copying of this e-mail is strictly prohibited and may be unlawful.

SCG Transmission General Requirements

Transmission Technical
Services Department

9400 Oakdale Ave
Chatsworth, CA 91311
SC9314

April 11, 2022

Cindi Hoover
Kern County Planning & Natural Resources Dept
hooverc@kerncounty.com

Subject: **Carbon TerraVault**

DCF: **0547-22-85N**

The following are general requirements provided when performing work or planning projects near SoCalGas high pressure lines. Please review requirements along with project plans and notify SoCalGas Transmission Department about any questions or conflicts.

It is highly recommended that communication is maintained with SoCalGas to address all conflicts. Depending on the specific scope of your project there may be less or more requirements that need to be discussed regarding your project.

1. Consideration must be given to the safety of our pipeline(s) during all project stages.
2. SoCalGas must have continuous and uninterrupted access to the pipeline(s) and easement(s). In addition, SoCalGas conducts routine patrols and surveys of the pipeline(s); SoCalGas needs drivable access along the pipeline(s)/easement(s).
3. Buried pipelines must have a minimum cover of 3 feet and a maximum cover of 7 feet below finished grade. No change of grade whatsoever, even within these parameters, shall be made without prior approval of SoCalGas.
4. Prior to SoCalGas approving encroachment onto its easement(s), SoCalGas must be furnished with final grading plans showing the depth of the pipeline(s) below the existing surface and the depth of the pipeline(s) below the proposed finished grade. These elevations must meet SoCalGas' requirements for buried pipelines.
5. No permanent structures, such as buildings, block walls, foundations, gates, etc., shall be constructed within the easement or over the pipeline(s).

SCG Transmission General Requirements

6 - There shall be no planting of trees or other deep-rooted plants within the easement(s) or over the pipeline(s).

7 - Substructures shall cross perpendicular to the easement(s). Substructure crossings must provide a minimum of 18-inches vertical clearance from the pipeline(s). Additional separation is required for leach lines, fuel lines, etc.

8 - Parallel encroachments within the easement(s) are prohibited. In areas where a parallel substructure is being constructed outside of the easement(s), SoCalGas requires five feet of separation, with three feet of undisturbed fill, in order to protect the integrity of our facilities and allow the facilities to be safely accessed during inspection, maintenance, and repair. Additional separation may be needed for leach lines, fuel lines, high voltage electric, etc.

9 - All encroachments onto SoCalGas' easement(s) must have written approval of SoCalGas prior to construction or encroaching onto the easement(s).

10 - All work within the SoCalGas easement(s) and/or within 10 feet of the pipeline(s) must be witnessed by a SoCalGas representative, and no work will be allowed without the SoCalGas representative on site.

11 - No heavy equipment shall cross the pipeline(s) without SoCalGas' approval. Additional protective measures may be required where heavy equipment is expected to cross the pipeline(s).

12 - No mechanical equipment shall operate within three horizontal feet of the pipeline(s), and any closer work must be performed by hand.

13 - No mechanical equipment shall operate within two vertical feet of the pipeline(s), and any closer work must be performed by hand.

14 - Buried pipeline(s) shall not be left exposed, and exposed pipeline(s) shall not be buried, without prior inspection and approval by SoCalGas. If the pipeline(s) are exposed during construction (e.g. substructure crossings, etc.), the pipeline must be backfilled with sand or zero-sack slurry only.

15 - No vibratory compaction is permitted over the pipeline(s). In rare cases, vibratory compaction may be approved by SoCalGas' Engineering Department following review of detailed site conditions, pipeline data, and equipment specifications.

16 - All contractors and subcontractors must be notified of the presence of the pipeline(s).

17 - Contractors and subcontractors must call DigAlert (811) at least 2 working days prior to construction, grading, or excavation.

18 - Once approved, encroachments within SoCalGas' easement(s) shall be documented in an easement amendment or other document, as deemed appropriate by SoCalGas' Land Services Department.

SCG Transmission General Requirements

In addition to the previous requirements, SoCalGas recommends the following:

19 - Potholes should be made, as necessary, to establish the horizontal and vertical alignment of the pipeline(s) within the project area. This information should be indicated on the plans, as needed. CAUTION: SoCalGas personnel must be present during potholing operations. Arrangements for SoCalGas personnel to stand by during potholing activities can be made by calling DigAlert at 811.

20 - Consideration should be given to building setbacks from the easement lines. A minimum 15-foot setback is recommended whenever possible.

21 - All potential buyers or tenants of the property should be made aware of the presence of the pipeline(s) and easement restrictions.

Best Regards,

SoCalGas Transmission Technical Services

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Comment 21
SoCalGas

21-001

The comment states that it was confirmed that there may be a potential conflict with the outlined project area. As indicated in Chapter 8, *Organizations and Persons Consulte*d, of the DREIR, Southern California Gas Company (SoCalGas) is a part of the regional and local organizations consulted during the project. Any previous comments received from SoCalGas are recorded and considered.

21-002

The comment states that SoCalGas has a previous notice for the project indicating "No Conflict." A letter dated January 18, 2024 from SoCalGas states that "The Transmission Department of SoCalGas does not operate any facilities within your proposed improvement. However, the Distribution Department of SoCalGas may maintain and operate facilities within your project scope." The comment states that the previous response indicating "No Conflict" was in error and should be disregarded.

The comment states that Transmission line 85N falls within the proposed work area and that an engineering review would be required to assure there are no concerns. The project design and construction would conform to industry accepted best practices as well as all local, state, and federal requirements. This comment is noted and will be considered by County decisionmakers in regards to working near transmission lines.

21-003

The comment requests that the letter provided upon the initial request titled DCF# 0547-22-85N be referenced. DCF# 0547-22-85N is dated April 11, 2022 and is recorded alongside other SoCalGas comments. This comment is noted and will be considered by County decisionmakers in regards to SoCalGas responses to the project.

21-004

The comment requests that the correct project area is highlighted by SoCalGas for their records. Figure 3-3 Site Plan in Chapter 3, *Project Description*, of the DREIR portrays the project area. The chapter also contains additional figures portraying various aspects of the project area, including regional location (Figure 3-1) and location of wells (Figures 3-5 and 3-6).

21-005

The comment states that the initial response would apply and requests that the General Requirements letter included in the initial response be considered moving forward. As described in Chapter 3.0 of the DREIR, *Project Description*, design consideration would include: Consultation with the jurisdictional state and federal regulatory agencies; Adherence to CFR Title 49 Part 192 “Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards,” appropriate sections of the American Petroleum Institute (API), American National Standards Institute (ANSI), American Society of Mechanical Engineers

(ASME), National Association of Corrosion Engineers (NACE), and other applicable codes; and Continued incorporation of the use of in-line inspection tools as noted in the Company Integrity Management Program, as described under Pipeline Design, Construction, Maintenance, Operation, and Safety. General Order 112-F § 143.5 (GO 112-F), issued by the California Public Utilities Commission (CPUC), prohibits a building or other encroachment to be constructed within the pipeline Right-of-Way that would hinder maintenance activities on the pipeline or cause a lengthy delay in accessing the pipeline facilities in an emergency. Additionally, a case-specific evaluation by a qualified SoCalGas Transmission representative would be needed for a proposed development or activity. This comment is noted and will be considered by County decisionmakers in regards to working near transmission lines.

22: Friends of the Earth Individual Signature Letters

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From: Friends of the Earth
To: CTV1EIRComments
Subject: Reject the Carbon TerraVault I carbon capture and storage scheme
Date: Thursday, July 18, 2024 12:26:15 PM

CAUTION: This email originated from outside of the organization. Do not click links, open attachments, or provide information unless you recognize the sender and know the content is safe.

22-001

The Carbon TerraVault I carbon capture and storage project planned in Elk Hills is a dangerous distraction that will prolong the life of dirty fossil fuel operations and divert critical resources from truly clean, renewable energy. The project will also threaten public health and safety, drain Kern County's limited water supplies, and delay California's needed transition away from fossil fuels — while doing nothing to protect the climate.

Carbon capture and storage projects like Carbon TerraVault I consistently overpromise and underdeliver, but oil companies promote this flawed technology anyway to keep themselves in business — even though it's been proven to be dangerous. For example, the depleted oil field where California Resources Corporation wants to store carbon waste has hundreds of drilling sites that haven't been properly sealed, increasing the risk of dangerous CO2 leaks. These risks are amplified in a seismically active region like Kern County, where frequent earthquakes threaten the safe storage of carbon.

According to the project's draft environmental impact report, Carbon TerraVault I will also have "significant and unavoidable" impacts on air quality in an air basin that's considered one of the most polluted in the country. This will endanger the health and safety of low-income communities and communities of color, who already bear the brunt of environmental injustices.

The project poses other serious safety concerns. It will require building more than 13 miles of pipeline to transport carbon dioxide, and portions of the pipeline will pass within 2.5 miles of McKittrick Elementary School. CO2 leaks can have devastating consequences on public health, including seizures, loss of consciousness, asphyxiation, and possibly death.

Finally, the project will threaten Kern County's limited water supply by relying on an already overdrafted water source. Compromising the county's groundwater supply to appease Big Oil is an impermissible risk you must reject.

Please do the right thing for water, wildlife, people, and the planet and reject this dangerous project.

Thank you,
Ritchie Starr

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Comment 22
Friends of the Earth Individual Signature Letters

22-001

This comment comprises the same letter that 2038 individuals signed and sent generated by Friends of the Earth. All letters are included in Appendix C-1. Thank you for your comment and participation in the public process. This comment is noted for the record and will be provided to the Planning Commission and Board of Supervisors for consideration. Additional information can be found in the following global responses.

GR-2: Extending the Life of Fossil Fuel Facilities, water-demand response, GR-3: Environmental Justice and Public Participation; GR-4: CO_2 Pipelines, GR-6: Air Quality Impacts, and GR-7: Geological and Induced Seismicity Risk.

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23: Last Chance Alliance

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From:	Woody Little
To:	CTV1EIRComments
Subject:	ATTN: Keith Alvidrez, Planner II – Comments on recirculated draft EIR for Carbon TerraVault I
Date:	Thursday, July 18, 2024 3:36:01 PM
Attachments:	Re CarbonTerraVault I Draft EIR – Last Chance Alliance member comments to Kern County Planning and Nat Resources.xlsx Re CarbonTerraVault I Draft EIR – Last Chance Alliance member comments to Kern County Planning and Nat Resources - EPA Comment Letters.csv

CAUTION: This email originated from outside of the organization. Do not click links, open attachments, or provide information unless you recognize the sender and know the content is safe.

Good afternoon,

Please see the attached comments from 236 members of the Last Chance Alliance in opposition to the Carbon TerraVault I project.

I am attaching them in both Excel and csv form.

Best,
Woody Little

23-001

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Woody Little | *he/him*
Organizing and Special Projects Manager
Last Chance Alliance
woody@lastchancealliance.org | 510-418-8785

First name	Last name	Email	Zip code	Letter Body
Andrew	Reich	andrewlreich@gmail.com	90004	Dear Kern County Planning and Natural Resources Department, The Carbon TerraVault I Elk Hills carbon capture project is a dangerous distraction that will prolong the life of dirty fossil fuel operations and divert critical resources away from truly clean, renewable energy. The project will threaten public health and Kern County's limited water supplies while doing nothing to protect our climate. Carbon capture and storage (CCS) projects have consistently over-promised and under-delivered, but oil companies are promoting this flawed technology to keep themselves in business. Carbon TerraVault I is no exception: The project will deploy expensive and failed CCS technology that will only serve to delay our transition off fossil fuels, while leading to harmful impacts to air, climate, water, health and safety, seismicity, pipeline safety, and animal and plant species in the region. For example, the depleted oil field that California Resources Corporation wants to use to store the carbon dioxide has hundreds of old drilling sites that have not been properly sealed, which increases the risk of dangerous leaks from the storage site. These risks are amplified in a seismically active region like Kern County, where frequent earthquakes threaten the safe storage of carbon. According to its draft Environmental Impact Report, the project will also have "significant and unavoidable" impacts on air quality in an air basin that is already considered one of the most polluted in the country. Low-income communities and communities of color, who are already bearing the brunt of environmental injustice, will once again pay the price with their health and safety. The project poses other serious safety concerns including over 13 miles of pipeline to transport carbon dioxide, portions of which pass dangerously close to McKittrick Elementary School. Carbon dioxide leaks can have devastating consequences including asphyxiation, seizures, loss of consciousness, and potentially death. The project also threatens Kern County's fragile water supply since it will rely on an already overdrafted water source. Compromising groundwater supply in a County where water is already limited is an impermissible risk that your agency should reject. For the sake of our air, water, health, and climate, I urge you to reject this dangerous project. Sincerely,

23-002

Comment 23
Last Chance Alliance

23-001

This comment comprises the same letter that 236 individuals signed and sent generated by Last Chance Alliance. All letters are included in Appendix C-2. Thank you for your comment and participation in the public process. This comment is noted for the record and will be provided to the Planning Commission and Board of Supervisors for consideration. Additional information can be found in the following global responses. GR-2: Extending the Life of Fossil Fuel Facilities,, GR-3: Environmental Justice and Public Participation; GR-4: CO_2 Pipelines, GR-6: Air Quality Impacts, and GR-7: Geological and Induced Seismicity Risk.

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