Draft
Environmental Impact Report
SCH# 2023050214

Volume 2
Appendices A through E1

ENTERPRISE SOLAR STORAGE PROJECT
by Enterprise Solar Storage, LLC *(PP23401)*

Site 1
Zone Change Case No. 60, Map No. 196
Conditional Use Permit No. 62, Map No. 196
Nonsummary Vacations Map No. 196

Site 2
Specific Plan Amendment No. 34, Map No. 196
Zone Change Case No. 61, Map No. 196
Conditional Use Permit No. 63, Map No. 196
Nonsummary Vacations Map No. 196

Site 3
Zone Change Case No. 3, Map No. 195
Zone Change Case No. 62, Map No. 196
Conditional Use Permit No. 2, Map No. 195
Conditional Use Permit No. 64, Map No. 196
Conditional Use Permit No. 65, Map No. 196
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Nonsummary Vacations Map No. 196

Site 4
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Kern County
Planning and Natural Resources Department
Bakersfield, California
November 2023

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Appendix A Notice of Preparation of a Draft Environmental Impact Report for the Enterprise Solar Storage Project

Appendix B Glare Analysis Report

Appendix C 10-Year Farming History Memorandum

Appendix D Air Quality and Greenhouse Gas Technical Report

Appendix E Biological Resource Reports

- E1-Wildlife Report
- E1A-Supplemental Wildlife Memorandum for High Voltage Work near Windhub Substation
- E1B-Wildlife Resources Memorandum for High Voltage Work near Windhub Substation
- E1C-Swainson's Hawk (Buteo swainson) Guideline Survey & Nesting Raptor Survey Report

Appendix A
Notice of Preparation of a Draft Environmental Impact Report for the Enterprise Solar Storage Project

Lorelei H. Oviatt, AICP, Director
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Bakersfield, CA 93301-2323
Phone: (661) 862-8600
Fax: (661) 862-8601 **TTY Relay 1-800-735-2929**
Email: planning@kerncounty.com
Web Address: http://kernplanning.com/

PLANNING AND NATURAL RESOURCES DEPARTMENT

Planning
Community Development
Administrative Operations

DATE: May 8, 2023

TO: See Attached Mailing List

FROM: Kern County Planning and Natural Resources Department
Attn: Keith Alvidrez
2700 "M" Street, Suite 100
Bakersfield, CA 93301
(661) 862-5015; alvidrezk@kerncounty.com

SUBJECT: NOTICE OF PREPARATION (NOP) OF A DRAFT ENVIRONMENTAL IMPACT REPORT (EIR) FOR THE ENTERPRISE SOLAR STORAGE PROJECT BY ENTERPRISE SOLAR STORAGE, LLC.

The Kern County Planning and Natural Resources Department as Lead Agency (per CEQA Guidelines Section 15062) has determined that preparation of an Environmental Impact Report (per CEQA Guidelines 15161) is necessary for the proposed project identified below. The Planning and Natural Resources Department solicits the views of your agency as to the scope and content of the environmental information which is germane to your agency's statutory responsibilities in connection with the proposed project. Your agency may need to use the EIR prepared by our agency when considering your permit or other approval of the project.

You are invited to view the NOP and submit written comments regarding the scope and content of the environmental information in connection with the proposed project should you wish to do so. Due to the limits mandated by State law, your response must be received by **June 6, 2023 at 5:00 p.m**. Comments can be submitted to the Kern County Planning and Natural Resources Department at the address shown above or to alvidrezk@kerncounty.com. A Scoping Meeting will be held on **Thursday, May 25, 2023 at 1:30 p.m.**, at the address listed above.

PROJECT TITLE: Enterprise Solar Storage Project by Enterprise Solar Storage, LLC. (PP23401); PLN21-02330: Site 1 – ZCC 60, Map 196; CUP 62, Map 196; Non-Summary Street Vacations. Site 2 – SPA 34, Map 196; ZCC 61, Map 196; CUP 63, Map 196. Site 3 – ZCC 3, Map 195; ZCC 62, Map 196; CUP 2, Map 195; CUP 64, Map 196; CUP 65, Map 196; SPA 35, Map 196; Non-Summary Street Vacations. Site 4 – SPA 4, Map 212; ZCC 4, Map 195; ZCC 3, Map 212; CUP 3, Map 195; CUP 6, Map 212; GPA 3, Map 212; Non-Summary Street Vacations. Site 5 – CUP 20, Map 197.

PROJECT LOCATION: The proposed project site is located at the western edge of the Antelope Valley, approximately two miles south of the community of Mojave, two miles southwest of the City of California City, approximately one mile north of Edwards Air Force Base, and eight miles north of the unincorporated community of Rosamond. The proposed project site is located within Section 6 of Township 10 North, Range 11 West, Sections 20-26, 28, and 36 of Township 11 North, Range 12 West, and Sections 30 and 32 of Township 11 North, Range 11 West, with the interconnection facilities located in Section 17 and 20 of Township 11 North, Range 13 West.

PROJECT DESCRIPTION:

The Enterprise Solar Storage Project (proposed project) is a proposal by Enterprise Solar Storage, LLC (project proponent) to construct and operate a 600-megawatt (MW) photovoltaic (PV) solar facility with approximately 1,000 MW of battery energy storage, or up to 4,000 megawatt-hours (MWh) of energy storage capacity, on approximately 2,228 acres across 147 privately owned parcels in an unincorporated area of southeastern Kern County, California. An additional 10 acres on four parcels are proposed for a temporary construction laydown yard. A second temporary construction laydown yard is proposed; however, the location of which is within the boundary of the adjacent previously approved Sanborn Solar project. An additional 23 acres on one parcel is proposed for a step-up substation, north of the Windhub Substation

Documents can be viewed online at: https://kernplanning.com/planning/notices-of-preparation/

Signature: Keith Alvidrez
Name: Keith Alvidrez, Planner I

Enterprise Solar Project
Agency & Tribal List

San Bernardino Co Planning Dept
385 North Arrowhead Avenue, 1st Floor
San Bernardino, CA 92415-0182

Edwards AFB, Mission Sustainability Liaison
412 TW, Bldg 2750, Ste 117-14
195 East Popson Avenue
Edwards AFB, CA 93524

U.S. Fish & Wildlife Service
777 East Tahquitz Canyon Way, Suite 208
Palm Springs, CA 92262

U.S. Dept of Agriculture/NRCS
5080 California Avenue, Ste 150
Bakersfield, CA 93309-0711

Caltrans/Dist 6
Planning/Land Bank Bldg.
P.O. Box 12616
Fresno, CA 93778

State Dept of Conservation
Director's Office
801 "K" Street, MS 24-01
Sacramento, CA 95814-3528

California Fish & Wildlife
1234 East Shaw Avenue
Fresno, CA 93710

California Regional Water Quality Control Board/Lahontan Region
15095 Amargosa Road - Bld 2, Suite 210
Victorville, CA 92392

Kern County
Agriculture Department

California City Planning Dept
21000 Hacienda Blvd.
California City, CA 93515

U.S. Bureau of Land Management
Ridgecrest Field Office
300 South Richmond Road
Ridgecrest, CA 93555

Federal Aviation Administration
Western Reg Office/
777 South Aviation Boulevard
Suite 150
El Segundo, CA 90245

Eastern Kern Resource Cons Dist
300 South Richmond Road
Ridgecrest, CA 93555-4436

State Air Resources Board
Stationary Resource Division
P.O. Box 2815
Sacramento, CA 95812

Caltrans/Dist 9
Planning Department
500 South Main Street
Bishop, CA 93514

State Dept of Conservation
Geologic Energy Management Division
11000 River Run Boulevard
Bakersfield, CA 93311

California Highway Patrol
Planning & Analysis Division
P.O. Box 942898
Sacramento, CA 94298-0001

State Dept of Toxic Substance Control
Environmental Protection Agency
1515 Tollhouse Road
Clovis, CA 93612

Kern County Airports Department

Los Angeles Co Reg Planning Dept
320 West Temple Street
Los Angeles, CA 90012

China Lake Naval Weapons Center
Tim Fox, RLA - Comm Plans & Liaison
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Mail Stop 4001
China Lake, CA 93555

Federal Communications Comm
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Cerritos, CA 90701

Environmental Protection Agency
Region IX Office
75 Hawthorn Street
San Francisco, CA 94105

So. San Joaquin Valley Arch Info Ctr
California State University of Bkfd
9001 Stockdale Highway
Bakersfield, CA 93311

Caltrans/
Division of Aeronautics, MS #40
P.O. Box 942873
Sacramento, CA 94273-0001

California Energy Commission
James W. Reed, Jr.
1516 Ninth Street
Mail Stop 17
Sacramento, CA 95814

Public Utilities Comm Energy Div
505 Van Ness Avenue
San Francisco, CA 94102

Cal Environmental Protection Agency/
Dept of Toxic Substances Control, Reg 1
Attn: Dave Kereazis, Permit Div - CEQA
8800 Cal Center Drive, 2nd Floor
Sacramento, CA 95826

Kern County Administrative Officer

Kern County Public Works Department/
Building & Development/Floodplain

Kern County Public Works Department/
Building & Development/Survey

Kern County
Env Health Services Department

Kern County Fire Dept (Put in FIRE BOX)
Regina Arriaga
Roxanne Routh
Jim Killam

Kern County Fire Dept
Cary Wright, Fire Marshall

Kern County Library/Beale
Local History Room

Kern County Library/Beale
Andie Sullivan

Kern County Parks & Recreation

Kern County Sheriff's Dept
Administration

Kern County Public Works Department/
Building & Development/Development
Review

Kern County Public Works
Department/Operations &
Maintenance/Regulatory Monitoring &
Reporting

Kern County Public Works Department/
Building & Development/Code
Compliance

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Mojave, CA 93502-1113

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Mojave, CA 93501

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5801 Sundale Avenue
Bakersfield, CA 93309

KernCOG
1401 19th Street - Suite 300
Bakersfield, CA 93301

Local Agency Formation Comm/LAFCO
5300 Lennox Avenue, Suite 303
Bakersfield, CA 93309

Mojave Public Utility Dist
15844 "K" Street
Mojave, CA 93501

Kern County Water Agency
3200 Rio Mirada Drive
Bakersfield, CA 93308

East Kern Air Pollution
Control District

Antelope Valley-East Kern
Water Agency
6500 West Avenue N
Palmdale, CA 93551

Mojave Airport
1434 Flightline
Mojave, CA 93501

East Kern Airport Dist
Attention Stuart Witt
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Mojave, CA 93501

East Kern Airport Dist Engineer
3900 Ridgemoor Avenue
Bakersfield, CA 93306

Northcutt and Associates
4220 Poplar Street
Lake Isabella, CA 93240-9536

Adams, Broadwell, Joseph & Cardozo
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601 Gateway Boulevard, Suite 1000
South San Francisco, CA 94080

U.S. Air Force
Attn: David Bell/AFCEC CZPW
Western Regional/Leg Branch
510 Hickam Avenue, Bld 250-A
Travis AFD, CA 94535-2729

U.S. Army
Attn: Philip Crosbie, Chief
Strategic Plans, S3, NTC
P.O. Box 10172
Fort Irwin, CA 92310

U.S. Army
Attn: Tim Kilgannon, Reg 9 Coord
Office of Strategic Integration
721 - 19th Street, Room 427
Denver, CO 80202

U.S. Navy
Attn: Steve Chung, Plans & Liaison
Officer
1220 Pacific Highway
San Diego, CA 92132-5190

U.S. Marine Corps
Command Gen MCIWEST-MCB CamPen
Attn: A/CS, G7
Box 555010, Bldg 1160, Rm 280
Camp Pendleton, CA 92055-5246

Los Angeles Audubon
926 Citrus Avenue
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Defenders of Wildlife/
Kim Delfino, California Dir
980 - 9th Street, Suite 1730
Sacramento, CA 95814

Native American Heritage Council
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Attn: Gene Albitre
3401 Aslin Street
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Southern California Gas Co
35118 McMurtrey Avenue
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1095 Ave of the Americas – FL 25, Ste A
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Robert Burgett
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& the Environmental/
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1012 Jefferson Street
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Rosemead, CA 91770

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Southern California Edison
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Charlotte, NC 28273

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San Francisco, CA 94101-1407

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Big Pine, CA, 93513

Big Pine Paiute Tribe of the Owens Valley
Danelle Gutierrez, Tribal Historic Preservation Officer
P.O. Box 700
Big Pine, CA, 93513

Big Pine Paiute Tribe of Owens Valley
Sally Manning, Environmental Director P. O. Box 700
Big Pine, CA, 93513

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Coastal Band of the Chumash Nation
Mia Lopez, Chairperson
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Coastal Band of the Chumash Nation
Gabe Frausto, Vice Chair
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Santa Rosa Rancheria Tachi Yokut Tribe
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Santa Ynez Band of Chumash Indians
Kenneth Kahn, Chairperson
P.O. Box 517
Santa Ynez, CA, 93460

Tejon Indian Tribe
Octavio Escobedo, Chairperson
P.O. Box 640 Arvin, CA, 93203

Tejon Indian Tribe
Colin Rambo,
P.O. Box 640 Arvin, CA, 93203

Tubatulabals of Kern Valley
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Lake Isabella, CA, 93240

Michael Strickler
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1125 NW Couch St, Ste 700, 7th Fl
Portland, OR 97209

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803 Tucker Road
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Tule River Indian Tribe
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P.O. Box 589 Porterville, CA, 93258

Xolon-Salinan Tribe
Karen White, Chairperson
P. O. Box 7045
Spreckels, CA, 93962

yak tityu tityu yak tiłhini – Northern Chumash Tribe Mona Tucker, Chairperson
660 Camino Del Rey
Arroyo Grande, CA, 93420

Kern Valley Indian Community
Julie Turner, Secretary
P.O. Box 1010
Lake Isabella, CA, 93240

Kern Valley Indian Community
Brandy Kendricks
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Tehachapi, CA 93561

Quechan Tribe of the Fort Yuma Reservation
Jordan D. Joaquin, President
P.O. Box 1899
Yuma, AZ, 85366

Quechan Tribe of the Fort Yuma Reservation
Virgil S. Smith, Vice President
P.O. Box 1899
Yuma, AZ, 85366

Quechan Tribe of the Fort Yuma Reservation Manfred Scott, Acting Chairman Kw'ts'an P.O. Box 1899
Yuma, AZ, 85366

Fernandeno Tataviam Band of Mission Indians
Jairo Avila, Tribal Historic and Cultural Preservation Officer
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Kern Valley Indian Community
Robert Robinson, Chairperson
P.O. Box 1010
Lake Isabella, CA, 93240

Kitanemuk & Yowlumne Tejon Indians
Delia Dominguez, Chairperson
115 Radio Street
Bakersfield, CA, 93305

Tejon Indian Tribe
Attn: Collin Rambo, Cultural Resource Management Technician
1731 Hasti Acres Dr., Suite 108
Bakersfield, CA 93309

Quechan Tribe of the Fort Yuma Reservation
Jill McCormick, Historic Preservation Officer
P.O. Box 1899
Yuma, AZ, 85366

Torres Martinez Desert Cahuilla Indians
Attn: Michael Mirelez, Cultural Resources Coordinator
PO Box 1160
Thermal, CA 92274

Twenty-Nine Palms Band of Mission Indians
Attn: Anthony Madrigal Jr., Tribal Grants Administrator

46-200 Harrison Place
Coachella, CA 92236

Wuksache Indian Tribe/Eshom Valley Band
Kenneth Woodrow, Chairperson
1179 Rock Haven Ct.
Salinas, CA 93906

Twenty-Nine Palms Band of Mission Indians
Attn: Darrell Mike, Tribal Chairman
46-200 Harrison Place
Coachella, CA 92236

San Manuel Band of Mission Indians
Attn: Jessica Mauck, Cultural Resources Analyst
26569 Community Center Dr.
Highland, CA 92346

Lorelei H. Oviatt, AICP, Director
2700 "M" Street, Suite 100
Bakersfield, CA 93301-2323
Phone: (661) 862-8600
Fax: (661) 862-8601 **TTY Relay 1-800-735-2929**
Email: planning@kerncounty.com
Web Address: http://kernplanning.com/

PLANNING AND NATURAL RESOURCES DEPARTMENT

Planning
Community Development
Administrative Operations

DATE: May 8, 2023

TO: Surrounding Property Owners within 1,000 Feet of Project Boundary; and Interested Parties

FROM: Kern County Planning and Natural Resources Department
2700 "M" Street, Suite 100
Bakersfield, CA 93311

SUBJECT: Notice of Preparation of an Environmental Impact Report – Enterprise Solar Storage Project by Enterprise Solar Storage, LLC. (PP23401).

Dear Sir or Madam:

The Kern County Planning and Natural Resources Department has determined that preparation of an Environmental Impact Report (EIR) is necessary for the proposed project identified below. The purpose of this letter is to notify interested parties and surrounding property owners within 1,000 feet of the project boundaries of this determination. A copy of the Initial Study/Notice of Preparation (IS/NOP) prepared for this proposed project is available for viewing at the following Kern County website:

https.//kernplanning.com/planning/notices-of-preparation/

The purpose of the IS/NOP is to describe the proposed project, specify the project location, and to identify the potential environmental impacts of the project so that Responsible Agencies and interested persons can provide a meaningful response related to potential environmental concerns that should be analyzed in the Environmental Impact Report.

You are invited to view the NOP and submit written comments regarding the scope and content of the environmental information in connection with the proposed project should you wish to do so. Due to the limits mandated by State law, your response must be received by **June 6, 2023 at 5:00 p.m**. Comments can be submitted to the Kern County Planning and Natural Resources Department at the address shown above or to alvidrezk@kerncounty.com. A Scoping Meeting will be held on **Thursday, May 25, 2023 at 1:30 p.m.**, at the address listed above.

Please be advised that any comments received after the dates listed above will still be included in the public record for this project and made available to decision makers when this project is scheduled for consideration at a public hearing. Please also be advised that you will receive an additional notice in the mail once a public hearing date is scheduled for this project. You will also be provided additional opportunities to submit comments at that time.

PROJECT TITLE: Enterprise Solar Storage Project by Enterprise Solar Storage, LLC. (PP23401); PLN21-02330: Site 1 – ZCC 60, Map 196; CUP 62, Map 196; Non-Summary Street Vacations. Site 2 – SPA 34, Map 196; ZCC 61, Map 196; CUP 63, Map 196. Site 3 – ZCC 3, Map 195; ZCC 62, Map 196; CUP 2, Map 195; CUP 64, Map 196; CUP 65, Map 196; SPA 35, Map 196; Non-Summary Street Vacations. Site 4 – SPA 4, Map 212; ZCC 4, Map 195; ZCC 3, Map 212; CUP 3, Map 195; CUP 6, Map 212; GPA 3, Map 212; Non-Summary Street Vacations. Site 5 – CUP 20, Map 197.

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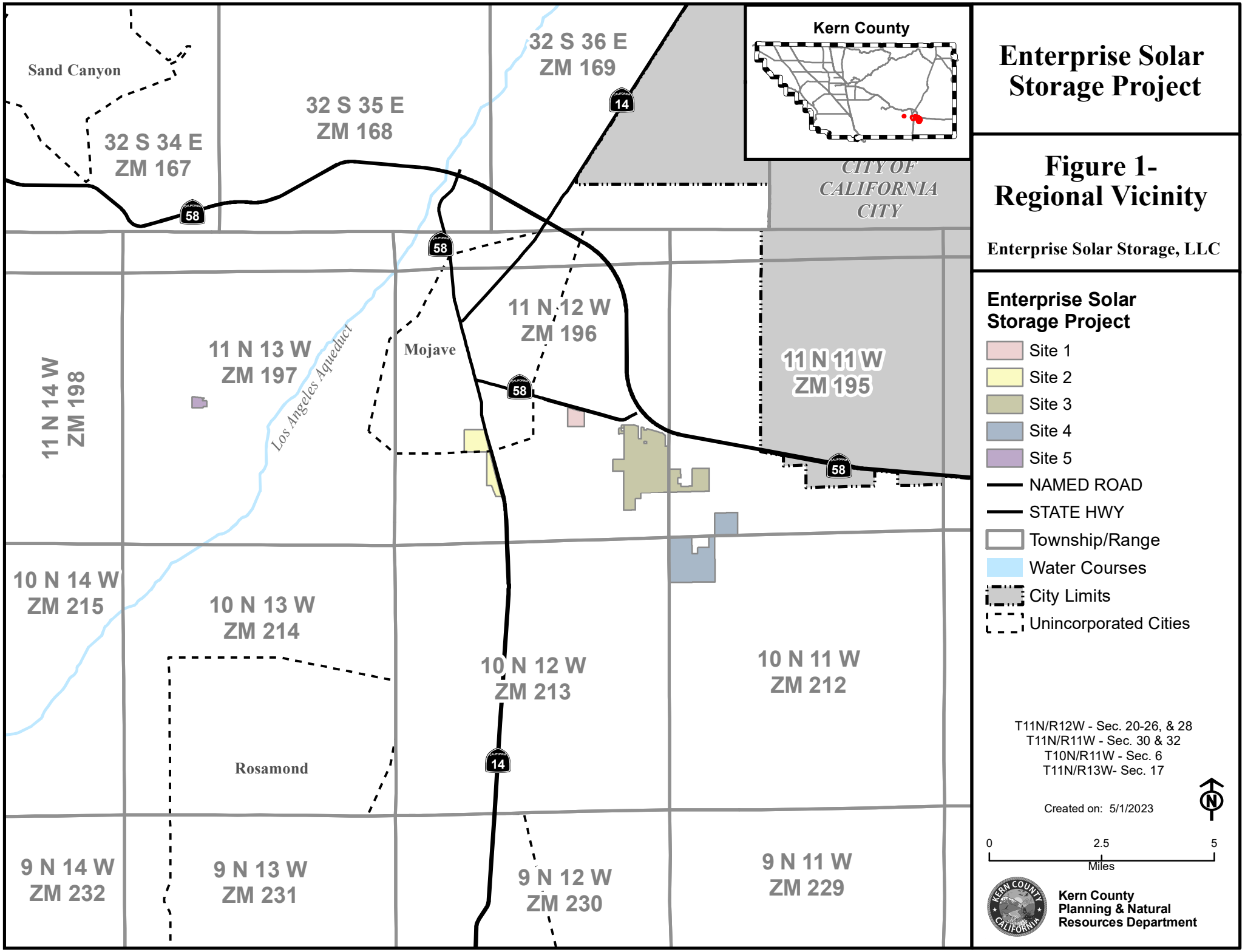
Should you have any questions regarding this project, or the Initial Study/Notice of Preparation, please feel free to contact Keith Alvidrez, Planner 1, by phone at (661) 862-5015 or email alvidrezk@kerncounty.com.

Sincerely,

Keith Alvidrez

Keith Alvidrez, Planner I
Planning and Natural Resources Department

Attachments: Figure 1 – Regional Vicinity


Kern County
Sand Canyon
32 S 34 E
ZM 167
32 S 35 E
ZM 168
32 S 36 E
ZM 169
CITY OF
CALIFORNIA
CITY
11 N 14 W
ZM 198
11 N 13 W
ZM 197
Mojave
Los Angeles Aqueduct
11 N 12 W
ZM 196
11 N 11 W
ZM 195
10 N 14 W
ZM 215
10 N 13 W
ZM 214
Rosamond
10 N 12 W
ZM 213
10 N 11 W
ZM 212
9 N 14 W
ZM 232
9 N 13 W
ZM 231
9 N 12 W
ZM 230
9 N 11 W
ZM 229
58
14
Enterprise Solar Storage Project
Figure 1- Regional Vicinity
Enterprise Solar Storage, LLC
Enterprise Solar Storage Project
Site 1
Site 2
Site 3
Site 4
Site 5
NAMED ROAD
STATE HWY
Township/Range
Water Courses
City Limits
Unincorporated Cities
T11N/R12W - Sec. 20-26, & 28
T11N/R11W - Sec. 30 & 32
T10N/R11W - Sec. 6
T11N/R13W- Sec. 17
Created on: 5/1/2023
N
0
2.5
5
Miles
Kern County
Planning & Natural
Resources Department

Enterprise Solar
APN List

235 410 01 00 4
26SB 8ME LLC
4370 TOWN CENTER BL STE 110
EL DORADO HILLS CA 95762

428 171 16 00 2
1987 DE MONTE FAMILY TRUST A
2423 NICKLAUS DR
SANTA MARIA CA 93455-1524

428 171 07 00 6
ADKISON FAMILY TRUST
17641 FAIRBREEZE CT
RIVERSIDE CA 92504-8849

235 204 16 00 5
AHN YOUNG OCK
1614 W 168TH ST # C
GARDENA CA 90247

235 410 09 00 8
ALBERTS LARRY & SANDRA
3860 MISSION HILLS RD
NORTHBROOK IL 60062-5742

428 191 29 00 6
ALCARAZ GEORGE
15855 MAYALL ST
NORTH HILLS CA 91343

428 171 35 00 7
ALDACO JOSE A
44135 BEGONIY ST
LANCASTER CA 93535

427 090 39 00 2
ALL AMERICAN PIPELINE LP
3600 BOWMAN CT
BAKERSFIELD CA 93308

428 191 20 00 9
ALLEN RICHARD & JUNE REV TR
2710 SAFE CI
LANCASTER CA 93536

244 413 58 00 7
AMAYA SEGUNDO REINALDO
CALDERON
15805 MOSSDALE AV
LANCASTER CA 93535

235 191 08 00 9
ANA PROPERTIES LLC
P O BOX 1510
LA MIRADA CA 90637

235 132 52 00 5
ANTELOPE VALLEY E KERN WTR AG
P O BOX 3176
QUARTZ HILL CA 93534

428 202 37 00 8
ARCA LILIA F
187 CHERRYWOOD LN
BATTLE CREEK MI 49015-7605

427 100 14 00 1
ANTELOPE VALLEY E KERN WTR AG
P O BOX 847
BISHOP CA 93514

427 020 28 00 9
ANTELOPE VALLEY-EAST KERN
WATER AGENCY
6500 W AVENUE N
PALMDALE CA 93551

244 233 05 00 1
AV VISTA HOLDINGS LLC
602 COMMERCE AV STE F
PALMDALE CA 93551

235 204 20 00 6
APPLE VALLEY LAND OWNERS
3787 E 11TH ST
LONG BEACH CA 90804

235 204 18 00 1
AQUINO DEMETRIO Z ET AL
8560 4TH AV
HESPERIA CA 92345-4051

235 192 07 00 3
BELTRAN TR & BERG N & M TR
25175 LUNA BONITA DR
LAGUNA HILLS CA 92653-5650

428 162 12 00 4
ASAMOTO MARITAL TR
16216 DAPHNE AV
TORRANCE CA 90504

235 163 10 00 9
ASH DONALD G ET AL
914 WEST FAIRVIEW AV # 16
ARCADIA CA 91006

235 204 22 00 2
BLAUSTEIN MARK MORRIS
6282 S SONIC DR
SAINT GEORGE UT 84790

428 212 11 00 5
BASTIDA ROGELIO & VICTORIA
2848 AUGUSTA WY
SANTA ANA CA 92706-1121

244 234 08 00 7
BAYSHORE LLC
1925 E CENTURY PK STE 1700
LOS ANGELES CA 90067

428 161 09 00 9
WIEGAND CAROLYN ANITA LIV TR
11455 PAULS DR
CONIFER CO 80433

235 191 10 00 4
BIVEN EARL U
6352 SIERRA ELENA RD.
IRVINE CA 92715-3927

428 191 27 00 0
BLANKE CHAD
895 7TH ST
OGDEN UT 84404-5159

235 172 04 00 8
ZAPATA MICHAEL & VALENCIA
GERALDINE
10665 DOROTHY AV
GARDEN GROVETY CA 92843-2416

428 030 17 00 7
BNSF RAILWAY CO
PO BOX 961039
FORT WORTH TX 76161

428 171 03 00 4
BOBBITT JANET J
9000 5TH AV
INGLEWOOD CA 90305

428 192 08 00 2
BOUCHARD ROBERT J & MARIE P
8021 VIA DE VIVA
SCOTTSDALE AZ 85258

428 173 07 00 0
BRADY MAL & PARTICIA E
P O BOX 544
CARPINTERIA CA 93014

235 202 04 00 6
BULL JACK W
15514 CALLE HERMOSA
SANTA CLARITA CA 91390-1014

428 211 39 00 0
BURGERS WILLY L
7461 MERMAID LN
CARLSBAD CA 92011

428 174 28 00 8
CADIZ ERNESTO G & EVANGELINE
854 S LAFLIN ST
CHICAGO IL 60607-4026

235 182 05 00 4
CASTELLANOS JOSE M & LIDIA
FAMILY REV TRUST
6759 COLOMA WY
RIVERSIDE CA 92509

235 202 07 00 5
CENTURY LAND LLC
PO BOX 4276
ORANGE CA 92863-4276

427 030 07 00 1
WESTERN NATURAL RESOURCES
LLC
11512 EL CAMINO REAL STE 370
SAN DIEGO CA 92130

235 204 42 00 0
WILLIAMS FMLY TR
4627 MARBELLA CT
SAN JOSE CA 95124

235 192 10 00 1
BOYER EMMETT L
5209 TAMANAR DR
LAS VEGAS NV 89130-0120

244 413 60 00 2
BRAMBACH CHAUNCEY STEPHEN
JR
PO BOX 643
MOJAVE CA 93502-0105

235 212 23 00 4
BULL JACK W
808 WEST AVENUE J-10
LANCASTER CA 93534

428 171 04 00 7
BURNS YVONNE
830 RIESSEN RD
GRANTS PASS OR 97526-9374

428 172 04 00 4
CALDWELL JOLENE ALLEN
8200 CORTELAND DR
KNOXVILLE TN 37909

235 191 07 00 6
CAMPBELL SHANNON M
12885 OAK TREE LN
POWAY CA 92064-6048

428 202 34 00 9
CARLSON CHILDRENS TR
25612 GOLDENSPRING DR
DANA POINT CA 92629-1537

235 191 04 00 7
CATBAGAN POMPEYO &
ADELAIDA Z
2354 PERU ST
LOS ANGELES CA 90039

427 400 08 00 1
CHARTER VENTURE LLC
P O BOX 11513
GLENDALE CA 91226

244 413 49 00 1
WESTRUP JEAN M
10306 CHESTNUT ST
BELLFLOWER CA 90706

428 172 10 00 1
BOBBITT TURNER TRUST
30015 HAWKSET ST
CASTAIC CA 91384-3403

235 191 09 00 2
BRACAMONTES FRANCISCA
4889 INGLEWOOD BL
CULVER CITY CA 90230-5861

428 174 36 00 1
BRANDEN MICHAEL
PO BOX 12472
MARINA DEL REY CA 90295-3472

428 174 13 00 4
BURGALES JAVIER VIVANCO
32597 SUNNYVAIL CIRCLE
TEMECULA CA 92592

235 181 13 00 0
BUSH FAMILY TRUST
4095 FRUIT ST SP 212
LA VERNE CA 91750-2919

235 182 08 00 3
CAMPBELL BRADLEY C LIVING
TRUST
22394 MONTERA CT
SALINAS CA 93908

235 163 09 00 7
CANN FAMILY TRUST
29268 PARADISE CANYON DR
MENIFEE CA 92584-8796

244 234 28 00 5
CARPENTER SUSAN
5 ROUND HILL CI
MADISON WI 53717

235 192 06 00 0
CEDERLIND LEON E LIV REV TR
807 W 15 RD
PHILLIPS NE 68865-3704

244 234 26 00 9
CHAVEZ SARA
831 N CLYBOURN AV
BURBANK CA 91505-2708

235 410 19 00 7
CHENG CHAUR C & C Y & C C ET AL
19604 CASTLE BAR DR
ROLLING HTS CA 91748

235 164 09 00 4
CLAWSON WILLIAM J
13930 CHURCH PL APT 68G
SEAL BEACH CA 90740-5320

235 410 08 00 5
COOLEY SCOTT M 1997 SEPARATE PROPERTY TRUST
15900 KENNEDY RD
LOS GATOS CA 95032

428 171 17 00 5
CURTIS ADRIANA
22583 FLAMINGO ST
WOODLAND HILLS CA 91364-4917

235 212 20 00 5
DEBS GLORIA J SEPARATE PROP TRUST
12206 MELINDA CI
SARATOGA CA 95070

235 212 08 00 1
DL INVESTORS 1 LLC
166 W WASHINGTON ST STE 730
CHICAGO IL 60602

235 212 04 00 9
DUDDY TR
4038 SAN REMO WY
TARZANA CA 91356-5700

244 413 41 00 7
DYAS ROBERT K & KATHRYN M
P O BOX 687
ROSAMOND CA 93560

428 173 02 00 5
EASTERN KERN CO RESOURCE CONSERVATION DIST
300 S RICHMOND RD
RIDGECREST CA 93555-4436

427 030 28 00 2
EDWARDS SANBORN LAND HOLDINGS LLC
11455 EL CAMINO REAL STE 160
SAN DIEGO CA 92130

244 411 03 00 3
CHINGARI JOSEPH J JR
2325 FARGO CT
TRACY CA 95377

235 171 15 00 3
COHEN JONATHAN J
2980 ALLESANDRO ST APT 205
LOS ANGELES CA 90039-3448

428 161 19 00 8
CORDON JUAN D & ZOILA M AB TRUST
3034 N CHARLOTTE AV
ROSEMEAD CA 91770

235 181 15 00 6
DAVIS DOUGLAS & YVONNE
1991 VIKING DR
CAMARILLO CA 93010-2136

244 234 29 00 8
DELGADO MIGUEL A
200 ARBOR ST
VACAVILLE CA 95688-2702

235 132 13 00 2
DORSETT DANA P
87 HICKS ST # 2B
BROOKLYN NY 11201

428 174 19 00 2
DURAN ESIQUE
15616 PATRONELLA AV
GARDENA CA 90249

244 234 15 00 7
EAGLE DESERT VISTA CORP
PO BOX 2470
VICTORVILLE CA 92393

235 171 06 00 7
EDEN SCOTT
951 MT VIEW LN
MOLALLA OR 97038-7373

235 164 13 00 5
EL PARAISO LIV TR
PO BOX 330134
PACOIMA CA 91333

428 174 02 00 2
CHITTY LOUIS & NANCY DOWNS
PO BOX 21680
LONG BEACH CA 90801-4680

428 174 24 00 6
COLEMAN GLEN R
904 WEST AVENUE J-8
LANCASTER CA 93534

428 030 33 00 3
COUNTY OF KERN
1115 TRUXTUN AV FLR 3
BAKERSFIELD CA 93301

428 202 35 00 2
DAVIS RANDOLPH S & MELINDA
24 SYDNEY CI
HARPERS FERRY WV 25425

244 234 32 00 6
DISCOUNTLAND INC
2261 MONACO DR
OXNARD CA 93035-2915

428 171 33 00 1
DOWD SUSAN
4926 SW 11TH PL
MARGATE FL 33068

235 204 12 00 3
DUTRA GERALD O TR
2845 CARRADALE DR
ROSEVILLE CA 95661-4047

244 233 01 00 9
EDWARDS SANBORN LAND HOLDINGS LLC
9480 GATEWAY DR STE 201
RENO NV 89521

235 172 06 00 4
ELASAAD MOHAMAD & KATHI
PO BOX 2075
LANCASTER CA 93539

244 413 59 00 0
WILSON THOMAS J & YURIKO
91-1012 KAIOHEE ST
EWA BEACH HI 96706-5078

428 151 06 00 7
ELMOHTASEB SAGA
36 DOVETAILL
IRVINE CA 92603

235 163 04 00 2
EMAMI DARA
12166 METRIC BL # 3004
AUSTIN TX 78758-8609

235 164 07 00 8
EMPIRE LAND INVS LLC
3207 W HIBISCUS DR
BELLEAIR BEACH FL 33786-3629

428 140 17 00 9
ENGEL ROBERT
26500 AGOURA RD
CALABASAS CA 91302-1952

428 151 07 00 0
FLASH EXPRESS LLC
9230 MARGERY AV
CALIFORNIA CITY CA 93505

235 181 12 00 7
FOGG FRANCES WING YEE
1319 BARRINGTON WY U 101
GLENDALE CA 91206-5631

428 201 02 00 9
FOX STEPHEN CRAIG & SCOTT C
3588 QUIMBY ST
SAN DIEGO CA 92106-1840

235 204 07 00 9
FRESOLONE BYPASS TR
11766 RICASOLI WY
PORTER RANCH CA 91326-4615

244 413 42 00 0
FRIEDMAN BERNARD & BETTY E
4513 GILBERT ST
SCOTTSDALE AZ 85255

428 161 05 00 7
FUKUMOTO RAY & MARIKO
REVOCABLE LIV TRUST
8150 SIERRA BONITA AV
S SAN GABRIEL CA 91770

428 171 13 00 3
FUND 5 LLC
PO BOX 1413
BEND OR 97709

428 202 50 00 5
GAOIRAN LUIS G & TERESITA T
440 KEA ST
KAHULUI HI 96732-1424

428 151 08 00 3
GENTRY TRUST
28338 HIDDEN HILLS DR
SANTA CLARITA CA 91390

428 161 12 00 7
GIBBS MARJORIE J
217 VIA ORVIETO
NEWPORT BEACH CA 92663-4924

235 191 06 00 3
GILL NANCY G
11572 MORNING SPRING CT
CUPERTINO CA 95014-5121

235 204 21 00 9
GILSDORF E G SR & B A & S
248 PARK LAKE DR
BULLHEAD CITY AZ 86429-7252

235 204 02 00 4
GLASGOW ERNEST J & KAREN F
766 N CAMBRIDGE ST
ORANGE CA 92867-6842

235 192 08 00 6
GOMES DANIEL
3630 W BOUQUET AV
ANAHEIM CA 92804-4611

235 212 10 00 6
GONZALEZ ALAN JEFFERY
PO BOX 15616
LONG BEACH CA 90815

235 212 03 00 6
GRAVES JOHN J
34 LINCOLN AV
OLD GREENWICH CT 06870

244 411 04 00 6
GREEN VICTORIA LEE
3300 KAUFFMAN AV # 9
VANCOUVER WA 98660-1483

428 151 05 00 4
GUIANG RODOLFO L JR & ERLINDA
E TRUST
2741 VIA ANITA
PALOS VERDES ES CA 90274-1012

235 204 11 00 0
HADEN MARY
4660 DEAN DR
VENTURA CA 93003-3833

244 234 17 00 3
HART PHUOC THI
3031 S LORI LN
SARATOGA SPRING UT 84045-5030

428 152 06 00 4
HAYNES ANTHONY
1240 SE JOHNSON AV
PULLMAN WA 99163-5413

428 162 01 00 2
HAZEN LARRY E LIVING TRU
8311 W MANCHESTER AV APT 1
PLAYA DEL REY CA 90293-8130

428 171 14 00 6
HENDERSON ROWENA L TR
1485 N LONGHORN AV
EAGLE ID 83616

235 171 05 00 4
HENDRICKS TAMARA S &
GREGORY A
PO BOX 56867
SHERMAN OAKS CA 91413-6867

429 152 18 00 6
HERNANDEZ MONICA Y AYALA
PO BOX 902064
PALMDALE CA 93590-2064

235 192 12 00 7
HOLZER SURVIVOR TRUST
261 W KENNETH RD
GLENDALE CA 91202-1458

428 152 04 00 8
HORVATH JENO & PAMELA INTER VIVOEXEMP TRUST
16654 SOLEDAD CANYON RD # 517
SANTA CLARITA CA 91387

235 204 26 00 4
HSU SHIH CHIEH
100 WHITE JASMINE
IRVINE CA 92618

428 192 17 00 8
IRYAMI MOUSA & ALBERT
11872 WILSHIRE BL
W LOS ANGELES CA 90025

235 204 23 00 5
JAMES LON O TR
2714 KITCHEN DICK RD
SEQUIM WA 98382-9538

428 192 07 00 9
JIBILIAN ALBERT
8117 W MANCHESTER AV # 777
PLAYA DEL REY CA 90293-8728

244 234 12 00 8
JOHNSTON BARBARA Z
106 SILVER VALLEY BL
MUNROE FALLS OH 44262

235 172 05 00 1
KEGANS JEAN E TR
474 BLOCKHOUSE RUN RD # G
NEW BRIGHTON PA 15066-3565

428 191 15 00 5
KIDZ KIDDS INC
190 SIERRA KOURT STE A307
PALMDALE CA 93551

428 202 36 00 5
KIRKSEY PATRICK W
241 N BALDWIN AV # B
SIERRA MADRE CA 91024

428 152 02 00 2
LAW ARDEN S
PO BOX 4971
COVINA CA 91723

235 172 09 00 3
HOU QINGMING
195 41ST ST STE 11140
OAKLAND CA 94611

428 172 03 00 1
HUTCHISON DENISE & ZANETTA DANNY
PO BOX 2453
AVILA BEACH CA 93424-2453

235 204 24 00 8
J D LOOMIS INVS LLC
7100 LOCH LOMOND DR
BETHESDA MD 20817-4760

244 234 35 00 5
JAMES MILDRED J SEPARATE PROPERTY TRUST
12823 ENCANTO WY
REDDING CA 96003

235 163 13 00 8
JIMENEZ PEDRO
785 GLEN OAKS RD
THOUSAND OAKS CA 91360

428 171 34 00 4
JORDAN HELEN M
2356 WILLIET WY
ARROYO GRANDE CA 93420

428 161 14 00 3
KEREN & ASSCS LLC
P O BOX 2016
BEVERLY HILLS CA 90213

428 140 10 00 8
KILBY SIDNEY ROBERT
P O BOX 1085
MOJAVE CA 93502

428 212 30 00 0
KLASSEN VIRGINIA M
14710 SE TIGER MOUNTAIN RD
ISSAQUAH WA 98027-7333

428 174 01 00 9
LEE JANG WOO
2867 MUIR TRAIL DR
FULLERTON CA 92833-5517

244 413 45 00 9
HSU JOSHUA S & JENNIFER K
24401 E STAR CT
DIAMOND BAR CA 91765

235 181 16 00 9
HUYNH CHIN & NGUYEN BINH
16098 MOUNT HICKS ST
FOUNTAIN VALLEY CA 92708-1723

235 164 08 00 1
JACKSON LISA A & DENNIS R
2303 HARBINGER LN
DALLAS TX 75287-5823

244 411 41 00 3
JASZAROWSKI WAYNE
39577 CORBETT CANYON CI
MURRIETA CA 92563-4831

428 192 09 00 5
JOHNSON RUSSELL V & SUSAN FAMILY TRUST
3425 HERON LN
PASO ROBLES CA 93446

235 192 11 01 3
KALRA HIRA LAL & NEETA
5936 LEMP AV
NO HOLLYWOOD CA 91601

235 134 01 00 1
KHAN FAMILY TRUST 2001
5315 HEIDORN RANCH RD
BRENTWOOD CA 94513-5304

235 163 01 00 3
KIM FAMILY TRUST
11828 DARBY AV
NORTHRIDGE CA 91326

428 140 18 00 2
KLEINE NEIL WAYNE REV TRUST
55 CATHEDRAL ROCK DR # 45
SEDONA AZ 86351

235 204 03 00 7
LELAH CHRIS
1770 GREEN VALLEY PKWY # 2811
HENDERSON NV 89074

244 234 33 00 9
LENAHAN TRUCKING LLC
1104 VIEWPOINT CT
FRAZIER PARK CA 93225

235 171 08 00 3
LEVY LINDA SUSAN
19780 SIERRA MEADOWS LN
PORTER RANCH CA 91326-4125

235 065 03 00 4
LIU WARNER
18830 NORWALK BL
ARTESIA CA 90701-5973

235 202 11 00 6
LOCKWOOD LARRY
110 S MOUNTAIN VIEW ST
YERRINGTON NV 89447

235 204 31 00 8
LOPEZ CONSUELO TRUST
12648 REXTON ST
NORWALK CA 90650-4458

244 413 44 00 6
LOPEZ GLADYS
68140 SANTELMO RD
CATHEDRAL CITY CA 92234

235 212 16 00 4
LOPEZ GLICERIO B
115 MINGES FOREST
BATTLE CREEK MI 49015

244 234 36 00 8
LORENZO VENTON T
2115 DENMEAD ST
LAKEWOOD CA 90712

235 164 10 00 6
LU DANNY & CONNIE TR
735 S SEVENTH ST
ALHAMBRA CA 91801

235 171 07 00 0
MAES WILLIAM ARTHUR &
DOREEN KAY FAMILY TR
7671 NEARFIELD LN
LA PALMA CA 90623-1530

235 212 14 00 8
MAKHANIAN ENTERPRISES
1920 GRIFFITH AV
LOS ANGELES CA 90011

428 192 14 00 9
MALEKZADEH ALI A & ALVAREZ
M
19 E CHATFIELD PL
PAINTED POST NY 14870

428 191 18 00 4
MARTINEZ DENISE A
1542 ALAYSSA DR
IDAHO FALLS ID 83402

235 163 08 00 4
MAQ DEVELOPERS LLC
6221 WEST ATLANTIC BL
MARGATE FL 33063

235 204 09 00 5
MARTIN JOHN A & GAIL R TRUST
552 DUNES ST
MORRO BAY CA 93442-1902

428 191 25 00 4
MAURER ROBERT R REVOCABLE
TRUST
20165 RICKY LN
SPRINGDALE AR 72764

244 234 30 00 0
MARTINI JOSEPH F TR
41181 SUMMITVIEW LN
PALMDALE CA 93551-2763

428 172 05 00 7
MATROS BARBARA LEE
1768 GREENTREE RD
ENCINITAS CA 92021-3024

235 204 29 00 3
MEINERT GORDON E & LINDA
1649 2ND ST
DUARTE CA 91010

244 413 52 00 9
MC CURDY SUSAN H TR
1737 LA LOMA RD
PASADENA CA 91105-1332

244 411 14 00 5
MC GOWAN MARION J TR
P O BOX 19372
SAN DIEGO CA 92159

244 411 47 00 1
MILLER CECILIA J
136 CHARMOUTH DR
SYRACUSE NY 13207-1949

235 202 12 00 9
MENDOZA SARA EVELLA
5506 PINEHURST AV
MILWAUKIE OR 97267-1536

428 191 22 00 5
MIHALAK HELEN A
2158 BUCKSKIN PL
RIVERSIDE CA 92506-4607

235 171 16 00 6
MOJAVE AIRPORT INDUSTRIAL
LLC
12671 HIGH BLUFF DR STE 150
SAN DIEGO CA 92130

428 162 10 00 8
MITCHELL SANDRA JEAN
183 PHEASANT DR
BAYVILLE NJ 08721-1940

428 211 21 00 7
MOJAVE 58 INVS LLC
PO BOX 9716
BAKERSFIELD CA 93389

427 020 43 00 2
WORLD ENERGY MOJAVE LLC
225 FRANKLIN ST STE 2330
BOSTON MA 02110

428 161 15 00 6
MOJAVE PIPELINE CO ET AL
PO BOX 4372
HOUSTON TX 77210-4372

429 152 20 00 1
MONTES NEMECIO A & GARCIA
MARIA ESPERANZA
10482 SILVER ST
MOJAVE CA 93501-7050

428 192 06 00 6
MOODY CANIDA C
13712 MILL VALLEY RD
VALENCIA CA 91355-2641

428 151 02 00 5
MOONBASE & BACK PARRA LLC
7415 HAVENHURST PL
VAN NUYS CA 91406

428 162 22 00 3
NAGEL FAMILY TRUST
9800 JAMES RIVER CI
FOUNTAIN VALLEY CA 92708-7310

428 152 05 00 1
NGUYEN BINH N & HUYNH CHIN T
16098 MOUNT HICKS ST
FOUNTAIN VALLEY CA 92708-1723

244 413 43 00 3
NAVARRO RONNY
15901 BADGER FLAT RD
LOS BANOS CA 93635-9786

235 410 02 00 7
NELSON TAWNEY LYNNE
188 MEADOW VIEW DR
PHOENIX OR 97535-9431

235 181 07 00 3
NORRIS CHRISTOPHER T &
TOMMIE L
23638 LYONS AV # 162
NEWHALL CA 91321-2513

428 171 18 00 8
NORTON LYNN MARIE
6005 PASEO CANYON DR
MALIBU CA 90265-3131

428 162 15 00 3
NGUYEN DAO TH H
3115 LASHBROOK AV
EL MONTE CA 91733

244 234 10 00 2
O BRIEN SUSAN M TRUST
3921 SUNSET LN
OXNARD CA 93035-3948

428 212 18 00 6
O KELLY SOLOMON KAREN
86 LAWRENCE AV
WATSONVILLE CA 95076-2930

244 234 27 00 2
NYE JAMES
11325 BARHARBOR WY
KNOXVILLE TN 37934-3962

428 191 19 00 7
OJO DAVID & GBEMISOLA
7318 DANA DR
PALMDALE CA 93551

427 090 11 00 0
OLIVER STEVEN LIVING TRUST
468 MEADOWBROOK DR
SANTA BARBARA CA 93108-2687

428 173 08 00 3
OJO ADENIKE T
9501 COPPER CREEK CT
UPPER MARLBORO MD 20772

235 410 33 00 7
OSTERMIER BERNARD J
20451 SHAMROCK PL
CHATSWORTH CA 91311-1746

427 090 37 00 6
PACIFIC GAS & ELECTRIC CO
1 MARKET PZ STE 400
SAN FRANCISCO CA 94105-1004

428 192 12 00 3
ONODERA FAMILY TR
5558 W BAYSHORE DR
PORT ORANGE FL 32127-6116

428 174 27 00 5
PALM HORIZON
4640 DUNAS LN
TARZANA CA 91356-4602

428 174 30 00 3
PANG HOWARD F
PO BOX 1673
ARCADIA CA 91077-1673

428 140 20 00 7
PAGE TRUST
21250 TRAIL RD
YORBA LINDA CA 92886-7806

235 164 04 00 9
PEARSON FAMILY TRUST FBO
PEARSON TIMOTHY A
16516 WILKIE AV
TORRANCE CA 90504-1844

428 171 32 00 8
PATTERSON FREDA B
1713 W ALMANSOR ST
ALHAMBRA CA 91801

428 174 32 00 9
PANG SHIOULAN
1609 SOUTH CAMPBELL
ALHAMBRA CA 91803

235 204 25 00 1
WOODS LONNIE C
4709 LA RICA AV
BALDWIN PARK CA 91706

428 191 26 00 7
PEPPER GLENN E & VIRGINIA
5608 HAROLD WY
SACRAMENTO CA 95822-3128

244 413 40 00 4
PAULEY JOSEPH L & BEVERLY M
TR
P O BOX 57
ROSAMOND CA 93560

235 204 27 00 7
WU CHIE HUEI & YU-CHEN
10521 FREDRICK DR
VILLA PARK CA 92667-5334

428 162 23 00 6
WU FAMILY SURVIVOR'S TRUST
5012 SPENCER ST
TORRANCE CA 90503-2231

428 202 48 00 0
PEREZ PEDRO & CONNIE FAMILY
TRUST
828 S 6TH ST
MONTEBELLO CA 90640-5914

244 413 56 00 1
PERSICO FAMILY TR
11102 PARAMOUNT
DOWNEY CA 90241

428 162 08 00 3
PHAM CONG CHI
8132 E HILLSDALE DR
ORANGE CA 92869

428 162 09 00 6
PHAN ANN FAMILY TRUST
1551 RESORT ST
UPLAND CA 91784-7450

235 164 01 00 0
PHILLIPS LEE ROY & CAROLYN TR
1524 W KILDARE AV
LANCASTER CA 93534

244 411 40 00 0
PIERSON EARLINE & HIBBLER JOHN
845 WEST STOCKWELL
COMPTON CA 90222

244 413 50 00 3
PIFER LIVING TR
26616 PARISO DR
MISSION VIEJO CA 92691

235 182 06 01 6
PLANK OREN D
1205 E D ST
ONTARIO CA 91764-4329

428 192 16 00 5
PNW HOLDINGS LLC
166 W WASHINGTON ST STE 730
CHICAGO IL 60602-3588

235 182 07 00 0
PORTER MICHELLE A
20206 BEECHVIEW LN
KATY TX 77449

244 413 02 00 4
PREWITT MARK A & BARBARA K
P O BOX 1146
ROY WA 98580

428 191 21 00 2
PROFESSIONAL EQUITIES IN
23201 MILL CREEK DR FLR 3
LAGUNA HILLS CA 92653-1692

235 164 03 00 6
PROPERTY ENTERPRISES LLC
11280 CORBIN AV STE A
PORTER RANCH CA 91326

428 174 20 00 4
PW REAL EST VENTURES LLC
166 W WASHINGTON ST STE 730
CHICAGO IL 60602

428 211 55 00 6
RAMOS W KENT
P O BOX 401
WEST SACRAMENTO CA 95691

235 191 05 01 9
RAWLS SHEILA D
3108 W GRANDVIEW AV
SPOKANE WA 99224-5527

427 030 37 00 8
RE COLUMBIA 3 LANDCO LLC
1906 TOWNE CENTRE BL U 370
ANNAPOLIS MD 21401-3685

427 400 03 00 6
RE RIO GRANDE LANDCO LLC
1906 TOWN CENTRE BL U 370
ANNAPOLIS MD 21401

244 411 13 00 2
REIFMAN IRVING
12121 WILSHIRE BL STE 1120
LOS ANGELES CA 90025-1164

428 140 21 00 0
REISING JAMES
33781 PASEO DE DECORA
SAN JUAN CAPIST CA 92675-5032

235 164 12 00 2
RICH EST PROP INC
18175 KAREN DR
TARZANA CA 91356-4605

428 161 08 00 6
RIAZ PARVEEN
11866 BROADWAY RD
MOORPARK CA 93021

428 172 08 00 6
RICCIARDI JOHN G
3195 SE VILLA CARMEL DR
PORT ORCHARD WA 98366

427 100 05 00 5
ROGOW BARRY
24731 CALLE LARGO
CALABASAS CA 91302

427 020 42 00 9
RLS INVS L P
P O BOX 50591
IDAHO FALLS ID 83405

428 174 26 00 2
ROBERTS WILLIAM
P O BOX 712501
SAN DIEGO CA 92171-2501

428 191 28 00 3
WOODLEY REALTY CORP
1246 5 CAHUENGA BL
LOS ANGELES CA 90038

428 202 33 00 6
RONAS ERLINDA P
77 SARRAGUT ST
SAN FRANCISCO CA 94112

428 172 01 00 5
ROTUNNO FAMILY TRUST
1001 W LAMBERT RD SP 221
LA HABRA CA 90631-1423

235 410 03 00 0
WRIGHT MILDRED L TR
1732 S MAGNOLIA AV
ONTARIO CA 91762

428 191 24 00 1
ROWTON EARL
1043 HIGHWAY 95
INDIAN VALLEY ID 83632

235 410 20 00 9
ROXY TR
19401 OPAL LN
SANTA CLARITA CA 91350-3244

235 164 05 00 2
RUEDAS VICTOR
2103 N LOMITA AV
FRESNO CA 93703

244 413 55 00 8
RUSEN ANTHONY R
10325 LUBAO
CHATSWORTH CA 91311

244 413 63 00 1
RUSEN HARTLEY D
10325 LUBAO
CHATSWORTH CA 91311

244 411 01 00 7
SAGLIMBENI NICHOLAS
530 S LAKE AV # 601
PASADENA CA 91101

235 163 14 00 1
RUSHING LESTER W & SUSAN FAMILY TR
2159 N WEST AV
PALMDALE CA 93551

427 400 07 00 8
RYBE CORP
4361 W AVE N8
PALMDALE CA 93551-1832

235 164 06 00 5
SANDRICK FAMILY TRUST
3012 SHADY BROOK
BEDFORD TX 76021

235 132 16 00 1
SAHOTA MANDEEP K
8499 MONTE CRISTO AV
LIVINGSTON CA 95334-9354

235 163 07 00 1
SALVADOR OMAR A Q & OSELLIE L
1302 HALL LN
SUISUN CITY CA 94585

428 174 35 00 8
SAUCEDO ALEX & ANN MARIE E
30 LUNETTE
FOOTHILL RANCH CA 92610-2200

428 161 04 00 4
SANTARELLI FAMILY TR
2321 E CURTIS CT
GLENDORA CA 91741-4003

235 163 05 00 5
SANTOS BLANCA ESTELA
13949 CLYDESDALE RUN LN
VICTORVILLE CA 92394-7403

235 171 14 00 0
SEIZED PROP
13312 RANCHERO RD 430
OAK HILLS CA 92344

244 234 13 00 1
SCOTT LINDA LEE
PO BOX 274
FALL RIVER MILL CA 96028-0274

235 410 14 00 2
SEASONS LAND CORP
3595 INLAND EMPIRE BL # 3
ONTARIO CA 91764

235 182 04 00 1
SHAW FAMILY MARTIAL TRUST
3048 EMERALD ISLE DR
GLENDALE CA 91206-1010

428 202 49 00 3
SELIS LAURA
2461 A ST
SAN DIEGO CA 92102

428 152 03 00 5
SERVICE ROCK PRODUCTS LP
200 S MAIN ST STE 200
CORONA CA 92882-2212

428 171 12 00 0
SMITH DON S LIV TR
18691 PLUMOSA ST
FOUNTAIN VLY CA 92708

235 212 15 00 1
SIMMONS TONY
7236 CALIFORNIA CITY BL
CALIFORNIA CITY CA 93505

235 163 03 00 9
SMALEWITZ JACOB
1525 E TODD DR
TEMPE AZ 85283

428 192 15 00 2
SPUHLER BETTY F TRUST
P O BOX 252
ACME WA 98220-0252

235 172 10 00 5
SOELTER JOHN
1440 W OAKLAHOMA STAR TR
BILLINGS MT 59105

428 140 09 00 6
SOUMEKH MICHAEL & RACHEL
1140 S ALFRED ST
LOS ANGELES CA 90035

428 191 17 00 1
STEPHAN JACQUELINE DENNOU
1331 BRIARGATE LN
GLENDORA CA 91740

427 030 04 00 2
STANDARD HILL MINES CO
4361 W AVENUE N8
PALMDALE CA 93551-1832

428 211 14 00 7
STATE OF CALIFORNIA
500 S MAIN ST
BISHOP CA 93514

235 192 09 00 9
YING WILLIAM H
P O BOX 79486
CORONA CA 92877-0182

428 171 19 00 1
STEPHENS ELSWORTH & HELEN TRUST
1105 WEST AVENUE L-8
LANCASTER CA 93534

427 100 03 00 9
STURDEVANT JANET M REV FMLY TR
1605 STORMY WY
PASO ROBLES CA 93446-1856

428 161 02 00 8
TANG DAVID K
1942 SAMARA DR
ROWLAND HTS CA 91745

428 162 16 00 6
THOMPSON MARK E A P C PENSION PLAN
963 W AVENUE J
LANCASTER CA 93534

427 090 55 00 8
TIERRA GRANDE MOBILE HOME PARK LLC
2283 E MAZIE AV
FRESNO CA 93730-9727

428 191 14 00 2
TUCKER KENNETH L
39852 NARCISSUS WY
PALM DESSERT CA 92211

427 020 35 00 9
UNION PACIFIC R/R CO
1400 DOUGLAS ST
OMAHA NE 68179

429 152 21 00 4
VILLEGAS NEURL E & ALCAZAR IDEANIA
1700 KIBBY RD
MERCED CA 95341-9301

235 202 10 00 3
WALSH THOMAS S TRUST
160 TELOMA DR
VENTURA CA 93003-2138

428 140 19 00 5
WARK FAMILY TRUST
6600 VISTA DEL REINO
LAS CRUCES NM 88007-8920

235 204 05 00 3
WEST COAST LAND HOLDINGS LLC
16835 ALGONQUIN ST # 254
HUNTINGTON BCH CA 92649-3810

235 164 11 00 9
SYLVESTER DRURY M
PO BOX 2231
PRESCOTT AZ 86302-2231

235 212 18 00 0
THOMPSON VON TUNGELN PC RETIREMENT TRUST
963 WEST AVENUE J
LANCASTER CA 93534

428 161 10 00 1
TONG NHIEM & LY HUONG P
PO BOX 2411
LA HABRA CA 90632-2411

428 211 37 00 4
TURKAL STEVEN A & LEONCIA P
1660 E GLENHAVEN DR
PHOENIX AZ 85048-9432

428 191 16 00 8
VALENCIA MADRIGAL FERNANDO
745 S VELIE ST
VISALIA CA 93292

428 151 17 00 9
VIX ENTERPRISES INC
507 E NORMAN AV
ARCADIA CA 91006

428 162 24 00 9
WANG NATHAN & LYNDA S
12523 NEON WY
GRANADA HILLS CA 91344-1342

244 234 02 00 9
WEBSTER CHARLEEN
5161 DECATUR DR
LA PALMA CA 90623

428 171 25 00 8
WESTERN NATIONAL RESOURCES LLC
114551 EL CAMINO REAL STE 160
SAN DIEGO CA 92130

235 204 04 00 0
YU WING KWONG & SAU KING
216 S ELECTRIC AV
ALHAMBRA CA 91801

235 212 22 00 1
TAJIMA FAMILY TRUST A
6307 LA PINTURA DR
LA JOLLA CA 92037-6940

235 204 28 00 0
THANH NGUYEN TUAN
1819 ESCONDIDO TERRACE
HENDERSON NV 89007

235 181 06 00 0
TIERNEY PIERRE A & MARILYN TR
10401 SANDE ST
CYPRESS CA 90630-4565

244 234 03 00 2
TORRES VINCENT G REVOCABLE TRUST
17422 KLEE ST
SHERWOOD FOREST CA 91325-3235

428 192 13 00 6
VIA BURTON ASSCS LLC
4956 VIA DIEGO
YORBA LINDA CA 92887

428 161 06 00 0
VUONG HUNG
8524 SHARP AV
SUN VALLEY CA 91352

235 065 02 00 1
WANG PEI-HO CHEN
1235 S 1ST AV
ARCADIA CA 91006

235 204 41 00 7
WESERN NATURAL RESOURCES LLC
11455 EL CAMINO REAL STE 160
SAN DIEGO CA 92130

428 201 01 00 6
YU JEFFREY T & OLIVIA L FAM TR
20932 SARAHILLS DR
SARATOGA CA 95070-4383

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 # _____

Project Title: Enterprise Solar Storage Project by Enterprise Solar Storage, LLC

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: Mojave, California City

Cross Streets: State Route 14 and State Route 58 — Zip Code: 93501

Lat. / Long.: 35.02055° N, 118.10569° W (NAD 83) — Total Acres: 2,228

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

Within 2 Miles: State Hwy #: SR-58 / SR-14 — Waterways: N/A

Airports: Mojave — Railways: N/A — Schools: Mojave Jr./Senior High

---

Document Type:

CEQA: ☒ NOP ☐ Early Cons ☐ Neg Dec ☐ Mit Neg Dec ☐ Draft EIR ☐ Supplement/Subsequent EIR (Prior SCH No.) _____ ☐ Other _____

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: Street Vacation

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 Photovoltaic Solar MW 600MW
☐ Waste Treatment: Type _____ MGD _____
☐ Hazardous Waste: Type _____
☒ Other: Energy Storage System 4,000MWh

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:

Site 1 – Vacant Land/A-1/8.5. **Site 2** – Vacant Land/A-1, E (1/4), R-1, R-1 FPS, R-2 PD, R-2 PD FPS, CO PD, C-2 PD FPS, CH PD, CH PD FPS, OS, OS FPS/ 2.5, 3.1, 5.2, 5.3, 5.4, 6.2, 6.3, Low Den. Res. **Site 3** – Vacant Land/ A-1, A-1 H/8.5. **Site 4** – Vacant Land/A-1/1.1, 2.4, 8.5. **Site 5** – Wind Energy Facility/A WE/8.4.

Kern County General Plan and Specific Plan Map Code Designation: 1.1 (State and Federal Land), 2.4 (Steep Slope), 2.5 (Flood Hazard). 3.1 (Parks and Recreation Areas), 5.2 (Residential – Maximum 16 Units/Net Acre), 5.3 (Residential – Maximum 10 Units/Net Acre), 5.4 (Maximum 4 Units/Net Acre), 6.2 (General Commercial), 6.3 (Highway Commercial), 8.4 (Mineral and Petroleum, Min 5 Acre Parcel Size), 8.5 (Resource Management, Min 20 Acre Parcel Size).

Kern County Zoning District: A (Exclusive Agriculture); A-1 (Limited Agriculture); A-1 H (Limited Agriculture, Airport Approach Height Combining); A WE (Exclusive Agriculture, Wind Energy Combining), E (1/4) (Estate ¼ Acre), R-1 (Low Density Residential), R-1 FPS (Low Density Residential, Floodplain Secondary Combining), R-2 PD (Medium Density Residential, Precise Development Combining), R-2 PD FPS (Medium Density Residential, Precise Development Combining, Floodplain Secondary Combining), CO PD (Commercial Office, Precise Development Combining), C-2 PD FPS (General Commercial, Precise Development Combining, Floodplain Secondary), CH PD (Highway Commercial, Precise Development

Combining) CH PD FPS (Highway Commercial, Precise Development Combining, Floodplain Secondary Combining), OS (Open Space), OS FPS (Open Space, Floodplain Secondary Combining).

Project Description:

The Enterprise Solar Storage Project (proposed project) is a proposal by Enterprise Solar Storage, LLC (project proponent) to construct and operate a 600-megawatt (MW) photovoltaic (PV) solar facility with approximately 1,000 MW of battery energy storage, or up to 4,000 megawatt-hours (MWh) of energy storage capacity, on approximately 2,228 acres across 147 privately owned parcels in an unincorporated area of southeastern Kern County, California. An additional 10 acres on four parcels are proposed for a temporary construction laydown yard. A second temporary construction laydown yard is proposed; however, the location of which is within the boundary of the adjacent previously approved Sanborn Solar project. An additional 23 acres on one parcel is proposed for a step-up substation, north of the Windhub Substation.

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**".

S	Air Resources Board	X	Office of Emergency Services
	Boating & Waterways, Department of		Office of Historic Preservation
	California Highway Patrol		Office of Public-School Construction
X	CalFire		Parks & Recreation
S	Caltrans District # 6 & 9		Pesticide Regulation, Department of
S	Caltrans Division of Aeronautics		Public Utilities Commission
	Caltrans Planning (Headquarters)	S	Regional WQCB # Lahontan
	Central Valley Flood Protection Board	X	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
S	Conservation, Department of		Santa Monica Mountains Conservancy
	Corrections, Department of		State Lands Commission
	Delta Protection Commission		SWRCB: Clean Water Grants
	Education, Department of	X	SWRCB: Water Quality
S	Energy Commission		SWRCB: Water Rights
S	Fish & Game Region # Fresno		Tahoe Regional Planning Agency
	Food & Agriculture, Department of	S	Toxic Substances Control, Department of
	General Services, Department of	S	Water Resources, Department of
	Health Services, Department of		
	Housing & Community Development		Other _____
	Integrated Waste Management Board		Other _____
X	Native American Heritage Commission		

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

Starting Date May 8, 2023 Ending Date June 6, 2023

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:** 5/8/2023

Cindi Hoover, Division Chief

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

NOTICE OF PREPARATION/INITIAL STUDY CHECKLIST

Enterprise Solar Storage Project
by Enterprise Solar Storage, LLC

Site 1
ZCC 60, Map 196; CUP 62, Map 196; Non-Summary Street Vacation

Site 2
SPA 34, Map 196; ZCC 61, Map 196; CUP 63, Map 196

Site 3
ZCC 3, Map 195; ZCC 62, Map 196; CUP 2, Map 195;
CUP 64, Map 196; CUP 65, Map 196; SPA 35, Map 196;
Non-Summary Street Vacation

Site 4
SPA 4, Map 212; ZCC 4, Map 195; ZCC 3, Map 212;
CUP 3, Map 195; CUP 6, Map 212; GPA 3, Map 212;
Non-Summary Street Vacation

Site 5
CUP 20, Map 197

PLN21-02330
(PP23401)

LEAD AGENCY:

Kern County Planning and Natural Resources Department
2700 M Street, Suite 100
Bakersfield, CA 93301-2370

Contact: Keith Alvidrez
(661) 862-5015
AlvidrezK@kerncounty.com

May 2023

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INTRODUCTION

Pursuant to the California Environmental Quality Act (CEQA), the Kern County Planning and Natural Resources Department (County) will initiate the preparation of an Environmental Impact Report (EIR) for the Enterprise Solar Storage Project in the unincorporated area of southeastern Kern County, California.

1. Project Description

1.1. Project Location

The Enterprise Solar Storage Project (proposed project) is a proposal by Enterprise Solar Storage, LLC (project proponent) to construct and operate a 600-megawatt (MW) photovoltaic (PV) solar facility with approximately 1,000 MW of battery energy storage, or up to 4,000 megawatt-hours (MWh) of energy storage capacity, on approximately 2,230 acres across 147 privately owned parcels in an unincorporated area of southeastern Kern County, California. An additional 10 acres on four parcels are proposed for a temporary construction laydown yard. A second temporary construction laydown yard is proposed; however, the location of which is within the boundary of the adjacent previously approved Sanborn Solar project.

A double-circuit 230 kV generation tie (gen-tie) transmission line will carry power generated by project solar facilities from the on-site collector substations to a proposed step-up substation located north of Oak Creek Road, north of the existing SCE-owned Windhub Substation. At the step-up substation the voltage is then increased from 230 kV to 500 kV. A new 500 kV gen-tie line will be constructed from the step-up substation to the Windhub Substation for interconnection to the Windhub Substation, and ultimately the grid. The 230 kV gen-tie line would be co-located within the gen-tie line corridor approved as part of the Sanborn Solar Project in 2020. The alignment for the new 500 kV gen-tie line is included in the study area for the project.

The proposed project site is located at the western edge of the Antelope Valley, approximately two miles south of the community of Mojave, two miles southwest of the City of California City, approximately one mile north of Edwards Air Force Base, and eight miles north of the unincorporated community of Rosamond. The proposed project site is located within Section 6 of Township 10 North, Range 11 West, Sections 20-26, 28, and 36 of Township 11 North, Range 12 West, and Sections 30 and 32 of Township 11 North, Range 11 West, with the interconnection facilities located in Section 17 and 20 of Township 11 North, Range 13 West. The proposed project boundary is shown in *Figure 1 – Regional Vicinity.*

The proposed project site consists of five non-contiguous locations identified by their relative geographic location; Site 1 (Northern), Site 2 (Western), Site 3 (Eastern), Site 4 (Southern), and Site 5 (Step-up Substation). Site 1 (Northern) is directly south of State Route 58 (SR-58), generally west of 10th Street and north of Purdy Avenue. Site 2 (Western) is west of SR-14, east of 25th Street West, south of Camelot Boulevard, and generally north of Purdy Avenue with one small portion extending south of Purdy Avenue and north of Sunset Avenue. Site 3 (Eastern) is east of 10th Street, south of SR-58, and north of Silver Queen Road. Site 4 (Southern) is south of the BNSF Railway with a large portion of the site being located south of Silver Queen Road. Site 5 (Step-up Substation) is located north of Oak Creek Road, north of the existing Windhub Substation. The proposed project boundaries are shown in *Figure 2 – Local Vicinity*.

1.2. Environmental Setting

The proposed project site is situated in the southeastern corner of the desert region, in unincorporated Kern County. The proposed project is currently undeveloped and has mostly been used for grazing. Development in the area surrounding the proposed project sites is primarily used for rural residential, agricultural, undeveloped land, and large-scale renewable energy purposes.

Sensitive receptors located in the project area consist of rural residential dwellings located at varying distances from the proposed project sites. The nearest sensitive receptor appears to be a residence located approximately 0.37-mile north of Site 2 (Western).

The proposed project area has a relatively flat terrain with site elevations ranging between 2,520 and 2,750 feet above mean sea level due to being south of the Tehachapi Mountains where lands gradually slope downward from the northwest towards the southeast. Additionally, the proposed project area is largely composed of Garlock loamy sand and Cajon loamy sand with the nearest active fault located approximately 7.5 miles northwest of Site 2 (Western). Therefore, the seismic activity and soil type of the project area contribute to soil stability of the proposed project sites. Desert vegetation dominates the regional landscape of the proposed project area and is comprised of allscale saltbush (Atriplex polycarpa) scrub, creosote bush (Larrea tridentata) scrub, and western Joshua tree (Yucca brevifolia).

Majority of the proposed project sites are designated as Zone "X" on the Flood Insurance Rate Map (FIRM) as issued by the Federal Emergency Management Agency (FEMA), which indicates the site is not in an area of flood hazard. However, five (5) parcels within the proposed project boundaries (427-100-22, 427-100-24, 427-100-27, 429-030-02, and 244-234-10) are in Zone A of the FEMA FIRM, which indicates a Special Flood Hazard as shown in *Figure 3 – Flood Hazard*. The project site is not identified as a wetland area on the National Wetlands Inventory.

The proposed project sites are not designated by the California Department of Conservation (DOC) as Prime Farmland, Farmland of Statewide Importance, or Unique Farmland. Additionally, none of the proposed project's parcels are subjected to a Williamson Act Land Use contract or within an Agriculture Preserve boundary.

Additionally, the proposed project sites are not within a mineral recovery area or within a designated mineral and petroleum resource site designated by the Kern County General Plan, nor is it identified as a mineral resource zone by the Department of Conservation's State Mining and Geology Board. The project site is not located within the County's NR (Natural Resources) or PE (Petroleum Extraction) Zone Districts and based on a review of records maintained by the California Department of Conservation/California Department of Conservation Geologic Energy Management Division (CalGEM), there are no oil wells identified on site.

The proposed project would be served by the Kern County Sheriff's Office (KCSO) for law enforcement and public safety, Kern County Fire Department (KCFD) for fire protection, and Kern County Medical Emergency Service for emergency medical and rescue services. The nearest KCSO substation and KCFD fire station (Station No. 14) that would serve the project are both located in the community of Mojave, which is approximately up to 8 miles of the proposed project area. The nearest hospital is the Adventist Health Tehachapi Valley Hospital at 1100 Magellan Drive in the city of Tehachapi, which is approximately up to 25 miles northwest of the proposed project area. The nearest school is approximately 2 miles north of Site 2 (Western), which is Mojave Jr./Sr. High at 15732 O Street.

The proposed project sites are within the administrative boundaries of the Kern County General Plan (KCGP), Mojave Specific Plan (MSP), West Edwards Road Settlement Specific Plan, and Soledad Mountain Elephant Butte Specific Plan, as shown in *Table 1: Project Assessor Parcel Numbers, Existing Land Uses, ALUCP and Acreages, Figure 4a: Existing General/Specific Plan Designations (Site 1), Figure 4b: Existing General/Specific Plan Designations (Site 2), Figure 4c: Existing General/Specific Plan Designations (Site 3), Figure 4d: Existing General/Specific Plan Designations (Site 4), and Figure 4e: Existing General/Specific Plan Designations (Site 5)*.

The proposed project is also subject to the provisions of the Kern County Zoning Ordinance and spans across Zone Maps 195, 196 (including, Section Detail 196-20), 197, and 212. As shown in Table 1 and *Figure 5a: Existing Zoning Classifications (Site 1), Figure 5b: Existing Zoning Classifications (Site 2), Figure 5c: Existing Zoning Classifications (Site 3), Figure 5d: Existing Zoning Classifications (Site 4), Figure 5e: Existing Zoning Classifications (Site 5)*, a majority of the parcels within the proposed project boundary are zoned A (Exclusive Agriculture) and A-1 (Limited Agriculture) with many also having a Floodplain Secondary Combining, Precise Development Combining, and/or Airport Approach Height Combining District Overlay. Additional zoning of the proposed project includes Commercial (General, Highway, and Office), Estate 0.25 acres, Residential (Low-Density and Medium Density), and Open Space Districts.

Portions of the proposed project are located within the Mojave Airport Sphere of Influence (SOI) for the East Kern Airport District, per the Kern County Airport Land Use Compatibility Plan (ALUCP). *Table 1: Project Assessor Parcel Numbers, Existing Land Uses, ALUCP, and Acreages and Figure 6: Existing ALUCP* shows the proposed project parcels within the ALUCP zones and *Table 2: ALUCP Zones* identifies the location and impact elements for those zones.

Table 3: Proposed Project Site and Surrounding Land Uses demonstrates the existing land use of the proposed project sites and surrounding areas.

The proposed project will require a Zone Classification Change (ZCC) to Exclusive Agriculture from the existing zoning (excluding their combining zone classification) as solar energy electrical generators are authorized within the Exclusive Agriculture with a conditional use permit.

Table 1:
Project Assessor Parcel Numbers, Existing Land Uses, ALUCP, and Acreages

Count	APN	Zone Map	General/Specific Plan	Map Code Designation	Existing Zoning	ALUCP Designation	Acres
Site 1 (Northern)							
1.	428-140-09	196	Mojave SP	8.5	A-1	C	17.49
2.	428-140-10	196	Mojave SP	8.5	A-1	C	3.07
3.	428-140-11	196	Mojave SP	8.5	A-1	C	3.45
4.	428-140-12	196	Mojave SP	8.5	A-1	C	2.55
5.	428-140-13	196	Mojave SP	8.5	A-1	C	7.66
6.	428-140-15	196	Mojave SP	8.5	A-1	C	15.93
7.	428-140-16	196	Mojave SP	8.5	A-1	C	15.15
8.	428-152-01	196	Mojave SP	8.5	A-1	C	14.06
9.	428-152-02	196	Mojave SP	8.5	A-1	B1	13.58
Site 1 (Northern) Total Acreages: 92.94							

Site 2 (Western)							
10.	427-020-27	196	Mojave SP	6.3	CH PD	D	7.12
11.	427-030-07	196	Soledad Mtn – Elephant Butte SP	LDR	A-1	E1	1.59
12.	427-030-35	196	Soledad Mtn – Elephant Butte SP	LDR	A-1	D/E1	75.59
13.	427-030-36	196	Soledad Mtn – Elephant Butte SP	LDR	A-1	E1	37.35
14.	427-100-22	196-20	Mojave SP	3.1, 3.1/2.5, 5.2, 5.2/2.5, 5.3, 6.2, 6.2/2.5, 6.3, 6.3/2.5	R-2 PD, C-2 PD FPS, OS FPS,OS, R-2 PD FPS,CH PD FPS, CO PD	D	51.35
15.	427-100-23	196-20	Mojave SP	3.1, 5.2, 5.3, 5.4	R-1	D	34.7
16.	427-100-24	196-20	Mojave SP	5.3, 5.4, 6.3/2.5	R-1, E (1/4), R-2 PD, R-2 PD FPS, R-1 FPS	D	71.28
						Site 2 (Western) Total Acreages: 278.98	
Site 3 (Eastern)							
17.	235-202-02	195	KCGP	8.5	A-1	-	40
18.	235-202-07	195	KCGP	8.5	A-1	-	10
19.	235-202-08	195	KCGP	8.5	A-1	-	10
20.	235-202-09	195	KCGP	8.5	A-1	-	10
21.	235-202-10	195	KCGP	8.5	A-1	-	10
22.	235-202-11	195	KCGP	8.5	A-1	-	10
23.	235-202-12	195	KCGP	8.5	A-1	-	10
24.	235-202-13	195	KCGP	8.5	A-1	-	10
25.	235-202-14	195	KCGP	8.5	A-1	-	10
26.	235-204-01	195	KCGP	8.5	A-1	B2	10.14
27.	235-204-07	195	KCGP	8.5	A-1	-	5.07
28.	235-204-08	195	KCGP	8.5	A-1	B2	5.07
29.	235-204-09	195	KCGP	8.5	A-1	B2	5.07
30.	235-204-10	195	KCGP	8.5	A-1	-	5.07
31.	235-204-17	195	KCGP	8.5	A-1	-	2.61
32.	235-204-18	195	KCGP	8.5	A-1	-	2.61
33.	235-204-19	195	KCGP	8.5	A-1	-	2.61
34.	235-204-20	195	KCGP	8.5	A-1	-	10.15
35.	235-204-21	195	KCGP	8.5	A-1	-	2.61
36.	235-204-31	195	KCGP	8.5	A-1	-	2.61
37.	235-204-32	195	KCGP	8.5	A-1	-	2.61
38.	235-204-33	195	KCGP	8.5	A-1	-	5.08

39.	235-204-34	195	KCGP	8.5	A-1	-	5.08
40.	235-204-35	195	KCGP	8.5	A-1	-	2.54
41.	235-204-36	195	KCGP	8.5	A-1	-	2.54
42.	235-204-37	195	KCGP	8.5	A-1	-	2.54
43.	235-204-38	195	KCGP	8.5	A-1	-	2.53
44.	235-204-39	195	KCGP	8.5	A-1	-	5
45.	235-204-40	195	KCGP	8.5	A-1	-	2.5
46.	235-204-41	195	KCGP	8.5	A-1	-	2.5
47.	235-204-42	195	KCGP	8.5	A-1	-	10
48.	428-030-06 (portion of)	196	Mojave SP	8.5	A	C	40
49.	428-161-01	196	Mojave SP	8.5	A-1 H	B2	40
50.	428-161-02	196	Mojave SP	8.5	A-1 H	B2	20
51.	428-161-03	196	Mojave SP	8.5	A-1 H	B2	19.76
52.	428-161-04	196	Mojave SP	8.5	A-1 H	B2/C	9.06
53.	428-161-07	196	Mojave SP	8.5	A-1 H	B2	2.5
54.	428-161-08	196	Mojave SP	8.5	A-1 H	B2	2.5
55.	428-161-10	196	Mojave SP	8.5	A-1 H	B2	7.89
56.	428-161-11	196	Mojave SP	8.5	A-1 H	C	17.42
57.	428-161-14	196	Mojave SP	8.5	A-1 H	B2/C	5.2
58.	428-161-16	196	Mojave SP	8.5	A-1 H	B2	3.26
59.	428-161-20	196	Mojave SP	8.5	A-1 H	B2/C	5.1
60.	428-162-11	196	Mojave SP	8.5	A-1	C	5.04
61.	428-162-12	196	Mojave SP	8.5	A-1, A-1 H	C	21.54
62.	428-162-13	196	Mojave SP	8.5	A-1 H	C	2.55
63.	428-162-14	196	Mojave SP	8.5	A-1 H	B2/C	2.55
64.	428-162-15	196	Mojave SP	8.5	A-1 H	C	2.55
65.	428-162-16	196	Mojave SP	8.5	A-1 H	B2/C	2.55
66.	428-162-17	196	Mojave SP	8.5	A-1, A-1 H	C	4.88
67.	428-162-18	196	Mojave SP	8.5	A-1, A-1 H	C	3.6
68.	428-162-19	196	Mojave SP	8.5	A-1	C	2.5
69.	428-162-20	196	Mojave SP	8.5	A-1	C	2.51
70.	428-162-21	196	Mojave SP	8.5	A-1	C	2.5
71.	428-162-22	196	Mojave SP	8.5	A-1, A-1 H	C	2.51
72.	428-162-23	196	Mojave SP	8.5	A-1, A-1 H	C	7.35
73.	428-162-24	196	Mojave SP	8.5	A-1, A-1 H	C	3.11
74.	428-162-27	196	Mojave SP	8.5	A-1 H	B2/C	20
75.	428-171-01	196	Mojave SP	8.5	A-1 H	B2	10
76.	428-171-02	196	Mojave SP	8.5	A-1 H	B2	10
77.	428-171-03	196	Mojave SP	8.5	A-1, A-1 H	B2	20
78.	428-171-04	196	Mojave SP	8.5	A-1, A-1 H	B2/C	15
79.	428-171-05	196	Mojave SP	8.5	A-1 H	B2	5
80.	428-171-06	196	Mojave SP	8.5	A-1 H	B2	2.5
81.	428-171-07	196	Mojave SP	8.5	A-1 H	B2	2.5
82.	428-171-08	196	Mojave SP	8.5	A-1 H	B2	2.5
83.	428-171-10	196	Mojave SP	8.5	A-1 H	B2	2.5
84.	428-171-11	196	Mojave SP	8.5	A-1 H	B2	2.5
85.	428-171-12	196	Mojave SP	8.5	A-1 H	B2	2.5
86.	428-171-13	196	Mojave SP	8.5	A-1 H	B2	2.5

87.	428-171-14	196	Mojave SP	8.5	A-1 H	B2	2.5
88.	428-171-16	196	Mojave SP	8.5	A-1	C	5
89.	428-171-17	196	Mojave SP	8.5	A-1	B2/C	2.5
90.	428-171-18	196	Mojave SP	8.5	A-1, A-1 H	B2/C	2.5
91.	428-171-19	196	Mojave SP	8.5	A-1 H	B2	2.5
92.	428-171-20	196	Mojave SP	8.5	A-1 H	B2	2.5
93.	428-171-21	196	Mojave SP	8.5	A-1 H	B2	2.5
94.	428-171-22	196	Mojave SP	8.5	A-1 H	B2	2.5
95.	428-171-23	196	Mojave SP	8.5	A-1, A-1 H	B2/C	10
96.	428-171-24	196	Mojave SP	8.5	A-1	B2/C	2.5
97.	428-171-25	196	Mojave SP	8.5	A-1	C	2.5
98.	428-171-26	196	Mojave SP	8.5	A-1	C	5
99.	428-171-27	196	Mojave SP	8.5	A-1	C	10
100.	428-171-28	196	Mojave SP	8.5	A-1	C	10
101.	428-171-29	196	Mojave SP	8.5	A-1	C	2.5
102.	428-171-30	196	Mojave SP	8.5	A-1	B2/C	2.5
103.	428-171-31	196	Mojave SP	8.5	A-1, A-1 H	B2/C	2.5
104.	428-171-32	196	Mojave SP	8.5	A-1, A-1 H	B2/C	2.5
105.	428-171-33	196	Mojave SP	8.5	A-1, A-1 H	B2/C	5
106.	428-171-34	196	Mojave SP	8.5	A-1 H	B2	2.5
107.	428-171-35	196	Mojave SP	8.5	A-1 H	B2	2.5
108.	428-172-01	196	Mojave SP	8.5	A-1, A-1 H	B2/C	20
109.	428-172-02	196	Mojave SP	8.5	A-1 H	B2/C	20
110.	428-172-03	196	Mojave SP	8.5	A-1 H	B2	20
111.	428-172-04	196	Mojave SP	8.5	A-1 H	B2/C	5
112.	428-172-05	196	Mojave SP	8.5	A-1 H	B2/C	15
113.	428-172-06	196	Mojave SP	8.5	A-1 H	B2/C	20
114.	428-172-07	196	Mojave SP	8.5	A-1 H	B2/C	15
115.	428-172-08	196	Mojave SP	8.5	A-1 H	B2	5
116.	428-172-10	196	Mojave SP	8.5	A-1, A-1 H	B2/C	160
117.	428-172-11	196	Mojave SP	8.5	A-1 H	B2	20
118.	428-172-12	196	Mojave SP	8.5	A-1 H	B2	10
119.	428-172-13	196	Mojave SP	8.5	A-1 H	B2	10
120.	428-173-01	196	Mojave SP	8.5	A-1, A-1 H	B2/C	120
121.	428-173-02	196	Mojave SP	8.5	A-1	C	2.56
122.	428-173-03	196	Mojave SP	8.5	A-1	C	2.56
123.	428-173-04	196	Mojave SP	8.5	A-1	C	2.5
124.	428-173-05	196	Mojave SP	8.5	A-1	C	2.56
125.	428-173-06	196	Mojave SP	8.5	A-1	C	10
126.	428-173-07	196	Mojave SP	8.5	A-1	C	2.56
127.	428-173-08	196	Mojave SP	8.5	A-1	C	2.56
128.	428-173-09	196	Mojave SP	8.5	A-1	C	2.56
129.	428-173-10	196	Mojave SP	8.5	A-1	C	2.56
130.	428-173-11	196	Mojave SP	8.5	A-1	C	10
131.	428-174-25	196	Mojave SP	8.5	A-1	C	10
132.	428-174-33	196	Mojave SP	8.5	A-1	C	20
133.	428-174-34	196	Mojave SP	8.5	A-1	C	10
134.	428-174-35	196	Mojave SP	8.5	A-1	C	10
135.	428-174-36	196	Mojave SP	8.5	A-1	C	20

						Site 3 (Eastern) Total Acreages: 968.85	
Site 3 (Temporary Laydown Yards)							
136.	428-191-23	196	Mojave SP	8.5	A-1 H	B2	2.5
137.	428-191-25	196	Mojave SP	8.5	A-1 H	B2	2.5
138.	428-191-26	196	Mojave SP	8.5	A-1 H	B2	2.5
139.	428-191-27	196	Mojave SP	8.5	A-1 H	B2	2.5
						Site 3 (Temporary Laydown Yards) Total Acreages: 10	
Site 4 (Southern)							
140.	235-132-13	195	KCGP	8.5	A-1	-	157.27
141.	244-234-02	212	KCGP	8.5, 2.4	A-1	-	161.46
142.	244-234-08	212	KCGP/Western Edwards Road Settlement SP	1.1, 8.5	A-1	-	160
143.	244-234-17	212	KCGP	8.5	A-1	-	10
144.	244-234-18	212	KCGP	8.5	A-1	-	10
145.	244-234-28	212	KCGP	8.5	A-1	-	5.05
146.	244-234-29	212	KCGP	8.5	A-1	-	5.05
147.	244-234-30	212	KCGP	8.5	A-1	-	10.02
148.	244-234-32	212	KCGP	8.5	A-1	-	20
149.	244-234-33	212	KCGP	8.5	A-1	-	20
150.	244-234-35	212	KCGP	8.5	A-1	-	10.02
151.	244-234-10*	212	KCGP/Western Edwards Road Settlement SP	1.1	A-1	-	161.83
						Site 4 (Southern) Total Acreages: 730.7	
Site 5 (Substation)							
152.	237-031-04	197	KCGP	8.4	A WE	-	23
						Site 5 (Substation) Total Acreages: 23	

Key
* SCE transmission line APN

Kern County General Plan (KCGP) and Specific Plan (SP)Map Code Designation:
1.1 (State and Federal Land)
2.4 (Steep Slope)
2.5 (Flood Hazard)
3.1 (Parks and Recreation Areas)
5.2 (Residential - Maximum 16 Units/Net Acre)
5.3 (Residential - Maximum 10 Units/Net Acre)
5.4 (Residential – Maximum 4 Units/Net Acre)
6.2 (General Commercial)
6.3 (Highway Commercial)
8.4 (Mineral and Petroleum, Min 5 Acre Parcel Size)
8.5 (Resource Management, Min. 20 Acre Parcel Size)

Soledad Mtn. – Elephant Butte Specific Plan Designation:
LDR = Low Density Residential

Kern County Zoning District:
A (Exclusive Agriculture); A-1 (Limited Agriculture); A-1 H (Limited Agriculture, Airport Approach Height Combining); A WE (Exclusive Agriculture, Wind Energy Combining District); C-2 PD FPS (General Commercial, Precise Development Combining, Floodplain Secondary Combining); CH PD (Highway Commercial, Precise Development Combining);CH PD FPS (Highway Commercial, Precise Development Combining, Floodplain Secondary Combining); CO PD (Commercial Office, Precise Development Combining); OS (Open Space); OS FPS (Open Space, Floodplain Secondary Combining); R-1 (Low-Density Residential District); R-1 FPS (Low-Density Residential District, Floodplain

Secondary Combining); R-2 PD (Medium- Density Residential District, Precise Development Combining); R-2 PD FPS (Medium-Density Residential District, Precise Development Combining, Floodplain Secondary Combining); and, E(1/4) (Estate District, Min. one-quarter acre).

Table 2: ALUCP Zones

Zone	Location	Impact Elements
B1	Approach/Departure Zone and adjacent to Runway	Substantial risk – aircraft commonly below 400 ft. AGL or within 1,000 ft. of runway. Substantial noise.
B2	Extended Approach/Departure Zone	Significant risk – aircraft commonly below 800ft. AGL. Significant noise.
C	Common Traffic Pattern	Limited risk – aircraft at or below 1,00 ft. AGL. Frequent noise intrusion
D	Other Airport Environs	Negligible risk. Potential for annoyance from overflights.
E	Special Land Use	Compatibility issues.

Table 3: Proposed Project Site and Surrounding Land Uses

Area	Existing Land Use	Existing General/Specific Plan Map Code Designation	Existing Zoning Classification
Site 1 (Northern)	Vacant Land	8.5	A-1
North	State Highway 58, Vacant Land, and Industrial	7.1	A-1 M-1 PD
East	Industrial	8.5	M-2 PD H
South	Vacant Land	8.5	A A-1
West	Vacant Land	8.5	A
Site 2 (Western)	Vacant Land	2.5, 3.1, 5.2, 5.3, 5.4, 6.2, 6.3, LDR	A-1, E (1/4), R-1, R-1 FPS, R-2 PD, R-2 PD FPS, CO PD, C-2 PD FPS, CH PD, CH PD FPS, OS, OS FPS
North	Vacant Land	6.1, 2.5	C-2 PD
East	State Highway 14 and Vacant Land	7.3, 2.5	M-3 PD M-3 PD FPS
South	Solar Field	4.1, 5.2, 5.3, 6.2	A A-1

West	Vacant Land and Solar Field	4.1, 5.3, 5.4, 5.6, 6.2	A A-1
Site 3 (Eastern)	Vacant Land	8.5	A-1, A-1 H
North	State Highway 58 and Vacant Land	4.1, 7.1	M-1 PD M-1 PD H A-1
East	Vacant Land	4.1, 8.5	A-1
South	Vacant Land and Railroad	4.1, 8.5	A-1
West	Vacant Land	4.1, 8.5	A-1 A-1 H A
Site 4 (Southern)	Vacant Land	1.1, 2.4, 8.5	A-1
North	Vacant Land and Railroad	8.5	A-1
East	Vacant Land	2.4, 8.5	A-1
South	Vacant Land	4.1, 8.5	A-1
West	Vacant Land	2.4, 4.1, 8.5	A-1
Site 5 (Substation)	Wind Energy Facility	8.4	A WE
North	Wind Energy Facility	8.4, 8.5	A WE OS
East	Wind Energy Facility	8.4, 8.5	A WE OS
South	Windhub Substation	7.3	M-3
West	Wind Energy Facility	8.4	A WE

Kern County General Plan (KCGP) and Specific Plan (SP)Map Code Designation:
1.1 (State and Federal Land
2.4 (Steep Slope)
2.5 (Flood Hazard)
3.4 (Solid Waste Disposal Facility)
4.1 (Accepted County Plan Areas)
5.2 (Residential - Maximum 16 Units/Net Acre)
5.3 (Residential - Maximum 10 Units/Net Acre)
5.4 (Maximum 4 Units/Net Acre
5.6 (Minimum 2.5 Gross Acres/Unit)
6.1 (Regional Commercial)
6.2 (General Commercial)
6.3 (Highway Commercial)
7.1 (Light Industrial)
7.3 (Heavy Industrial)
8.4 (Mineral and Petroleum, Min 5 Acre Parcel Size)
8.5 (Resource Management, Min. 20 Acre Parcel Size)
LDR = Low Density Residential

Kern County Zoning District:
A (Exclusive Agriculture); A-1 (Limited Agriculture); A-1 H (Limited Agriculture, Airport Approach Height Combining); A WE (Exclusive Agriculture, Wind Energy Combining District); C-2 PD (General Commercial, Precise Development Combining); C-2 PD FPS (General Commercial, Precise Development Combining, Floodplain Secondary Combining); CH PD (Highway Commercial, Precise Development Combining); CH PD FPS (Highway Commercial, Precise Development Combining, Floodplain Secondary Combining); CO PD (Commercial Office, Precise Development Combining);M-1 PD (Light Industrial, Precise Development Combining);OS (Open Space); OS FPS (Open Space, Precise Development Combining);R-1 (Low-Density Residential District); R-1 FPS (Low-Density Residential District);R-2 PD (Medium – Density Residential District, Precise Development Combining); R-2 PD FPS (Medium – Density Residential District, Precise Development Combining, Floodplain Secondary Combining); M-1 PD H (Light Industrial, Precise Development Combining, Airport Approach Height Combining);M-2 PD H (Medium Industrial, Precise Development Combining, Airport Approach Height Combining);M-3 (Heavy Industrial); M-3 PD (Heavy Industrial, Precise Development Combining);M-3 PD FPS (Heavy Industrial, Precise Development Combining, Floodplain Secondary Combining); and E (1/4) (Estate District, Min one-quarter acre).

1.3. Project Description

Enterprise Solar Storage, LLC (Enterprise) is proposing to construct, operate, maintain, and decommission a 600 MW PV solar facility with approximately 1,000 MW of battery energy storage, or up to 4,000 MWh of energy storage capacity, on approximately 2,229 acres across 147 privately owned parcels in an unincorporated area of southeastern Kern County, California. As previously mentioned, an additional 10 acres on four parcels are proposed for a temporary construction laydown yard. A second temporary construction laydown yard is proposed; however, the location of which is within the boundary of the adjacent previously approved Sanborn Solar project. An additional 23 acres on one parcel is proposed for step-up substation, north of the Windhub substation.

Other associated infrastructure would include PV solar generating facilities and solar modules, energy storage system, electrical collection system and inverters, collector substations, grid interconnection, telecommunication facilities, site access and security, which will be described in further detail in Section 1.4. Primary access to the proposed project sites would be from Purdy Avenue, State Route (SR) 58, Lone Butte Road, and Silver Queen Road.

The project consists of four separate solar sites, one temporary construction laydown area, and one step-up substation located north of the Windhub substation (identified as site 5). Implementation of the project as

proposed includes the following requests (see *Table 4: Project Assessor Parcel Numbers, Existing and Proposed Land Use, and Acreage* and *Figure 7a – Proposed General/Specific Plan Designations (Site 2), Figure 7b – Proposed General/Specific Plan Designations (Site 4), Figure 8a – Proposed Zoning Classifications (Site 1), Figure 8b – Proposed Zoning Classifications (Site 2), Figure 8c – Proposed Zoning Classifications (Site 3), Figure 8d – Proposed Zoning Classifications (Site 4), and Figure 9 – Circulation Element Amendment*:

Site 1 (Northern):

(a) Zone Classification Change No. 60, Map 196

- From A-1 (Limited Agriculture) to A (Exclusive Agriculture), or a more restrictive district, on approximately 93 acres.

(b) Conditional Use Permit No. 62, Map 196 to allow for the construction and operation of a solar facility and associated infrastructure, including energy storage, on approximately 93 acres in an A (Exclusive Agriculture) District, pursuant to Chapter 19.12.030.G of the Kern County Zoning Ordinance.

Site 2 (Western):

(a) Specific Plan Amendment No. 34, Map 196 of the Mojave Specific Plan from Land Use Designations 3.1 (Parks and Recreation) on approximately 19 acres, 5.2 (Residential, maximum 16 units/net acre) on approximately 13 acres, 5.3 (Residential, maximum 10 units/net acre) on approximately 90 acres, 5.4 (Residential, maximum 4 unit/net acres) on approximately 15 acres, 6.2 (General Commercial) on approximately 15 acres, and 6.3 (Highway Commercial) on approximately 5 acres to 8.5 (Resources Management), or a more restrict designation for approximately 157 acres.

(b) Zone Classification Change No. 61, Map 196

- From A-1 (Limited Agriculture) to A (Exclusive Agriculture), or a more restrictive district, on approximately 115 acres;
- From C-2 PD FPS (General Commercial Precise Development Combining Floodplain Secondary Combining) to A FPS (Exclusive Agriculture Floodplain Secondary Combining), or a more restrictive district, on approximately 18 acres
- From CH PD (Highway Commercial Precise Development Combining) to A (Exclusive Agriculture), or a more restrictive district, on approximately 7 acres;
- From CH PD FPS (Highway Commercial Precise Development Combining Floodplain Secondary Combining) to A FPS (Exclusive Agriculture Floodplain Secondary Combining), or a more restrictive district, on approximately 4 acres
- From CO PD (Commercial Office Precise Development Combining) to A (Exclusive Agriculture), or a more restrictive district, on approximately 5 acres;
- From OS (Open Space) to A (Exclusive Agriculture), or a more restrictive district, on approximately 4 acres;

- From OS FPS (Open Space Floodplain Secondary Combining) to A FPS (Exclusive Agriculture Floodplain Secondary Combining), or a more restrictive district, on approximately 6 acres;
- From E (1/4) (Estate 1/4 Acre) to A (Exclusive Agriculture), or a more restrictive district, on approximately 16 acres;
- From R-1 (Low Density Residential) to A (Exclusive Agriculture), or a more restrictive district, on approximately 18 acres;
- From R-1 FPS (Low Density Residential Floodplain Secondary Combining) to A FPS (Exclusive Agriculture Floodplain Secondary Combining), or a more restrictive district, on approximately 2 acres
- From R-2 PD (Medium Density Residential Precise Development Combining) to A (Exclusive Agriculture), or a more restrictive district, on approximately 8 acres; and
- From R-2 PD FPS (Medium Density Residential Precise Development Combining Floodplain Secondary Combining) to A FPS (Exclusive Agriculture Floodplain Secondary Combining), or a more restrictive district, on approximately 2 acres.

(c) Conditional Use Permit 63, Map 196 to allow for the construction and operation of a solar facility and associated infrastructure, including energy storage, on approximately 278.98 acres in an A (Exclusive Agriculture) District, pursuant to Chapter 19.12.030.G of the Kern County Zoning Ordinance.

Site 3 Eastern:

(a) Zone Classification Change No. 3, Map 195 from A-1 (Limited Agriculture) to A (Exclusive Agriculture), or a more restrictive district on approximately 217 acres;

(b) Zone Classification Change No. 62, Map 196

- From A-1 (Limited Agriculture) to A (Exclusive Agriculture), or a more restrictive district, on approximately 165 acres
- From A-1 H (Limited Agriculture Airport Approach Height Combining) to A H (Exclusive Agriculture Airport Approach Height Combining), or a more restrictive district, on approximately 763 acres

(c) Conditional Use Permit No. 2, Map 195 to allow for the construction and operation of a solar facility and associated infrastructure, including energy storage, on approximately 216.54 acres in an A (Exclusive Agriculture) District, pursuant to Chapter 19.12.030.G of the Kern County Zoning Ordinance;

(d) Conditional Use Permit No. 64, Map 196 to allow for the construction and operation of a solar facility and associated infrastructure, including energy storage, on approximately 1,008.85 acres in an A (Exclusive Agriculture) District, pursuant to Chapter 19.12.030.G of the Kern County Zoning Ordinance;

(e) Conditional Use Permit No. 65, Map 196 to allow for the temporary construction staging and equipment storage yard for on approximately 10 acres in an A (Exclusive Agriculture District), pursuant to Chapter 19.12.030.K of the Kern County Zoning Ordinance; and

(f) Specific Plan Amendment No. 35, Map 196 to the Circulation Element of the Mojave Plan to remove future road reservations on section and mid-section lines within the project boundary.

Site 4 Southern:

(a) Specific Plan Amendment No. 4, Map 212 to the West Edwards Road Settlement to change designation from 1.1 (State and Federal Lands) to 8.5 (Resource Management), or a more restrict designation, on approximately 186 acres.

(b) Zone Classification Change No. 4, Map 195 from A-1 (Limited Agriculture) to A (Exclusive Agriculture), or a more restrictive district on approximately 157 acres;

(c) Zone Classification Change No. 3, Map No 212 from A-1 (Limited Agriculture) to A (Exclusive Agriculture), or a more restrictive district on approximately 573.43 acres;

(d) Conditional Use Permit No. 3, Map 195 to allow for the construction and operation of a solar facility and associated infrastructure, including energy storage, on approximately 157 acres in an A (Exclusive Agriculture) District, pursuant to Chapter 19.12.030.G of the Kern County Zoning Ordinance;

(e) Conditional Use Permit No. 6, Map 212 to allow for the construction and operation of a solar facility and associated infrastructure, including energy storage, on approximately 573.43 acres in an A (Exclusive Agriculture) District, pursuant to Chapter 19.12.030.G of the Kern County Zoning Ordinance;

(f) General Plan Amendment No. 3, Map 212 to the Circulation Element of the Kern County General Plan to remove future road reservations on section and mid-section lines within the project boundary.

Site 5 Substation:

(a) Conditional Use Permit No. 20, Map 197 to allow for the construction and operation of a step-up substation, on approximately 23 acres in an A WE (Exclusive Agriculture Wind Energy Combining) District, pursuant to Chapter 19.12.030.G of the Kern County Zoning Ordinance.

The project applicant may also request either a Non-Summary Street Vacation to remove roads and public street easements within the proposed solar facility or process a parcel merger in the future that will result in the elimination of the identified public easements. The easements that will be requested to be vacated are shown in *Figure 10a - Nonsummary Street Vacations (Site 1), Figure 10b – Nonsummary Street Vacations (Site 2), Figure 10c – Nonsummary Street Vacations (Site 3), and Figure 10d – Nonsummary Street Vacations (Site 4).*

Should individual parcels be affected by this request, the project proponent shall record private access for the benefit of the affected parcel such that legal access remains.

At the end of the proposed project's operational term, the project proponent would determine whether the project site should be decommissioned and deconstructed or if it would seek an extension of its CUP. If any portion of the project site is decommissioned, it would be converted to other uses in accordance with the

applicable land use regulations in effect at that time. The power generated on the project site would assist the state in complying with the Renewables Portfolio Standard under Senate Bill 350, which requires that by December 31, 2030, 50 percent of all electricity sold in the state shall be generated from renewable energy sources. The power generated on the project site would be sold to California investor-owned utilities, municipalities, community choice aggregators, or other purchasers in furtherance of the goals of the California Renewable Energy Portfolio Standard. The project has an anticipated operational life of up to approximately 35 years.

Table 4: Project Assessor Parcel Numbers, Existing and Proposed Land Uses, and Acreages identifies the proposed project parcels, existing land uses, and the proposed land uses for the proposed project.

Table 4:
Project Assessor Parcel Numbers, Existing and Proposed Land Uses, and Acreages

Count	APN	Zone Map	General/Specific Plan	Existing Map Code Designation	Proposed Map Code Designation	Existing Zoning	Proposed Zoning	Acres
Site 1 (Northern)								
1.	428-140-09	196	Mojave SP	8.5	8.5	A-1	A	17.49
2.	428-140-10	196	Mojave SP	8.5	8.5	A-1	A	3.07
3.	428-140-11	196	Mojave SP	8.5	8.5	A-1	A	3.45
4.	428-140-12	196	Mojave SP	8.5	8.5	A-1	A	2.55
5.	428-140-13	196	Mojave SP	8.5	8.5	A-1	A	7.66
6.	428-140-15	196	Mojave SP	8.5	8.5	A-1	A	15.93
7.	428-140-16	196	Mojave SP	8.5	8.5	A-1	A	15.15
8.	428-152-01	196	Mojave SP	8.5	8.5	A-1	A	14.06
9.	428-152-02	196	Mojave SP	8.5	8.5	A-1	A	13.58
Site 1 (Northern) Total Acreages: 92.94								
Site 2 (Western)								
10.	427-020-27	196	Mojave SP	6.3	6.3	CH PD	A	7.12
11.	427-030-07	196	Soledad Mtn – Elephant Butte SP	LDR	LDR	A-1	A	1.59
12.	427-030-35	196	Soledad Mtn – Elephant Butte SP	LDR	LDR	A-1	A	75.59
13.	427-030-36	196	Soledad Mtn – Elephant Butte SP	LDR	LDR	A-1	A	37.35
14.	427-100-22	196-20	Mojave SP	3.1, 3.1/2.5, 5.2, 5.2/2.5, 5.3, 6.2, 6.2/2.5, 6.3, 6.3/2.5	8.5 and 2.5	R-2 PD, C-2 PD FPS, OS FPS,OS, R-2 PD FPS,CH PD FPS, CO PD	A PD FPS	51.35
15.	427-100-23	196-20	Mojave SP	3.1, 5.2, 5.3, 5.4	8.5	R-1	A	34.7

16.	427-100-24	196-20	Mojave SP	5.3, 5.4, 6.3/2.5	8.5 and 2.5	R-1, E (1/4), R-2 PD, R-2 PD FPS, R-1 FPS	A PD FPS	71.28
								Site 2 (Western) Total Acreages: 278.98
Site 3 (Eastern)								
17.	235-202-02	195	KCGP	8.5	8.5	A-1	A	40
18.	235-202-07	195	KCGP	8.5	8.5	A-1	A	10
19.	235-202-08	195	KCGP	8.5	8.5	A-1	A	10
20.	235-202-09	195	KCGP	8.5	8.5	A-1	A	10
21.	235-202-10	195	KCGP	8.5	8.5	A-1	A	10
22.	235-202-11	195	KCGP	8.5	8.5	A-1	A	10
23.	235-202-12	195	KCGP	8.5	8.5	A-1	A	10
24.	235-202-13	195	KCGP	8.5	8.5	A-1	A	10
25.	235-202-14	195	KCGP	8.5	8.5	A-1	A	10
26.	235-204-01	195	KCGP	8.5	8.5	A-1	A	10.14
27.	235-204-07	195	KCGP	8.5	8.5	A-1	A	5.07
28.	235-204-08	195	KCGP	8.5	8.5	A-1	A	5.07
29.	235-204-09	195	KCGP	8.5	8.5	A-1	A	5.07
30.	235-204-10	195	KCGP	8.5	8.5	A-1	A	5.07
31.	235-204-17	195	KCGP	8.5	8.5	A-1	A	2.61
32.	235-204-18	195	KCGP	8.5	8.5	A-1	A	2.61
33.	235-204-19	195	KCGP	8.5	8.5	A-1	A	2.61
34.	235-204-20	195	KCGP	8.5	8.5	A-1	A	10.15
35.	235-204-21	195	KCGP	8.5	8.5	A-1	A	2.61
36.	235-204-31	195	KCGP	8.5	8.5	A-1	A	2.61
37.	235-204-32	195	KCGP	8.5	8.5	A-1	A	2.61
38.	235-204-33	195	KCGP	8.5	8.5	A-1	A	5.08
39.	235-204-34	195	KCGP	8.5	8.5	A-1	A	5.08
40.	235-204-35	195	KCGP	8.5	8.5	A-1	A	2.54
41.	235-204-36	195	KCGP	8.5	8.5	A-1	A	2.54
42.	235-204-37	195	KCGP	8.5	8.5	A-1	A	2.54
43.	235-204-38	195	KCGP	8.5	8.5	A-1	A	2.53
44.	235-204-39	195	KCGP	8.5	8.5	A-1	A	5
45.	235-204-40	195	KCGP	8.5	8.5	A-1	A	2.5
46.	235-204-41	195	KCGP	8.5	8.5	A-1	A	2.5
47.	235-204-42	195	KCGP	8.5	8.5	A-1	A	10
48.	428-030-06 (portion of)	196	Mojave SP	8.5	8.5	A	A	40
49.	428-161-01	196	Mojave SP	8.5	8.5	A-1 H	A H	40
50.	428-161-02	196	Mojave SP	8.5	8.5	A-1 H	A H	20
51.	428-161-03	196	Mojave SP	8.5	8.5	A-1 H	A H	19.76
52.	428-161-04	196	Mojave SP	8.5	8.5	A-1 H	A H	9.06
53.	428-161-07	196	Mojave SP	8.5	8.5	A-1 H	A H	2.5
54.	428-161-08	196	Mojave SP	8.5	8.5	A-1 H	A H	2.5
55.	428-161-10	196	Mojave SP	8.5	8.5	A-1 H	A H	7.89
56.	428-161-11	196	Mojave SP	8.5	8.5	A-1 H	A H	17.42
57.	428-161-14	196	Mojave SP	8.5	8.5	A-1 H	A H	5.2
58.	428-161-16	196	Mojave SP	8.5	8.5	A-1 H	A H	3.26

59.	428-161-20	196	Mojave SP	8.5	8.5	A-1 H	A H	5.1
60.	428-162-11	196	Mojave SP	8.5	8.5	A-1	A H	5.04
61.	428-162-12	196	Mojave SP	8.5	8.5	A-1, A-1 H	A H	21.54
62.	428-162-13	196	Mojave SP	8.5	8.5	A-1 H	A H	2.55
63.	428-162-14	196	Mojave SP	8.5	8.5	A-1 H	A H	2.55
64.	428-162-15	196	Mojave SP	8.5	8.5	A-1 H	A H	2.55
65.	428-162-16	196	Mojave SP	8.5	8.5	A-1 H	A H	2.55
66.	428-162-17	196	Mojave SP	8.5	8.5	A-1, A-1 H	A H	4.88
67.	428-162-18	196	Mojave SP	8.5	8.5	A-1, A-1 H	A H	3.6
68.	428-162-19	196	Mojave SP	8.5	8.5	A-1	A	2.5
69.	428-162-20	196	Mojave SP	8.5	8.5	A-1	A	2.51
70.	428-162-21	196	Mojave SP	8.5	8.5	A-1	A	2.5
71.	428-162-22	196	Mojave SP	8.5	8.5	A-1, A-1 H	A H	2.51
72.	428-162-23	196	Mojave SP	8.5	8.5	A-1, A-1 H	A H	7.35
73.	428-162-24	196	Mojave SP	8.5	8.5	A-1, A-1 H	A H	3.11
74.	428-162-27	196	Mojave SP	8.5	8.5	A-1 H	A H	20
75.	428-171-01	196	Mojave SP	8.5	8.5	A-1 H	A H	10
76.	428-171-02	196	Mojave SP	8.5	8.5	A-1 H	A H	10
77.	428-171-03	196	Mojave SP	8.5	8.5	A-1, A-1 H	A H	20
78.	428-171-04	196	Mojave SP	8.5	8.5	A-1, A-1 H	A H	15
79.	428-171-05	196	Mojave SP	8.5	8.5	A-1 H	A H	5
80.	428-171-06	196	Mojave SP	8.5	8.5	A-1 H	A H	2.5
81.	428-171-07	196	Mojave SP	8.5	8.5	A-1 H	A H	2.5
82.	428-171-08	196	Mojave SP	8.5	8.5	A-1 H	A H	2.5
83.	428-171-10	196	Mojave SP	8.5	8.5	A-1 H	A H	2.5
84.	428-171-11	196	Mojave SP	8.5	8.5	A-1 H	A H	2.5
85.	428-171-12	196	Mojave SP	8.5	8.5	A-1 H	A H	2.5
86.	428-171-13	196	Mojave SP	8.5	8.5	A-1 H	A H	2.5
87.	428-171-14	196	Mojave SP	8.5	8.5	A-1 H	A H	2.5
88.	428-171-16	196	Mojave SP	8.5	8.5	A-1	A	5
89.	428-171-17	196	Mojave SP	8.5	8.5	A-1	A	2.5
90.	428-171-18	196	Mojave SP	8.5	8.5	A-1, A-1 H	A H	2.5
91.	428-171-19	196	Mojave SP	8.5	8.5	A-1 H	A H	2.5
92.	428-171-20	196	Mojave SP	8.5	8.5	A-1 H	A H	2.5
93.	428-171-21	196	Mojave SP	8.5	8.5	A-1 H	A H	2.5
94.	428-171-22	196	Mojave SP	8.5	8.5	A-1 H	A H	2.5
95.	428-171-23	196	Mojave SP	8.5	8.5	A-1, A-1 H	A H	10
96.	428-171-24	196	Mojave SP	8.5	8.5	A-1	A	2.5
97.	428-171-25	196	Mojave SP	8.5	8.5	A-1	A	2.5
98.	428-171-26	196	Mojave SP	8.5	8.5	A-1	A	5
99.	428-171-27	196	Mojave SP	8.5	8.5	A-1	A	10
100.	428-171-28	196	Mojave SP	8.5	8.5	A-1	A	10
101.	428-171-29	196	Mojave SP	8.5	8.5	A-1	A	2.5
102.	428-171-30	196	Mojave SP	8.5	8.5	A-1	A	2.5
103.	428-171-31	196	Mojave SP	8.5	8.5	A-1, A-1 H	A H	2.5
104.	428-171-32	196	Mojave SP	8.5	8.5	A-1, A-1 H	A H	2.5
105.	428-171-33	196	Mojave SP	8.5	8.5	A-1, A-1 H	A H	5
106.	428-171-34	196	Mojave SP	8.5	8.5	A-1 H	A H	2.5
107.	428-171-35	196	Mojave SP	8.5	8.5	A-1 H	A H	2.5

108.	428-172-01	196	Mojave SP	8.5	8.5	A-1, A-1 H	A H	20
109.	428-172-02	196	Mojave SP	8.5	8.5	A-1 H	A H	20
110.	428-172-03	196	Mojave SP	8.5	8.5	A-1 H	A H	20
111.	428-172-04	196	Mojave SP	8.5	8.5	A-1 H	A H	5
112.	428-172-05	196	Mojave SP	8.5	8.5	A-1 H	A H	15
113.	428-172-06	196	Mojave SP	8.5	8.5	A-1 H	A H	20
114.	428-172-07	196	Mojave SP	8.5	8.5	A-1 H	A H	15
115.	428-172-08	196	Mojave SP	8.5	8.5	A-1 H	A H	5
116.	428-172-10	196	Mojave SP	8.5	8.5	A-1, A-1 H	A H	160
117.	428-172-11	196	Mojave SP	8.5	8.5	A-1 H	A H	20
118.	428-172-12	196	Mojave SP	8.5	8.5	A-1 H	A H	10
119.	428-172-13	196	Mojave SP	8.5	8.5	A-1 H	A H	10
120.	428-173-01	196	Mojave SP	8.5	8.5	A-1, A-1 H	A H	120
121.	428-173-02	196	Mojave SP	8.5	8.5	A-1	A	2.56
122.	428-173-03	196	Mojave SP	8.5	8.5	A-1	A	2.56
123.	428-173-04	196	Mojave SP	8.5	8.5	A-1	A	2.5
124.	428-173-05	196	Mojave SP	8.5	8.5	A-1	A	2.56
125.	428-173-06	196	Mojave SP	8.5	8.5	A-1	A	10
126.	428-173-07	196	Mojave SP	8.5	8.5	A-1	A	2.56
127.	428-173-08	196	Mojave SP	8.5	8.5	A-1	A	2.56
128.	428-173-09	196	Mojave SP	8.5	8.5	A-1	A	2.56
129.	428-173-10	196	Mojave SP	8.5	8.5	A-1	A	2.56
130.	428-173-11	196	Mojave SP	8.5	8.5	A-1	A	10
131.	428-174-25	196	Mojave SP	8.5	8.5	A-1	A	10
132.	428-174-33	196	Mojave SP	8.5	8.5	A-1	A	20
133.	428-174-34	196	Mojave SP	8.5	8.5	A-1	A	10
134.	428-174-35	196	Mojave SP	8.5	8.5	A-1	A	10
135.	428-174-36	196	Mojave SP	8.5	8.5	A-1	A	20
							Site 3 (Eastern) Total Acreages: 968.85	
Site 3 (Temporary Laydown Yards)								
136.	428-191-23	196	Mojave SP	8.5	8.5	A-1 H	A H	2.5
137.	428-191-25	196	Mojave SP	8.5	8.5	A-1 H	A H	2.5
138.	428-191-26	196	Mojave SP	8.5	8.5	A-1 H	A H	2.5
139.	428-191-27	196	Mojave SP	8.5	8.5	A-1 H	A H	2.5
							Site 3 (Temporary Laydown Yards) Total Acreages: 10	
Site 4 (Southern)								
140.	235-132-13	195	KCGP	8.5	8.5	A-1	A	157.27
141.	244-234-02	212	KCGP	8.5, 2.4	8.5, 2.4	A-1	A	161.46
142.	244-234-08	212	KCGP/Western Edwards Road Settlement SP	1.1, 8.5	8.5	A-1	A	160
143.	244-234-17	212	KCGP	8.5	8.5	A-1	A	10
144.	244-234-18	212	KCGP	8.5	8.5	A-1	A	10
145.	244-234-28	212	KCGP	8.5	8.5	A-1	A	5.05
146.	244-234-29	212	KCGP	8.5	8.5	A-1	A	5.05
147.	244-234-30	212	KCGP	8.5	8.5	A-1	A	10.02
148.	244-234-32	212	KCGP	8.5	8.5	A-1	A	20
149.	244-234-33	212	KCGP	8.5	8.5	A-1	A	20
150.	244-234-35	212	KCGP	8.5	8.5	A-1	A	10.02

151.	244-234-10*	212	KCGP/Western Edwards Road Settlement SP	1.1	8.5	A-1	A	161.83
								Site 4 (Southern) Total Acreages: 730.7
Site 5 (Substation)								
152.	237-031-04	197	KCGP	8.4	8.4	A WE	A WE	23
								Site 5 (Substation) Total Acreages: 23

Key
* SCE transmission line APN

Kern County General Plan (KCGP) and Specific Plan (SP)Map Code Designation:
1.1 (State and Federal Land)
2.4 (Steep Slope)
2.5 (Flood Hazard)
3.1 (Parks and Recreation Areas)
5.2 (Residential - Maximum 16 Units/Net Acre)
5.3 (Residential - Maximum 10 Units/Net Acre)
5.4 (Residential – Maximum 4 Units/Net Acre)
6.2 (General Commercial)
6.3 (Highway Commercial)
8.4 (Mineral and Petroleum, Min 5 Acre Parcel Size)
8.5 (Resource Management, Min. 20 Acre Parcel Size)

Soledad Mtn. – Elephant Butte Specific Plan Designation:
LDR = Low Density Residential

Kern County Zoning District:

A (Exclusive Agriculture); A H (Exclusive Agriculture, Airport Approach Height Combining); A PD FPS (Exclusive Agriculture, Precise Development PlanA-1 (Limited Agriculture); A-1 H (Limited Agriculture, Airport Approach Height Combining); A WE (Exclusive Agriculture, Wind Energy Combining District); C-2 PD (General Commercial, Precise Development Combining); C-2 PD FPS (General Commercial, Precise Development Combining, Floodplain Secondary Combining); CH PD (Highway Commercial, Precise Development Combining); CH PD FPS (Highway Commercial, Precise Development Combining, Floodplain Secondary Combining); CO PD (Commercial Office, Precise Development Combining);M-1 PD (Light Industrial, Precise Development Combining);OS (Open Space); OS FPS (Open Space, Precise Development Combining);R-1 (Low-Density Residential District); R-1 FPS (Low-Density Residential District);R-2 PD (Medium – Density Residential District, Precise Development Combining); R-2 PD FPS (Medium – Density Residential District, Precise Development Combining, Floodplain Secondary Combining); M-1 PD H (Light Industrial, Precise Development Combining, Airport Approach Height Combining);M-2 PD H (Medium Industrial, Precise Development Combining, Airport Approach Height Combining);M-3 (Heavy Industrial); M-3 PD (Heavy Industrial, Precise Development Combining);M-3 PD FPS (Heavy Industrial, Precise Development Combining, Floodplain Secondary Combining); and E (1/4) (Estate District, Min one-quarter acre).

1.4. Project Facilities, Construction Activities, and Operations

Project Facilities

The project facilities would include the following components, which are described in greater detail below and shown on *Figure 11 – Proposed Site Plan Overview, Figure 11a - Proposed Site 1 Plan, Figure 11b - Proposed Site 2 Plan, Figure 11c - Proposed Site 3 Plan, Figure 11d - Proposed Site 4 Plan, Figure 11d - Proposed Site 4 Plan, and Figure 11e - Proposed Site 5 Plan.*

- Solar PV Generating Facilities and Solar Modules
- Energy Storage System
- Electrical Collection System and Inverters

- Collector Substations
- 230 kV to 500 kV Step-up Substation
- Grid Interconnection
- Telecommunications Facilities
- Site and Access and Security
- Southern California Edison (SCE) Transmission Line Relocation

Solar PV Generating Facilities and Solar Modules

The proposed project would use PV solar technology designed in a collection of subarrays to convert solar energy directly to electrical power for export to the electrical grid. It would include the installation of PV modules that would be mounted on steel support posts that would be pile-driven into the ground and connected to inverters. The modules would be made of a thin film material or polycrystalline silicon material covering the glass panes, which would be dark in color, highly absorptive, and have minimum reflectivity. The modules would be manufactured at an offsite location and transported to the site.

Solar modules for the proposed project would be provided on either a fixed-mount array system or a single-axis tracker system. Depending on the type of technology (modules) used, the panels would measure between 4 and 7 feet in length, and the total height of the panel system measured from ground surface would be approximately 7 to 12 feet. The length of each row of panels would be 350 to 400 feet and would be oriented in the east-west direction in the case of a fixed-mount array being used, and oriented in the north-south direction in the case of single-axis trackers being used.

Spacing between each row would be approximately 8 to 22 feet to allow access and reduce shading between rows. Single-axis tracking systems would employ a motor mechanism that would allow the arrays to track the path of the sun (from east to west) throughout the day with a range of up to 120 degrees. The motors would be installed after the horizontal cross-members are in place. In the morning, the panels would face east. The panels would slowly move to the upright position at noon and on to the west at sundown. The panels would stow horizontally overnight, and as operational conditions dictate. The panels would reset to the east in the evening or early morning to receive sunlight at sunrise.

Energy Storage System

The proposed energy storage system(s) would use direct current (DC)-coupled and/or alternating current (AC)- coupled battery storage. The DC energy storage system would be distributed and located throughout the solar arrays. The AC energy storage system could be either centralized and located close to the collector substation or distributed throughout the solar arrays. The energy storage batteries within both proposed systems would be housed in a structure or within Conex boxes. If a structure is constructed, the maximum height (including any screening for heating, ventilation, and air conditioning [HVAC]) is anticipated to be approximately 35 feet. The batteries under this configuration would be housed in open-air-style racking (similar to computer racking) approximately 10 to 12 feet high. The associated inverters, transformers, and switchgear would be located immediately adjacent to the structure on concrete pads or driven pier foundations.

The energy storage structure would also have a fire rating in conformance with County standards and specialized fire suppression systems installed for the battery rooms. All non-battery rooms would have

County-approved fire suppression systems. The structure would also have HVAC cooling in the battery room to maintain energy efficiency. Power to the HVAC, lighting, and similar would be provided via a connection to the onsite collector substation service transformer with connection lines installed above ground and/or below ground. The energy storage system would be unstaffed, with remote operational control and periodic inspections and maintenance performed, as necessary.

Electrical Collection System and Inverters

The solar panels would be electrically connected to each other via above- and underground wiring. Underground electrical cables (underground collection system) would be installed from groups of PV arrays that would be arranged into power blocks. The cables would convey DC electricity to inverters, which convert the DC electricity to AC. All electrical inverters and the transformers would be dispersed among the arrays and installed on prefabricated metal skids that would sit on steel pier foundations or concrete foundations, depending on the design. The inverter pad transformers would step up the voltage of the array output, which would be collected at the onsite circuit breakers or switchgear positions. From the circuit breakers or switchgear positions, the medium- voltage collector lines would be routed underground or above-ground to onsite step-up collector substations.

Collector Substations

The onsite collector substation is the termination point of the collection system of 34.5-kV AC electricity. The output of the entire field is passed through an interconnection step-up transformer to convert it to the grid- tie voltage at 230 kV. A minimum of two onsite collector substations will be needed for this project pending final engineering. The proposed substations would host the grid intertie safety equipment and switches required to interconnect to the high-voltage transmission system. The open-air collector substations would likely be constructed on Site 3 (Eastern) at the corner of the general alignment of Purdy Avenue and 10th Street and on Site 2 (Western) north of Purdy Ave just west of Hwy 14. The proposed location of the collector stations is shown within the site plan. The footprint, approximately 375 ft x 350 ft, would be sized to accommodate all required equipment with safety-related setbacks and would consist of components up to 75 feet in height.

High Voltage Step-Up Substation

The project includes a new high voltage step-up substation located north of the SCE owned Windhub substation off Oak Creek Road. At this substation, the 230 kV transmission will be stepped up to 500 KV for interconnection with Windhub's 500 kV transmission banks. This step-up substation will be on private land and will be owned and operated by the project owner. A new 500 kV transmission line will be built from the 230 kV-500 kV substation into Windhub for ultimate grid connection. The 500 kV transmission line will be constructed on either 1) the east and south sides of Windhub where it will transition into Windhub's 500 kV transmission banks or 2) will transition directly into the Windhub substation from the north, depending on final high voltage engineering.

Grid Interconnection

From the 230-kV Project collector substation in Site 3 (Eastern), the energy generated would interconnect via a new double-circuit gen-tie line to be installed within the previously approved Sanborn Solar project (2020) then running west within the same gen-tie corridor as the approved Sanborn gen-tie line. The collector substation in Site 2 (Western) would interconnect via a direct tap or other high voltage connection into the line. The final design, layout, and required interconnection components would be determined at the detailed engineering stage. The 230 kV generation will get stepped up to 500 kV at a new substation (owned and operated by the project owner) to be built north of the SCE owned Windhub substation. New 500 kV

gen-tie lines (owned and maintained by the project owner) would then connect from the step-up substation into Windhub.

Telecommunication Facilities

The Supervisory Control and Data Acquisition (SCADA) system is critical to the California Independent System Operator and SCE utility interconnection, and for the proper operation and maintenance of the proposed project, which uses proprietary software; a fiberoptic transmission system; and a telephone, radio, and other means of communication such as radio links and phase loop communication systems. The SCADA system functions as a remote start, stop, reset, and tag out for the facility, and provides site diagnostic information from the energy generating facility. The SCADA system would also control the collector substation, allowing for fully centralized operation of the proposed project to meet all California Independent System Operator and utility interconnection requirements.

The proposed project would use local exchange carrier services for telecommunication to support remote monitoring requirements. It would connect to telecommunication fiberoptic lines owned and managed by AT&T or alternative provider. The cabinet holding the connection equipment would have a base of approximately 4 feet by 2 feet and would be approximately 5 feet in height. From the point of demarcation, an underground fiberoptic cable would be installed within the footprint of the proposed project to connect the cabinet to the SCADA equipment within the solar collector substations.

Site Access and Security

The site can be accessed from various separate roadways. Interstate 5 is the largest highway that would provide regional access to the site from the north and the south, along with SRs 14, 58, and 138. The solar facility can be accessed via Purdy Avenue, Camelot Blvd, Decatur Ave, Sunset Ave, and Silver Queen Rd.

Although the existing roadways would be used to the greatest extent possible, new unpaved roads would be constructed to serve as access roads from the existing road network to the solar array blocks. Access roads would be up to 25 feet wide and would be cleared and compacted for travel and access to the solar blocks. These site access roads would remain in place for ongoing operations and maintenance activities after construction is completed. Cut slopes and other road construction activities would be constructed in a similar fashion. Dirt roads that are located within the boundaries of the proposed project and that are not the subject of a written easement would be closed to third-party use for vehicular or other access. Any such third parties that may currently use these dirt roads would be rerouted to the major access routes, which would remain open.

Final service road alignments would depend on the final placement of the solar panels and on the results of field investigations, including topography and any other site-specific details to be incorporated into the final design. Should access roads be required to cross streambed areas under the jurisdiction of the CDFW, appropriate crossings would be installed to minimize impacts to these jurisdictional areas and comply with all California Fish and Game Code requirements, including authorization through a Streambed Alteration Agreement as appropriate.

All fence installation requirements would be evaluated, and the best-fit scenario would be incorporated in the site. The fences would be installed around the perimeter of each site, substation, switchyard, and other areas requiring controlled access for safety and security purposes. The fencing would remain for the life of the Project. The proposed fencing locations are included in the preliminary plot plan.

Permanent motion-sensitive, directional security lights would be installed to provide adequate illumination around the substation areas and points of ingress/egress. All lighting would be shielded and directed downward to minimize the potential for glare or spillover onto adjacent properties. All lighting would also conform to applicable County night-sky ordinance requirements. Lighting would be used from dusk to dawn once the facilities are operational. Motion-sensitive cameras may also be installed throughout each solar facility at the inverters for added security. The cameras would be mounted on poles approximately 20 feet in height.

SCE Transmission Line Relocation

The relocated transmission structures will be wood or metal ranging from 50 to 70 feet above ground and will accommodate the relocated 66 kV transmission line as well as a potential distribution circuit with polymer insulators. SCE will complete relocation of the transmission line by grading an approximate 20-foot-wide access road within SCE's right-of-way (ROW) to facilitate construction and future maintenance of the line. Construction will include using bladed equipment (scraper or bulldozer), backhoe, and other support vehicles. Placement of transmission structures will require an auger truck to bore the holes, a crane, manlifts/boom truck, and other support vehicles to place the structures. Stringing the 66 kV conductors will be completed using manlifts/boom trucks, hydraulic tensioning machines, wire reel stringing trailers, drum pulling machines, and other support vehicles. After the relocated transmission line is installed and energized, the old transmission line will be demolished using equipment used to install and tension the relocated transmission line. Other support vehicles will be used to remove the old conductors and poles which will be recycled offsite or disposed as appropriate. Final grading for the relocated transmission line will be performed during construction of the solar project as part of the final grading. SCE will prepare and submit a Storm Water Pollution Prevention Plan (SWPPP) prior to land disturbance. It is anticipated that relocation of the transmission line will be completed in four months using up to 50 construction workers per week. The relocation of the transmission line will be performed prior to solar tracker installation. The construction will require approximately an additional 0.5 acre-foot of construction water to be used for dust suppression.

Construction Activities

Construction of the proposed project is expected to last for approximately 24 months and would proceed following receipt of all permits and agency approvals. The construction activities for the proposed project are categorized into three main phases:

- Site Preparation;
- System Installation; and,
- Testing, Commissioning, and Cleanup

Schedule and Workforce

Construction workforce is expected to peak at 550 individuals. However, the average daily workforce is expected to be 250 construction, supervisory, support, and construction management personnel onsite during construction. It is anticipated that the construction workforce would commute to the site each day from local communities and report to the designated construction staging yards prior to the beginning of each workday. Construction staff not drawn from the local labor pool would stay in local hotels in Rosamond, Mojave, Lancaster, or other local communities. One or more of the proposed laydown yards may be used as a parking and meeting area for the construction employees. Workers could use Hwy 58,

Purdy Avenue or other local roads as points of ingress/egress to the solar sites and, once onsite, they would access various sections via the existing and improved network of dirt roads.

The proposed project would be constructed by several specialized construction contractors. Construction would primarily occur during daylight hours, Monday through Friday, between 7:00 a.m. and 6:00 p.m., as required to meet the construction schedule. Any construction work performed outside the normal work schedule would be coordinated with the appropriate agencies and would conform to the Kern County Noise Ordinance (Chapter 8.36).

Site Preparation

The construction contractor would be required to incorporate BMPs consistent with the County zoning ordinance and with guidelines provided in the California Stormwater Quality Association's Construction Best Management Practice Handbook, including the preparation of a Stormwater Pollution Prevention Plan (SWPPP) and soil erosion and sedimentation control plan to reduce potential impacts related to construction of the proposed project. Prior to initial construction mobilization, preconstruction surveys would be performed, and sediment and erosion controls would be installed in accordance with the approved SWPPP. Stabilized construction entrances and exits would be installed at driveways to reduce tracking of sediment onto adjacent public roadways. Site preparation would also be consistent with County BMPs and Eastern Kern Air Pollution Control District rules for dust control. Laydown yards used for temporary offices, equipment and material unloading and storage, worker parking, and other construction related activities would be prepped by mowing and clearing existing vegetation and installation of temporary security fencing. In heavy use zones crushed aggregate may be applied.

Site preparation would involve the removal and proper disposal of existing vegetation and debris that would unduly interfere with the proposed project construction or the health and safety of onsite personnel. Dust minimizing techniques would be employed, such as maintaining natural vegetation where possible, using mow-and-roll vegetation clearance strategy, placing wind control fencing, applying water, and applying dust suppressants. Conventional grading would be performed throughout the site but minimized to the maximum extent possible to reduce unnecessary soil movement that may result in dust. Earthwork, scrapers, excavators, dozers, water trucks, paddlewheels, haul vehicles, and graders may all be used to perform grading. Land-leveling equipment, such as a smooth steel drum roller, would be used to even the surface of the ground and to compact the upper layer of soil to a value recommended by a geotechnical engineer for structural support. Access roads may be additionally compacted to 90 percent greater, as required, to support construction and emergency vehicles. Certain access roads may also require the use of aggregate or decomposed granite to meet emergency access requirements. Soil movement from grading would be balanced on the site, and no import or export of soils would occur.

Trenching would be required for placement of underground electrical and communication lines, and may include the use of trenchers, backhoes, excavators, haul vehicles, compaction equipment, and water trucks. After preparation of the site, the pads for structures, equipment enclosures, and equipment vaults would be prepared per geotechnical engineer recommendations. The substation and switchyard areas would have a grounding grid installed and would be covered with aggregate surfacing for safe operation. Collection and transmission structures from the substation to the existing transmission line would require drilling for foundation support, and the soils removed would be spread across the site.

System Installation

The construction of the solar arrays would include support structures and associated electrical equipment and cabling. It would start with steel foundation piles being driven into the soil using pneumatic techniques. The piles are typically spaced approximately 10 to 15 feet apart and installed to a revealed height of approximately 4 feet above grade.

Once the piles have been installed, the horizontal cross-members would be placed and secured. The arrays would consist of either a fixed-mount array system or a motorized single-axis tracking system. For a fixed-mount system, a galvanized metal racking system, which holds the PV modules in the correct position for maximum capture of solar insulation, would be field-assembled and attached to the horizontal cross-members. For a single-axis tracking system, the trackers and their associated motors would be mounted to the horizontal cross-members.

Concrete would be required for the footings and pads for the substation transformers and switchyard equipment and may also be required for pile foundation support in the event soils prevent some piles from being driven to appropriate depths. Final concrete specifications would be determined during detailed design engineering. There would be no concrete batch plants required onsite. Concrete would be purchased from an offsite supplier and trucked into the site.

There would be multiple crews working onsite with various equipment and vehicles, including special vehicles for transporting the modules and other equipment. As the solar arrays are installed, the collector substations, high voltage components, and other associated buildings would be constructed, and the electrical collection and communication systems would be installed. The electrical and communication wiring for the solar arrays would be installed in underground trenches or placed in aboveground cable trays or cable support systems, and some of the mid-voltage collection runs and communication systems may be overhead lines. The wiring would connect to the appropriate electrical and communication terminations and the circuits would be checked and commissioned prior to operation.

Testing, Commissioning, and Cleanup

After each major electrical system component (including interconnection, high-voltage transmission, electrical collection system, and the solar arrays) is completed, the system would be thoroughly inspected and tested to ensure it is ready to carry energy. The system would then be energized, and additional testing would be done to ensure safe operation.

Startup refers to commissioning activities that would occur after mechanical completion of the solar modules and commissioning of the electrical systems.

After construction of the proposed is complete, the site would be cleaned up and restored to facilitate operational activities. All waste, debris, and construction equipment would be removed from the site. During construction, the site would be kept as clean as possible. After construction, any visible waste on the site would be removed. Laydown yards or other areas disturbed during construction that are not needed for facility operations would be revegetated.

Construction Water Use

During construction of the proposed project, water would be required for common construction-related purposes, including but not limited to dust suppression, soil compaction, and grading. Dust-control water may be used for ingress and egress of onsite construction vehicle equipment traffic and for the construction

of the solar equipment. A sanitary water supply would not be required during construction because restroom facilities would be provided by portable units to be serviced by licensed providers.

The overall construction water usage is anticipated to be approximately 335 acre-feet during the 24-month construction period. The water used is anticipated to be purchased from Mojave Public Utility District with existing or new onsite water wells used as a secondary source. Water demand during construction is expected to be the same if the proposed project is constructed during a year with normal precipitation, a year with less-than-average precipitation, or a multiyear period of less-than-average precipitation.

Construction Electrical Supply

Power required for construction activities, such as for the temporary construction trailers, would be provided via portable generators or temporary local distribution. Generators used onsite would abide by California Air Resources Board and Eastern Kern Air Pollution Control District regulations.

Operations

The facility would operate year-round. It is anticipated that approximately six permanent full-time staff employees would be needed to maintain the facility. Additional staff would also be needed for certain activities such as solar panel washing. Typical operational and maintenance activities that would occur onsite include, but are not limited to, liaison and remote monitoring; administration and reporting; semi-annual and annual services; remote operations of inverters and battery energy storage systems; site security and management; additional communication protocol; repair and maintenance of solar facilities, battery storage facilities, substations, electrical transmission lines, and other Project facilities; mowing and vegetation control; and periodic panel washing. It is expected that staff will primarily operate from an operations facility that is offsite. However, small satellite portable office trailers may be placed on the project site to help facilitate rapid repair of equipment.

Operation Water Use

During operations, the water used will be provided from the Mojave Public Utility District or provided from the existing or new onsite water wells. Water would be required for panel washing, equipment washing, non-sanitary uses, and other miscellaneous water uses, such as landscaping. During solar and energy storage project operations, solar panel washing is expected to occur one to four times per year based on site conditions, such as usual weather occurrences, wild/forest fires, local air pollutants, and other similar conditions. Panel washing would require 15 days to complete per wash cycle. Water consumption is expected to be around 0.28 gallon per square yard of panel, based on other similar operations. Given a 600-MW plant, with four cycles per year, the annual water usage is expected to be up to approximately 25 acre-feet of water. This amount includes the water necessary for the operations, fire suppression, and site maintenance. Onsite water resources would also include an aboveground 10,000-gallon fire tank, which would be placed at each site entrance. The footprint of the tanks are approximately 20 feet by 20 feet.

Operation Electrical Supply

Power for operational and maintenance activities would be provided by the proposed project's electrical generation or supplied by the local power provider. The proposed project would require electrical enclosures, substation equipment, tracker motors (if non-self-powered single-axis trackers are used), battery storage, and plant lighting and security. The battery rooms in the substation buildings would supply DC power for the backup protection equipment.

Decommissioning

The Project has an anticipated operational life of up to 35 years, after which the Applicant may choose to update site technology and recommission, or to decommission the site and remove the systems and their components. All decommissioning and restoration activities would adhere to the requirements of the appropriate governing authorities and in accordance with all applicable federal, state, and County regulations. The site could then be converted to other uses in accordance with the applicable land use regulations in effect at that time.

It is anticipated that during Project decommissioning, Project structures would be removed from the ground on the site. Aboveground equipment that would be removed would include module posts and support structures, onsite transmission poles that are not shared with third parties, and the overhead collection system within the site; inverters, transformers, electrical wiring, battery storage equipment, and equipment on the inverter pads. The Project would include BMPs to ensure the collection and recycling of modules and to avoid the potential for modules to be disposed of as municipal waste. The substation would be removed if they are owned by the Applicant; however, if a public or private utility assumes ownership of the substation, the equipment may remain onsite to be used as part of the utility service to supply other applications.

Equipment would be de-energized prior to removal, salvaged (where possible), placed in appropriate shipping containers, and secured in a truck transport trailer for shipment offsite to be recycled or disposed of at an appropriately licensed disposal facility. Removal of the solar modules would include removing the racks on which the solar panels are attached and placing them in secure transport crates and a trailer for storage for ultimate transportation to another facility or to a recycling or disposal facility. Once the solar modules have been removed, the racks would be disassembled and the structures supporting the racks would be removed. Site infrastructure would be removed, including the fences and the concrete pads that may support the inverters, transformers, and related equipment, and concrete posts will be removed to grade level. The demolition debris and removed equipment may be cut or dismantled into pieces that can be safely lifted or carried with the equipment being used. All removed materials would be recycled to the extent feasible.

1.5. Project Objectives

The project proponent had defined the following objectives for the proposed project:

- Establish solar PV power-generation with battery energy storage facilities of sufficient size and configuration to produce reliable electricity in an economically feasible and commercially financeable manner that can be marketed to different California utility companies.
- Utilize vacant land with limited water for a renewable energy project over 35 years.
- Assist the County in promoting its role as the State’s leading producer of renewable energy.
- Provide green jobs to Kern County residents and the state of California
- Site and design the project in an environmentally responsible manner which includes:
    - Locating generation facilities in areas which receive intense solar radiation;
    - Using existing electrical transmission facilities, rights-of-way, roads, and other existing infrastructure where practical;

  - Minimizing water use; and,
  - Reducing greenhouse gas emissions

- Support California's efforts to reduce greenhouse gas emissions consistent with California Assembly Bill 32, the Global Warming Solutions Act of 2006, and Senate Bill 32, to at least 40 percent below the statewide greenhouse gas emissions limit by 2030.

1.6. Proposed Discretionary Actions/Required Approvals

The Kern County Planning and Natural Resources Department as the CEQA Lead Agency (per CEQA Guidelines Section 15052) has discretionary responsibility for the Enterprise Solar Storage Project owned by Enterprise Solar Storage, LLC. To implement this project, the project proponent may need to obtain the following discretionary and ministerial permits/approvals, but not be limited to:

- **Federal**
  - U.S. Fish and Wildlife Service (USFWS) Section 10 Incidental Take Permit and Habitat Conservation Plan (if required).
- **State**
  - California Public Utilities Commission (CPUC)
    - Section 851 Permit
  - California Department of Fish and Wildlife (CDFW)
    - Section 2081 Permit (State-listed endangered species) (if required)
  - Central Valley Water Quality Control Board (RWQCB)
    - Regional Water Quality Certification (401 Permit) (if required)
    - National Pollution Discharge Elimination System (NPDES) Construction General Permit
    - General Construction Stormwater Permit (Preparation of a SWPPP)
  - California Department of Transportation (Caltrans)
    - Right-of-Way Encroachment Permit (if required)
    - Permit for Transport of Oversized Loads
- **Local**
  - Kern County
    - Certification of Final Environmental Impact Report
    - Adoption of 15091 Findings of Fact and 15093 Statement of Overriding Considerations
    - Adoption of Mitigation Monitoring and Reporting Program

- Approval of Amendments to the Kern County General and Specific Plans
- Approval of Changes in Zone Classifications
- Approval of Conditional Use Permits for the project sites
- Approval of Non-Summary Vacations of Public Access Easements
- Approval of Kern County Grading and Building Permits
- Approval of Kern County Encroachment Permits
- Approval of Fire Safety Plan

- East Kern Air Pollution Control District
  - Approval of Fugitive Dust Control Plan
  - Authority to Construct (ATC)
  - Permit to Operate (PTO)

The preceding discretionary actions/approvals are potentially required and do not necessarily represent a comprehensive list of all possible discretionary permits/approvals required. Other additional permits or approvals from responsible agencies may be required for the proposed project

Figure 1 – Regional Vicinity

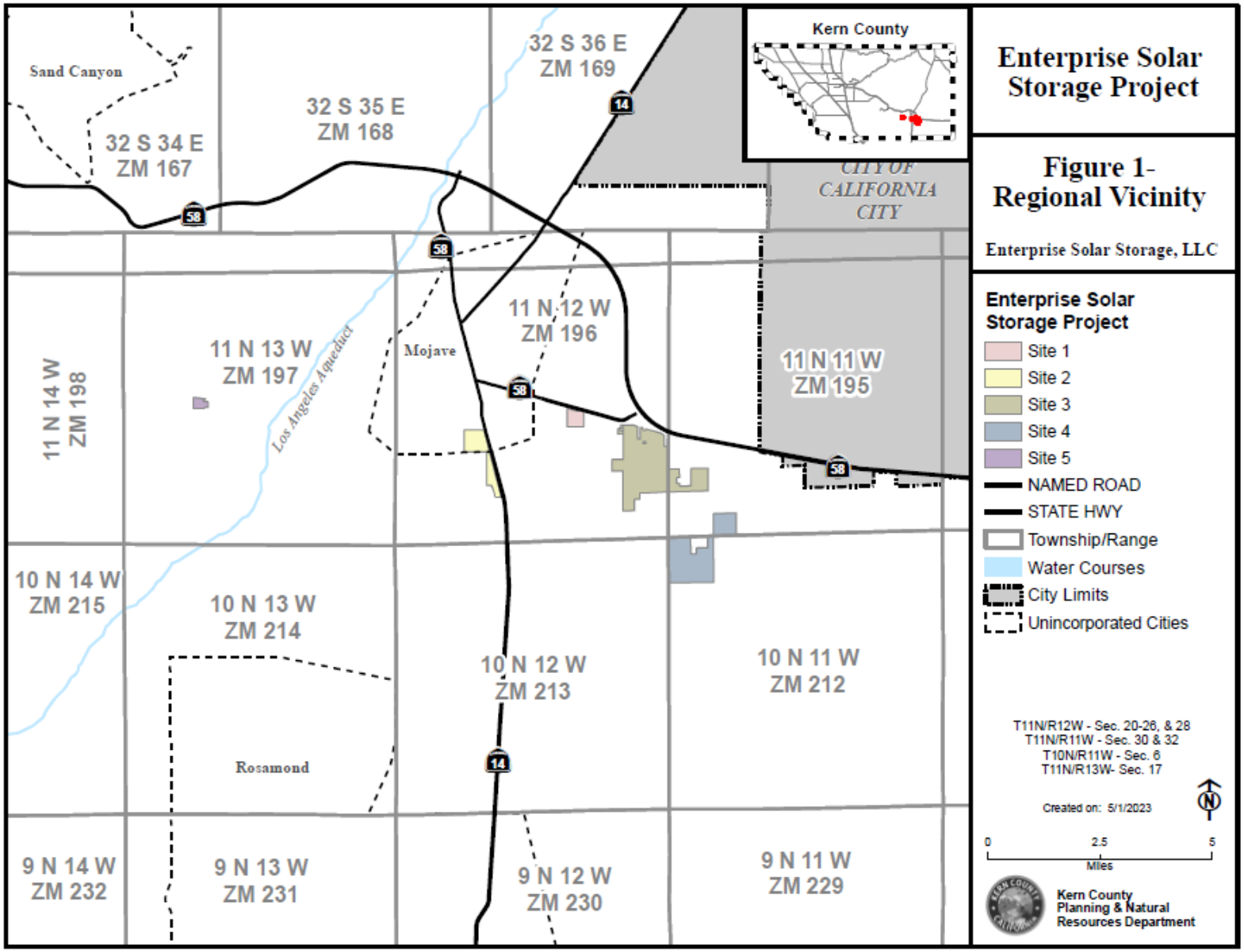


Figure 2 – Local Vicinity

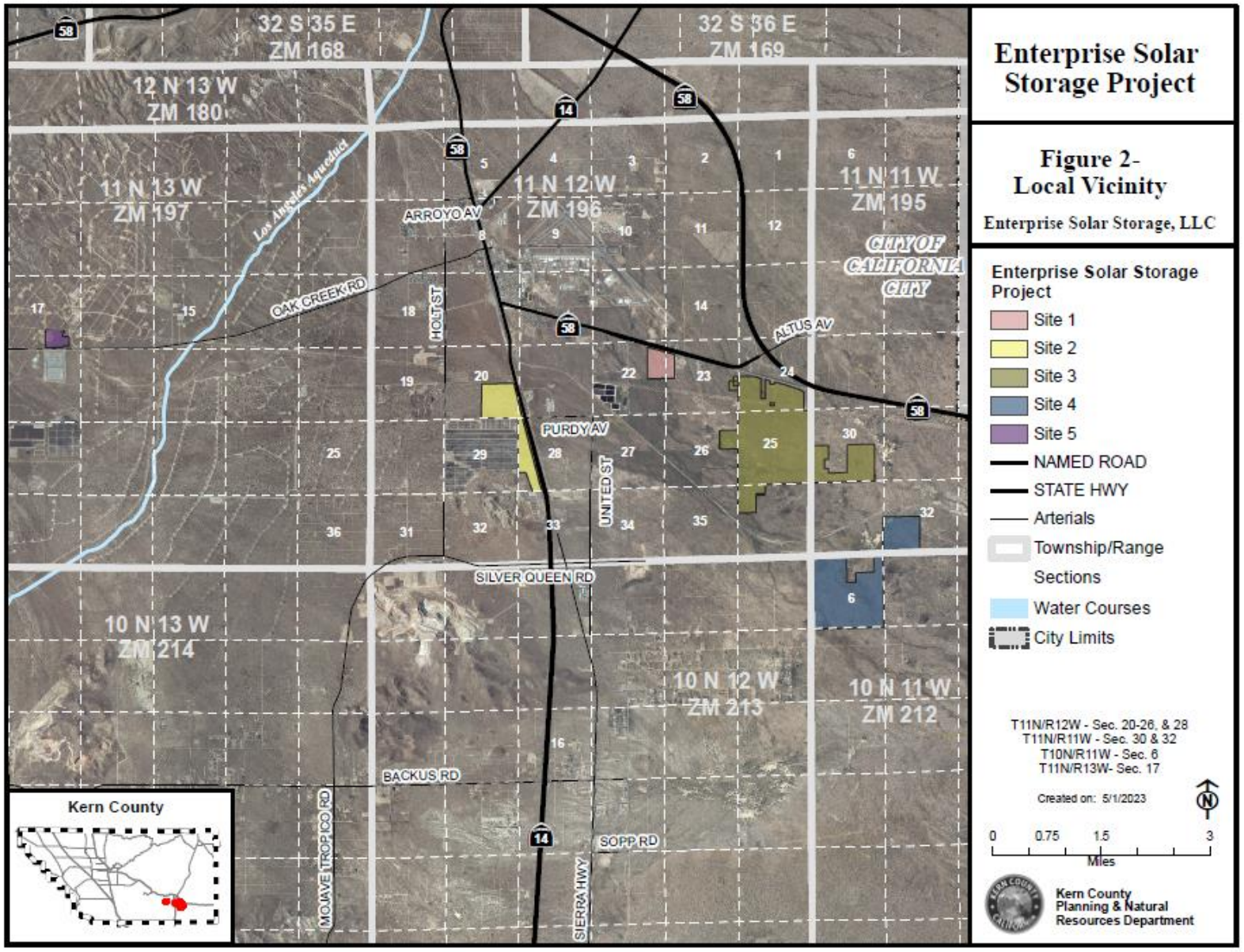


Figure 3 – Flood Hazard

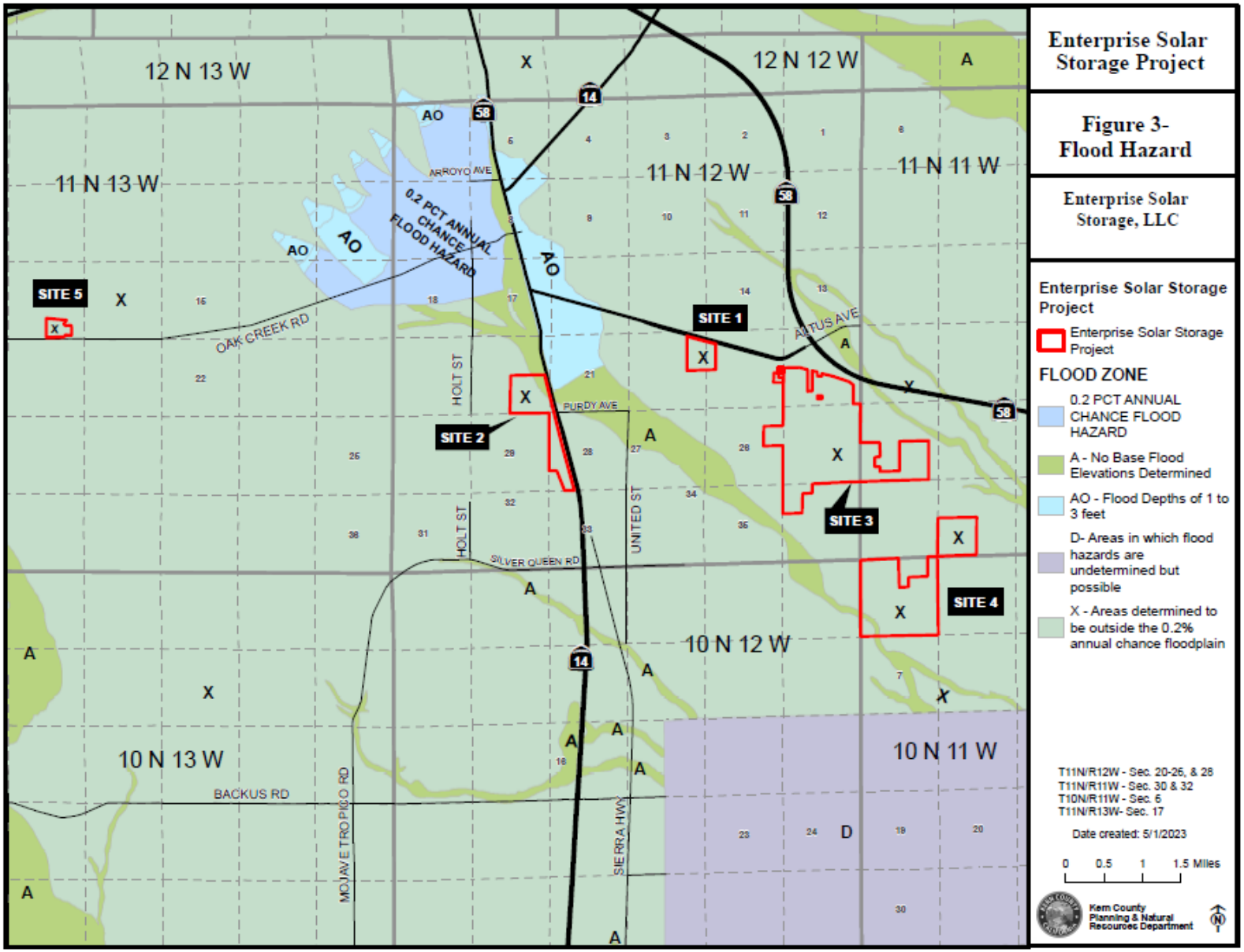


Figure 4a – Existing General/Specific Plan Designations (Site 1)

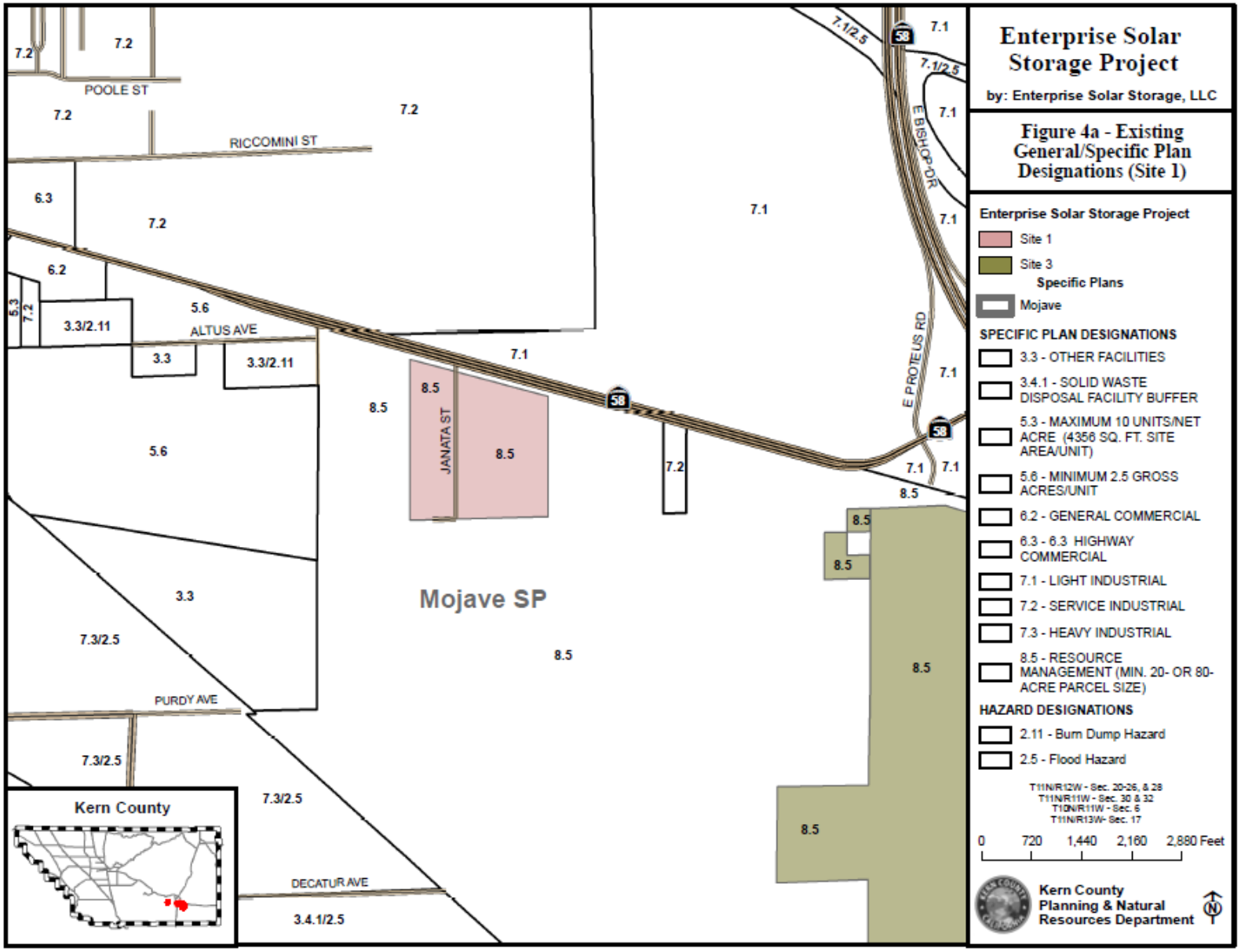


Figure 4b – Existing General/Specific Plan Designations (Site 2)

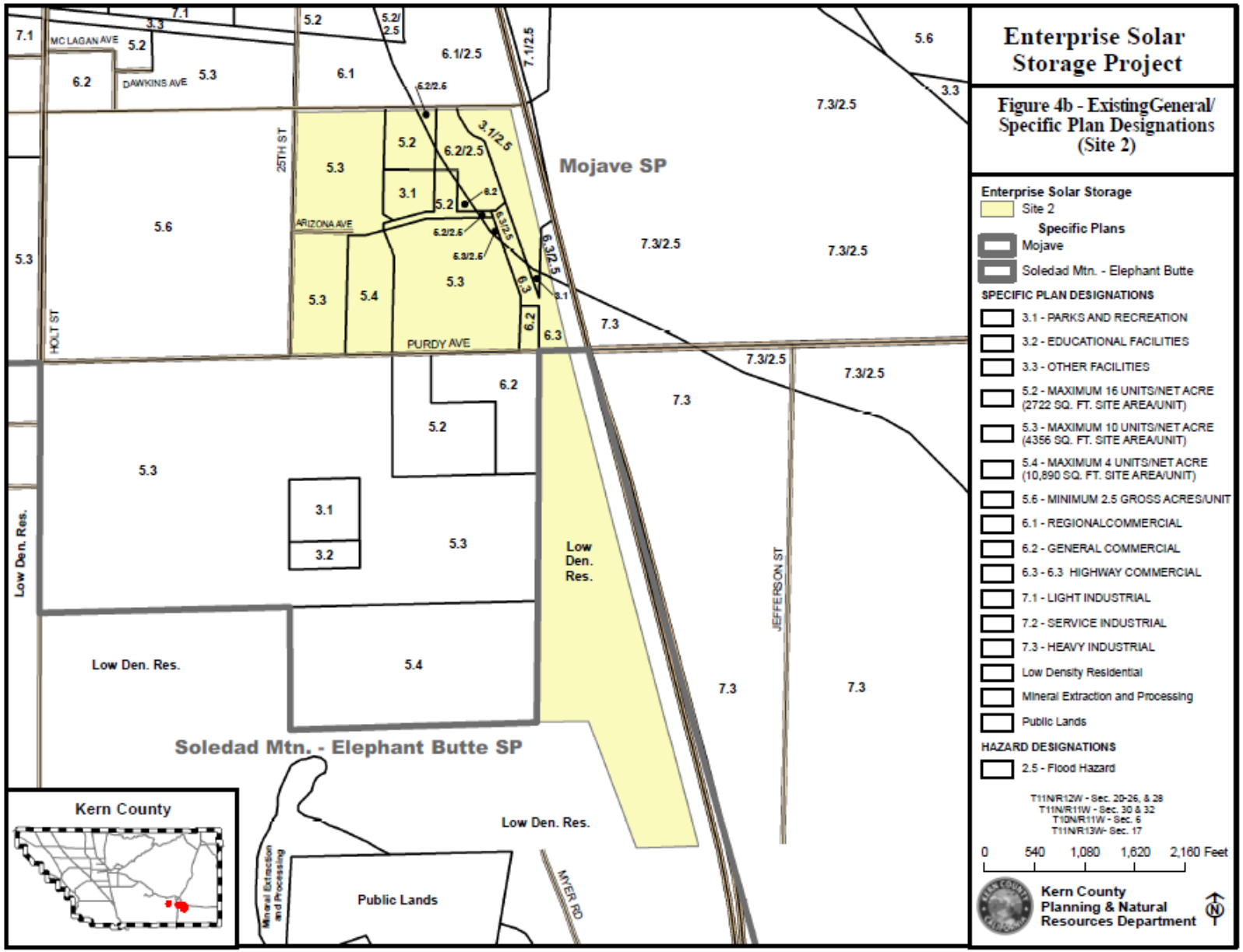


Figure 4c – Existing General/Specific Plan Designations (Site 3)

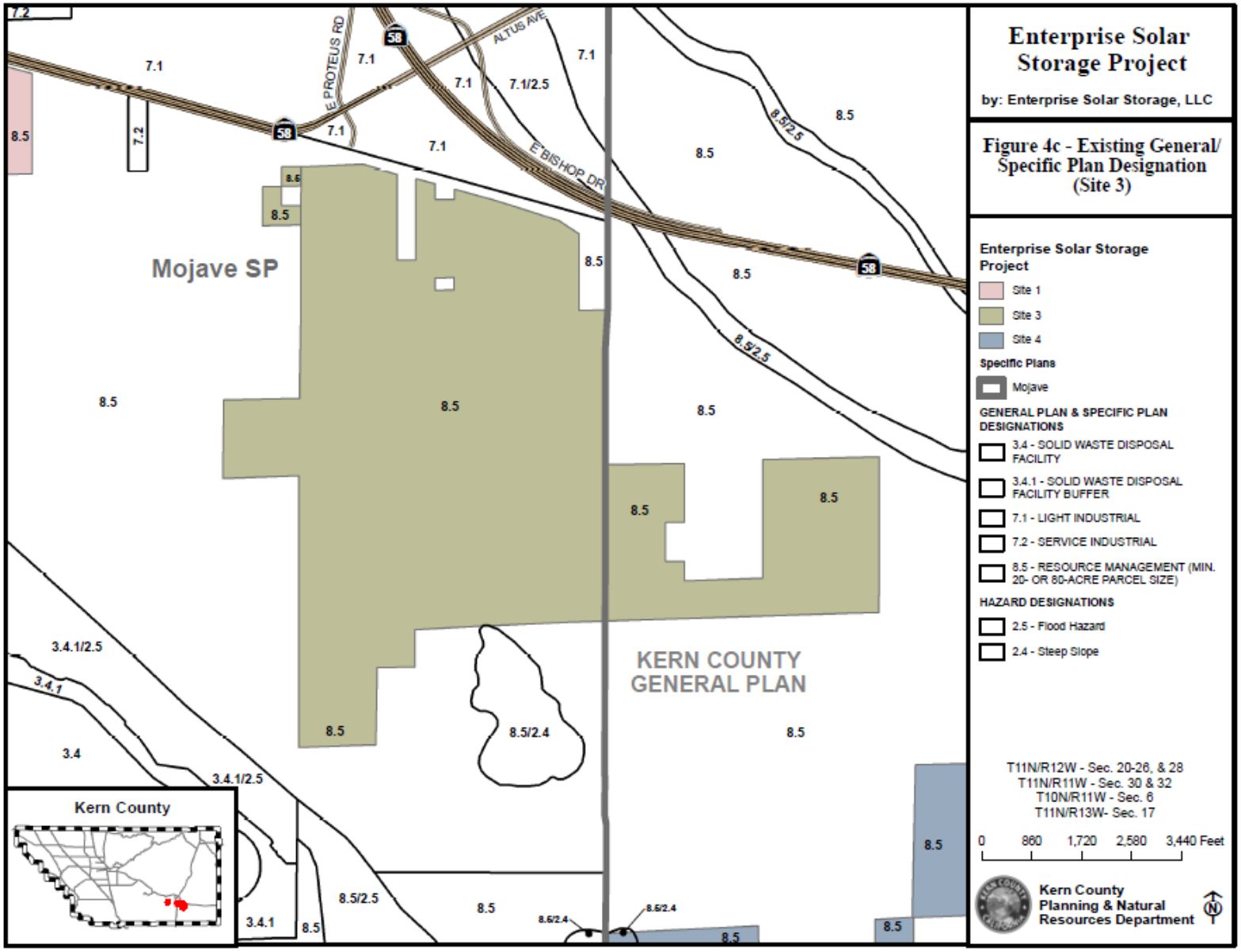


Figure 4d – Existing General/Specific Plan Designations (Site 4)

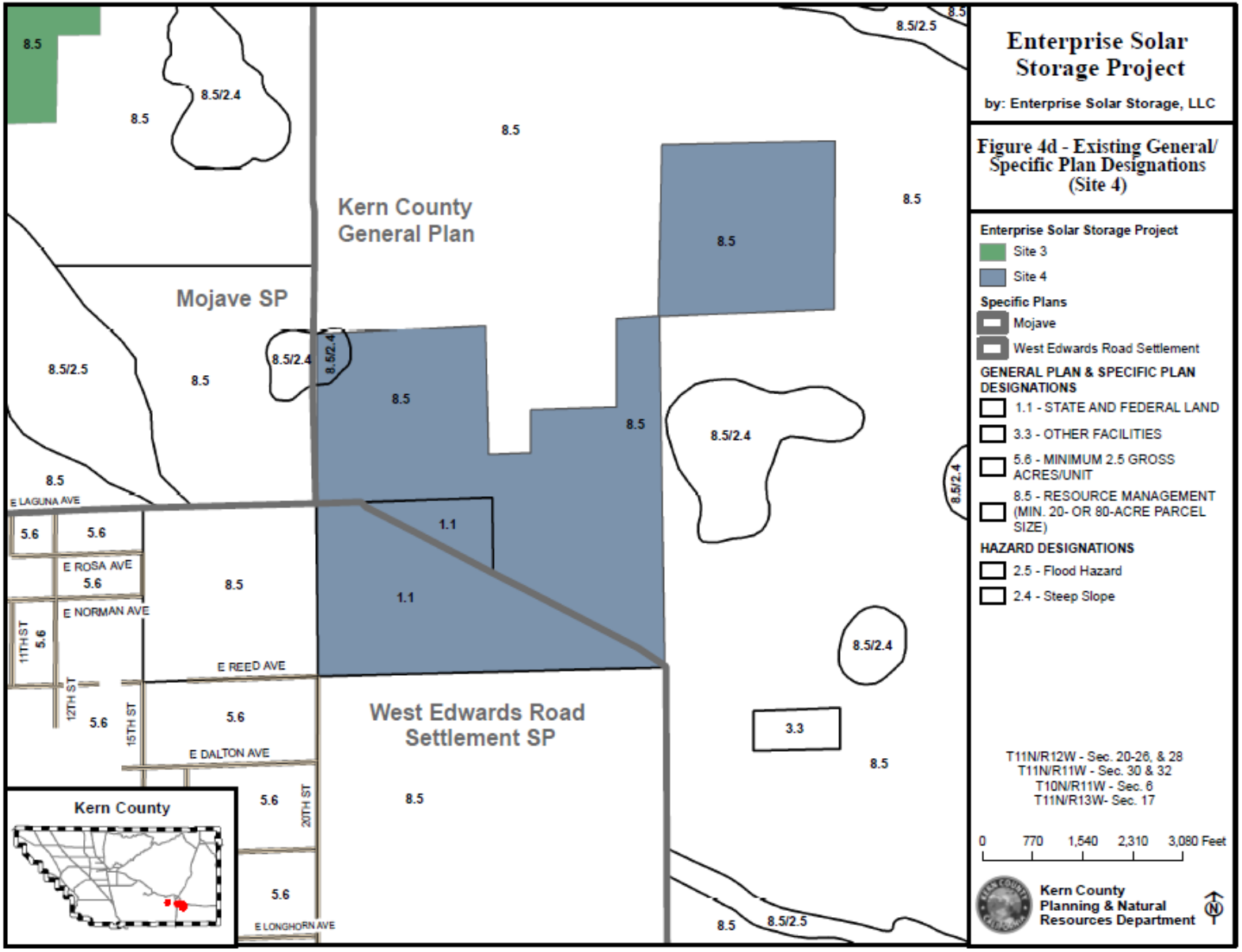


Figure 4e – Existing General/Specific Plan Designations (Site 5)

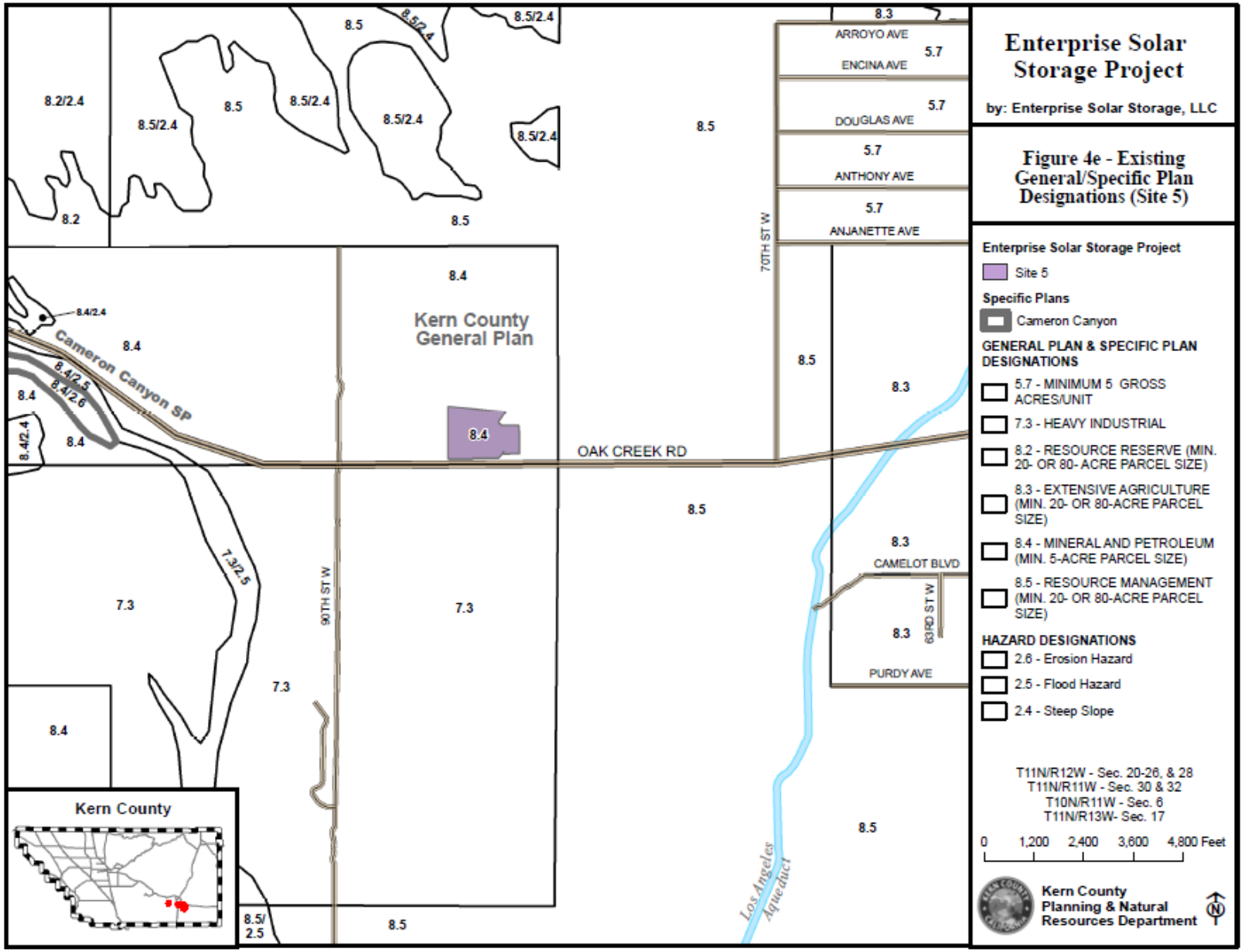


Figure 5a – Existing Zoning Classifications (Site 1)

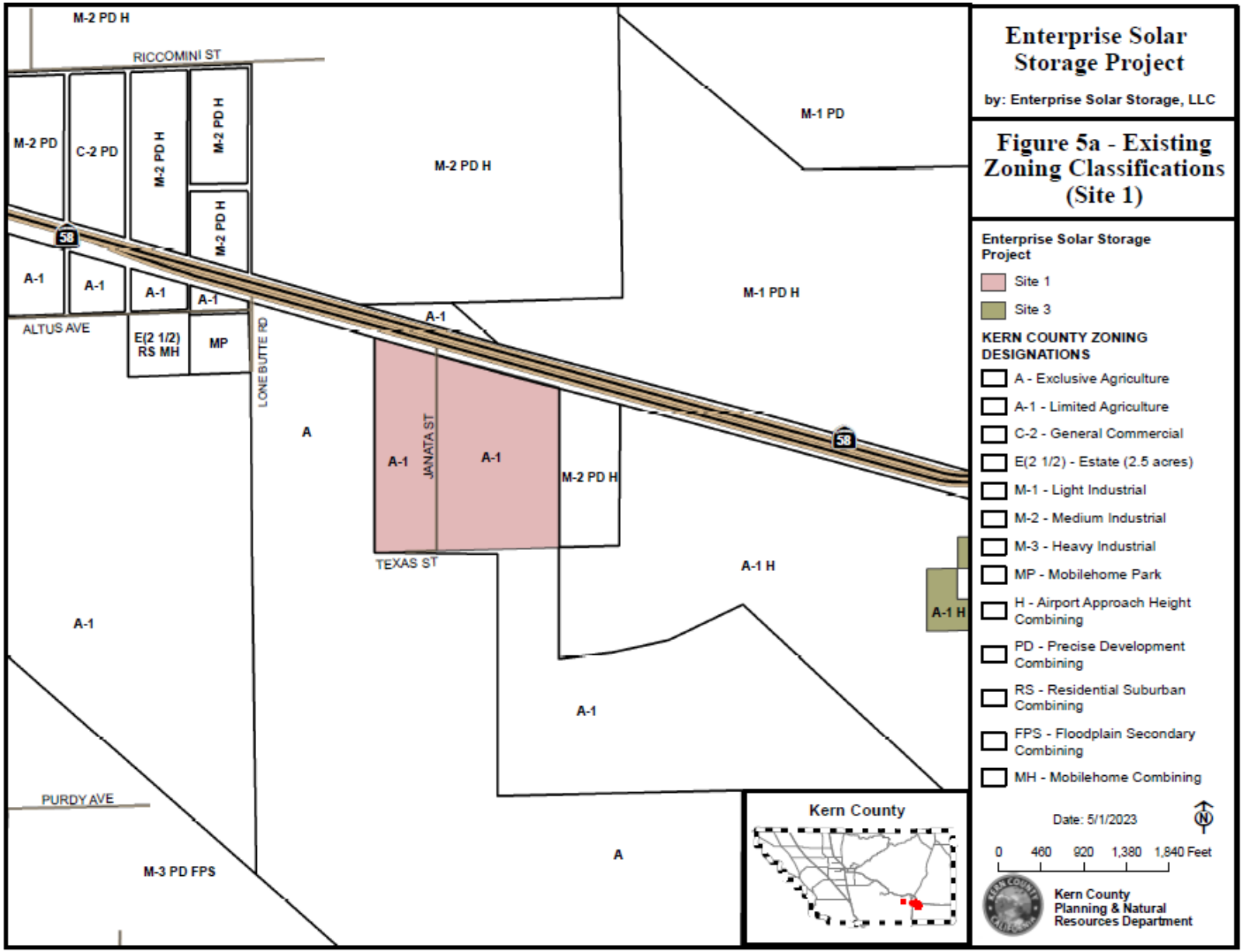


Figure 5b – Existing Zoning Classifications (Site 2)

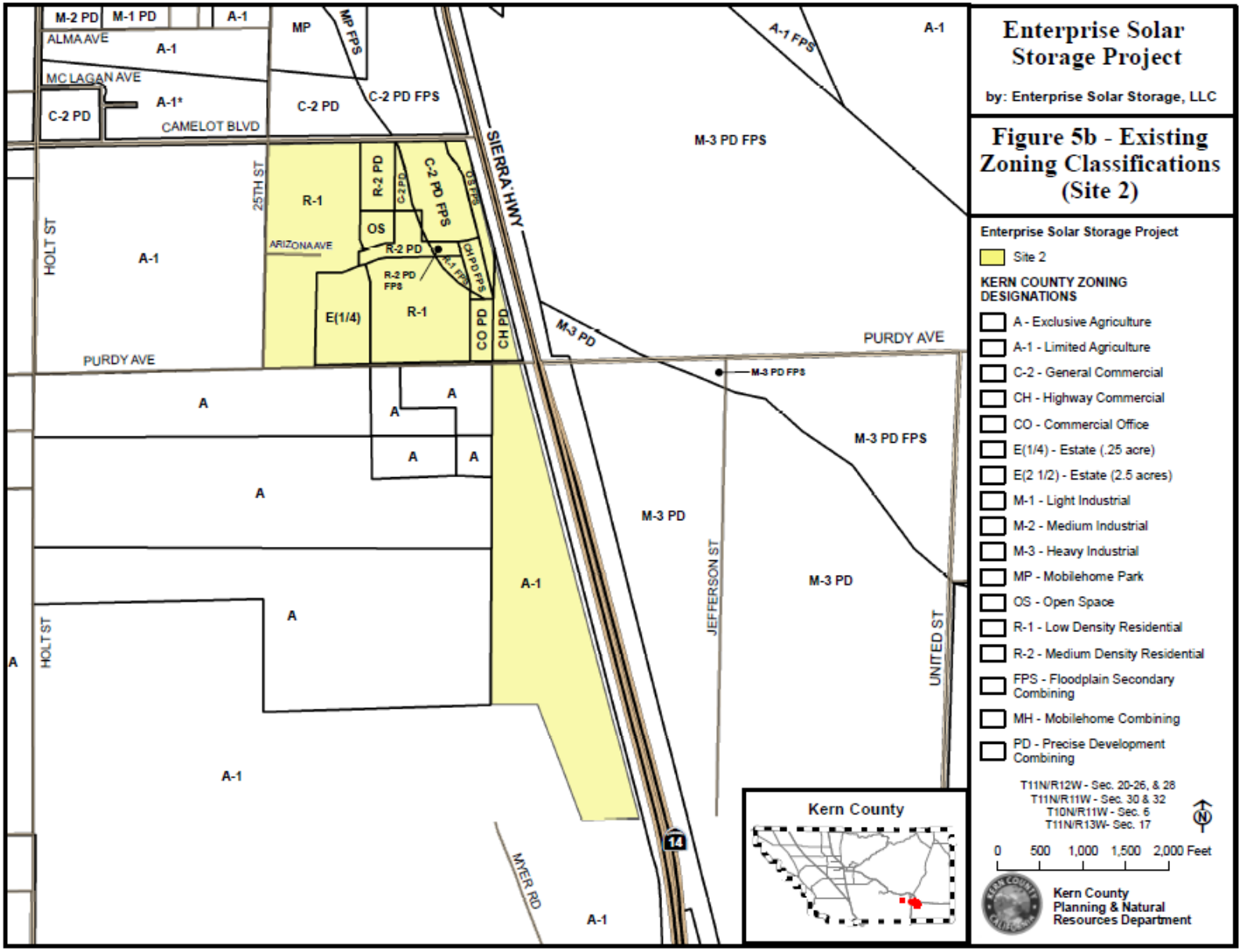


Figure 5c – Existing Zoning Classifications (Site 3)

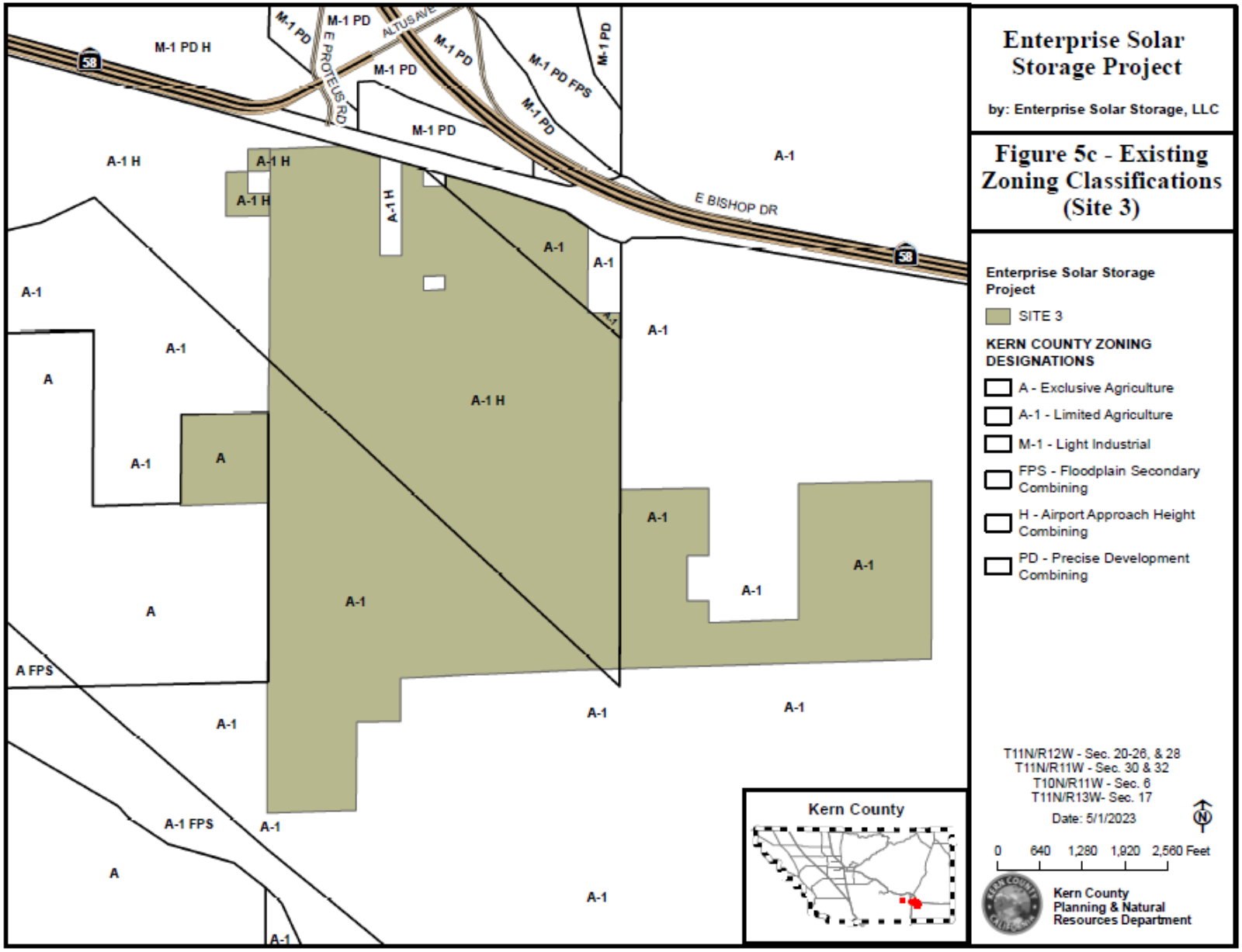


Figure 5d – Existing Zoning Classifications (Site 4)

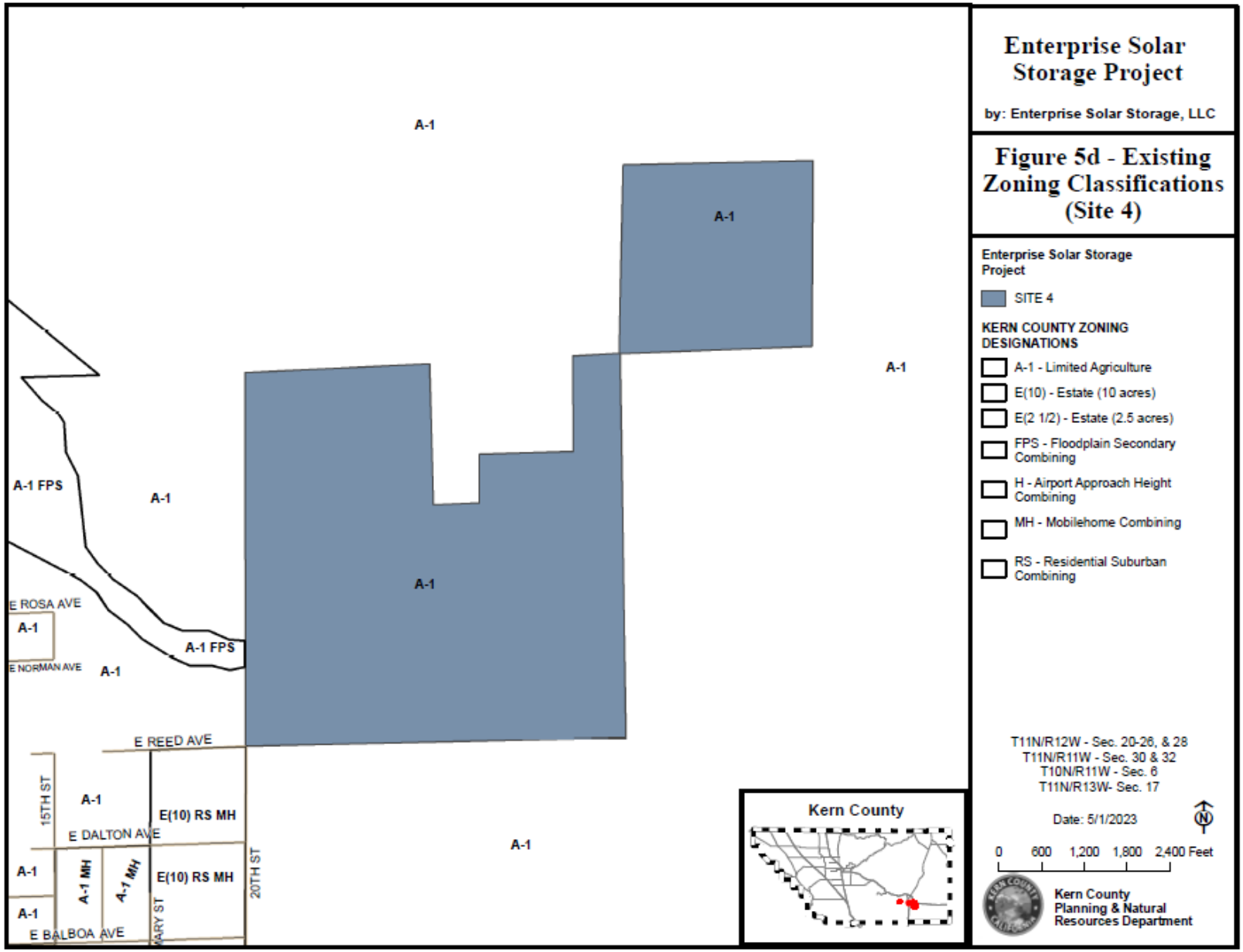


Figure 5e – Existing Zoning Classifications (Site 5)

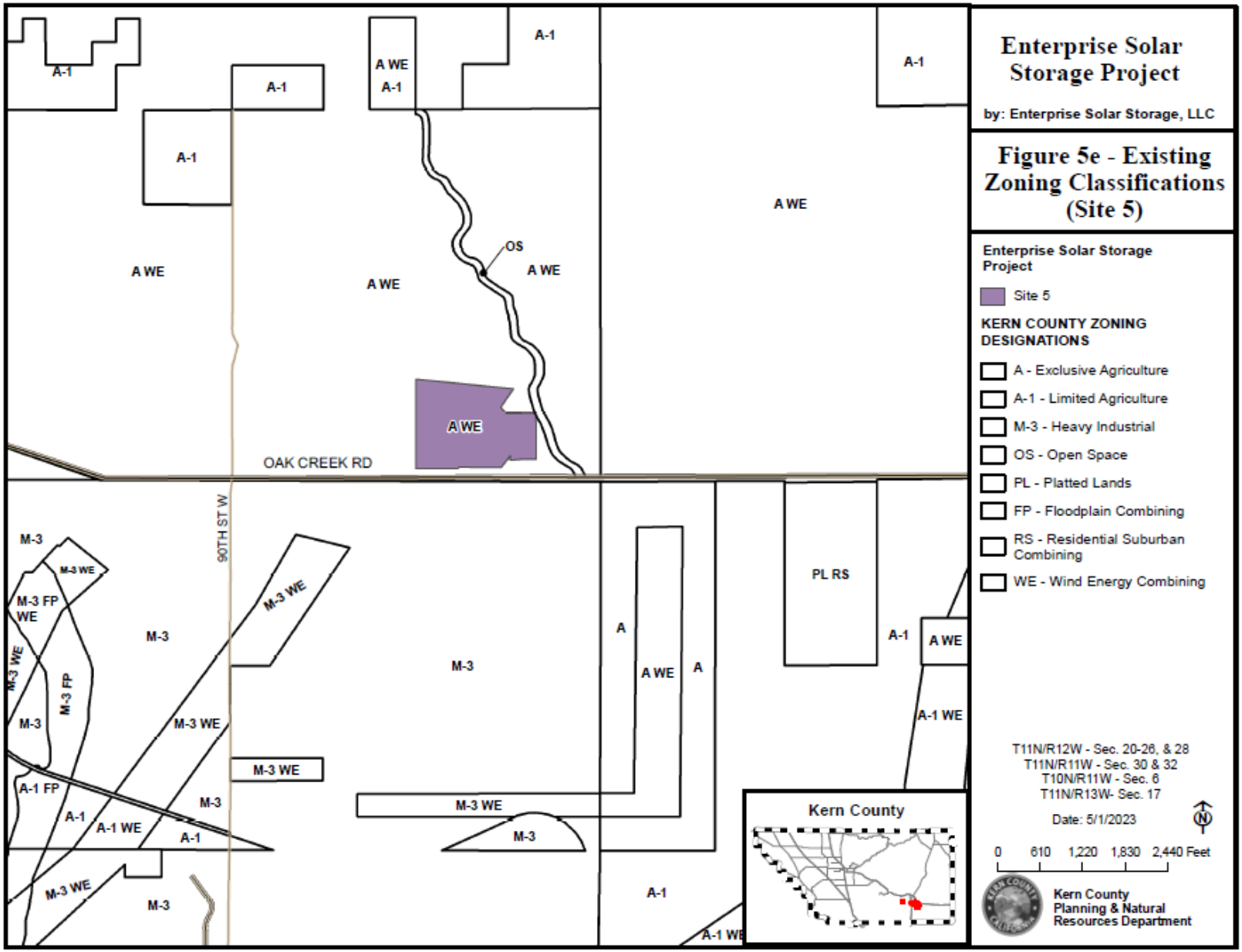


Figure 6 – Existing ALUCP

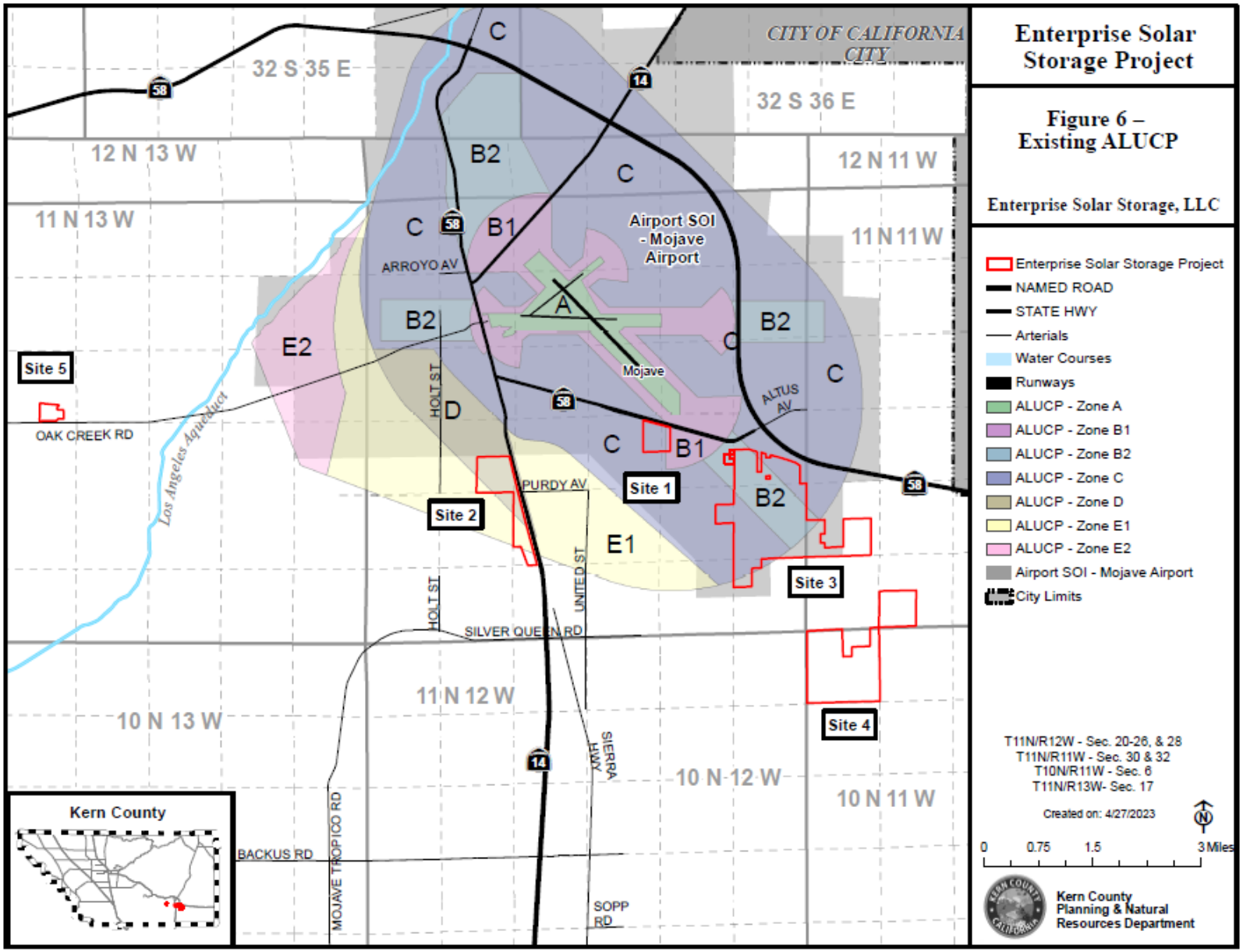


Figure 7a – Proposed General/Specific Plan Designations (Site 2)

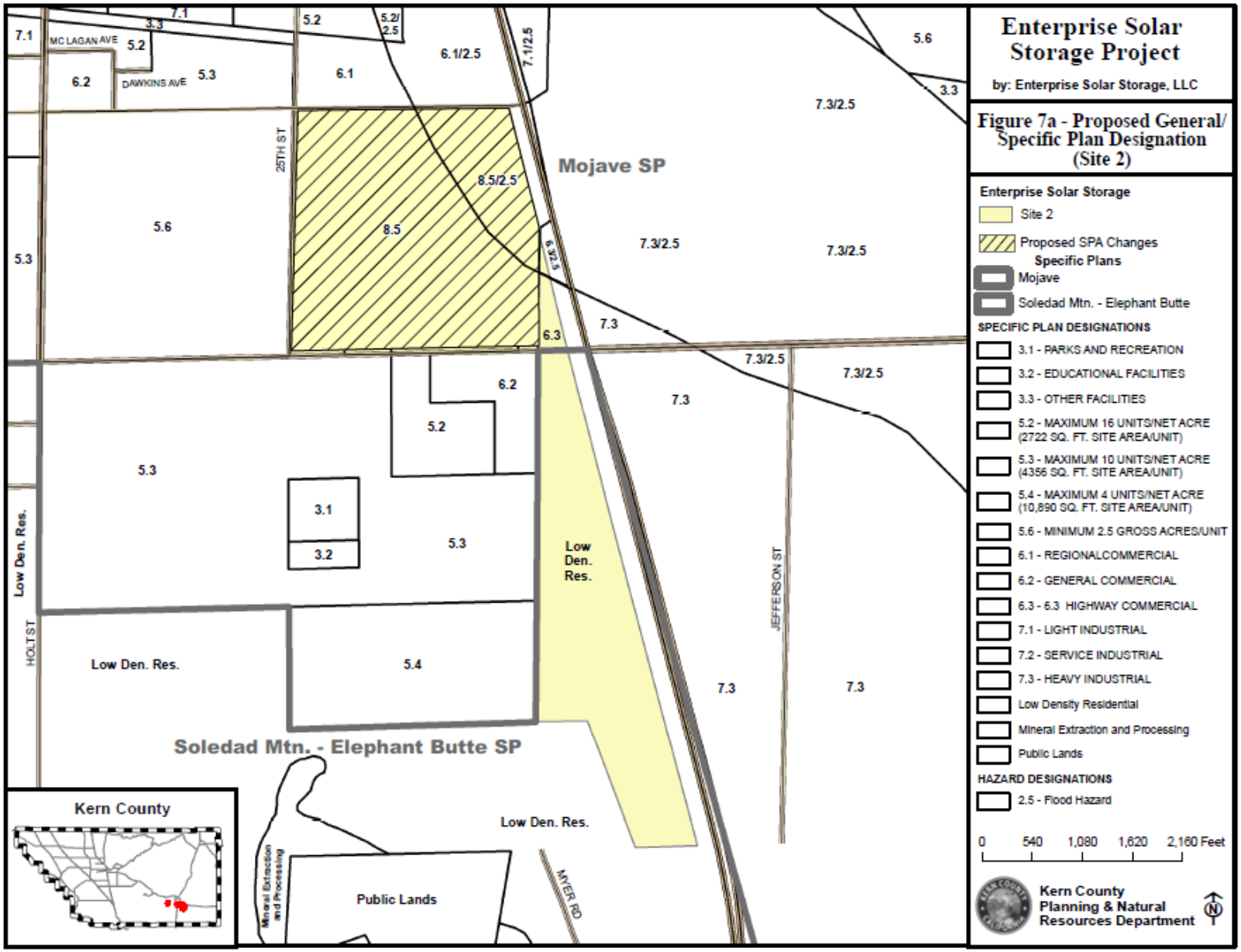


Figure 7b – Proposed General/Specific Plan Designations (Site 4)

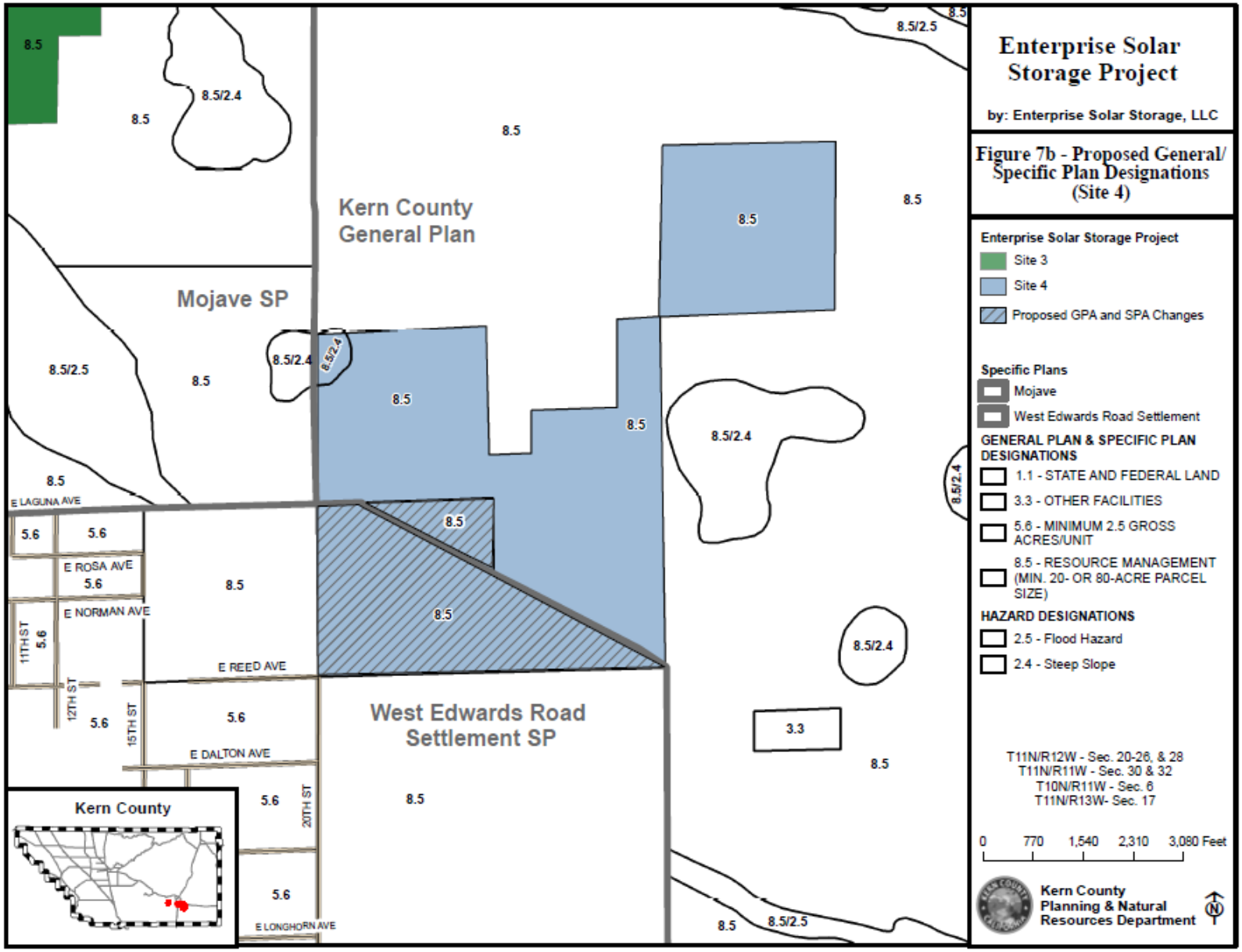


Figure 8a – Proposed Zoning Classifications (Site 1)

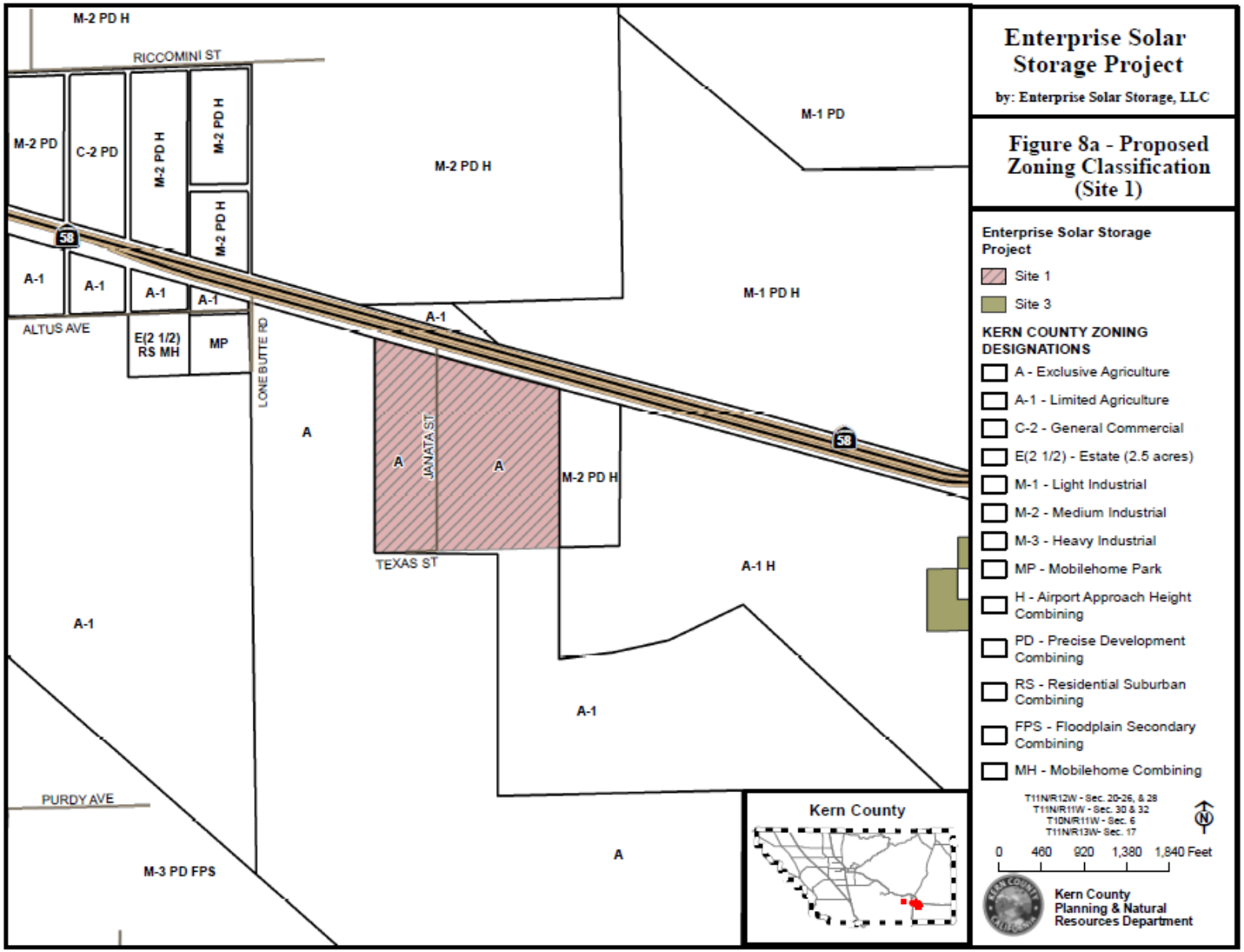


Figure 8b – Proposed Zoning Classifications (Site 2)

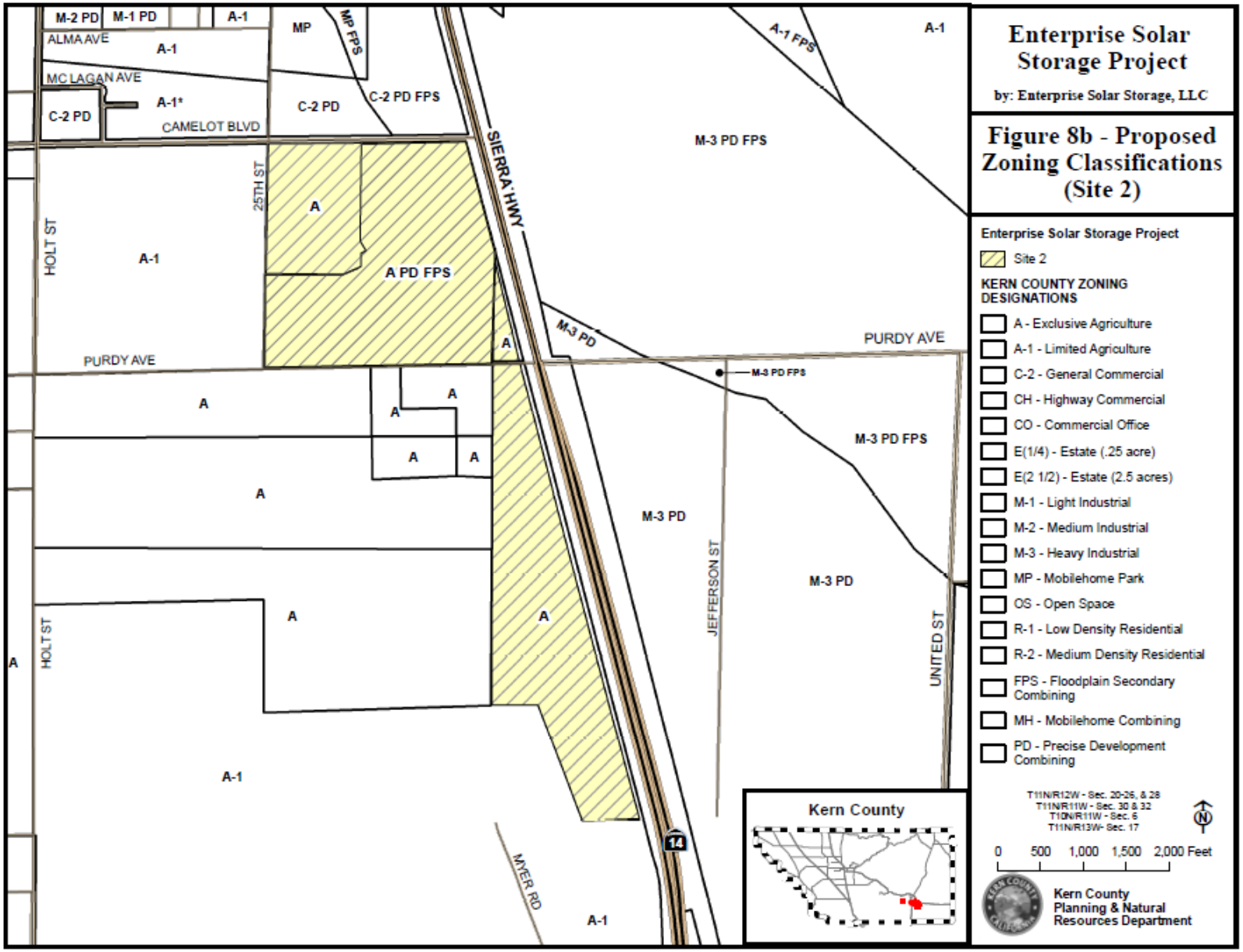


Figure 8c – Proposed Zoning Classifications (Site 3)

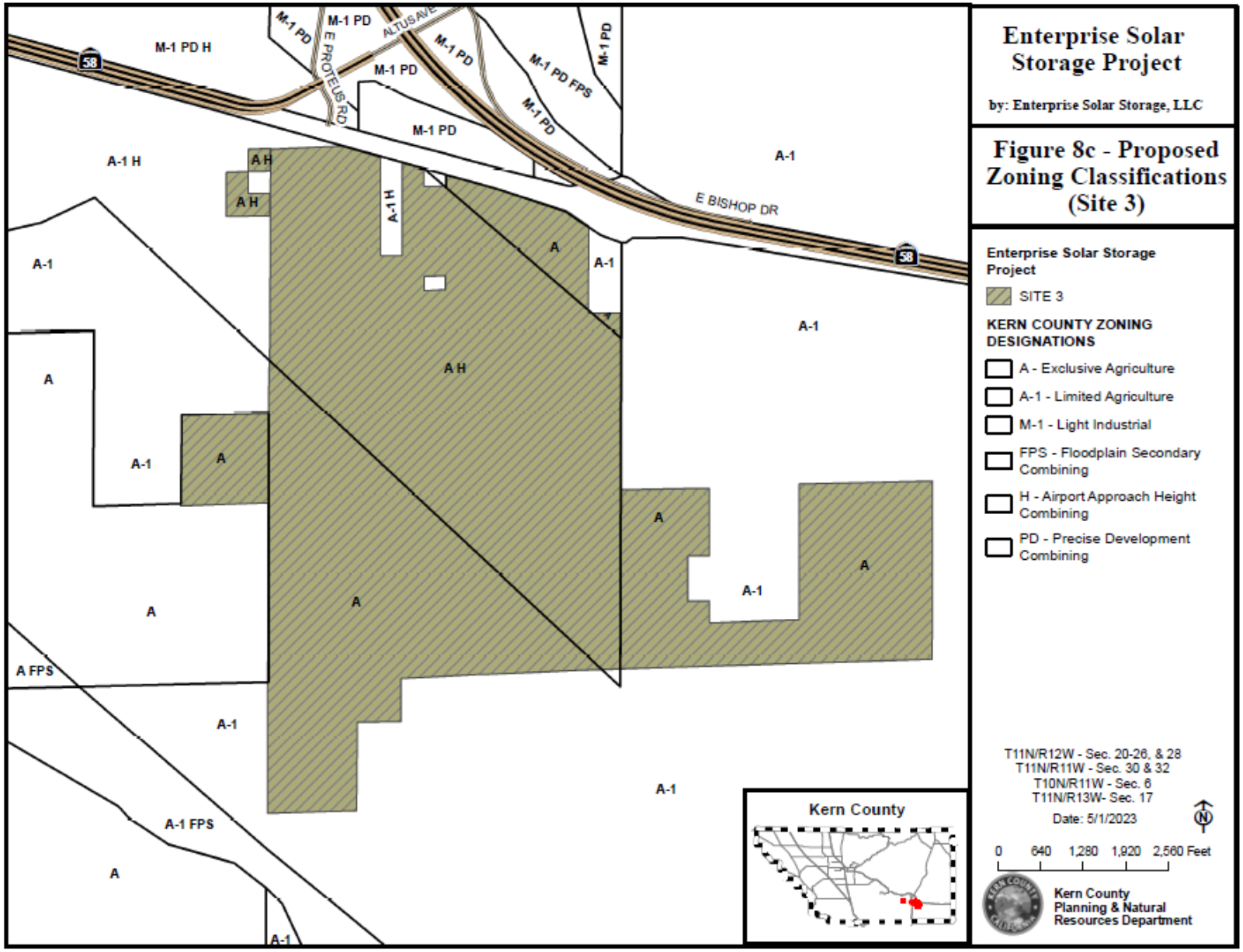


Figure 8d – Proposed Zoning Classifications (Site 4)

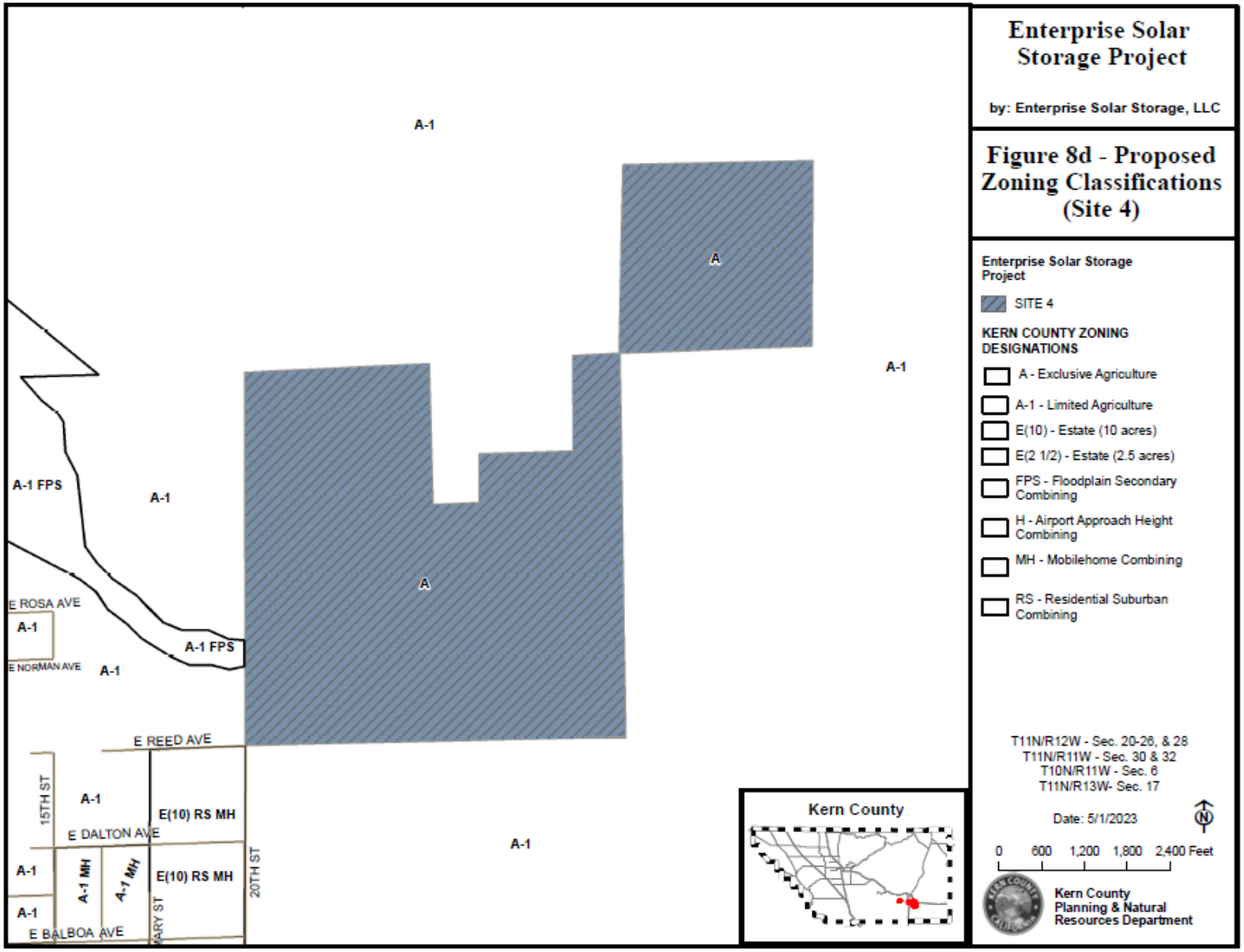


Figure 9 – Circulation Element Amendment

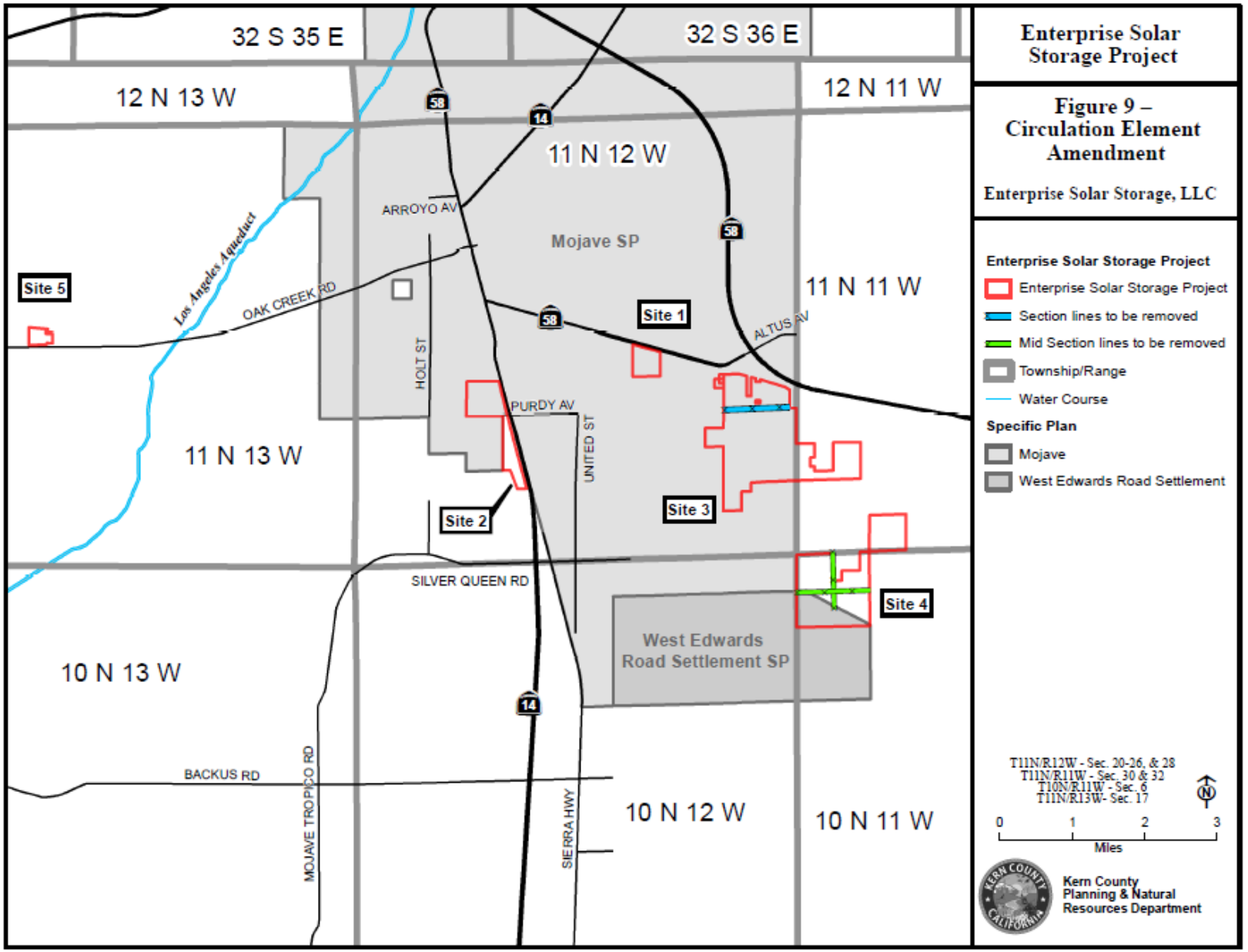


Figure 10a – Nonsummary Street Vacations (Site 1)

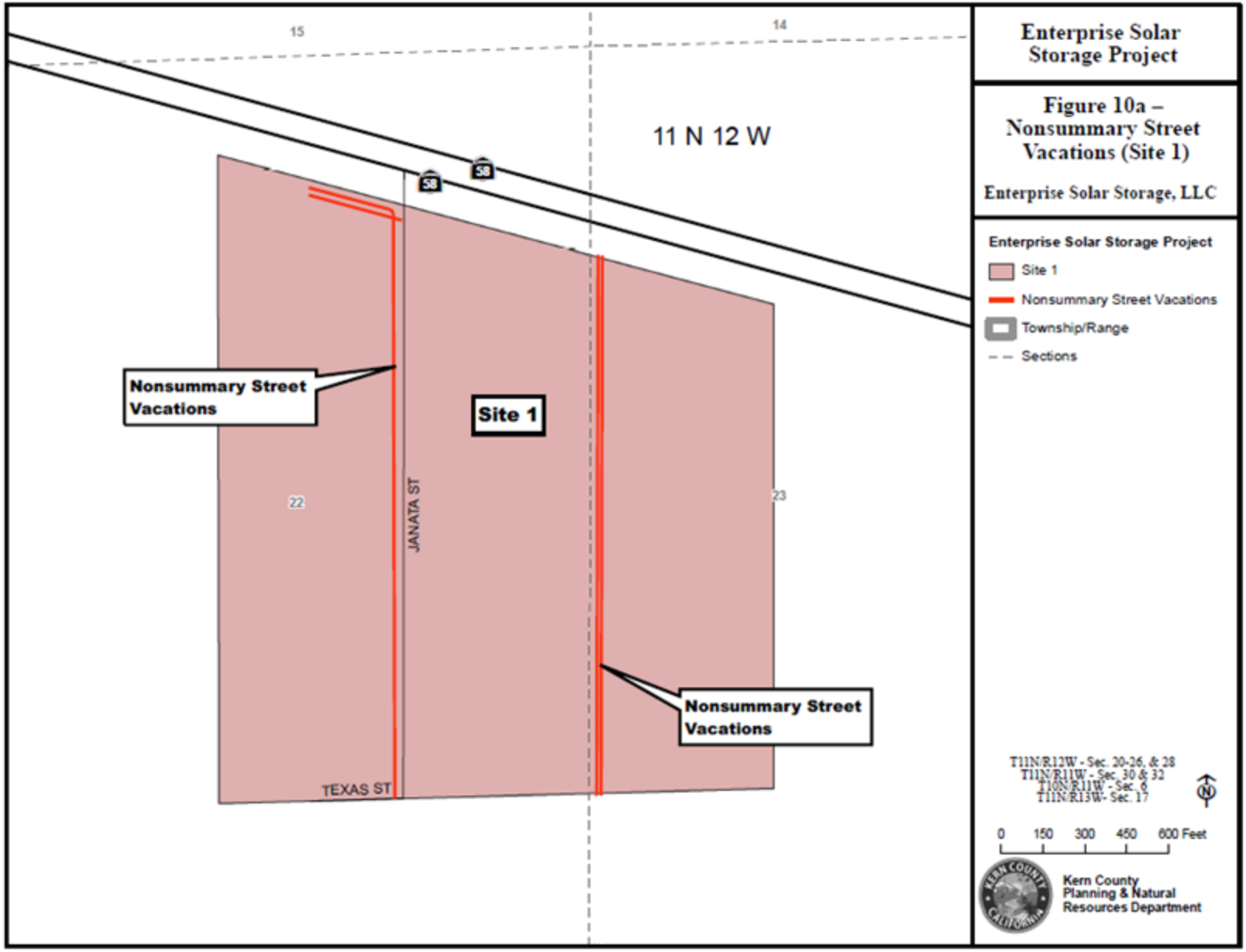


Figure 10b – Nonsummary Street Vacations (Site 2)

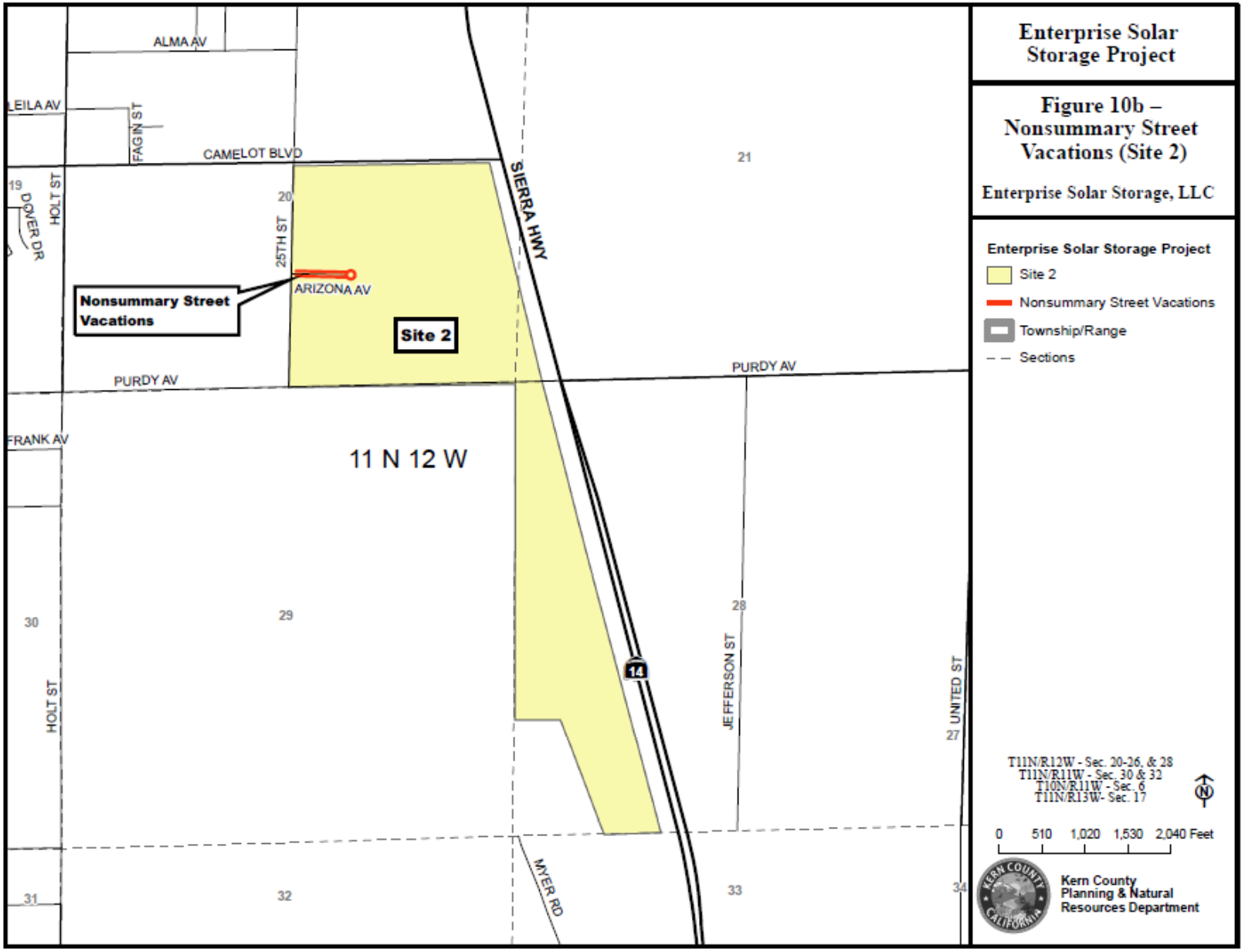


Figure 10c – Nonsummary Street Vacations (Site 3)

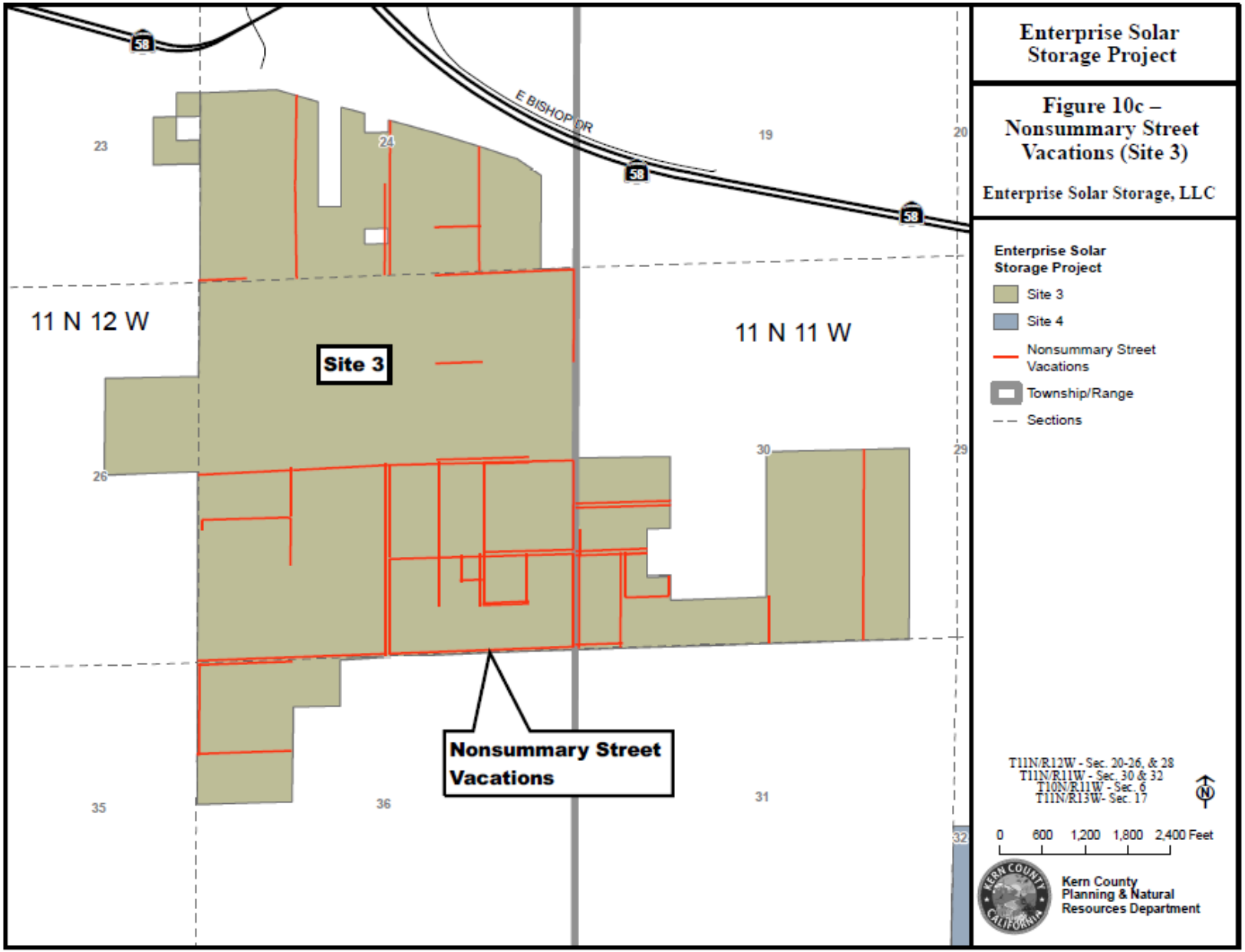


Figure 10d – Nonsummary Street Vacations (Site 4)

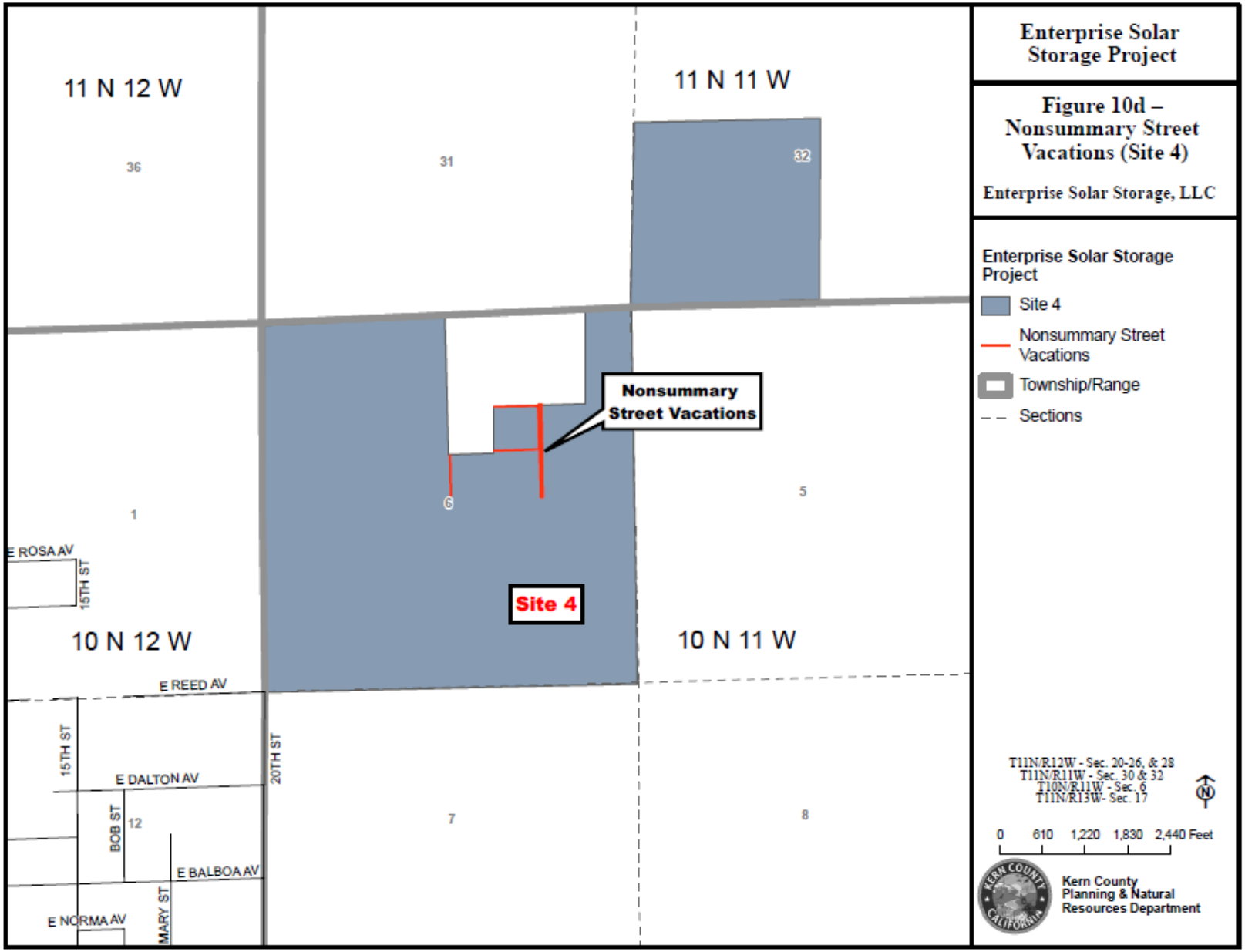


Figure 11 – Proposed Site Plan Overview

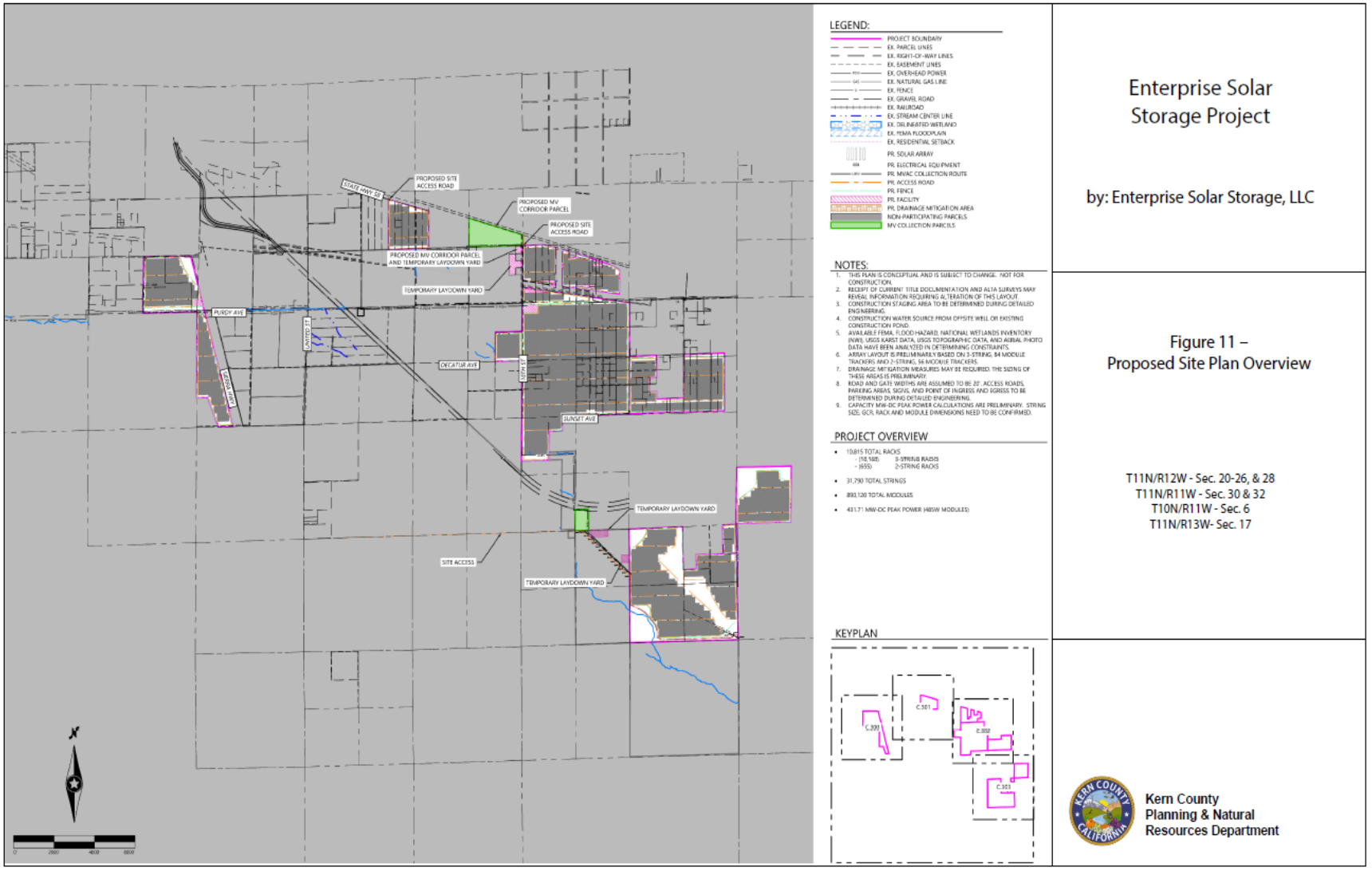


Figure 11a – Proposed Site 1 Plan

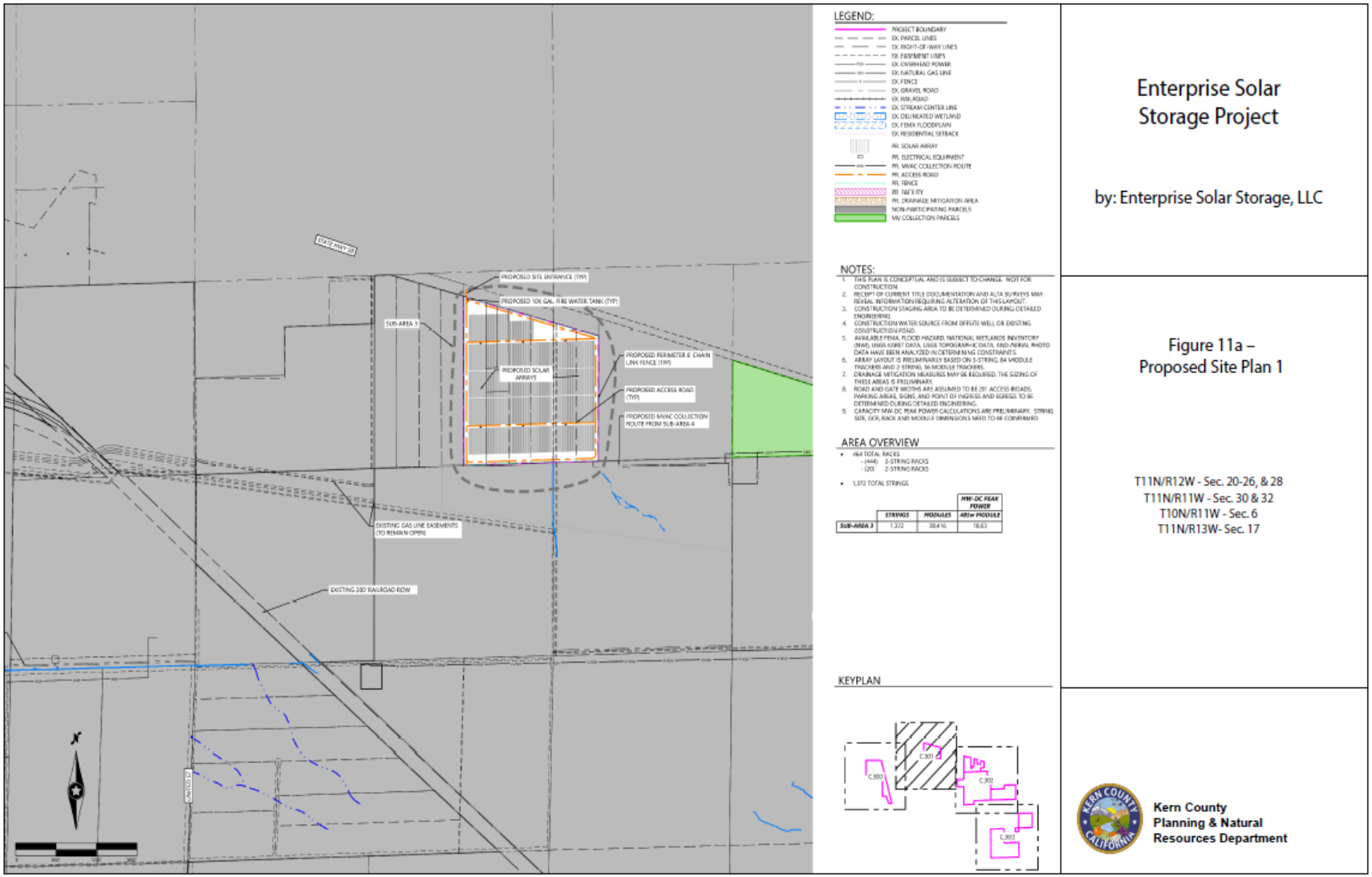


Figure 11b – Proposed Site 2 Plan

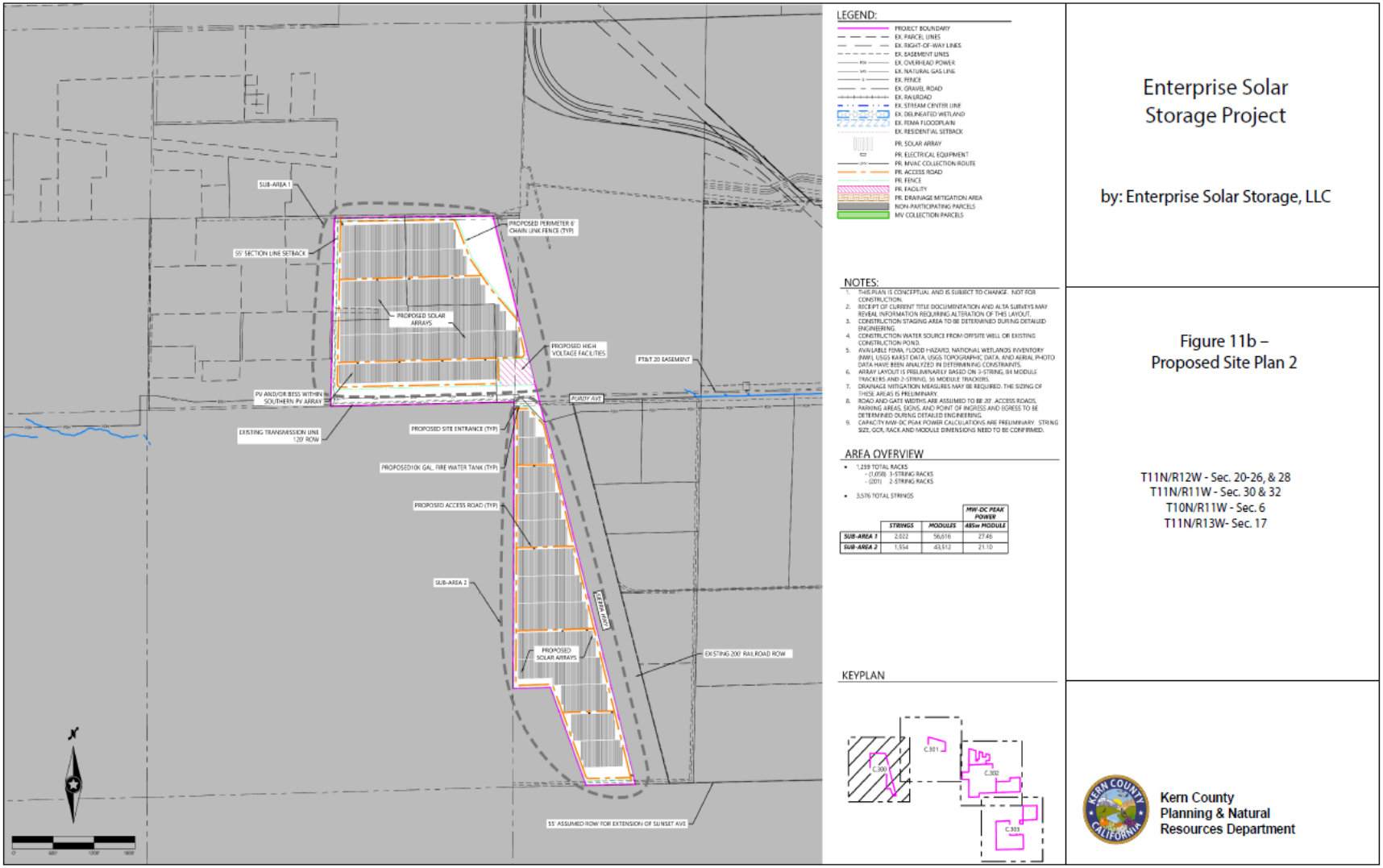


Figure 11c – Proposed Site 3 Plan

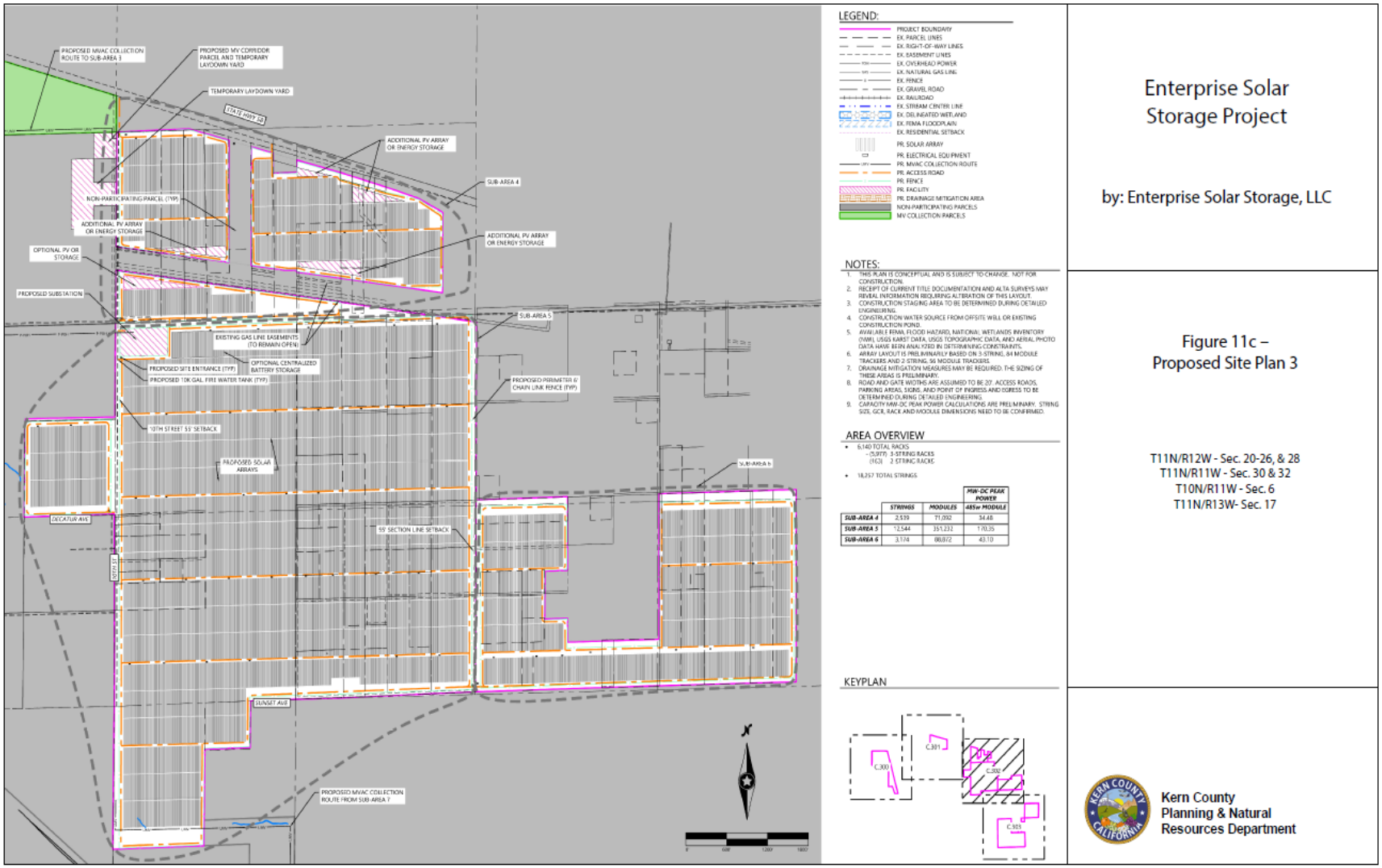


Figure 11d – Proposed Site 4 Plan

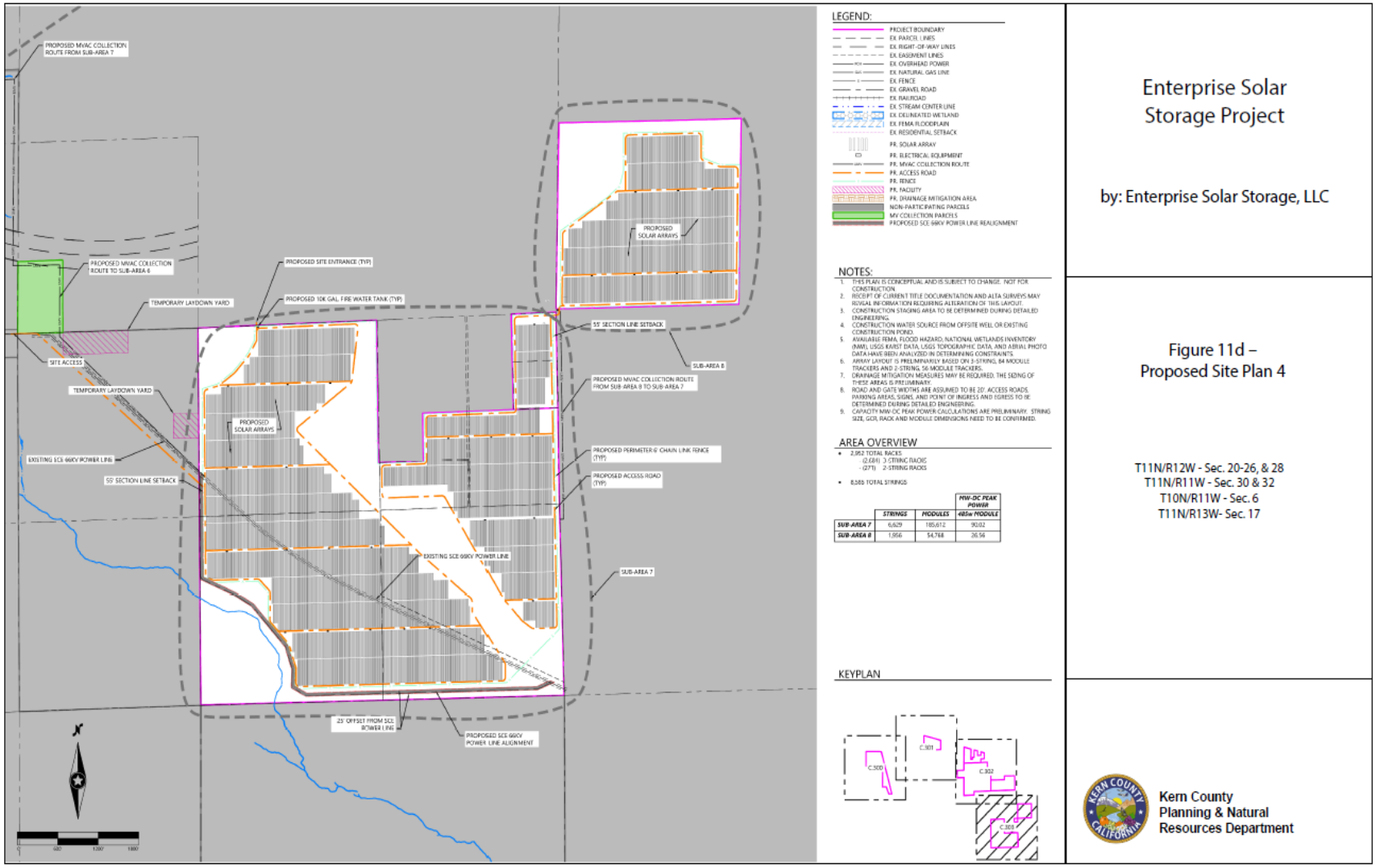
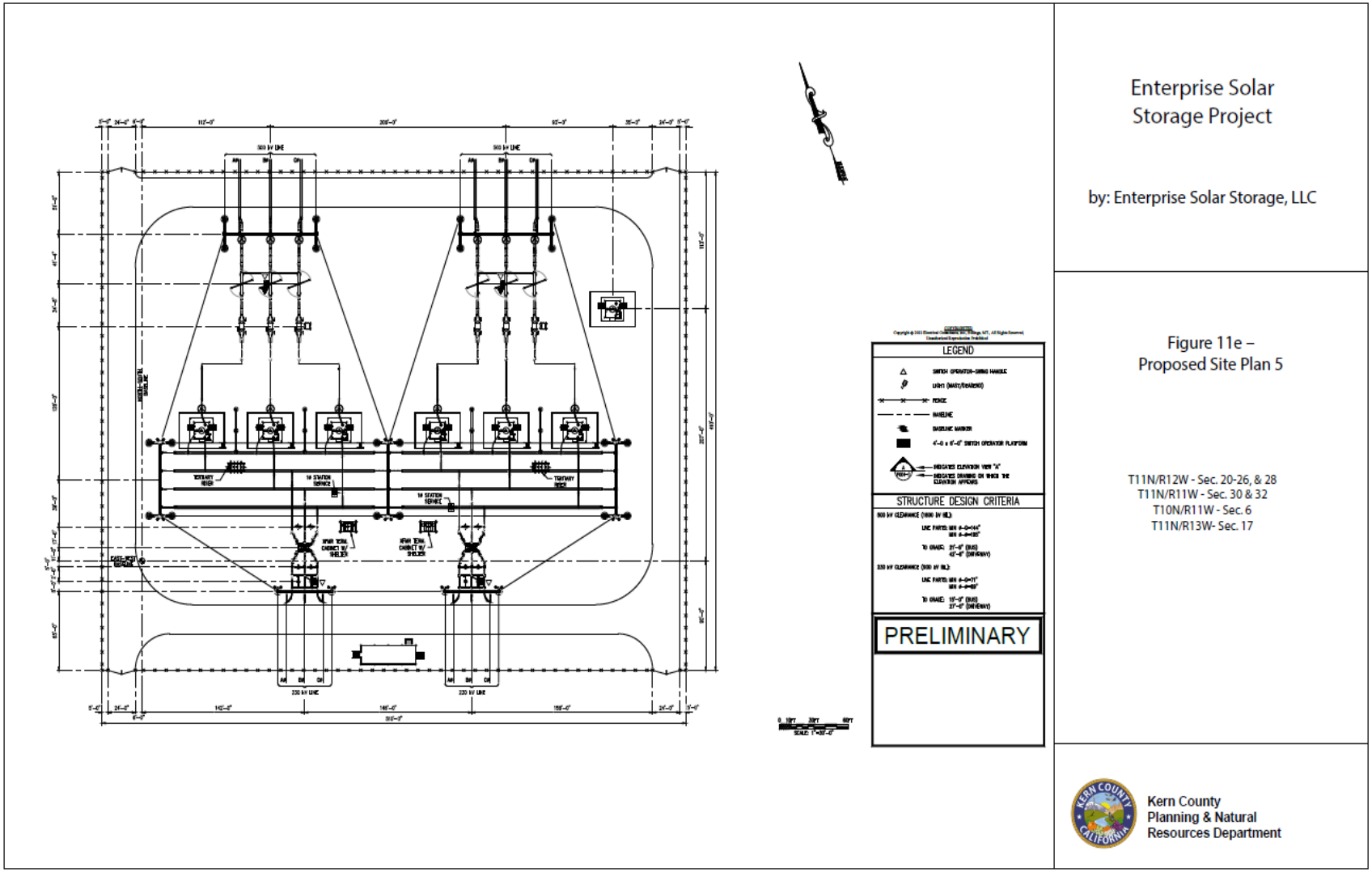


Figure 11e – Proposed Site 5 Plan



2. Kern County Environmental Checklist Form

2.1. Environmental Factors Potentially Affected

In accordance with CEQA Guidelines, the County intends to prepare an Environmental Impact Report (EIR) to evaluate potential environmental effects of the project and to propose mitigation measures to reduce any significant effects identified.

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "potentially significant impact" as indicated by the Kern County Environmental Checklist. As such, the analysis contained within the EIR will focus on these issue areas.

☒	Aesthetics	☒	Agricultural and Forestry Resources	☒	Air Quality
☒	Biological Resources	☒	Cultural Resources	☒	Energy
☒	Geology and Soils	☒	Greenhouse Gas Emissions	☒	Hazards and Hazardous Materials
☒	Hydrology and Water Quality	☒	Land Use and Planning	☒	Mineral Resources
☒	Noise	☐	Population and Housing	☒	Public Services
☐	Recreation	☒	Transportation and Traffic	☒	Tribal Cultural Resources
☒	Utilities/Service Systems	☒	Wildfire	☒	Mandatory Findings of Significance

Other Environmental Issues

The County conducted a preliminary review of the proposed Project and has determined it is not likely to result in significant environmental effects to the following resources. Therefore, further analysis is not warranted in the EIR.

- **Population / Housing:** The proposed Project will not induce substantial unplanned population growth through the construction of new homes, roads, or other infrastructure nor displace any housing units or people.

  Although the proposed project would provide new employment consistent with the adopted Kern County General Plan goals, plan, and policies, long-term employment opportunities would be minimal. The proposed project would require an operational/maintenance staff of up to six (6) full-time employees.

  It is estimated that up to 250-550 full-time employees per day would be required during peak construction periods for the proposed project. The entire construction process is anticipated to take 24 months. Therefore, the majority of project-generated jobs would be from the local and regional area and would occur on a temporary and short-term basis. Construction workers are expected to travel to the sites from various local communities and locations throughout Southern California, and few, if any workers expected to relocate to the surrounding area because of these temporary jobs. If temporary housing should be necessary, it is expected that accommodations (i.e., extended stay hotels, apartments, RV parks, homes for rent or sale) would be available in the nearby communities of California City, Mojave and Rosamond. Therefore, the project is not anticipated to directly or indirectly induce the development of any new housing or businesses within the local communities.

The proposed project is located on vacant land with no existing housing. Residences in the area are sparse and rural in nature, with the nearest residence approximately 0.37 mile north of Site 2 (Western). As such, the proposed project is not anticipated to displace existing housing that would necessitate the construction of replacement housing elsewhere.

- **Recreation:** The Kern County General Plan does not identify any existing or proposed recreational facilities near the project area.

  The proposed project itself does not include new recreational facilities and is not anticipated to increase demands on existing facilities. The number of workers needed during the construction phase would largely depend on the specific stage of construction and range between 250-550 workers. These workers are not likely to visit local parks or recreation facilities during the workday and the workers that are relocating temporarily during construction would create little or no impact on local recreational resources after work hours.

  Operation of the proposed project would require up to six (6) full-time employees for maintenance and monitoring activities, but they would likely be drawn from the local labor force and would commute from their existing permanent residence to the project site. However, even if the maintenance/monitoring employees were hired from out of the area and relocated to eastern Kern County, the addition of any such families to the project area would not result in a substantial increase in the number of users at local parks or recreational facilities. As a result, there would not be a detectable increase in the use of existing neighborhood or regional parks or other recreational facilities, and therefore, no deterioration of any such facilities would occur or require the construction of new facilities as a result of project implementation.

2.2. Determination

(To be completed by the Lead Agency)

Based on this initial evaluation:

☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☐ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☒ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect (a) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and (b) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENT IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Signature: Keith Alvidrez	Date: May 8, 2023
Printed Name: Keith Alvidrez	Title: Planner I

Appendix B
Glare Analysis Report

DRAFT

Glare Analysis Report

Enterprise Solar Project

JULY 2023

Prepared for:

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Prepared by:

DUDEK

38 North Marengo Avenue
Pasadena, California 91101

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APPENDIX

A Detailed Modeling Results

Acronyms and Abbreviations

Acronym/Abbreviation	Definition
CEQA	California Environmental Quality Act
FAA	Federal Aviation Administration
gen-tie	generation tie
kV	kilovolt
MASP	Mojave Air and Space Port
project	Enterprise Solar Project
PV	Photovoltaic
report	Glare Analysis Report

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1 Introduction

1.1 Purpose and Scope

The purpose of this Glare Analysis Report (report) is to assess the potential glare impacts associated with implementation of the Enterprise Solar Project (Project) in order to comply with policies described in Kern County's General Plan and Airport Land Use Compatibility Plan (see Section 3, Regulations and Regulatory Requirements).

The project is not located on federally obligated airport property; hence it does not need approval from the U.S. Federal Aviation Administration (FAA). Nevertheless, the analysis was conducted per FAA's recommended procedures described in the Technical Guidance for Evaluating Selected Solar Technologies on Airports (FAA 2018); the geometric glare modeling software used adheres to FAA policy regarding solar energy system projects on federally obligated airports (86 FR 25801–25803).

This report focuses on the potential for glare on sensitive receptors within a 5-mile glare study area as well as the six runway approach paths and single air traffic control tower associated with the Mojave Air and Space Port (MASP), which is a federally obligated public-use airport with approximately 17,575 annual aircraft operations (Kern County 2012).

This report includes an introduction to the photovoltaic (PV) technologies proposed for the Project and their potential to result in glare. Section 2, Project Description, provides a description of the Project and the Project location; Section 3, Regulations and Regulatory Requirements, describes the criteria that must be met by solar energy systems on airport property and relevant glare policies or standards adopted by Kern County; and Section 4, Glare Impacts, describes the methodology used to perform the glare analysis and provides a summary of the analysis results. Section 5, References Reviewed, provides a list of the references cited in this report, and Section 6, Document Preparers, provides a list of those involved in the preparation of this report. Lastly, the complete detailed glare results generated by the modeling software are provided in Appendix A, Detailed Modeling Results.

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2 Project Description

2.1 Project Characteristics

The Project proposes to develop a PV solar facility and associated infrastructure necessary to generate 600 megawatts of renewable electrical energy with up to 4,000 megawatt-hours of energy storage capacity (approximately 1,000 megawatts) on approximately 2,230 acres.

The Project consists of five non-contiguous sites, including four solar facility sites (referred to in this report as Site 1 through Site 4) plus a step-up substation site, as well as corridors for the medium voltage collection lines and generation tie (gen-tie) line, which together make up the Project site. The Project will interconnect to the existing Windhub Substation, which is owned and operated by Southern California Edison. The interconnect will be via a newly constructed 230-kilovolt (kV) gen-tie line that will carry power generated by the Project to the Project's proposed step-up substation, located north of Southern California Edison's Windhub Substation. At the step-up substation, the voltage will be increased from 230 kV to 500 kV, and a new 500 kV gen-tie line will be constructed from the step-up substation to the Windhub Substation for interconnection to the Windhub Substation, and ultimately the grid. The 230 kV gen-tie line would be co-located within the gen-tie line corridor approved as part of the Sanborn Solar project in 2020 and constructed in 2021.

This report considers the PV solar arrays in Site 1 through Site 4 and their potential to generate glare on nearby sensitive receptors within a 5-mile glare study area. As portions of the Project site are located within the MASP Influence Area, runway approach path receptors and an air traffic control tower associated with MASP were also included. The Project includes other components that do not have potential for significant glare and are therefore not analyzed in this report, including:

- Battery energy storage facilities
- Internal roads
- The Project step-up substation (Site 5)
- Access roads
- Gen-tie lines
- A meteorological station
- Site security, fencing, and lighting

All of the Project components are located off airport property; outside of navigable airspace; and outside of the Runway Protection Zone, Runway Safety Area, Object Free Area, and Clearway as defined by FAA (FAA 2018).

2.2 Regional and Local Setting

The Project is situated in the southeastern corner of the desert region in unincorporated Kern County. The Project area has a relatively flat terrain with site elevations ranging between 2,520 and 2,750 feet above mean sea level due to being south of the Tehachapi Mountains where lands gradually slope downward from the northwest toward the southeast. Additionally, the Project area is largely composed of Garlock loamy sand and Cajon loamy sand with

the nearest active fault located approximately 7.5 miles northwest of Site 2 (Western). Desert vegetation dominates the regional landscape of the project area and is composed of allscale saltbush (*Atriplex polycarpa*) scrub, creosote bush (*Larrea tridentata*) scrub, and western Joshua tree (*Yucca brevifolia*).

Communities within the vicinity of the project are the communities of Mojave, Tehachapi, California City, and Rosamond in Kern County and the cities of Lancaster and Palmdale in Los Angeles County. Figure 1, Project Location and Study Area, shows the project features and the communities within the glare analysis study area.

There are several proposed, existing, and permitted solar energy and transmission projects in the region where the Project is located. As shown in Figure 2, Surrounding Solar Projects, the Sanborn Solar project is located between Sites 1 (Northern), 2 (Western), and 3 (Eastern) and to the west and north of Site 4 (Southern). The Edwards Solar project is located approximately 1 mile south of Site 4 (Southern). The RE Camelot Solar project, RE Columbia Two Solar project, RE Columbia Three Solar project, and RE Rio Grande Solar project are operational and adjacent to Site 2 (Western). The Windhub Solar project and the SEPV Solar project, approximately 5 miles to the west, are currently operational, as are the Rosamond One, Rosamond Two, and Catalina Solar projects to the southwest.

Portions of the Project are located within the MASP Influence Area. Figure 3, Existing ALUCP, shows the Project site and its vicinity, with respect to Airport Land Use Compatibility Plan zones, and Table 1, Kern County Airport Land Use Compatibility Plan Zones, identifies the location and impact elements for those zones.

Table 1. Kern County Airport Land Use Compatibility Plan Zones

Zone	Location	Impact Elements
B1	Approach/Departure Zone and adjacent to Runway	Substantial risk – aircraft commonly below 400 feet above ground level (AGL) or within 1,000 feet of runway. Substantial noise.
B2	Extended Approach/Departure Zone	Significant risk – aircraft commonly below 800 feet AGL. Significant noise.
C	Common Traffic Pattern	Limited risk – aircraft at or below 1,000 feet AGL. Frequent noise intrusion.
D	Other Airport Environs	Negligible risk. Potential for annoyance from overflights.
E	Special Land Use	Compatibility issues.

3 Regulations and Regulatory Requirements

3.1 Federal

U.S. Federal Aviation Administration

To understand and model glare, Dudek used FAA standards, which has approved the use of Sandia National Laboratories' Solar Glare Hazard Analysis Tool. With the Solar Glare Hazard Analysis Tool, standardized safety metrics define the anticipated glare intensity that would cause unwanted visual impacts to air traffic control towers and airplane pilots. Glare intensity is described according to potential for after-image and is illustrated on FAA's Solar Glare Ocular Hazard Plot. Low potential for after-image is referred to as "green" glare, and potential for after-image is referred to as "yellow" glare. "Red" glare is representative of glare conditions with potential for permanent eye damage.

The Solar Glare Hazard Analysis Tool and ForgeSolar (ForgeSolar 2019) are also able to evaluate the potential of a particular PV array to produce glare intensity, predicting when and where glare would occur from a proposed PV array at discrete observation points (e.g., from the air traffic control tower or runway approach). In instances where glare may be a concern, the tools can prescribe minor adjustments to the tilt, direction, and location of the panels to alleviate issues.

For this analysis, Dudek staff used the industry standard ForgeSolar 3D geometric glare analysis software tool to disclose potential glare impacts associated with operation of the Project. See Section 4.2.3, Geometric Glare Analysis, and Section 4.2.4, Limitations of the Geometric Analysis, for more information about the modeling parameters and limitations.

FAA has crafted a policy regarding the ocular hazards posed by solar projects to federally obligated airports. Initially, it was assumed that solar energy systems might generate new glint and glare effects for pilots during the final approach. However, FAA has since concluded that in most instances, the glint and glare from solar energy systems experienced by pilots during final approach are comparable to those routinely encountered from water bodies, glass facade buildings, parking lots, and similar features. Therefore, FAA has retracted its prior interim guidance, which mandated airports to analyze potential glint and glare effects for pilots on final approach (86 FR 25801–25803). Instead, FAA has determined that its policy should primarily focus on the impact of on-airport solar energy systems on federally obligated towered airports, especially the airport's air traffic control tower cab (86 FR 25801–25803).

Per FAA Policy 86 FR 25801–25803, the following criteria must be met for solar energy systems on airport property:

- No glare of any kind for air traffic control tower(s) at cab height

This policy only applies to proposed solar energy systems on federally obligated airport property and only those airports with control towers. Though the MASP is a federally obligated airport, the Project does not fall on airport property. For that reason, this policy does not apply to the Project; however, it was included in this reporting to describe the standard methodologies used to assess solar glare near operating airports.

3.2 State

California Environmental Quality Act

The California Environmental Quality Act (CEQA) requires an analysis of aesthetic impacts when an agency or individual proposes an activity that may cause either a direct physical change in the environment or a reasonably foreseeable indirect physical change in the environment. In Appendix G, Environmental Checklist Form, the 2023 CEQA Statute and Guidelines contains the follow impact threshold related to glare:

- Would the project create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

Other than the CEQA Guidelines, there are no state regulations pertaining to potential glare effects associated with the operation of solar facilities.

3.3 County of Kern

Kern County General Plan Chapter 1: Land Use, Open Space, and Conservation Element

The following policy and implementation measure pertain to glare generated by new discretionary projects in Kern County:

- 1.10.7 Light and Glare (Policy 47): Ensure that light and glare from discretionary new development projects are minimized in rural as well as urban areas.
- Implementation Measure AA: The County shall utilize CEQA Guidelines and the provisions of the Zoning Ordinance to minimize the impacts of light and glare on adjacent properties and in rural undeveloped areas.

Chapter 19.81: Dark Skies Ordinance (Outdoor Lighting)

There are no local glare regulations that are applicable to the project. The Kern County Dark Skies Ordinance (Chapter 19.81 of the Kern County Zoning Ordinance) addresses glare; however, regulations and development standards are specific to outdoor lighting and signage. There are no development standards in the Kern County Dark Skies Ordinance that pertain specifically to solar facilities.

Kern County Airport Land Use Compatibility Plan

Projects within the influence area of MASP, as shown on Figure 1, are subject to the policies outlined in the Kern County Airport Land Use Compatibility Plan (Kern County 2012). The following policies apply to the Project (Kern County 2012):

> New land uses (or the expansion of existing land uses) with activities which may produce hazards to aircraft in flight shall not be permitted within the Mojave Airport's influence area.... Specific characteristics to be avoided include:
>
> (1) Glare, distracting lights, or light patterns which could be mistaken for airport lights

4 Glare Impacts

4.1 General Concepts of Solar Technologies and Glare

The Project includes the installation of PV panels to convert the sun's light into electrical energy. To increase the efficiency of this conversion process, designers of solar systems strive to maximize the amount of solar energy that can be absorbed by solar cells. This work towards increasing efficiency has the added benefit of reducing the amount of light that could potentially reflect off the solar panels. Reflected light can cause glint (a quick reflection) and glare (reflection that lasts for a longer duration), which can create hazards for air-traffic-control personnel, motorists, and other potential receptors. For the purpose of this report, any light reflected off of the solar panels or any other reflective surface is referred to as "glare."

There are several key design considerations that can reduce glare from solar panels. One of the main factors of reflectance is the position of the PV modules relative to the sun. A panel that has been designed to absorb 90% of the sunlight that directly meets the face of the panels (perpendicular to the sun's rays) may have that absorption significantly reduced if the panel is not directly facing the sun (ForgeSolar 2019). Because the sun tracks across the sky over the course of a day, fixed-mount stationary panels can only maximize its efficiency for a few minutes out of the day when the sunlight is directly perpendicular to the face of the panel. To maximize the amount of solar energy generated from the solar array, some PV systems employ tracking mechanisms that adjust to track the sun's trajectory as it crosses the sky. Figure 4, Comparison of Photovoltaic Tracking Systems, provides an illustrative example of a fixed-mount panel system, single-axis tracking system, and dual-axis tracking system.

In addition to panel orientation, the materials used in the panel construction play an important role in reducing glare and maximizing efficiency. For example, different glass textures can be used to absorb light beams into the solar array, and anti-reflective coatings can be added to the glass to further reduce reflectivity at high-incidence angles (the angle at which the light hits the solar array).

The Project is anticipated to employ a single-axis tracking system, as illustrated by the middle panel system in Figure 4. The axis of rotation would be aligned north–south with a maximum tracking angle of 50°. The surface of the panels would be constructed out of smooth glass and would include an anti-reflective coating, as further described in Section 4.2.3.

Glare can result in visual hazards and temporary loss of vision. The hazard level of glare depends on the ocular impact to the observer. Generally, an ocular impact is calculated as a function of the incidence angle and the intensity of the light. For the purpose of this report, an ocular impact is classified in one of three categories, as follows:

- **Green:** Low potential for the glare to cause an after-image (also known as flash blindness)
- **Yellow:** Potential to cause a temporary after-image
- **Red:** Potential to cause retinal burn and permanent eye damage

4.2 Methodology

In order to determine where and when glare might occur as a result of development of the project, Dudek staff utilized a multistep process that included a combination of spatial analysis, 3D geometric modeling, and aerial imagery interpolation. A typical 5-mile study radius was used because that distance approximates the maximum distance that an observer standing at ground level could see the proposed PV panels before the curvature of the earth would intervene (assuming a perfect sphere, no built environmental obstruction, and flat topography). Because of the Project's vicinity to the MASP (located approximately 500 feet to the north of the Project), the existence of multiple highways to the east and west of the Project site, the 5-mile-radius study area was determined to be adequate for this analysis, as shown on Figure 1.

Dudek performed a visibility analysis on the surrounding terrain to predict where the Project would be visible at any location within the study area. Using publicly available terrain data, Dudek staff created a detailed elevation model that covered an area approximately 16 miles wide and approximately 14 miles tall. For information about technical limitations of the visibility analysis, please refer to section 4.2.4.

Dudek performed a visibility analysis on the surrounding terrain within the study area to estimate where the Project would be most visible. Because the geometric glare software utilized in this analysis does not take into consideration the terrain between the receptors and the Project's PV arrays, the visibility analysis is needed to reduce the possibility of a false-positive glare result. Because the Project PV arrays reside in four non-contiguous sites, Dudek determined that a separate visibility analysis should be performed for each site in order to assist with the per-site receptor selection process. Figure 5, Glare Analysis Groups and Receptors, illustrates the results of the visibility analysis, with light-blue areas predicted to have a more obscured view of the Project and dark-blue areas predicted to have a less obscured view of the Project. Locations in the study area with no coloring are predicted to have no view of the Project. It is important to note that the visibility analysis only models existing terrain and does not consider above-ground features such as vegetation or structures that might further obscure the visibility of the Project, and therefore should be viewed as a worst-case scenario.

Based on the visibility analysis, Dudek determined the location of potential receptors within the study area. All six runway approach path receptors associated with MASP were included in this analysis regardless of visibility or distance. Areas within the glare study area that were not predicted to have a direct line of site view of the Project were not included in the glare analysis. A geometric glare analysis was then conducted for the identified potential receptors to determine where and when glare might be encountered. Upon completion of the geometric analysis, Dudek reviewed the results for potential glare hazards and provided recommendations.

For compatibility with the modeling software, the Project's PV arrays had to be grouped together to create 80 analysis groups, labeled "PV01" through "PV80." These analysis groups were analyzed in 5 batches, one batch for Sites 1, 2, and 4, and two batches for Site 3. Site 5 would not contain any PV arrays, so it was not included in the analysis. All five analysis batches shared the same Project parameters. Potential receptors for each batch were selected based on the predicted visibility for that Site. The five analysis batches are shown on Figure 5, and the detailed modeling results are presented according to these batches in the appendices.

4.2.1 Airport Receptor Identification

Each modeled airport receptor type shown in Figure 5 is described in the following list, and the receptor's precise modeling parameters can be found in Appendix A:

- Air Traffic Control Tower Receptor – There is one currently operating control tower located on the southeast side of MASP, adjacent to runways 30 and 26. The control tower height was obtained from publicly available elevation data and was determined to be 85 feet above ground level.
- Airport Flight Approach Observation Route – Six flight approach observation routes were selected to simulate an aircraft following a straight-line approach toward each runway at MASP. Flight approach routes use glide slopes and elevation parameters, as well as cockpit visibility angles. Modeled flight approaches extended out 2 miles from each runway threshold.

Table 2 shows the flight approach parameters used for MASP. The locations of the flight approach paths are depicted on Figure 5.

Table 2. Flight Path Receptor Parameters

Runway Name	Threshold Crossing Height	Glide Slope	Direction (True Course)
Runway 4 (MASP 4)	50 feet	3.0 degrees	51.1 degrees
Runway 8 (MASP 8)	50 feet	3.0 degrees	90.1 degrees
Runway 12 (MASP 12)	50 feet	3.0 degrees	135.6 degrees
Runway 22 (MASP 22)	50 feet	3.0 degrees	232.5 degrees
Runway 26 (MASP 26)	50 feet	3.0 degrees	270.2 degrees
Runway 30 (MASP 30)	50 feet	3.0 degrees	314.8 degrees

4.2.2 Point and Route Receptor Identification

Using the visibility analysis results in conjunction with aerial imagery, road centerline data, and land use data, Dudek staff selected potential receptors based on their distance from the Project, orientation to the Project, and the percentage of the Project visible from the receptor's location. To avoid false positives in the glare results, only receptors that were likely able to see the Project from their location were selected for the analysis. Figure 5 shows the locations of analyzed receptors as well as the modeled array locations. Each modeled receptor type shown on Figure 5 is described below, and the receptor's precise modeling parameters can be found in Appendix A:

- Observation Point – Analysis of the Project included 31 existing potentially sensitive point receptors that were located within potential line of sight to the Project. Because modeling every point receptor would not be feasible, Dudek staff selected representative receptors from the study area. The eye-level height of all point observers was set to 5.5 feet. Descriptions of each observation point can be found in Table 3, Observation Point Descriptions.
- Highway/Road/Railroad Observation Route – Analysis included a combination of 33 road, highway (State Route 14 and State Route 58), and railroad observation routes, which were selected based on visibility, sensitivity, distance to the Project site, and level of traffic expected on the roadways. To keep the number of receptor routes within the allowed limit by the geometric modeling software, Dudek staff selected routes that would be representative of each road type and road direction of travel with potential views to the Project. Per the American Association of State Highway and Transportation Officials, the eye-level height of observers on highway routes was set to 7.6 feet, the average height for observers in large trucks. This height was selected to account for the higher potential for truck traffic on the highway routes. Railroad

routes used a height of 14 feet, the approximate eye-level height of an engineer in a train cab. The rest of the routes used an eye-level height of 3.5 feet, the average height of observers in passenger vehicles (AASHTO 2001). The analysis name and description of each observation route can be found in Table 4, Observation Route Names.

Table 3. Observation Point Descriptions

Observation Point ID	Description
OP 1	Representative Dwelling at 2778 Encina Avenue, Mojave, California
OP 2	Representative Dwelling at 2854 Encina Avenue, Mojave, California
OP 3	Representative Dwelling at 16732 Holt Street, Mojave, California
OP 4	Mojave Foursquare Church, Mojave, California
OP 5	Representative Dwelling at 3445 Douglas Avenue, Mojave, California
OP 6	Representative Dwelling at 3549 Douglas Avenue, Mojave, California
OP 7	Mojave West Park, Mojave, California
OP 8	Representative Dwelling at 16301 Koch Street, Mojave, California
OP 9	Representative Dwelling at 2870 Oak Creek Road, Mojave, California
OP 10	Representative Dwelling at Park Palace Apartments, Mojave, California
OP 11	Representative Dwelling at Park Palace Apartments, Mojave, California
OP 12	Representative Dwelling at Park Palace Apartments, Mojave, California
OP 13	Representative Dwelling at 15932 Jean Drive, Mojave, California
OP 14	Mojave High Desert Seventh-Day Adventist Church, Mojave, California
OP 15	Mountain View High School, Mojave, California
OP 16	Representative Dwelling at Santiago Estates, Mojave, California
OP 17	Representative Dwelling at Santiago Estates, Mojave, California
OP 18	Comfort Inn & Suites, Mojave, California
OP 19	Representative Dwelling at 1889 Victor Avenue, Mojave, California
OP 20	Representative Dwelling at 15315 Blackfield Street, Mojave, California
OP 21	Representative Dwelling at 15207 Carol Street, Mojave, California
OP 22	Representative Dwelling at 1592 Barstow Road, Mojave, California
OP 23	Tierra Grande Mobile Home Park, Mojave, California
OP 24	Representative Dwelling at 3021 Cromwell Avenue, Mojave, California
OP 25	Representative Dwelling at 14300 Dover Drive, Mojave, California
OP 26	Representative Dwelling at 14200 Winchester Drive, Mojave, California
OP 27	Potential Dwelling at 11846-12606 United Street, Mojave, California
OP 28	Representative Dwelling on Anaconda Street, Mojave, California
OP 29	Representative Dwelling at 11086 Kelly Street, Mojave, California
OP 30	Representative Dwelling at 11106 Lone Butte Road, Mojave, California
OP 31	Representative Dwelling at 1672 Dalton Avenue, Mojave, California

Table 4. Observation Route Names

Observation Point ID	Description
Route 1	Altus Avenue
Route 2	BNSF Mojave Subdivision A
Route 3	BNSF Mojave Subdivision B
Route 4	BNSF Mojave Subdivision C
Route 5	BNSF Mojave Subdivision D
Route 6	BNSF Mojave Subdivision E
Route 7	Camelot Boulevard
Route 8	Dalton Avenue
Route 9	Holt Street
Route 10	Hyundai-Kia Boulevard
Route 11	Hyundai Proving Ground Track
Route 12	Lone Butte Road
Route 13	Lone Pine Subdivision
Route 14	Mojave Barstow Highway
Route 15	Oak Creek Industrial Lead Railroad
Route 16	Oakcreek Road A
Route 17	Oakcreek Road B
Route 18	Purdy Avenue
Route 19	Reed Avenue
Route 20	Riccomini Street
Route 21	Sierra Highway A
Route 22	Sierra Highway B
Route 23	Sierra Highway NB
Route 24	Silverqueen Road
Route 25	State Route 14
Route 26	State Route 14 NB
Route 27	State Route 14 SB
Route 28	State Route 58 A
Route 29	State Route 58 B
Route 30	State Route 58 SB Onramp at Altus Avenue
Route 31	United Street
Route 32	UP Mojave Subdivision
Route 33	Victor Avenue

4.2.3 Geometric Glare Analysis

Dudek staff used an industry standard 3D geometric glare analysis software tool developed by Sandia National Laboratories and licensed by ForgeSolar. Though initially developed for solar projects on airports, this software has been validated as effective for projects that are not located on airports. By inputting the solar panel locations and characteristics, as well as the locations and elevations of the receptors, the software is able to simulate the sun's

progression across the sky over the course of a year and model the potential glare caused by the proposed solar arrays. If glare is detected, the software can quantify the level of ocular impact hazard (green, yellow, or red) and pinpoint the exact time of year the glare would occur. This analysis is automatically performed for every minute of the calendar year for each PV array analysis group and for each potential receptor defined in the model.

Dudek staff consulted Enterprise Solar Storage, LLC to obtain the precise characteristics of the proposed solar array system. Data gathered included the physical location, orientation, build material, tilt angle, and tracking technology. All of these characteristics were entered into the modeling software, as provided in Table 5.

Table 5. Solar Array Model Inputs

Solar Array Characteristics	Proposed Project Configuration
Tracking method	Single-axis
Module surface material	Smooth glass with anti-reflective coating
Tracking axis orientation	North–south (180 degrees)
Maximum tracking angle	50 degrees
Resting angle (when sun leaves maximum tracking angle)	50 degrees (no backtracking)

As described in Table 5, the Project is anticipated to utilize a single-axis tracking system. This tracking system would be oriented running north–south with the panel faces rotating from east to west. The system would be able to track the sun's progression across the sky, within the system's 100-degree range of motion (50 degrees to the east and 50 degrees to the west). When the sun is not within the range of motion, the panels would rest at their maximum tracking angle of 50 degrees and will not employ a backtracking strategy.

4.2.4 Limitations of the Geometric Analysis

The glare modeling software used in this analysis does not consider existing vegetation, structures, or terrain that might obscure the view of the panels from receptor locations. Though the visibility analysis was performed to mitigate this software limitation, there is still a possibility that glare could be visible at receptors that are unable to clearly see the panels. The following features could partially conceal the solar panels from receptors:

- Buildings and other structures between the receptors and the Project site
- Trees and other vegetation between the receptors and the Project site

4.2.5 Baseline Glare Conditions

There are currently several sources of glare in the vicinity of the Project, which this analysis will refer to as "baseline conditions." While the level of glare caused by these sources was not assessed in this analysis, potential glare caused by the Project should be considered in the context of the existing baseline conditions. The following list describes existing human-made features in the vicinity of the Project that may create glare (also, see Figure 2):

- **Existing Utility-Scale PV Systems:** Figure 2 shows the locations of several existing utility-scale solar facilities within the study area. Section 2.2, Regional and Local Setting, describes these projects in more detail. Like the Project, these facilities have the potential to produce glare in the green or yellow ocular impact categories.

4.3 Glare Analysis Results

This glare analysis was conducted per FAA's recommended procedures described in the Technical Guidance for Evaluating Selected Solar Technologies on Airports (FAA 2018), and the geometric glare modeling software used adheres to FAA policy regarding solar energy system projects on federally obligated airports (86 FR 25801–25803). This policy does not apply to the Project but was included in this reporting to describe the standard methodologies used to assess solar glare near operating airports. Specifically, the glare analysis and software quantify the level of ocular impact hazard (reported as green or yellow glare) and pinpoint the exact time of year the glare would occur.

4.3.1 Results for Airport Receptors

The results of the analysis indicate that, under the parameters described in Section 4.2.3, the Project would not result in hazardous glare in the green, yellow, or red ocular impact categories for any of the six flight approach paths or the single air traffic control tower associated with MASP. See Table 6, Results for Airport Receptors, for the results of the glare analysis. Please refer to Appendix A for the detailed modeling parameters and results.

Table 6. Results for Airport Receptors

Airport Receptor	Green Glare	Yellow Glare	Red Glare
Air Traffic Control Tower	No Glare	No Glare	No Glare
Runway 4 (MASP 4)	No Glare	No Glare	No Glare
Runway 8 (MASP 8)	No Glare	No Glare	No Glare
Runway 12 (MASP 12)	No Glare	No Glare	No Glare
Runway 22 (MASP 22)	No Glare	No Glare	No Glare
Runway 26 (MASP 26)	No Glare	No Glare	No Glare
Runway 30 (MASP 30)	No Glare	No Glare	No Glare

4.3.2 Results for Point and Route Receptors

The results of the analysis indicate that, under the parameters described in Section 4.2.3, the Project would not result in hazardous glare in the green, yellow, or red ocular impact categories for any of the 31 point receptors or 33 routes receptors identified in Section 4.2.2 and shown on Figure 5. Please refer to Appendix A for the detailed modeling parameters and results.

4.3.3 Conclusion

As shown above, the results of the geometric glare analysis indicate that the Project (as described by the parameters in Section 4.2.3, Table 5) would not result in any significant glare impacts when analyzed in accordance with preferred FAA methodology for assessing impacts to aviation facilities and activities.

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5 References Reviewed

AASHTO (American Association of State Highway and Transportation Officials). 2001. *A Policy on Geometric Design of Highways and Streets.* 2001, Fourth Edition.

FAA (Federal Aviation Administration). 2018. *Technical Guidance for Evaluating Selected Solar Technologies on Airports.* Version 1.1. Washington, DC: FAA, Office of Airports, Office of Airport Planning and Programming. April 2018.

ForgeSolar (ForgeSolar: PV Planning & Glare Analysis). 2019. "ForgeSolar Help." https://www.forgesolar.com/help/.

Kern County (Kern County Planning and Community Development Department). 2012. *Airport Land Use Compatibility Plan.* November 13, 2012.

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6 Document Preparers

This report was prepared by Christopher Starbird.

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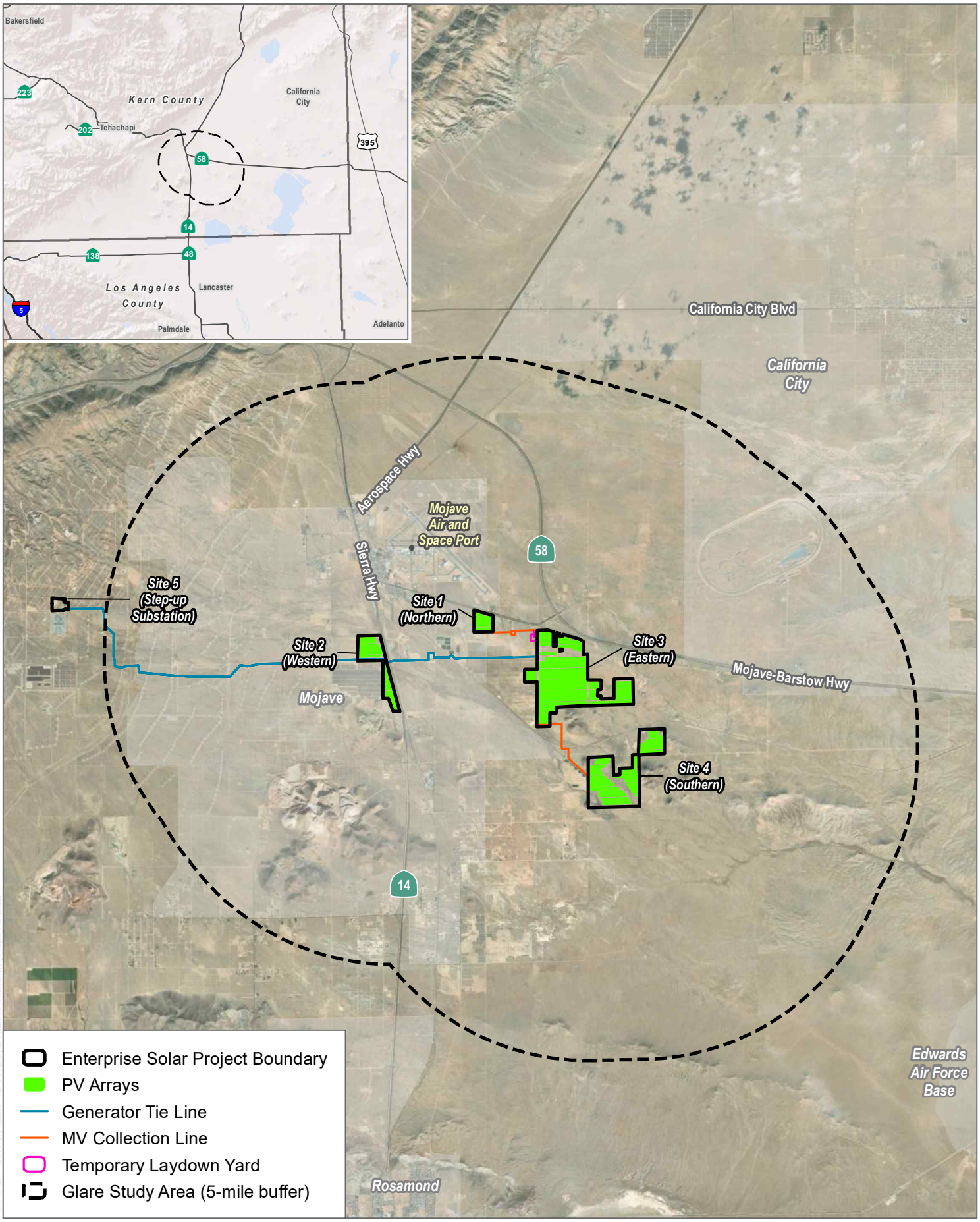

SOURCE: Esri, Digital Globe 2023, Open Street Map 2019

DUDEK

0 1.75 3.5 Miles

FIGURE 1

Project Location and Study Area

Enterprise Solar Project Glare Analysis Report

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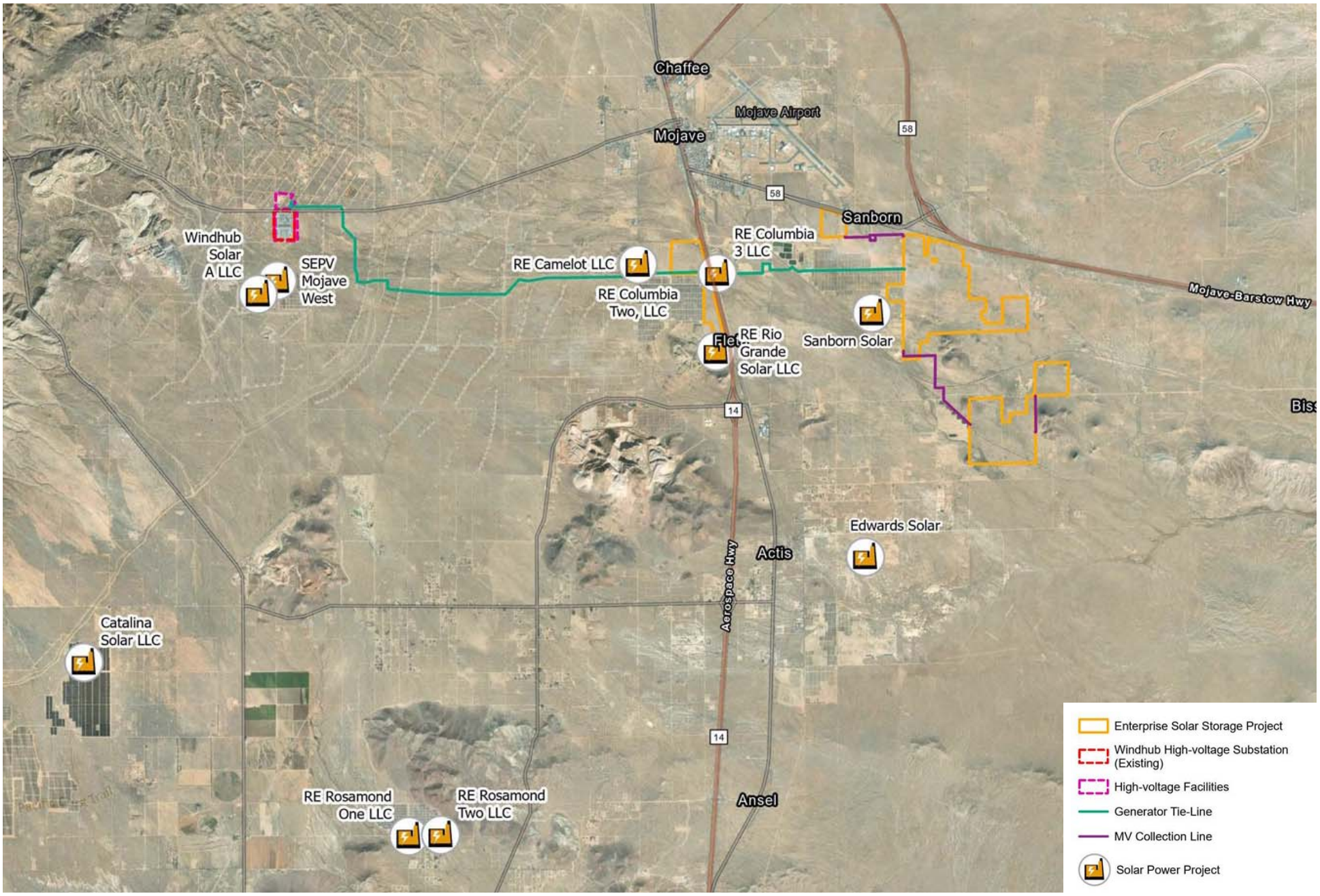

SOURCE: TerraGen, LLC 2023

FIGURE 2

Surrounding Solar Projects

Enterprise Solar Project Glare Analysis Report

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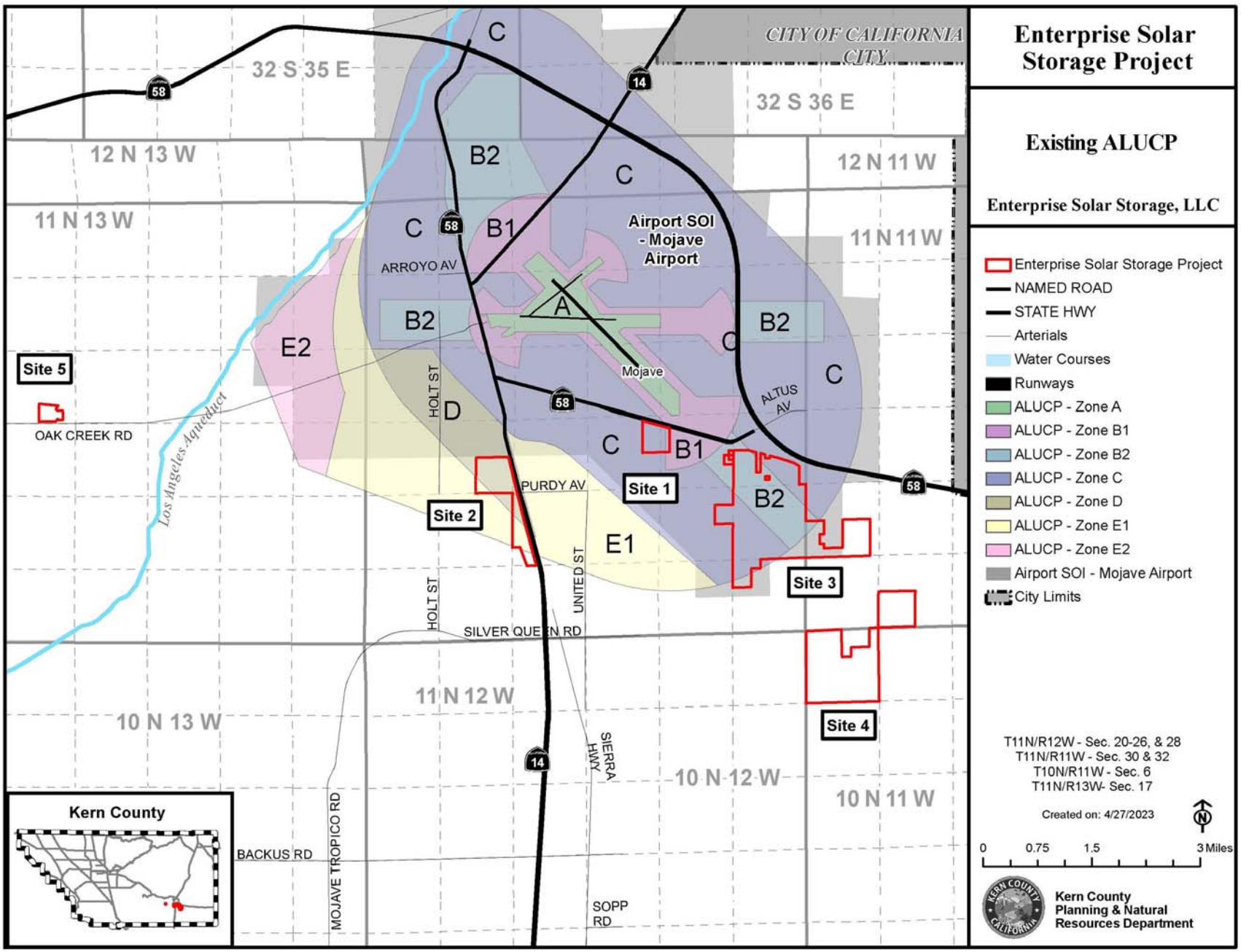

SOURCE: TerraGen, LLC 2023

FIGURE 3
Existing ALUCP

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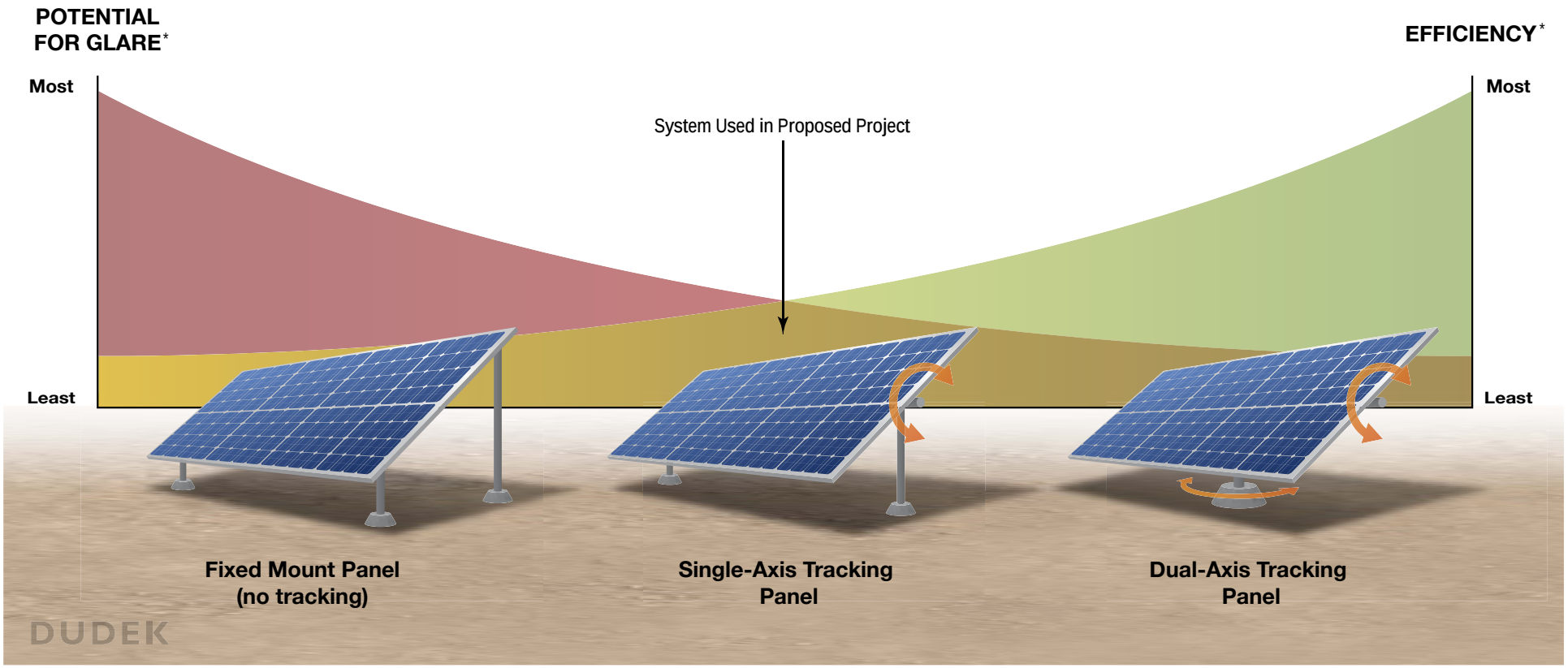

** Efficiency and glare relationships represented in this graphic have been exaggerated and are for illustrative purposes only.*

SOURCE: DUDEK 2023

FIGURE 4

Comparison of Photovoltaic Tracking Systems

Enterprise Solar Project Glare Analysis Report

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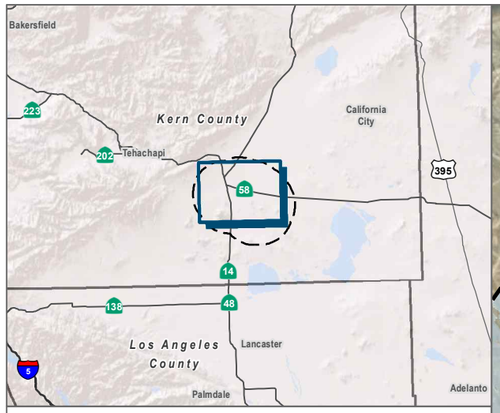

Glare Study Area (5-mile buffer)

Per-Site Visibility Analysis Area (5-mile buffer)

Enterprise Solar Project Boundary

Airport Receptors

ATCT Point Receptor

Airport Flight Approach Observation Route (2-mile)

Point and Route Receptors within Viewshed

Observation Point by Analysis ID

Receptor Route by Analysis ID

PV Analysis Group by Batch

PV Analysis Group Batch 1 (Site 1)

PV Analysis Group Batch 2 (Site 2)

PV Analysis Group Batch 3A (Site 3)

PV Analysis Group Batch 3B (Site 3)

PV Analysis Group Batch 4 (Site 4)

Visibility Analysis

Project is More Visible

Project is Less Visible

SOURCE: Esri, Digital Globe 2023, Open Street Map 2019

DUDEK

0 2,650 5,300 Feet

FIGURE 5

Glare Analysis Groups and Receptors

Enterprise Solar Project Glare Analysis Report

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Appendix A
Detailed Modeling Results

FORGESOLAR GLARE ANALYSIS

Project: **Enterprise Solar North**
Site configuration: **Enterprise Solar Site 1**

Created 30 Jun, 2023
Updated 30 Jun, 2023
Time-step 1 minute
Timezone offset UTC-8
Minimum sun altitude 0.0 deg
DNI peaks at 1,000.0 W/m^2
Category 100 MW to 1 GW
Site ID 94282.16538

Ocular transmission coefficient 0.5
Pupil diameter 0.002 m
Eye focal length 0.017 m
Sun subtended angle 9.3 mrad
PV analysis methodology V2

Summary of Results No glare predicted

PV Array	Tilt	Orient	Annual Green Glare		Annual Yellow Glare		Energy
	°	°	min	hr	min	hr	kWh
PV01	SA tracking	SA tracking	0	0.0	0	0.0	-
PV02	SA tracking	SA tracking	0	0.0	0	0.0	-
PV03	SA tracking	SA tracking	0	0.0	0	0.0	-
PV04	SA tracking	SA tracking	0	0.0	0	0.0	-
PV05	SA tracking	SA tracking	0	0.0	0	0.0	-
PV06	SA tracking	SA tracking	0	0.0	0	0.0	-
PV07	SA tracking	SA tracking	0	0.0	0	0.0	-

Total glare received by each receptor; may include duplicate times of glare from multiple reflective surfaces.

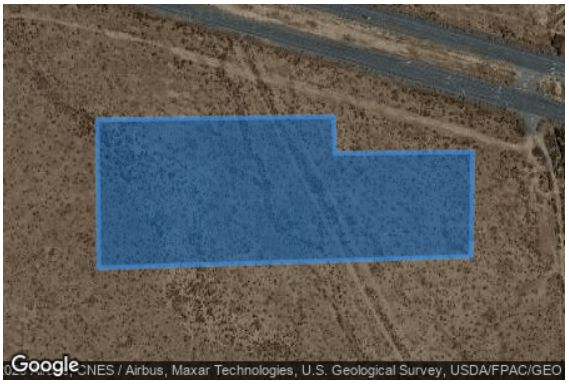
Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01	0	0.0	0	0.0
Route02	0	0.0	0	0.0
Route03	0	0.0	0	0.0
Route07	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route12	0	0.0	0	0.0
Route13	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route20	0	0.0	0	0.0
Route22	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route26	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

Component Data

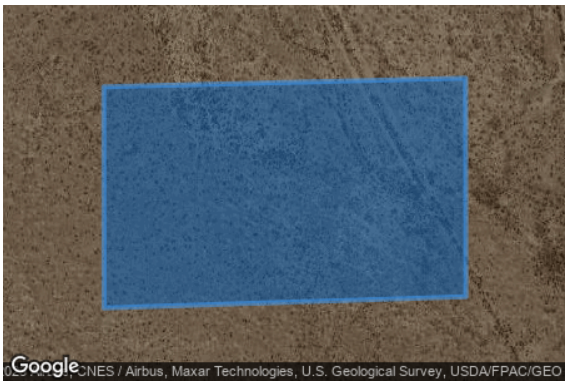
PV Arrays

Name: PV01
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



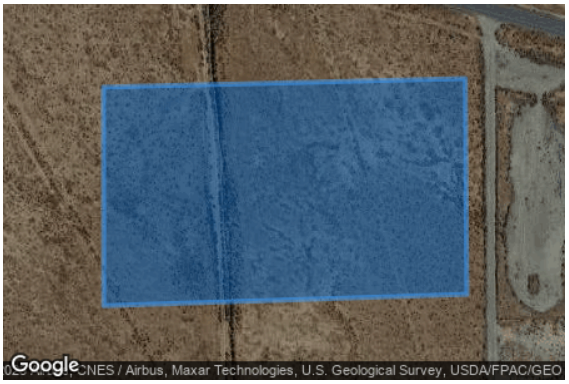
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.038476	-118.135912	2666.21	6.00	2672.21
2	35.038497	-118.133882	2665.38	6.00	2671.38
3	35.038240	-118.133870	2664.31	6.00	2670.31
4	35.038251	-118.132687	2662.18	6.00	2668.18
5	35.037516	-118.132697	2660.31	6.00	2666.31
6	35.037436	-118.135899	2664.67	6.00	2670.67
7	35.038476	-118.135912	2666.21	6.00	2672.21

Name: PV02
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



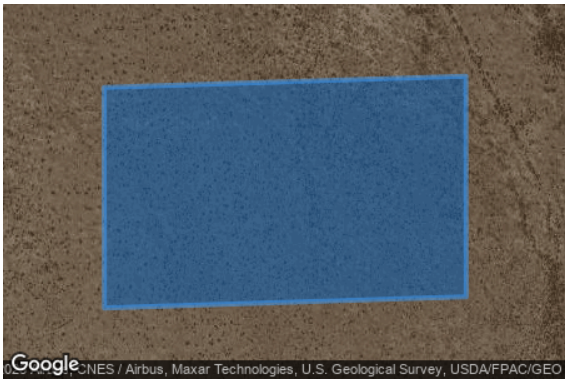
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.035889	-118.132787	2655.77	6.00	2661.77
2	35.035810	-118.135896	2659.04	6.00	2665.04
3	35.037360	-118.135898	2664.45	6.00	2670.45
4	35.037421	-118.132790	2660.19	6.00	2666.19
5	35.035889	-118.132787	2655.77	6.00	2661.77

Name: PV03
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



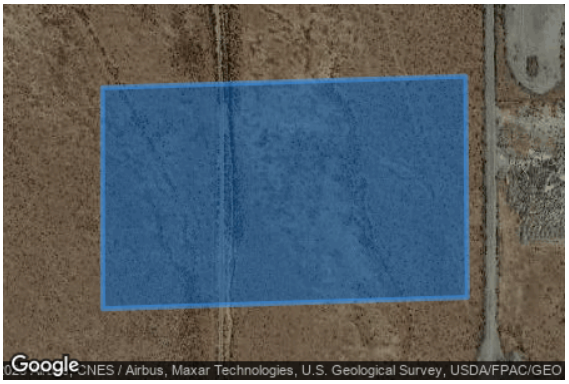
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.035969	-118.129667	2653.37	6.00	2659.37
2	35.035889	-118.132787	2655.77	6.00	2661.77
3	35.037421	-118.132790	2660.19	6.00	2666.19
4	35.037481	-118.129681	2657.83	6.00	2663.83
5	35.035969	-118.129667	2653.37	6.00	2659.37

Name: PV04
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



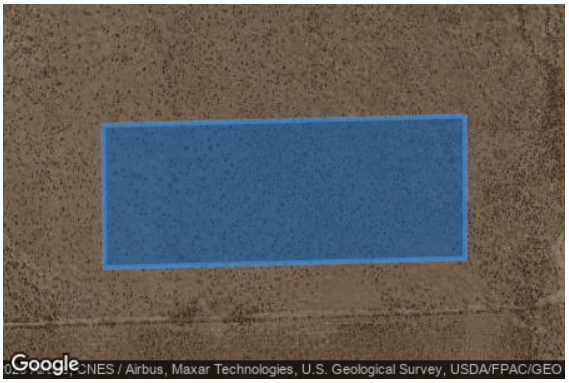
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.035810	-118.135896	2659.04	6.00	2665.04
2	35.035889	-118.132787	2655.77	6.00	2661.77
3	35.034339	-118.132785	2651.27	6.00	2657.27
4	35.034259	-118.135893	2654.21	6.00	2660.21
5	35.035810	-118.135896	2659.04	6.00	2665.04

Name: PV05
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



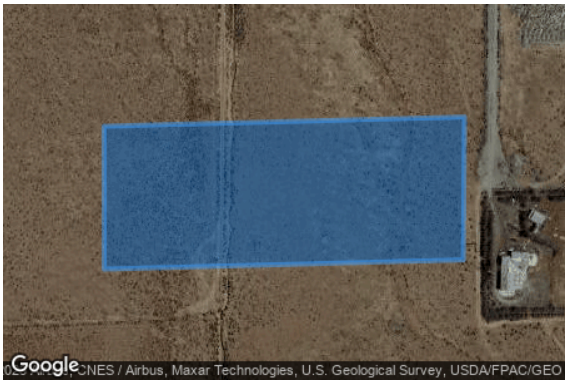
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.035889	-118.132787	2655.77	6.00	2661.77
2	35.035969	-118.129667	2653.37	6.00	2659.37
3	35.034419	-118.129653	2647.70	6.00	2653.70
4	35.034339	-118.132785	2651.27	6.00	2657.27
5	35.035889	-118.132787	2655.77	6.00	2661.77

Name: PV06
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.033237	-118.132783	2647.93	6.00	2653.93
2	35.033172	-118.135880	2650.64	6.00	2656.64
3	35.034173	-118.135893	2653.87	6.00	2659.87
4	35.034239	-118.132785	2650.47	6.00	2656.47
5	35.033237	-118.132783	2647.93	6.00	2653.93

Name: PV07
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.033237	-118.132783	2647.93	6.00	2653.93
2	35.034239	-118.132785	2650.47	6.00	2656.47
3	35.034304	-118.129688	2648.43	6.00	2654.43
4	35.033302	-118.129698	2647.27	6.00	2653.27
5	35.033237	-118.132783	2647.93	6.00	2653.93

Route Receptors

Name: Route01
Path type: Two-way
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.039709	-118.149508	2692.31	3.50	2695.81
2	35.039786	-118.146850	2688.25	3.50	2691.75
3	35.039858	-118.144386	2683.89	3.50	2687.39
4	35.039952	-118.141138	2679.77	3.50	2683.27
5	35.039967	-118.140607	2680.15	3.50	2683.65

Name: Route02
Path type: Two-way
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.053016	-118.174512	2763.21	14.00	2777.21
2	35.049021	-118.173193	2748.57	14.00	2762.57
3	35.046647	-118.172376	2738.96	14.00	2752.96
4	35.043624	-118.171384	2727.01	14.00	2741.01
5	35.040706	-118.170415	2715.53	14.00	2729.53
6	35.039571	-118.170018	2711.86	14.00	2725.86
7	35.039161	-118.169913	2710.79	14.00	2724.79
8	35.037893	-118.169238	2705.61	14.00	2719.61
9	35.037140	-118.168610	2703.94	14.00	2717.94
10	35.036226	-118.167413	2700.85	14.00	2714.85
11	35.035817	-118.166612	2699.02	14.00	2713.02
12	35.035475	-118.165590	2695.89	14.00	2709.89
13	35.035285	-118.164477	2694.19	14.00	2708.19
14	35.035182	-118.163050	2692.66	14.00	2706.66
15	35.034975	-118.161008	2690.95	14.00	2704.95
16	35.034834	-118.159674	2688.64	14.00	2702.64
17	35.034511	-118.158258	2684.72	14.00	2698.72
18	35.034122	-118.156993	2681.73	14.00	2695.73
19	35.034033	-118.156782	2681.24	14.00	2695.24

Name: Route03
Path type: Two-way
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.034033	-118.156782	2681.24	14.00	2695.24
2	35.033504	-118.155530	2678.08	14.00	2692.08
3	35.032485	-118.153847	2672.61	14.00	2686.61
4	35.030056	-118.150444	2665.27	14.00	2679.27
5	35.028485	-118.148260	2657.69	14.00	2671.69
6	35.025018	-118.143464	2641.83	14.00	2655.83
7	35.023170	-118.140898	2636.29	14.00	2650.29
8	35.021094	-118.138019	2629.19	14.00	2643.19
9	35.018750	-118.134756	2618.86	14.00	2632.86
10	35.016664	-118.131900	2612.85	14.00	2626.85
11	35.014911	-118.129473	2608.55	14.00	2622.55
12	35.012911	-118.126664	2601.79	14.00	2615.79
13	35.011110	-118.124157	2597.76	14.00	2611.76
14	35.008595	-118.120674	2590.69	14.00	2604.69
15	35.007042	-118.118538	2588.15	14.00	2602.15
16	35.005438	-118.116328	2585.22	14.00	2599.22

Name: Route07
Path type: Two-way
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.031949	-118.168513	2692.18	3.50	2695.68
2	35.031894	-118.173384	2703.23	3.50	2706.73
3	35.031842	-118.176690	2716.09	3.50	2719.59
4	35.031814	-118.179183	2726.72	3.50	2730.22
5	35.031748	-118.183808	2744.44	3.50	2747.94
6	35.031745	-118.185548	2751.13	3.50	2754.63
7	35.031614	-118.185765	2751.35	3.50	2754.85
8	35.031549	-118.189041	2768.11	3.50	2771.61
9	35.031507	-118.193333	2793.48	3.50	2796.98
10	35.031430	-118.196682	2808.94	3.50	2812.44
11	35.031378	-118.198900	2817.34	3.50	2820.84

Name: Route12
Path type: Two-way
Observer view angle: 50.0°



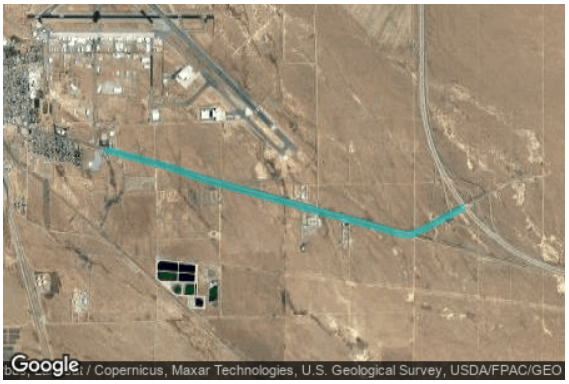
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.040368	-118.140624	2681.72	3.50	2685.22
2	35.040139	-118.140667	2680.42	3.50	2683.92
3	35.038329	-118.140681	2674.20	3.50	2677.70
4	35.037005	-118.140679	2667.47	3.50	2670.97
5	35.035781	-118.140685	2666.66	3.50	2670.16
6	35.034887	-118.140667	2664.38	3.50	2667.88
7	35.032798	-118.140689	2655.84	3.50	2659.34
8	35.032504	-118.140654	2653.89	3.50	2657.39
9	35.032383	-118.140549	2653.92	3.50	2657.42
10	35.032297	-118.140288	2654.38	3.50	2657.88
11	35.032197	-118.140262	2654.31	3.50	2657.81
12	35.031811	-118.140383	2652.49	3.50	2655.99
13	35.031074	-118.140469	2651.09	3.50	2654.59

Name: Route13
Path type: Two-way
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.093689	-118.134063	2836.92	14.00	2850.92
2	35.092179	-118.136080	2842.38	14.00	2856.38
3	35.090861	-118.137912	2845.42	14.00	2859.42
4	35.089714	-118.139535	2848.77	14.00	2862.77
5	35.088300	-118.141436	2849.83	14.00	2863.83
6	35.086599	-118.143754	2850.69	14.00	2864.69
7	35.085605	-118.145145	2852.58	14.00	2866.58
8	35.084382	-118.146907	2855.99	14.00	2869.99

Name: Route14
Path type: Two-way
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.037772	-118.107515	2648.38	7.60	2655.98
2	35.036787	-118.109729	2646.58	7.60	2654.18
3	35.035765	-118.111943	2627.76	7.60	2635.36
4	35.035277	-118.113091	2626.00	7.60	2633.60
5	35.034904	-118.114239	2629.08	7.60	2636.68
6	35.034808	-118.115190	2631.55	7.60	2639.15
7	35.034969	-118.116292	2632.51	7.60	2640.11
8	35.035330	-118.117742	2635.15	7.60	2642.75
9	35.035900	-118.120318	2640.47	7.60	2648.07
10	35.036954	-118.124982	2650.18	7.60	2657.78
11	35.038132	-118.130204	2660.80	7.60	2668.40
12	35.038891	-118.133499	2668.04	7.60	2675.64
13	35.040220	-118.139383	2680.46	7.60	2688.06
14	35.040828	-118.142063	2686.12	7.60	2693.72
15	35.041084	-118.143154	2688.52	7.60	2696.12
16	35.041949	-118.146125	2696.35	7.60	2703.95
17	35.042632	-118.148852	2703.92	7.60	2711.52
18	35.043562	-118.152972	2713.48	7.60	2721.08
19	35.044264	-118.156175	2719.34	7.60	2726.94

Name: Route18
Path type: Two-way
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.024698	-118.165092	2678.56	3.50	2682.06
2	35.024708	-118.164466	2675.88	3.50	2679.38
3	35.024770	-118.161439	2669.95	3.50	2673.45
4	35.024850	-118.158540	2664.58	3.50	2668.08
5	35.024911	-118.155455	2658.73	3.50	2662.23
6	35.024992	-118.151860	2652.80	3.50	2656.30
7	35.025042	-118.150097	2651.77	3.50	2655.27
8	35.025004	-118.149610	2651.31	3.50	2654.81
9	35.024890	-118.149494	2649.91	3.50	2653.41

Name: Route20
Path type: Two-way
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.046908	-118.155894	2726.92	3.50	2730.42
2	35.047005	-118.151081	2719.24	3.50	2722.74
3	35.047133	-118.146520	2711.73	3.50	2715.23
4	35.047417	-118.137988	2697.09	3.50	2700.59

Name: Route22
Path type: Two-way
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	34.985203	-118.152907	2609.82	7.60	2617.42
2	34.988454	-118.153869	2619.62	7.60	2627.22
3	34.992226	-118.155059	2628.37	7.60	2635.97
4	34.994123	-118.155657	2634.07	7.60	2641.67
5	34.995551	-118.156107	2635.73	7.60	2643.33
6	34.998213	-118.156970	2641.24	7.60	2648.84
7	35.001440	-118.158015	2641.64	7.60	2649.24

Name: Route23
Path type: One-way (toward increasing index)
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.004682	-118.160128	2651.02	7.60	2658.62
2	35.007744	-118.160491	2658.44	7.60	2666.04
3	35.008967	-118.160650	2660.32	7.60	2667.92
4	35.010398	-118.161079	2661.68	7.60	2669.28
5	35.011671	-118.161473	2661.42	7.60	2669.02
6	35.014174	-118.162269	2675.28	7.60	2682.88
7	35.016592	-118.163065	2681.28	7.60	2688.88
8	35.018652	-118.163739	2678.87	7.60	2686.47
9	35.021362	-118.164605	2676.80	7.60	2684.40
10	35.024702	-118.165691	2679.26	7.60	2686.86
11	35.027477	-118.166609	2682.76	7.60	2690.36
12	35.028936	-118.167108	2685.17	7.60	2692.77
13	35.031246	-118.167852	2690.35	7.60	2697.95
14	35.032648	-118.168290	2693.80	7.60	2701.40
15	35.034515	-118.168920	2698.35	7.60	2705.95
16	35.035695	-118.169349	2714.21	7.60	2721.81
17	35.037405	-118.169713	2736.62	7.60	2744.22

Name: Route26
Path type: One-way (toward increasing index)
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	34.972570	-118.159397	2630.61	7.60	2638.21
2	34.975154	-118.159193	2629.18	7.60	2636.78
3	34.977451	-118.159006	2619.34	7.60	2626.94
4	34.979655	-118.158837	2622.17	7.60	2629.77
5	34.980478	-118.158795	2624.34	7.60	2631.94
6	34.981358	-118.158788	2626.14	7.60	2633.74
7	34.982402	-118.158816	2628.34	7.60	2635.94
8	34.984248	-118.158906	2631.41	7.60	2639.01
9	34.987668	-118.159096	2638.62	7.60	2646.22
10	34.989650	-118.159204	2641.46	7.60	2649.06
11	34.992619	-118.159366	2644.94	7.60	2652.54
12	34.994637	-118.159466	2647.24	7.60	2654.84
13	34.998587	-118.159656	2649.61	7.60	2657.21
14	34.999810	-118.159719	2649.17	7.60	2656.77
15	35.002300	-118.159880	2647.63	7.60	2655.23
16	35.004425	-118.160119	2650.01	7.60	2657.61
17	35.004682	-118.160128	2651.02	7.60	2658.62

Name: Route27
Path type: One-way (toward increasing index)
Observer view angle: 50.0°



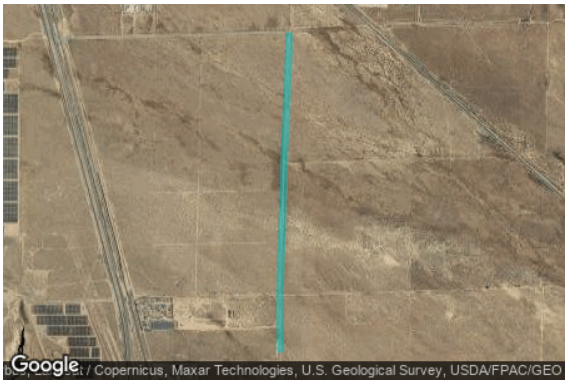
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.037411	-118.169805	2738.77	7.60	2746.37
2	35.036288	-118.169724	2726.45	7.60	2734.05
3	35.035051	-118.169391	2706.14	7.60	2713.74
4	35.031911	-118.168367	2692.88	7.60	2700.48
5	35.029615	-118.167632	2688.93	7.60	2696.53
6	35.027884	-118.167071	2685.42	7.60	2693.02
7	35.025310	-118.166214	2680.85	7.60	2688.45
8	35.023450	-118.165610	2677.92	7.60	2685.52
9	35.021533	-118.164997	2677.74	7.60	2685.34
10	35.019888	-118.164463	2678.93	7.60	2686.53
11	35.017149	-118.163579	2681.31	7.60	2688.91
12	35.015440	-118.163028	2679.78	7.60	2687.38
13	35.012772	-118.162162	2669.07	7.60	2676.67
14	35.011349	-118.161707	2663.84	7.60	2671.44
15	35.009918	-118.161269	2661.83	7.60	2669.43
16	35.009167	-118.161015	2660.49	7.60	2668.09
17	35.008473	-118.160875	2659.21	7.60	2666.81
18	35.008323	-118.160852	2658.91	7.60	2666.51

Name: Route29
Path type: Two-way
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.037962	-118.107122	2625.68	7.60	2633.28
2	35.036614	-118.105689	2620.36	7.60	2627.96
3	35.034386	-118.102715	2612.60	7.60	2620.20
4	35.032532	-118.099378	2602.75	7.60	2610.35
5	35.031237	-118.096102	2597.16	7.60	2604.76
6	35.030281	-118.092496	2589.56	7.60	2597.16
7	35.029384	-118.086780	2581.36	7.60	2588.96
8	35.028274	-118.079558	2570.47	7.60	2578.07
9	35.027071	-118.071579	2558.86	7.60	2566.46
10	35.026268	-118.066221	2553.25	7.60	2560.85
11	35.025268	-118.059848	2548.02	7.60	2555.62
12	35.024048	-118.051734	2541.66	7.60	2549.26
13	35.023052	-118.045084	2545.17	7.60	2552.77
14	35.021757	-118.036691	2567.39	7.60	2574.99
15	35.020696	-118.029670	2603.92	7.60	2611.52
16	35.020115	-118.025994	2633.18	7.60	2640.78
17	35.019843	-118.024280	2649.71	7.60	2657.31
18	35.019569	-118.022222	2655.43	7.60	2663.03
19	35.019462	-118.020337	2658.73	7.60	2666.33

Name: Route31
Path type: Two-way
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.024890	-118.149494	2649.91	3.50	2653.41
2	35.024508	-118.149493	2649.68	3.50	2653.18
3	35.022733	-118.149571	2645.88	3.50	2649.38
4	35.020148	-118.149717	2642.77	3.50	2646.27
5	35.018154	-118.149818	2640.29	3.50	2643.79
6	35.016169	-118.149895	2640.05	3.50	2643.55
7	35.014462	-118.149962	2641.25	3.50	2644.75
8	35.012572	-118.150040	2636.74	3.50	2640.24
9	35.010416	-118.150117	2633.44	3.50	2636.94
10	35.008493	-118.150113	2630.14	3.50	2633.64
11	35.007291	-118.150088	2629.53	3.50	2633.03

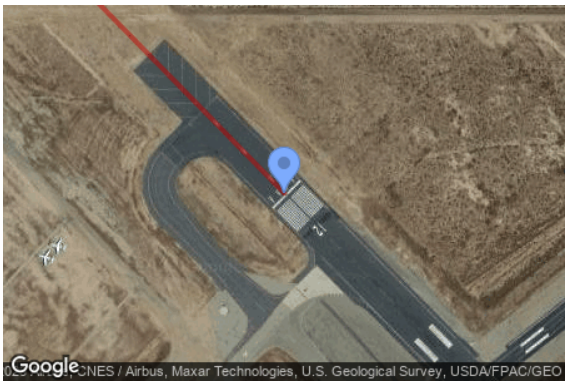
Name: Route32
Path type: Two-way
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	34.993461	-118.155078	2631.04	14.00	2645.04
2	34.997382	-118.156361	2639.79	14.00	2653.79
3	35.002401	-118.158008	2643.04	14.00	2657.04
4	35.006025	-118.159174	2643.43	14.00	2657.43
5	35.009064	-118.160137	2655.99	14.00	2669.99
6	35.010495	-118.160603	2658.54	14.00	2672.54
7	35.013189	-118.161507	2668.56	14.00	2682.56
8	35.018744	-118.163330	2677.33	14.00	2691.33
9	35.024727	-118.165241	2678.70	14.00	2692.70
10	35.030240	-118.167027	2687.13	14.00	2701.13
11	35.032233	-118.167680	2691.78	14.00	2705.78
12	35.034458	-118.168415	2696.20	14.00	2710.20
13	35.036696	-118.169151	2702.17	14.00	2716.17
14	35.037891	-118.169518	2707.02	14.00	2721.02

Flight Path Receptors

Name: MASP 12
Description: None
Threshold height: 50 ft
Direction: 135.6°
Glide slope: 3.0°
Pilot view restricted? Yes
Vertical view: 30.0°
Azimuthal view: 50.0°



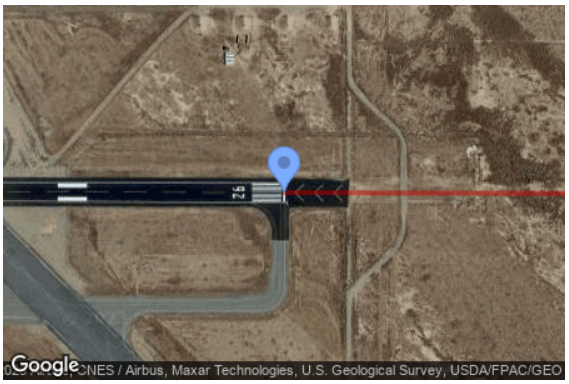
Point	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
Threshold	35.067997	-118.159056	2793.00	50.00	2843.00
Two-mile	35.088637	-118.183823	3014.80	381.60	3396.40

Name: MASP 22
Description: None
Threshold height: 50 ft
Direction: 232.5°
Glide slope: 3.0°
Pilot view restricted? Yes
Vertical view: 30.0°
Azimuthal view: 50.0°



Point	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
Threshold	35.067800	-118.151866	2778.90	50.00	2828.90
Two-mile	35.085397	-118.123804	2778.10	604.20	3382.30

Name: MASP 26
Description: None
Threshold height: 50 ft
Direction: 270.2°
Glide slope: 3.0°
Pilot view restricted? Yes
Vertical view: 30.0°
Azimuthal view: 50.0°



Point	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
Threshold	35.059183	-118.142549	2730.80	50.00	2780.80
Two-mile	35.059102	-118.107186	2677.40	656.90	3334.30

Name: MASP 30
Description: None
Threshold height: 50 ft
Direction: 314.8°
Glide slope: 3.0°
Pilot view restricted? Yes
Vertical view: 30.0°
Azimuthal view: 50.0°



Point	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
Threshold	35.046580	-118.133135	2681.00	50.00	2731.00
Two-mile	35.026204	-118.108051	2594.70	689.70	3284.40

Name: MASP 4
Description: None
Threshold height: 50 ft
Direction: 51.1°
Glide slope: 3.0°
Pilot view restricted? Yes
Vertical view: 30.0°
Azimuthal view: 50.0°



Point	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
Threshold	35.059748	-118.164297	2777.80	50.00	2827.80
Two-mile	35.041580	-118.191806	2772.90	608.30	3381.20

Name: MASP 8
Description: None
Threshold height: 50 ft
Direction: 90.1°
Glide slope: 3.0°
Pilot view restricted? Yes
Vertical view: 30.0°
Azimuthal view: 50.0°

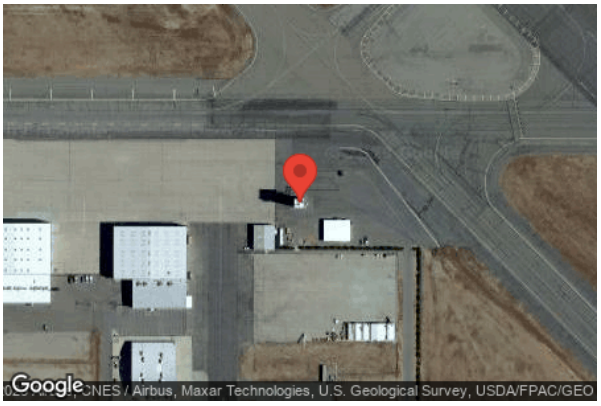


Point	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
Threshold	35.059242	-118.166076	2778.50	50.00	2828.50
Two-mile	35.059272	-118.201439	2921.10	460.80	3381.90

Discrete Observation Point Receptors

Name	ID	Latitude (°)	Longitude (°)	Elevation (ft)	Height (ft)
OP 1	1	35.065098	-118.180928	2843.42	5.50
OP 2	2	35.065057	-118.182564	2849.00	5.50
OP 3	3	35.064511	-118.184362	2856.49	5.50
OP 4	4	35.061390	-118.185376	2836.28	5.50
OP 5	5	35.061201	-118.193962	2873.23	5.50
OP 6	6	35.061183	-118.196242	2886.07	5.50
OP 7	7	35.060619	-118.189032	2846.51	5.50
OP 8	8	35.057993	-118.195225	2864.50	5.50
OP 23	23	35.038382	-118.167332	2704.07	5.50
OP 24	24	35.030481	-118.187314	2764.59	5.50
OP 25	25	35.029317	-118.187126	2766.42	5.50
OP 26	26	35.027578	-118.189024	2776.05	5.50
32-ATCT	32	35.057003	-118.149446	2742.00	85.00

Map image of 32-ATCT



Glare Analysis Results

Summary of Results No glare predicted

PV Array	Tilt	Orient	Annual Green Glare		Annual Yellow Glare		Energy
	°	°	min	hr	min	hr	kWh
PV01	SA tracking	SA tracking	0	0.0	0	0.0	-
PV02	SA tracking	SA tracking	0	0.0	0	0.0	-
PV03	SA tracking	SA tracking	0	0.0	0	0.0	-
PV04	SA tracking	SA tracking	0	0.0	0	0.0	-
PV05	SA tracking	SA tracking	0	0.0	0	0.0	-
PV06	SA tracking	SA tracking	0	0.0	0	0.0	-
PV07	SA tracking	SA tracking	0	0.0	0	0.0	-

Total glare received by each receptor; may include duplicate times of glare from multiple reflective surfaces.

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01	0	0.0	0	0.0
Route02	0	0.0	0	0.0
Route03	0	0.0	0	0.0
Route07	0	0.0	0	0.0
Route12	0	0.0	0	0.0
Route13	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route20	0	0.0	0	0.0
Route22	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route26	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV: PV01 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01	0	0.0	0	0.0
Route02	0	0.0	0	0.0
Route03	0	0.0	0	0.0
Route07	0	0.0	0	0.0
Route12	0	0.0	0	0.0
Route13	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route20	0	0.0	0	0.0
Route22	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route26	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV01 and Route: Route01

No glare found

PV01 and Route: Route02

No glare found

PV01 and Route: Route03

No glare found

PV01 and Route: Route07

No glare found

PV01 and Route: Route12

No glare found

PV01 and Route: Route13

No glare found

PV01 and Route: Route14

No glare found

PV01 and Route: Route18

No glare found

PV01 and Route: Route20

No glare found

PV01 and Route: Route22

No glare found

PV01 and Route: Route23

No glare found

PV01 and Route: Route26

No glare found

PV01 and Route: Route27

No glare found

PV01 and Route: Route29

No glare found

PV01 and Route: Route31

No glare found

PV01 and Route: Route32

No glare found

PV01 and FP: MASP 12

No glare found

PV01 and FP: MASP 22

No glare found

PV01 and FP: MASP 26

No glare found

PV01 and FP: MASP 30

No glare found

PV01 and FP: MASP 4

No glare found

PV01 and FP: MASP 8

No glare found

PV01 and OP 1

No glare found

PV01 and OP 2

No glare found

PV01 and OP 3

No glare found

PV01 and OP 4

No glare found

PV01 and OP 5

No glare found

PV01 and OP 6

No glare found

PV01 and OP 7

No glare found

PV01 and OP 8

No glare found

PV01 and OP 23

No glare found

PV01 and OP 24

No glare found

PV01 and OP 25

No glare found

PV01 and OP 26

No glare found

PV01 and 32-ATCT

No glare found

PV: PV02 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01	0	0.0	0	0.0
Route02	0	0.0	0	0.0
Route03	0	0.0	0	0.0
Route07	0	0.0	0	0.0
Route12	0	0.0	0	0.0
Route13	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route20	0	0.0	0	0.0
Route22	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route26	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV02 and Route: Route01

No glare found

PV02 and Route: Route02

No glare found

PV02 and Route: Route03

No glare found

PV02 and Route: Route07

No glare found

PV02 and Route: Route12

No glare found

PV02 and Route: Route13

No glare found

PV02 and Route: Route14

No glare found

PV02 and Route: Route18

No glare found

PV02 and Route: Route20

No glare found

PV02 and Route: Route22

No glare found

PV02 and Route: Route23

No glare found

PV02 and Route: Route26

No glare found

PV02 and Route: Route27

No glare found

PV02 and Route: Route29

No glare found

PV02 and Route: Route31

No glare found

PV02 and Route: Route32

No glare found

PV02 and FP: MASP 12

No glare found

PV02 and FP: MASP 22

No glare found

PV02 and FP: MASP 26

No glare found

PV02 and FP: MASP 30

No glare found

PV02 and FP: MASP 4

No glare found

PV02 and FP: MASP 8

No glare found

PV02 and OP 1

No glare found

PV02 and OP 2

No glare found

PV02 and OP 3

No glare found

PV02 and OP 4

No glare found

PV02 and OP 5

No glare found

PV02 and OP 6

No glare found

PV02 and OP 7

No glare found

PV02 and OP 8

No glare found

PV02 and OP 23

No glare found

PV02 and OP 24

No glare found

PV02 and OP 25

No glare found

PV02 and OP 26

No glare found

PV02 and 32-ATCT

No glare found

PV: PV03 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01	0	0.0	0	0.0
Route02	0	0.0	0	0.0
Route03	0	0.0	0	0.0
Route07	0	0.0	0	0.0
Route12	0	0.0	0	0.0
Route13	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route20	0	0.0	0	0.0
Route22	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route26	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV03 and Route: Route01

No glare found

PV03 and Route: Route02

No glare found

PV03 and Route: Route03

No glare found

PV03 and Route: Route07

No glare found

PV03 and Route: Route12

No glare found

PV03 and Route: Route13

No glare found

PV03 and Route: Route14

No glare found

PV03 and Route: Route18

No glare found

PV03 and Route: Route20

No glare found

PV03 and Route: Route22

No glare found

PV03 and Route: Route23

No glare found

PV03 and Route: Route26

No glare found

PV03 and Route: Route27

No glare found

PV03 and Route: Route29

No glare found

PV03 and Route: Route31

No glare found

PV03 and Route: Route32

No glare found

PV03 and FP: MASP 12

No glare found

PV03 and FP: MASP 22

No glare found

PV03 and FP: MASP 26

No glare found

PV03 and FP: MASP 30

No glare found

PV03 and FP: MASP 4

No glare found

PV03 and FP: MASP 8

No glare found

PV03 and OP 1

No glare found

PV03 and OP 2

No glare found

PV03 and OP 3

No glare found

PV03 and OP 4

No glare found

PV03 and OP 5

No glare found

PV03 and OP 6

No glare found

PV03 and OP 7

No glare found

PV03 and OP 8

No glare found

PV03 and OP 23

No glare found

PV03 and OP 24

No glare found

PV03 and OP 25

No glare found

PV03 and OP 26

No glare found

PV03 and 32-ATCT

No glare found

PV: PV04 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01	0	0.0	0	0.0
Route02	0	0.0	0	0.0
Route03	0	0.0	0	0.0
Route07	0	0.0	0	0.0
Route12	0	0.0	0	0.0
Route13	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route20	0	0.0	0	0.0
Route22	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route26	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV04 and Route: Route01

No glare found

PV04 and Route: Route02

No glare found

PV04 and Route: Route03

No glare found

PV04 and Route: Route07

No glare found

PV04 and Route: Route12

No glare found

PV04 and Route: Route13

No glare found

PV04 and Route: Route14

No glare found

PV04 and Route: Route18

No glare found

PV04 and Route: Route20

No glare found

PV04 and Route: Route22

No glare found

PV04 and Route: Route23

No glare found

PV04 and Route: Route26

No glare found

PV04 and Route: Route27

No glare found

PV04 and Route: Route29

No glare found

PV04 and Route: Route31

No glare found

PV04 and Route: Route32

No glare found

PV04 and FP: MASP 12

No glare found

PV04 and FP: MASP 22

No glare found

PV04 and FP: MASP 26

No glare found

PV04 and FP: MASP 30

No glare found

PV04 and FP: MASP 4

No glare found

PV04 and FP: MASP 8

No glare found

PV04 and OP 1

No glare found

PV04 and OP 2

No glare found

PV04 and OP 3

No glare found

PV04 and OP 4

No glare found

PV04 and OP 5

No glare found

PV04 and OP 6

No glare found

PV04 and OP 7

No glare found

PV04 and OP 8

No glare found

PV04 and OP 23

No glare found

PV04 and OP 24

No glare found

PV04 and OP 25

No glare found

PV04 and OP 26

No glare found

PV04 and 32-ATCT

No glare found

PV: PV05 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01	0	0.0	0	0.0
Route02	0	0.0	0	0.0
Route03	0	0.0	0	0.0
Route07	0	0.0	0	0.0
Route12	0	0.0	0	0.0
Route13	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route20	0	0.0	0	0.0
Route22	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route26	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV05 and Route: Route01

No glare found

PV05 and Route: Route02

No glare found

PV05 and Route: Route03

No glare found

PV05 and Route: Route07

No glare found

PV05 and Route: Route12

No glare found

PV05 and Route: Route13

No glare found

PV05 and Route: Route14

No glare found

PV05 and Route: Route18

No glare found

PV05 and Route: Route20

No glare found

PV05 and Route: Route22

No glare found

PV05 and Route: Route23

No glare found

PV05 and Route: Route26

No glare found

PV05 and Route: Route27

No glare found

PV05 and Route: Route29

No glare found

PV05 and Route: Route31

No glare found

PV05 and Route: Route32

No glare found

PV05 and FP: MASP 12

No glare found

PV05 and FP: MASP 22

No glare found

PV05 and FP: MASP 26

No glare found

PV05 and FP: MASP 30

No glare found

PV05 and FP: MASP 4

No glare found

PV05 and FP: MASP 8

No glare found

PV05 and OP 1

No glare found

PV05 and OP 2

No glare found

PV05 and OP 3

No glare found

PV05 and OP 4

No glare found

PV05 and OP 5

No glare found

PV05 and OP 6

No glare found

PV05 and OP 7

No glare found

PV05 and OP 8

No glare found

PV05 and OP 23

No glare found

PV05 and OP 24

No glare found

PV05 and OP 25

No glare found

PV05 and OP 26

No glare found

PV05 and 32-ATCT

No glare found

PV: PV06 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01	0	0.0	0	0.0
Route02	0	0.0	0	0.0
Route03	0	0.0	0	0.0
Route07	0	0.0	0	0.0
Route12	0	0.0	0	0.0
Route13	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route20	0	0.0	0	0.0
Route22	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route26	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV06 and Route: Route01

No glare found

PV06 and Route: Route02

No glare found

PV06 and Route: Route03

No glare found

PV06 and Route: Route07

No glare found

PV06 and Route: Route12

No glare found

PV06 and Route: Route13

No glare found

PV06 and Route: Route14

No glare found

PV06 and Route: Route18

No glare found

PV06 and Route: Route20

No glare found

PV06 and Route: Route22

No glare found

PV06 and Route: Route23

No glare found

PV06 and Route: Route26

No glare found

PV06 and Route: Route27

No glare found

PV06 and Route: Route29

No glare found

PV06 and Route: Route31

No glare found

PV06 and Route: Route32

No glare found

PV06 and FP: MASP 12

No glare found

PV06 and FP: MASP 22

No glare found

PV06 and FP: MASP 26

No glare found

PV06 and FP: MASP 30

No glare found

PV06 and FP: MASP 4

No glare found

PV06 and FP: MASP 8

No glare found

PV06 and OP 1

No glare found

PV06 and OP 2

No glare found

PV06 and OP 3

No glare found

PV06 and OP 4

No glare found

PV06 and OP 5

No glare found

PV06 and OP 6

No glare found

PV06 and OP 7

No glare found

PV06 and OP 8

No glare found

PV06 and OP 23

No glare found

PV06 and OP 24

No glare found

PV06 and OP 25

No glare found

PV06 and OP 26

No glare found

PV06 and 32-ATCT

No glare found

PV: PV07 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01	0	0.0	0	0.0
Route02	0	0.0	0	0.0
Route03	0	0.0	0	0.0
Route07	0	0.0	0	0.0
Route12	0	0.0	0	0.0
Route13	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route20	0	0.0	0	0.0
Route22	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route26	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV07 and Route: Route01

No glare found

PV07 and Route: Route02

No glare found

PV07 and Route: Route03

No glare found

PV07 and Route: Route07

No glare found

PV07 and Route: Route12

No glare found

PV07 and Route: Route13

No glare found

PV07 and Route: Route14

No glare found

PV07 and Route: Route18

No glare found

PV07 and Route: Route20

No glare found

PV07 and Route: Route22

No glare found

PV07 and Route: Route23

No glare found

PV07 and Route: Route26

No glare found

PV07 and Route: Route27

No glare found

PV07 and Route: Route29

No glare found

PV07 and Route: Route31

No glare found

PV07 and Route: Route32

No glare found

PV07 and FP: MASP 12

No glare found

PV07 and FP: MASP 22

No glare found

PV07 and FP: MASP 26

No glare found

PV07 and FP: MASP 30

No glare found

PV07 and FP: MASP 4

No glare found

PV07 and FP: MASP 8

No glare found

PV07 and OP 1

No glare found

PV07 and OP 2

No glare found

PV07 and OP 3

No glare found

PV07 and OP 4

No glare found

PV07 and OP 5

No glare found

PV07 and OP 6

No glare found

PV07 and OP 7

No glare found

PV07 and OP 8

No glare found

PV07 and OP 23

No glare found

PV07 and OP 24

No glare found

PV07 and OP 25

No glare found

PV07 and OP 26

No glare found

PV07 and 32-ATCT

No glare found

Assumptions

"Green" glare is glare with low potential to cause an after-image (flash blindness) when observed prior to a typical blink response time.
"Yellow" glare is glare with potential to cause an after-image (flash blindness) when observed prior to a typical blink response time.
Times associated with glare are denoted in Standard time. For Daylight Savings, add one hour.
The algorithm does not rigorously represent the detailed geometry of a system; detailed features such as gaps between modules, variable height of the PV array, and support structures may impact actual glare results. However, we have validated our models against several systems, including a PV array causing glare to the air-traffic control tower at Manchester-Boston Regional Airport and several sites in Albuquerque, and the tool accurately predicted the occurrence and intensity of glare at different times and days of the year.
Several V1 calculations utilize the PV array centroid, rather than the actual glare spot location, due to algorithm limitations. This may affect results for large PV footprints. Additional analyses of array sub-sections can provide additional information on expected glare. This primarily affects V1 analyses of path receptors.
Random number computations are utilized by various steps of the annual hazard analysis algorithm. Predicted minutes of glare can vary between runs as a result. This limitation primarily affects analyses of Observation Point receptors, including ATCTs. Note that the SGHAT/ ForgeSolar methodology has always relied on an analytical, qualitative approach to accurately determine the overall hazard (i.e. green vs. yellow) of expected glare on an annual basis.
The analysis does not automatically consider obstacles (either man-made or natural) between the observation points and the prescribed solar installation that may obstruct observed glare, such as trees, hills, buildings, etc.
The subtended source angle (glare spot size) is constrained by the PV array footprint size. Partitioning large arrays into smaller sections will reduce the maximum potential subtended angle, potentially impacting results if actual glare spots are larger than the sub-array size. Additional analyses of the combined area of adjacent sub-arrays can provide more information on potential glare hazards. (See previous point on related limitations.)
The variable direct normal irradiance (DNI) feature (if selected) scales the user-prescribed peak DNI using a typical clear-day irradiance profile. This profile has a lower DNI in the mornings and evenings and a maximum at solar noon. The scaling uses a clear-day irradiance profile based on a normalized time relative to sunrise, solar noon, and sunset, which are prescribed by a sun-position algorithm and the latitude and longitude obtained from Google maps. The actual DNI on any given day can be affected by cloud cover, atmospheric attenuation, and other environmental factors.
The ocular hazard predicted by the tool depends on a number of environmental, optical, and human factors, which can be uncertain. We provide input fields and typical ranges of values for these factors so that the user can vary these parameters to see if they have an impact on the results. The speed of SGHAT allows expedited sensitivity and parametric analyses.
The system output calculation is a DNI-based approximation that assumes clear, sunny skies year-round. It should not be used in place of more rigorous modeling methods.
Hazard zone boundaries shown in the Glare Hazard plot are an approximation and visual aid based on aggregated research data. Actual ocular impact outcomes encompass a continuous, not discrete, spectrum.
Glare locations displayed on receptor plots are approximate. Actual glare-spot locations may differ.
Refer to the Help page at **www.forgesolar.com/help/** for assumptions and limitations not listed here.

Default glare analysis parameters and observer eye characteristics (for reference only):

- Analysis time interval: 1 minute
- Ocular transmission coefficient: 0.5
- Pupil diameter: 0.002 meters
- Eye focal length: 0.017 meters
- Sun subtended angle: 9.3 milliradians

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FORGESOLAR GLARE ANALYSIS

Project: **Enterprise Solar North**
Site configuration: **Enterprise Solar Site 2**

Created 30 Jun, 2023
Updated 30 Jun, 2023
Time-step 1 minute
Timezone offset UTC-8
Minimum sun altitude 0.0 deg
DNI peaks at 1,000.0 W/m^2
Category 100 MW to 1 GW
Site ID 94280.16538

Ocular transmission coefficient 0.5
Pupil diameter 0.002 m
Eye focal length 0.017 m
Sun subtended angle 9.3 mrad
PV analysis methodology V2

Summary of Results No glare predicted

PV Array	Tilt	Orient	Annual Green Glare		Annual Yellow Glare		Energy
	°	°	min	hr	min	hr	kWh
PV08	SA tracking	SA tracking	0	0.0	0	0.0	-
PV09	SA tracking	SA tracking	0	0.0	0	0.0	-
PV10	SA tracking	SA tracking	0	0.0	0	0.0	-
PV11	SA tracking	SA tracking	0	0.0	0	0.0	-
PV12	SA tracking	SA tracking	0	0.0	0	0.0	-
PV13	SA tracking	SA tracking	0	0.0	0	0.0	-
PV14	SA tracking	SA tracking	0	0.0	0	0.0	-
PV15	SA tracking	SA tracking	0	0.0	0	0.0	-
PV16	SA tracking	SA tracking	0	0.0	0	0.0	-
PV17	SA tracking	SA tracking	0	0.0	0	0.0	-
PV18	SA tracking	SA tracking	0	0.0	0	0.0	-
PV19	SA tracking	SA tracking	0	0.0	0	0.0	-
PV20	SA tracking	SA tracking	0	0.0	0	0.0	-

Total glare received by each receptor; may include duplicate times of glare from multiple reflective surfaces.

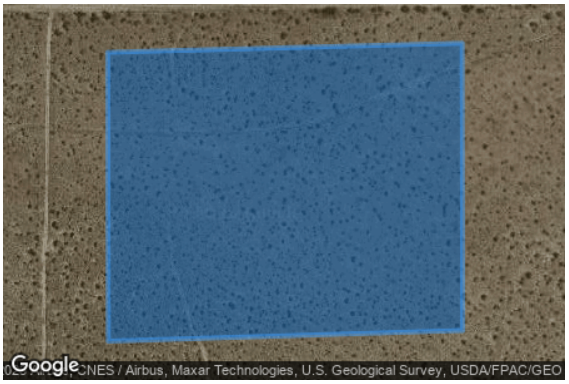
Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01	0	0.0	0	0.0
Route02	0	0.0	0	0.0
Route03	0	0.0	0	0.0
Route07	0	0.0	0	0.0
Route09	0	0.0	0	0.0
Route12	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route15	0	0.0	0	0.0
Route16	0	0.0	0	0.0
Route17	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route21	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
Route33	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

Component Data

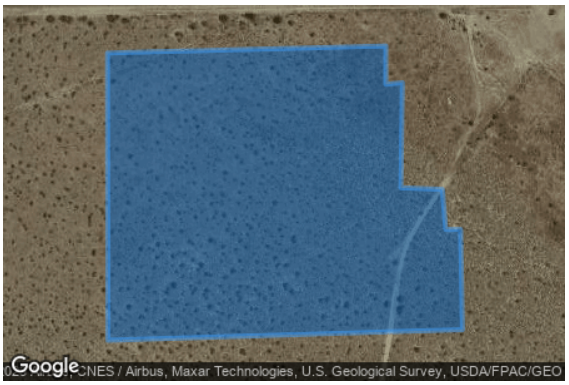
PV Arrays

Name: PV08
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



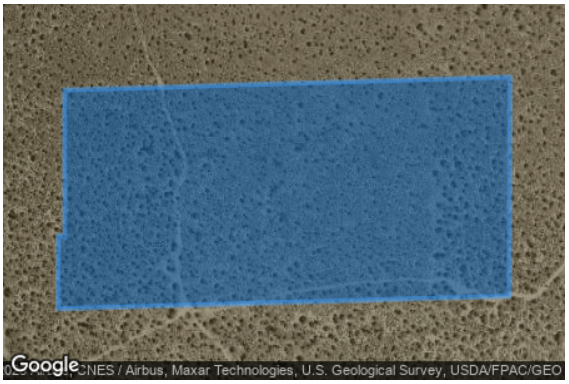
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.029530	-118.173145	2703.33	6.00	2709.33
2	35.029456	-118.176190	2715.28	6.00	2721.28
3	35.031481	-118.176194	2714.38	6.00	2720.38
4	35.031544	-118.173149	2701.56	6.00	2707.56
5	35.029530	-118.173145	2703.33	6.00	2709.33

Name: PV09
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



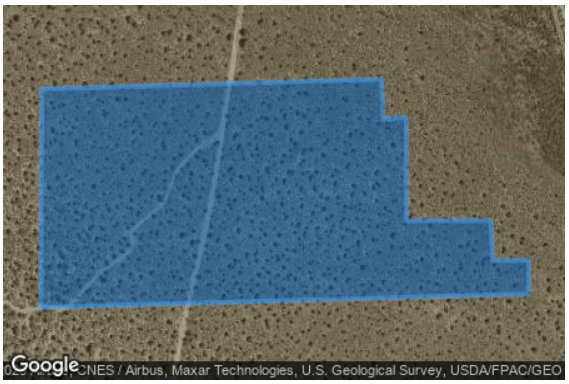
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.029530	-118.173145	2703.33	6.00	2709.33
2	35.031544	-118.173149	2701.56	6.00	2707.56
3	35.031594	-118.170758	2694.31	6.00	2700.31
4	35.031325	-118.170758	2693.81	6.00	2699.81
5	35.031336	-118.170616	2693.23	6.00	2699.23
6	35.030599	-118.170628	2692.75	6.00	2698.75
7	35.030588	-118.170273	2691.33	6.00	2697.33
8	35.030307	-118.170244	2692.28	6.00	2698.28
9	35.030307	-118.170116	2691.42	6.00	2697.42
10	35.029605	-118.170100	2692.35	6.00	2698.35
11	35.029530	-118.173145	2703.33	6.00	2709.33

Name: PV10
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



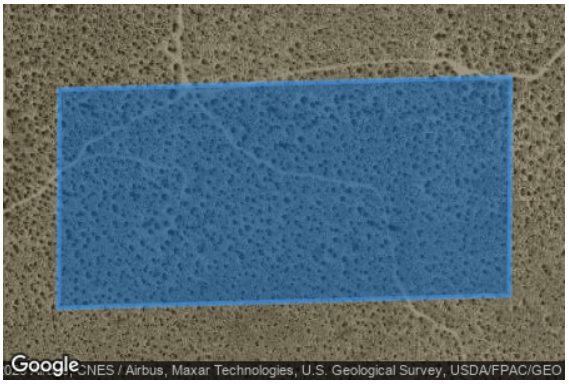
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.027882	-118.172368	2702.82	6.00	2708.82
2	35.027794	-118.176222	2716.66	6.00	2722.66
3	35.027793	-118.176247	2716.66	6.00	2722.66
4	35.028309	-118.176244	2716.42	6.00	2722.42
5	35.028297	-118.176187	2716.42	6.00	2722.42
6	35.029327	-118.176189	2715.84	6.00	2721.84
7	35.029419	-118.172361	2701.66	6.00	2707.66
8	35.028052	-118.172368	2703.43	6.00	2709.43
9	35.027882	-118.172368	2702.82	6.00	2708.82

Name: PV11
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.027979	-118.168180	2688.71	6.00	2694.71
2	35.027882	-118.172368	2702.82	6.00	2708.82
3	35.028052	-118.172368	2703.43	6.00	2709.43
4	35.029419	-118.172361	2701.66	6.00	2707.66
5	35.029489	-118.169445	2690.20	6.00	2696.20
6	35.029208	-118.169430	2690.72	6.00	2696.72
7	35.029220	-118.169231	2689.95	6.00	2695.95
8	35.028494	-118.169230	2691.86	6.00	2697.86
9	35.028495	-118.168504	2688.81	6.00	2694.81
10	35.028214	-118.168489	2689.54	6.00	2695.54
11	35.028215	-118.168176	2688.30	6.00	2694.30
12	35.027979	-118.168180	2688.71	6.00	2694.71

Name: PV12
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



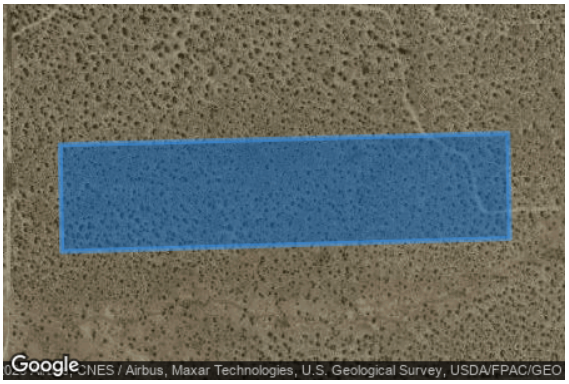
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.027793	-118.176247	2716.66	6.00	2722.66
2	35.027794	-118.176222	2716.66	6.00	2722.66
3	35.027882	-118.172368	2702.82	6.00	2708.82
4	35.026350	-118.172376	2700.87	6.00	2706.87
5	35.026261	-118.176254	2717.07	6.00	2723.07
6	35.027793	-118.176247	2716.66	6.00	2722.66

Name: PV13
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



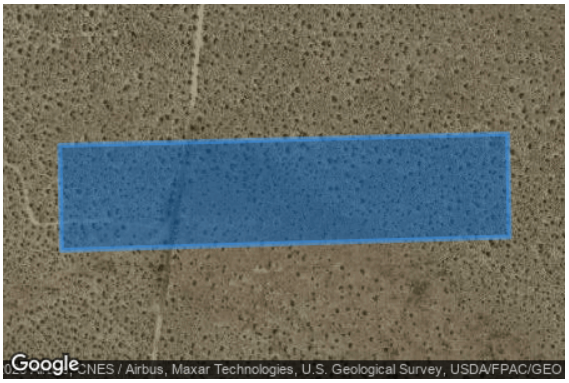
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.027882	-118.172368	2702.82	6.00	2708.82
2	35.027979	-118.168180	2688.71	6.00	2694.71
3	35.027466	-118.168189	2686.80	6.00	2692.80
4	35.027467	-118.167620	2685.74	6.00	2691.74
5	35.027186	-118.167591	2684.47	6.00	2690.47
6	35.027186	-118.167562	2684.47	6.00	2690.47
7	35.026460	-118.167575	2681.54	6.00	2687.54
8	35.026350	-118.172376	2700.87	6.00	2706.87
9	35.027882	-118.172368	2702.82	6.00	2708.82

Name: PV14
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.025511	-118.172461	2701.48	6.00	2707.48
2	35.025418	-118.176309	2717.61	6.00	2723.61
3	35.026167	-118.176325	2716.98	6.00	2722.98
4	35.026248	-118.172476	2701.38	6.00	2707.38
5	35.025511	-118.172461	2701.48	6.00	2707.48

Name: PV15
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



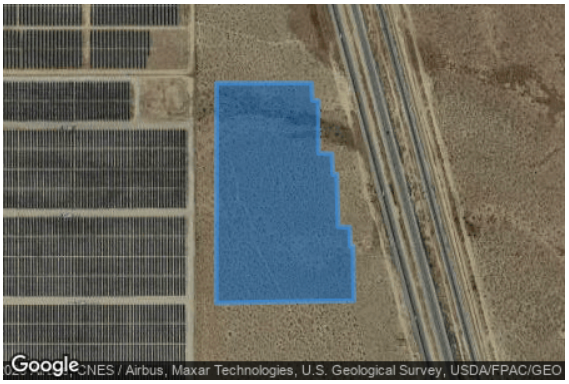
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.025511	-118.172461	2701.48	6.00	2707.48
2	35.026248	-118.172476	2701.38	6.00	2707.38
3	35.026330	-118.168628	2684.84	6.00	2690.84
4	35.025604	-118.168612	2687.61	6.00	2693.61
5	35.025511	-118.172461	2701.48	6.00	2707.48

Name: PV16
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



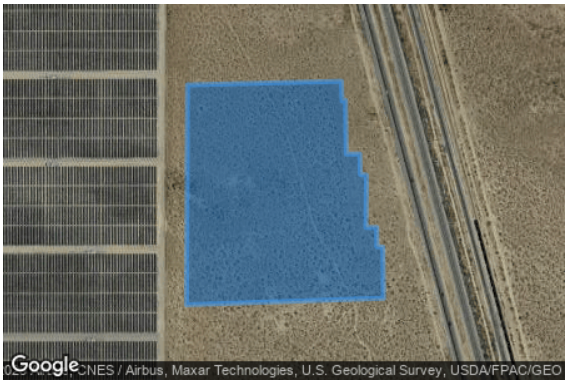
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.024417	-118.167576	2681.73	6.00	2687.73
2	35.024409	-118.167077	2680.34	6.00	2686.34
3	35.024132	-118.167065	2679.90	6.00	2685.90
4	35.024123	-118.166775	2678.79	6.00	2684.79
5	35.023379	-118.166774	2679.43	6.00	2685.43
6	35.023379	-118.166298	2676.75	6.00	2682.75
7	35.023112	-118.166286	2677.04	6.00	2683.04
8	35.023112	-118.166182	2676.56	6.00	2682.56
9	35.022406	-118.166169	2680.82	6.00	2686.82
10	35.022366	-118.167584	2684.40	6.00	2690.40
11	35.024417	-118.167576	2681.73	6.00	2687.73

Name: PV17
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



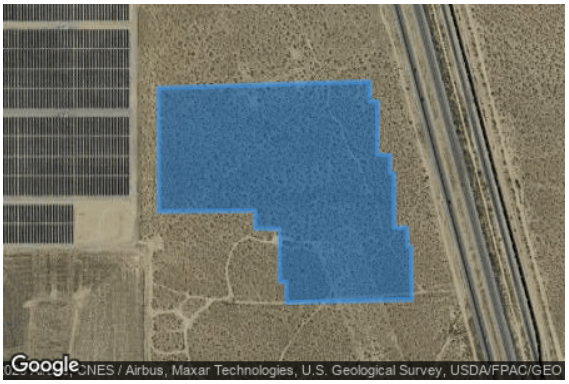
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.022252	-118.167583	2684.17	6.00	2690.17
2	35.022254	-118.165948	2681.20	6.00	2687.20
3	35.022015	-118.165936	2680.51	6.00	2686.51
4	35.022006	-118.165832	2679.72	6.00	2685.72
5	35.021271	-118.165830	2681.31	6.00	2687.31
6	35.021262	-118.165598	2680.21	6.00	2686.21
7	35.020976	-118.165586	2679.79	6.00	2685.79
8	35.020976	-118.165517	2679.79	6.00	2685.79
9	35.020242	-118.165492	2678.84	6.00	2684.84
10	35.020232	-118.165295	2677.76	6.00	2683.76
11	35.019965	-118.165283	2677.43	6.00	2683.43
12	35.019965	-118.165236	2677.43	6.00	2683.43
13	35.019202	-118.165223	2683.47	6.00	2689.47
14	35.019170	-118.167589	2689.02	6.00	2695.02
15	35.022252	-118.167583	2684.17	6.00	2690.17

Name: PV18
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



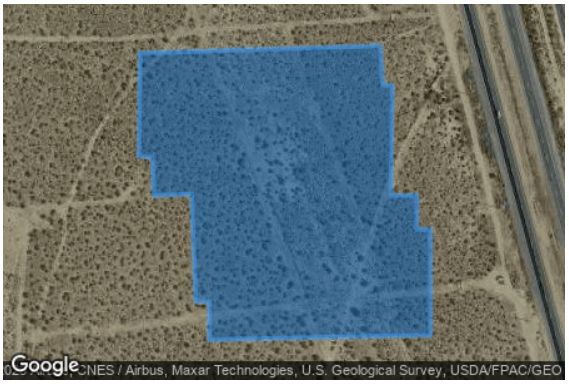
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.019065	-118.167589	2689.57	6.00	2695.57
2	35.019117	-118.164945	2682.49	6.00	2688.49
3	35.018840	-118.164932	2682.23	6.00	2688.23
4	35.018850	-118.164874	2681.66	6.00	2687.66
5	35.018096	-118.164861	2682.29	6.00	2688.29
6	35.018096	-118.164629	2680.90	6.00	2686.90
7	35.017810	-118.164617	2682.64	6.00	2688.64
8	35.017801	-118.164513	2682.42	6.00	2688.42
9	35.017066	-118.164523	2684.48	6.00	2690.48
10	35.017066	-118.164337	2683.31	6.00	2689.31
11	35.016799	-118.164337	2685.05	6.00	2691.05
12	35.016790	-118.164233	2684.36	6.00	2690.36
13	35.016074	-118.164220	2683.80	6.00	2689.80
14	35.015984	-118.167605	2698.82	6.00	2704.82
15	35.019065	-118.167589	2689.57	6.00	2695.57

Name: PV19
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.015879	-118.167617	2699.42	6.00	2705.42
2	35.015970	-118.163987	2681.42	6.00	2687.42
3	35.015693	-118.163975	2679.43	6.00	2685.43
4	35.015693	-118.163848	2680.51	6.00	2686.51
5	35.014949	-118.163858	2683.17	6.00	2689.17
6	35.014930	-118.163626	2682.23	6.00	2688.23
7	35.014692	-118.163637	2681.37	6.00	2687.37
8	35.014682	-118.163567	2681.02	6.00	2687.02
9	35.013919	-118.163566	2680.36	6.00	2686.36
10	35.013919	-118.163346	2679.84	6.00	2685.84
11	35.013652	-118.163333	2678.13	6.00	2684.13
12	35.013652	-118.163275	2677.87	6.00	2683.87
13	35.012908	-118.163262	2672.97	6.00	2678.97
14	35.012867	-118.165419	2684.07	6.00	2690.07
15	35.013153	-118.165420	2685.89	6.00	2691.89
16	35.013163	-118.165536	2686.19	6.00	2692.19
17	35.013897	-118.165537	2688.21	6.00	2694.21
18	35.013906	-118.165955	2690.06	6.00	2696.06
19	35.014154	-118.165955	2689.17	6.00	2695.17
20	35.014142	-118.167613	2697.24	6.00	2703.24
21	35.015879	-118.167617	2699.42	6.00	2705.42

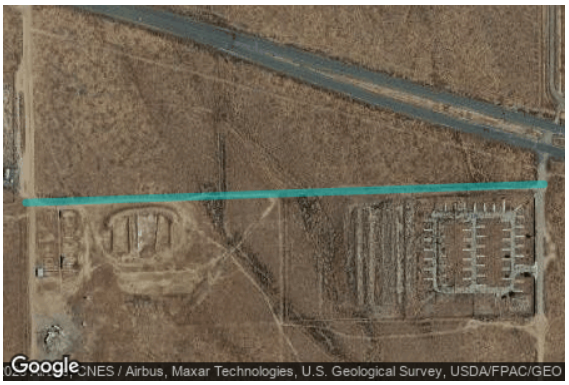
Name: PV20
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.012763	-118.165059	2681.48	6.00	2687.48
2	35.012813	-118.162995	2671.34	6.00	2677.34
3	35.012536	-118.162972	2670.02	6.00	2676.02
4	35.012537	-118.162891	2669.02	6.00	2675.02
5	35.011764	-118.162901	2669.56	6.00	2675.56
6	35.011764	-118.162680	2667.87	6.00	2673.87
7	35.011526	-118.162680	2669.14	6.00	2675.14
8	35.011526	-118.162564	2668.01	6.00	2674.01
9	35.010782	-118.162562	2669.96	6.00	2675.96
10	35.010750	-118.164464	2678.57	6.00	2684.57
11	35.011017	-118.164465	2679.65	6.00	2685.65
12	35.011017	-118.164581	2680.02	6.00	2686.02
13	35.011771	-118.164617	2681.19	6.00	2687.19
14	35.011761	-118.164941	2682.68	6.00	2688.68
15	35.012028	-118.164954	2682.90	6.00	2688.90
16	35.012037	-118.165070	2683.55	6.00	2689.55
17	35.012763	-118.165059	2681.48	6.00	2687.48

Route Receptors

Name: Route01
Path type: Two-way
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.039709	-118.149508	2692.31	3.50	2695.81
2	35.039786	-118.146850	2688.25	3.50	2691.75
3	35.039858	-118.144386	2683.89	3.50	2687.39
4	35.039952	-118.141138	2679.77	3.50	2683.27
5	35.039967	-118.140607	2680.15	3.50	2683.65

Name: Route02
Path type: Two-way
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.053016	-118.174512	2763.21	14.00	2777.21
2	35.049021	-118.173193	2748.57	14.00	2762.57
3	35.046647	-118.172376	2738.96	14.00	2752.96
4	35.043624	-118.171384	2727.01	14.00	2741.01
5	35.040706	-118.170415	2715.53	14.00	2729.53
6	35.039571	-118.170018	2711.86	14.00	2725.86
7	35.039161	-118.169913	2710.79	14.00	2724.79
8	35.037893	-118.169238	2705.61	14.00	2719.61
9	35.037140	-118.168610	2703.94	14.00	2717.94
10	35.036226	-118.167413	2700.85	14.00	2714.85
11	35.035817	-118.166612	2699.02	14.00	2713.02
12	35.035475	-118.165590	2695.89	14.00	2709.89
13	35.035285	-118.164477	2694.19	14.00	2708.19
14	35.035182	-118.163050	2692.66	14.00	2706.66
15	35.034975	-118.161008	2690.95	14.00	2704.95
16	35.034834	-118.159674	2688.64	14.00	2702.64
17	35.034511	-118.158258	2684.72	14.00	2698.72
18	35.034122	-118.156993	2681.73	14.00	2695.73
19	35.034033	-118.156782	2681.24	14.00	2695.24

Name: Route03
Path type: Two-way
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.034033	-118.156782	2681.24	14.00	2695.24
2	35.033504	-118.155530	2678.08	14.00	2692.08
3	35.032485	-118.153847	2672.61	14.00	2686.61
4	35.030056	-118.150444	2665.27	14.00	2679.27
5	35.028485	-118.148260	2657.69	14.00	2671.69
6	35.025018	-118.143464	2641.83	14.00	2655.83
7	35.023170	-118.140898	2636.29	14.00	2650.29
8	35.021094	-118.138019	2629.19	14.00	2643.19
9	35.018750	-118.134756	2618.86	14.00	2632.86
10	35.016664	-118.131900	2612.85	14.00	2626.85
11	35.014911	-118.129473	2608.55	14.00	2622.55
12	35.012911	-118.126664	2601.79	14.00	2615.79
13	35.011110	-118.124157	2597.76	14.00	2611.76
14	35.008595	-118.120674	2590.69	14.00	2604.69
15	35.007042	-118.118538	2588.15	14.00	2602.15
16	35.005438	-118.116328	2585.22	14.00	2599.22

Name: Route07
Path type: Two-way
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.031949	-118.168513	2692.18	3.50	2695.68
2	35.031894	-118.173384	2703.23	3.50	2706.73
3	35.031842	-118.176690	2716.09	3.50	2719.59
4	35.031814	-118.179183	2726.72	3.50	2730.22
5	35.031748	-118.183808	2744.44	3.50	2747.94
6	35.031745	-118.185548	2751.13	3.50	2754.63
7	35.031614	-118.185765	2751.35	3.50	2754.85
8	35.031549	-118.189041	2768.11	3.50	2771.61
9	35.031507	-118.193333	2793.48	3.50	2796.98
10	35.031430	-118.196682	2808.94	3.50	2812.44
11	35.031378	-118.198900	2817.34	3.50	2820.84

Name: Route09
Path type: Two-way
Observer view angle: 50.0°



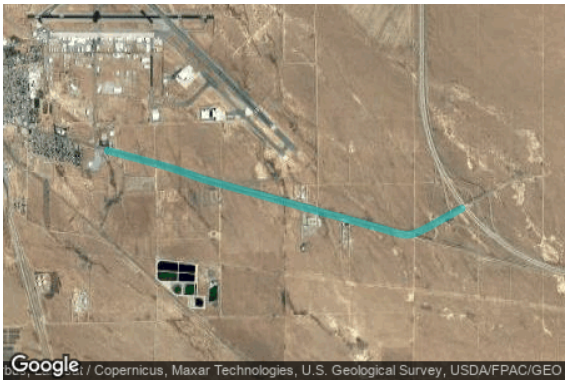
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.064321	-118.185842	2858.88	3.50	2862.38
2	35.061087	-118.185770	2835.99	3.50	2839.49
3	35.055737	-118.185576	2798.13	3.50	2801.63
4	35.053762	-118.185504	2784.45	3.50	2787.95
5	35.051721	-118.185486	2773.37	3.50	2776.87
6	35.050100	-118.185472	2764.77	3.50	2768.27
7	35.047908	-118.185453	2755.50	3.50	2759.00
8	35.044886	-118.185445	2749.40	3.50	2752.90
9	35.044254	-118.185446	2748.99	3.50	2752.49
10	35.042024	-118.185452	2748.48	3.50	2751.98
11	35.039734	-118.185458	2748.81	3.50	2752.31
12	35.037731	-118.185486	2750.20	3.50	2753.70
13	35.035730	-118.185525	2751.15	3.50	2754.65
14	35.034299	-118.185553	2752.24	3.50	2755.74
15	35.032651	-118.185585	2751.62	3.50	2755.12
16	35.024377	-118.185687	2761.05	3.50	2764.55

Name: Route12
Path type: Two-way
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.040368	-118.140624	2681.72	3.50	2685.22
2	35.040139	-118.140667	2680.42	3.50	2683.92
3	35.038329	-118.140681	2674.20	3.50	2677.70
4	35.037005	-118.140679	2667.47	3.50	2670.97
5	35.035781	-118.140685	2666.66	3.50	2670.16
6	35.034887	-118.140667	2664.38	3.50	2667.88
7	35.032798	-118.140689	2655.84	3.50	2659.34
8	35.032504	-118.140654	2653.89	3.50	2657.39
9	35.032383	-118.140549	2653.92	3.50	2657.42
10	35.032297	-118.140288	2654.38	3.50	2657.88
11	35.032197	-118.140262	2654.31	3.50	2657.81
12	35.031811	-118.140383	2652.49	3.50	2655.99
13	35.031074	-118.140469	2651.09	3.50	2654.59

Name: Route14
Path type: Two-way
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.037772	-118.107515	2648.38	7.60	2655.98
2	35.036787	-118.109729	2646.58	7.60	2654.18
3	35.035765	-118.111943	2627.76	7.60	2635.36
4	35.035277	-118.113091	2626.00	7.60	2633.60
5	35.034904	-118.114239	2629.08	7.60	2636.68
6	35.034808	-118.115190	2631.55	7.60	2639.15
7	35.034969	-118.116292	2632.51	7.60	2640.11
8	35.035330	-118.117742	2635.15	7.60	2642.75
9	35.035900	-118.120318	2640.47	7.60	2648.07
10	35.036954	-118.124982	2650.18	7.60	2657.78
11	35.038132	-118.130204	2660.80	7.60	2668.40
12	35.038891	-118.133499	2668.04	7.60	2675.64
13	35.040220	-118.139383	2680.46	7.60	2688.06
14	35.040828	-118.142063	2686.12	7.60	2693.72
15	35.041084	-118.143154	2688.52	7.60	2696.12
16	35.041949	-118.146125	2696.35	7.60	2703.95
17	35.042632	-118.148852	2703.92	7.60	2711.52
18	35.043562	-118.152972	2713.48	7.60	2721.08
19	35.044264	-118.156175	2719.34	7.60	2726.94

Name: Route15
Path type: Two-way
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.048370	-118.176036	2745.49	14.00	2759.49
2	35.047827	-118.178500	2745.20	14.00	2759.20
3	35.047068	-118.182054	2745.55	14.00	2759.55
4	35.046511	-118.184553	2747.88	14.00	2761.88
5	35.046088	-118.186489	2754.45	14.00	2768.45
6	35.045541	-118.189000	2765.00	14.00	2779.00
7	35.045243	-118.190345	2771.57	14.00	2785.57
8	35.045152	-118.190750	2773.03	14.00	2787.03
9	35.045094	-118.191087	2773.98	14.00	2787.98
10	35.045050	-118.191446	2774.36	14.00	2788.36
11	35.045040	-118.191968	2777.08	14.00	2791.08
12	35.045054	-118.195124	2792.49	14.00	2806.49
13	35.045061	-118.199949	2823.85	14.00	2837.85
14	35.045065	-118.207449	2868.68	14.00	2882.68
15	35.045040	-118.207838	2869.16	14.00	2883.16
16	35.044992	-118.208145	2872.36	14.00	2886.36
17	35.044920	-118.208470	2874.45	14.00	2888.45
18	35.044656	-118.209414	2880.03	14.00	2894.03

Name: Route16
Path type: Two-way
Observer view angle: 50.0°



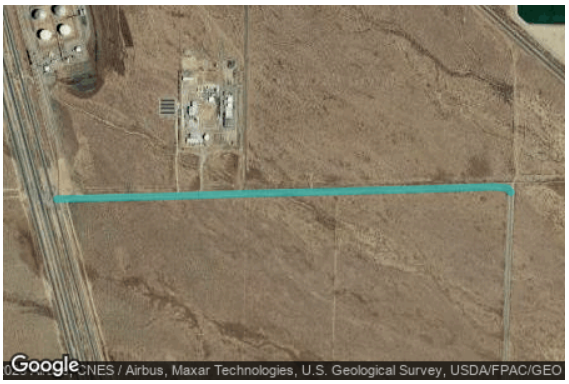
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.056973	-118.180319	2789.06	3.50	2792.56
2	35.055737	-118.185576	2798.13	3.50	2801.63

Name: Route17
Path type: Two-way
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.050359	-118.203244	2876.85	7.60	2884.45
2	35.048209	-118.210895	2909.75	7.60	2917.35
3	35.043537	-118.227555	3014.21	7.60	3021.81
4	35.041982	-118.233097	3058.40	7.60	3066.00
5	35.041148	-118.236069	3086.13	7.60	3093.73
6	35.040333	-118.242516	3124.98	7.60	3132.58
7	35.038549	-118.256621	3231.93	7.60	3239.53

Name: Route18
Path type: Two-way
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.024698	-118.165092	2678.56	3.50	2682.06
2	35.024708	-118.164466	2675.88	3.50	2679.38
3	35.024770	-118.161439	2669.95	3.50	2673.45
4	35.024850	-118.158540	2664.58	3.50	2668.08
5	35.024911	-118.155455	2658.73	3.50	2662.23
6	35.024992	-118.151860	2652.80	3.50	2656.30
7	35.025042	-118.150097	2651.77	3.50	2655.27
8	35.025004	-118.149610	2651.31	3.50	2654.81
9	35.024890	-118.149494	2649.91	3.50	2653.41

Name: Route21
Path type: Two-way
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.053376	-118.173997	2763.31	3.50	2766.81
2	35.050629	-118.173104	2754.11	3.50	2757.61
3	35.049685	-118.172797	2750.03	3.50	2753.53
4	35.047225	-118.172009	2740.58	3.50	2744.08
5	35.045630	-118.171510	2735.16	3.50	2738.66
6	35.043828	-118.170914	2727.85	3.50	2731.35
7	35.042727	-118.170555	2723.64	3.50	2727.14
8	35.040960	-118.169969	2726.10	3.50	2729.60
9	35.040273	-118.169767	2734.13	3.50	2737.63
10	35.039293	-118.169678	2725.78	3.50	2729.28
11	35.037426	-118.169718	2736.16	3.50	2739.66
12	35.037405	-118.169713	2736.62	3.50	2740.12

Name: Route23
Path type: One-way (toward increasing index)
Observer view angle: 50.0°



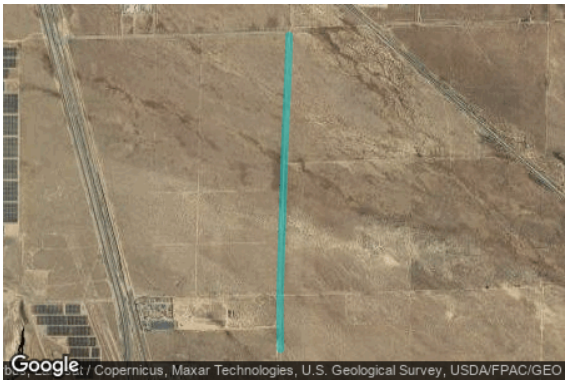
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.004682	-118.160128	2651.02	7.60	2658.62
2	35.007744	-118.160491	2658.44	7.60	2666.04
3	35.008967	-118.160650	2660.32	7.60	2667.92
4	35.010398	-118.161079	2661.68	7.60	2669.28
5	35.011671	-118.161473	2661.42	7.60	2669.02
6	35.014174	-118.162269	2675.28	7.60	2682.88
7	35.016592	-118.163065	2681.28	7.60	2688.88
8	35.018652	-118.163739	2678.87	7.60	2686.47
9	35.021362	-118.164605	2676.80	7.60	2684.40
10	35.024702	-118.165691	2679.26	7.60	2686.86
11	35.027477	-118.166609	2682.76	7.60	2690.36
12	35.028936	-118.167108	2685.17	7.60	2692.77
13	35.031246	-118.167852	2690.35	7.60	2697.95
14	35.032648	-118.168290	2693.80	7.60	2701.40
15	35.034515	-118.168920	2698.35	7.60	2705.95
16	35.035695	-118.169349	2714.21	7.60	2721.81
17	35.037405	-118.169713	2736.62	7.60	2744.22

Name: Route27
Path type: One-way (toward increasing index)
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.037411	-118.169805	2738.77	7.60	2746.37
2	35.036288	-118.169724	2726.45	7.60	2734.05
3	35.035051	-118.169391	2706.14	7.60	2713.74
4	35.031911	-118.168367	2692.88	7.60	2700.48
5	35.029615	-118.167632	2688.93	7.60	2696.53
6	35.027884	-118.167071	2685.42	7.60	2693.02
7	35.025310	-118.166214	2680.85	7.60	2688.45
8	35.023450	-118.165610	2677.92	7.60	2685.52
9	35.021533	-118.164997	2677.74	7.60	2685.34
10	35.019888	-118.164463	2678.93	7.60	2686.53
11	35.017149	-118.163579	2681.31	7.60	2688.91
12	35.015440	-118.163028	2679.78	7.60	2687.38
13	35.012772	-118.162162	2669.07	7.60	2676.67
14	35.011349	-118.161707	2663.84	7.60	2671.44
15	35.009918	-118.161269	2661.83	7.60	2669.43
16	35.009167	-118.161015	2660.49	7.60	2668.09
17	35.008473	-118.160875	2659.21	7.60	2666.81
18	35.008323	-118.160852	2658.91	7.60	2666.51

Name: Route31
Path type: Two-way
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.024890	-118.149494	2649.91	3.50	2653.41
2	35.024508	-118.149493	2649.68	3.50	2653.18
3	35.022733	-118.149571	2645.88	3.50	2649.38
4	35.020148	-118.149717	2642.77	3.50	2646.27
5	35.018154	-118.149818	2640.29	3.50	2643.79
6	35.016169	-118.149895	2640.05	3.50	2643.55
7	35.014462	-118.149962	2641.25	3.50	2644.75
8	35.012572	-118.150040	2636.74	3.50	2640.24
9	35.010416	-118.150117	2633.44	3.50	2636.94
10	35.008493	-118.150113	2630.14	3.50	2633.64
11	35.007291	-118.150088	2629.53	3.50	2633.03

Name: Route32
Path type: Two-way
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	34.993461	-118.155078	2631.04	14.00	2645.04
2	34.997382	-118.156361	2639.79	14.00	2653.79
3	35.002401	-118.158008	2643.04	14.00	2657.04
4	35.006025	-118.159174	2643.43	14.00	2657.43
5	35.009064	-118.160137	2655.99	14.00	2669.99
6	35.010495	-118.160603	2658.54	14.00	2672.54
7	35.013189	-118.161507	2668.56	14.00	2682.56
8	35.018744	-118.163330	2677.33	14.00	2691.33
9	35.024727	-118.165241	2678.70	14.00	2692.70
10	35.030240	-118.167027	2687.13	14.00	2701.13
11	35.032233	-118.167680	2691.78	14.00	2705.78
12	35.034458	-118.168415	2696.20	14.00	2710.20
13	35.036696	-118.169151	2702.17	14.00	2716.17
14	35.037891	-118.169518	2707.02	14.00	2721.02

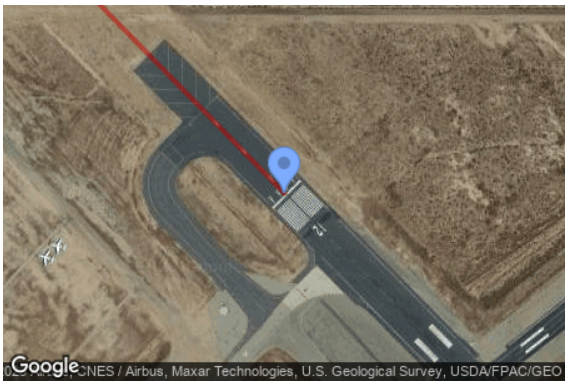
Name: Route33
Path type: Two-way
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.043679	-118.166001	2721.98	3.50	2725.48
2	35.043388	-118.164800	2720.75	3.50	2724.25
3	35.043167	-118.163799	2719.68	3.50	2723.18
4	35.042954	-118.162746	2718.43	3.50	2721.93
5	35.042577	-118.161084	2716.77	3.50	2720.27
6	35.042257	-118.159700	2714.36	3.50	2717.86

Flight Path Receptors

Name: MASP 12
Description: None
Threshold height: 50 ft
Direction: 135.6°
Glide slope: 3.0°
Pilot view restricted? Yes
Vertical view: 30.0°
Azimuthal view: 50.0°



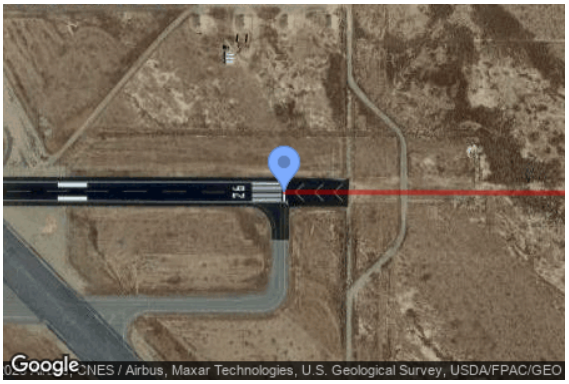
Point	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
Threshold	35.067997	-118.159056	2793.00	50.00	2843.00
Two-mile	35.088637	-118.183823	3014.80	381.60	3396.40

Name: MASP 22
Description: None
Threshold height: 50 ft
Direction: 232.5°
Glide slope: 3.0°
Pilot view restricted? Yes
Vertical view: 30.0°
Azimuthal view: 50.0°



Point	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
Threshold	35.067800	-118.151866	2778.90	50.00	2828.90
Two-mile	35.085397	-118.123804	2778.10	604.20	3382.30

Name: MASP 26
Description: None
Threshold height: 50 ft
Direction: 270.2°
Glide slope: 3.0°
Pilot view restricted? Yes
Vertical view: 30.0°
Azimuthal view: 50.0°



Point	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
Threshold	35.059183	-118.142549	2730.80	50.00	2780.80
Two-mile	35.059102	-118.107186	2677.40	656.90	3334.30

Name: MASP 30
Description: None
Threshold height: 50 ft
Direction: 314.8°
Glide slope: 3.0°
Pilot view restricted? Yes
Vertical view: 30.0°
Azimuthal view: 50.0°



Point	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
Threshold	35.046580	-118.133135	2681.00	50.00	2731.00
Two-mile	35.026204	-118.108051	2594.70	689.70	3284.40

Name: MASP 4
Description: None
Threshold height: 50 ft
Direction: 51.1°
Glide slope: 3.0°
Pilot view restricted? Yes
Vertical view: 30.0°
Azimuthal view: 50.0°



Point	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
Threshold	35.059748	-118.164297	2777.80	50.00	2827.80
Two-mile	35.041580	-118.191806	2772.90	608.30	3381.20

Name: MASP 8
Description: None
Threshold height: 50 ft
Direction: 90.1°
Glide slope: 3.0°
Pilot view restricted? Yes
Vertical view: 30.0°
Azimuthal view: 50.0°

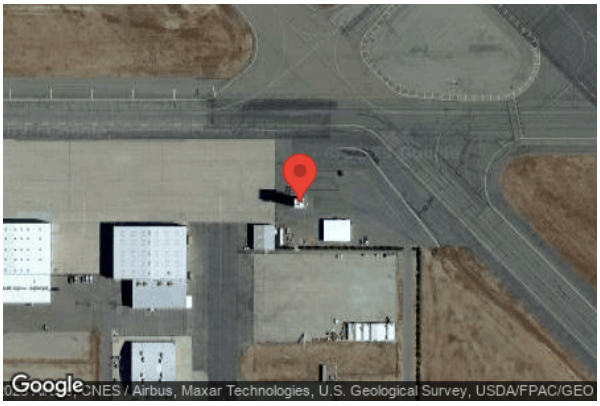


Point	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
Threshold	35.059242	-118.166076	2778.50	50.00	2828.50
Two-mile	35.059272	-118.201439	2921.10	460.80	3381.90

Discrete Observation Point Receptors

Name	ID	Latitude (°)	Longitude (°)	Elevation (ft)	Height (ft)
OP 1	1	35.065098	-118.180928	2843.42	5.50
OP 2	2	35.065057	-118.182564	2849.00	5.50
OP 3	3	35.064511	-118.184362	2856.49	5.50
OP 4	4	35.061390	-118.185376	2836.28	5.50
OP 5	5	35.061201	-118.193962	2873.23	5.50
OP 6	6	35.061183	-118.196242	2886.07	5.50
OP 7	7	35.060619	-118.189032	2846.51	5.50
OP 8	8	35.057993	-118.195225	2864.50	5.50
OP 9	9	35.055672	-118.182383	2787.82	5.50
OP 10	10	35.054138	-118.179421	2770.99	5.50
OP 11	11	35.054140	-118.178232	2769.81	5.50
OP 12	12	35.054141	-118.177319	2769.11	5.50
OP 13	13	35.052665	-118.187952	2786.84	5.50
OP 14	14	35.049394	-118.186277	2764.30	5.50
OP 15	15	35.049271	-118.188858	2775.43	5.50
OP 16	16	35.046436	-118.190359	2774.83	5.50
OP 17	17	35.046422	-118.192157	2782.95	5.50
OP 18	18	35.044898	-118.156588	2722.34	5.50
OP 19	19	35.043859	-118.166033	2723.17	5.50
OP 20	20	35.043399	-118.164002	2721.70	5.50
OP 21	21	35.042923	-118.161898	2717.78	5.50
OP 22	22	35.042417	-118.159757	2713.08	5.50
OP 23	23	35.038382	-118.167332	2704.07	5.50
OP 24	24	35.030481	-118.187314	2764.59	5.50
OP 25	25	35.029317	-118.187126	2766.42	5.50
OP 26	26	35.027578	-118.189024	2776.05	5.50
32-ATCT	32	35.057003	-118.149446	2742.00	85.00

Map image of 32-ATCT



Glare Analysis Results

Summary of Results No glare predicted

PV Array	Tilt	Orient	Annual Green Glare		Annual Yellow Glare		Energy
	°	°	min	hr	min	hr	kWh
PV08	SA tracking	SA tracking	0	0.0	0	0.0	-
PV09	SA tracking	SA tracking	0	0.0	0	0.0	-
PV10	SA tracking	SA tracking	0	0.0	0	0.0	-
PV11	SA tracking	SA tracking	0	0.0	0	0.0	-
PV12	SA tracking	SA tracking	0	0.0	0	0.0	-
PV13	SA tracking	SA tracking	0	0.0	0	0.0	-
PV14	SA tracking	SA tracking	0	0.0	0	0.0	-
PV15	SA tracking	SA tracking	0	0.0	0	0.0	-
PV16	SA tracking	SA tracking	0	0.0	0	0.0	-
PV17	SA tracking	SA tracking	0	0.0	0	0.0	-
PV18	SA tracking	SA tracking	0	0.0	0	0.0	-
PV19	SA tracking	SA tracking	0	0.0	0	0.0	-
PV20	SA tracking	SA tracking	0	0.0	0	0.0	-

Total glare received by each receptor; may include duplicate times of glare from multiple reflective surfaces.

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01	0	0.0	0	0.0
Route02	0	0.0	0	0.0
Route03	0	0.0	0	0.0
Route07	0	0.0	0	0.0
Route09	0	0.0	0	0.0
Route12	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route15	0	0.0	0	0.0
Route16	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route17	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route21	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
Route33	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV: PV08 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01	0	0.0	0	0.0
Route02	0	0.0	0	0.0
Route03	0	0.0	0	0.0
Route07	0	0.0	0	0.0
Route09	0	0.0	0	0.0
Route12	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route15	0	0.0	0	0.0
Route16	0	0.0	0	0.0
Route17	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route21	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
Route33	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV08 and Route: Route01

No glare found

PV08 and Route: Route02

No glare found

PV08 and Route: Route03

No glare found

PV08 and Route: Route07

No glare found

PV08 and Route: Route09

No glare found

PV08 and Route: Route12

No glare found

PV08 and Route: Route14

No glare found

PV08 and Route: Route15

No glare found

PV08 and Route: Route16

No glare found

PV08 and Route: Route17

No glare found

PV08 and Route: Route18

No glare found

PV08 and Route: Route21

No glare found

PV08 and Route: Route23

No glare found

PV08 and Route: Route27

No glare found

PV08 and Route: Route31

No glare found

PV08 and Route: Route32

No glare found

PV08 and Route: Route33

No glare found

PV08 and FP: MASP 12

No glare found

PV08 and FP: MASP 22

No glare found

PV08 and FP: MASP 26

No glare found

PV08 and FP: MASP 30

No glare found

PV08 and FP: MASP 4

No glare found

PV08 and FP: MASP 8

No glare found

PV08 and OP 1

No glare found

PV08 and OP 2

No glare found

PV08 and OP 3

No glare found

PV08 and OP 4

No glare found

PV08 and OP 5

No glare found

PV08 and OP 6

No glare found

PV08 and OP 7

No glare found

PV08 and OP 8

No glare found

PV08 and OP 9

No glare found

PV08 and OP 10

No glare found

PV08 and OP 11

No glare found

PV08 and OP 12

No glare found

PV08 and OP 13

No glare found

PV08 and OP 14

No glare found

PV08 and OP 15

No glare found

PV08 and OP 16

No glare found

PV08 and OP 17

No glare found

PV08 and OP 18

No glare found

PV08 and OP 19

No glare found

PV08 and OP 20

No glare found

PV08 and OP 21

No glare found

PV08 and OP 22

No glare found

PV08 and OP 23

No glare found

PV08 and OP 24

No glare found

PV08 and OP 25

No glare found

PV08 and OP 26

No glare found

PV08 and 32-ATCT

No glare found

PV: PV09 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01	0	0.0	0	0.0
Route02	0	0.0	0	0.0
Route03	0	0.0	0	0.0
Route07	0	0.0	0	0.0
Route09	0	0.0	0	0.0
Route12	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route15	0	0.0	0	0.0
Route16	0	0.0	0	0.0
Route17	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route21	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
Route33	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV09 and Route: Route01

No glare found

PV09 and Route: Route02

No glare found

PV09 and Route: Route03

No glare found

PV09 and Route: Route07

No glare found

PV09 and Route: Route09

No glare found

PV09 and Route: Route12

No glare found

PV09 and Route: Route14

No glare found

PV09 and Route: Route15

No glare found

PV09 and Route: Route16

No glare found

PV09 and Route: Route17

No glare found

PV09 and Route: Route18

No glare found

PV09 and Route: Route21

No glare found

PV09 and Route: Route23

No glare found

PV09 and Route: Route27

No glare found

PV09 and Route: Route31

No glare found

PV09 and Route: Route32

No glare found

PV09 and Route: Route33

No glare found

PV09 and FP: MASP 12

No glare found

PV09 and FP: MASP 22

No glare found

PV09 and FP: MASP 26

No glare found

PV09 and FP: MASP 30

No glare found

PV09 and FP: MASP 4

No glare found

PV09 and FP: MASP 8

No glare found

PV09 and OP 1

No glare found

PV09 and OP 2

No glare found

PV09 and OP 3

No glare found

PV09 and OP 4

No glare found

PV09 and OP 5

No glare found

PV09 and OP 6

No glare found

PV09 and OP 7

No glare found

PV09 and OP 8

No glare found

PV09 and OP 9

No glare found

PV09 and OP 10

No glare found

PV09 and OP 11

No glare found

PV09 and OP 12

No glare found

PV09 and OP 13

No glare found

PV09 and OP 14

No glare found

PV09 and OP 15

No glare found

PV09 and OP 16

No glare found

PV09 and OP 17

No glare found

PV09 and OP 18

No glare found

PV09 and OP 19

No glare found

PV09 and OP 20

No glare found

PV09 and OP 21

No glare found

PV09 and OP 22

No glare found

PV09 and OP 23

No glare found

PV09 and OP 24

No glare found

PV09 and OP 25

No glare found

PV09 and OP 26

No glare found

PV09 and 32-ATCT

No glare found

PV: PV10 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01	0	0.0	0	0.0
Route02	0	0.0	0	0.0
Route03	0	0.0	0	0.0
Route07	0	0.0	0	0.0
Route09	0	0.0	0	0.0
Route12	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route15	0	0.0	0	0.0
Route16	0	0.0	0	0.0
Route17	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route21	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
Route33	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV10 and Route: Route01

No glare found

PV10 and Route: Route02

No glare found

PV10 and Route: Route03

No glare found

PV10 and Route: Route07

No glare found

PV10 and Route: Route09

No glare found

PV10 and Route: Route12

No glare found

PV10 and Route: Route14

No glare found

PV10 and Route: Route15

No glare found

PV10 and Route: Route16

No glare found

PV10 and Route: Route17

No glare found

PV10 and Route: Route18

No glare found

PV10 and Route: Route21

No glare found

PV10 and Route: Route23

No glare found

PV10 and Route: Route27

No glare found

PV10 and Route: Route31

No glare found

PV10 and Route: Route32

No glare found

PV10 and Route: Route33

No glare found

PV10 and FP: MASP 12

No glare found

PV10 and FP: MASP 22

No glare found

PV10 and FP: MASP 26

No glare found

PV10 and FP: MASP 30

No glare found

PV10 and FP: MASP 4

No glare found

PV10 and FP: MASP 8

No glare found

PV10 and OP 1

No glare found

PV10 and OP 2

No glare found

PV10 and OP 3

No glare found

PV10 and OP 4

No glare found

PV10 and OP 5

No glare found

PV10 and OP 6

No glare found

PV10 and OP 7

No glare found

PV10 and OP 8

No glare found

PV10 and OP 9

No glare found

PV10 and OP 10

No glare found

PV10 and OP 11

No glare found

PV10 and OP 12

No glare found

PV10 and OP 13

No glare found

PV10 and OP 14

No glare found

PV10 and OP 15

No glare found

PV10 and OP 16

No glare found

PV10 and OP 17

No glare found

PV10 and OP 18

No glare found

PV10 and OP 19

No glare found

PV10 and OP 20

No glare found

PV10 and OP 21

No glare found

PV10 and OP 22

No glare found

PV10 and OP 23

No glare found

PV10 and OP 24

No glare found

PV10 and OP 25

No glare found

PV10 and OP 26

No glare found

PV10 and 32-ATCT

No glare found

PV: PV11 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01	0	0.0	0	0.0
Route02	0	0.0	0	0.0
Route03	0	0.0	0	0.0
Route07	0	0.0	0	0.0
Route09	0	0.0	0	0.0
Route12	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route15	0	0.0	0	0.0
Route16	0	0.0	0	0.0
Route17	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route21	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
Route33	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV11 and Route: Route01

No glare found

PV11 and Route: Route02

No glare found

PV11 and Route: Route03

No glare found

PV11 and Route: Route07

No glare found

PV11 and Route: Route09

No glare found

PV11 and Route: Route12

No glare found

PV11 and Route: Route14

No glare found

PV11 and Route: Route15

No glare found

PV11 and Route: Route16

No glare found

PV11 and Route: Route17

No glare found

PV11 and Route: Route18

No glare found

PV11 and Route: Route21

No glare found

PV11 and Route: Route23

No glare found

PV11 and Route: Route27

No glare found

PV11 and Route: Route31

No glare found

PV11 and Route: Route32

No glare found

PV11 and Route: Route33

No glare found

PV11 and FP: MASP 12

No glare found

PV11 and FP: MASP 22

No glare found

PV11 and FP: MASP 26

No glare found

PV11 and FP: MASP 30

No glare found

PV11 and FP: MASP 4

No glare found

PV11 and FP: MASP 8

No glare found

PV11 and OP 1

No glare found

PV11 and OP 2

No glare found

PV11 and OP 3

No glare found

PV11 and OP 4

No glare found

PV11 and OP 5

No glare found

PV11 and OP 6

No glare found

PV11 and OP 7

No glare found

PV11 and OP 8

No glare found

PV11 and OP 9

No glare found

PV11 and OP 10

No glare found

PV11 and OP 11

No glare found

PV11 and OP 12

No glare found

PV11 and OP 13

No glare found

PV11 and OP 14

No glare found

PV11 and OP 15

No glare found

PV11 and OP 16

No glare found

PV11 and OP 17

No glare found

PV11 and OP 18

No glare found

PV11 and OP 19

No glare found

PV11 and OP 20

No glare found

PV11 and OP 21

No glare found

PV11 and OP 22

No glare found

PV11 and OP 23

No glare found

PV11 and OP 24

No glare found

PV11 and OP 25

No glare found

PV11 and OP 26

No glare found

PV11 and 32-ATCT

No glare found

PV: PV12 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01	0	0.0	0	0.0
Route02	0	0.0	0	0.0
Route03	0	0.0	0	0.0
Route07	0	0.0	0	0.0
Route09	0	0.0	0	0.0
Route12	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route15	0	0.0	0	0.0
Route16	0	0.0	0	0.0
Route17	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route21	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
Route33	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV12 and Route: Route01

No glare found

PV12 and Route: Route02

No glare found

PV12 and Route: Route03

No glare found

PV12 and Route: Route07

No glare found

PV12 and Route: Route09

No glare found

PV12 and Route: Route12

No glare found

PV12 and Route: Route14

No glare found

PV12 and Route: Route15

No glare found

PV12 and Route: Route16

No glare found

PV12 and Route: Route17

No glare found

PV12 and Route: Route18

No glare found

PV12 and Route: Route21

No glare found

PV12 and Route: Route23

No glare found

PV12 and Route: Route27

No glare found

PV12 and Route: Route31

No glare found

PV12 and Route: Route32

No glare found

PV12 and Route: Route33

No glare found

PV12 and FP: MASP 12

No glare found

PV12 and FP: MASP 22

No glare found

PV12 and FP: MASP 26

No glare found

PV12 and FP: MASP 30

No glare found

PV12 and FP: MASP 4

No glare found

PV12 and FP: MASP 8

No glare found

PV12 and OP 1

No glare found

PV12 and OP 2

No glare found

PV12 and OP 3

No glare found

PV12 and OP 4

No glare found

PV12 and OP 5

No glare found

PV12 and OP 6

No glare found

PV12 and OP 7

No glare found

PV12 and OP 8

No glare found

PV12 and OP 9

No glare found

PV12 and OP 10

No glare found

PV12 and OP 11

No glare found

PV12 and OP 12

No glare found

PV12 and OP 13

No glare found

PV12 and OP 14

No glare found

PV12 and OP 15

No glare found

PV12 and OP 16

No glare found

PV12 and OP 17

No glare found

PV12 and OP 18

No glare found

PV12 and OP 19

No glare found

PV12 and OP 20

No glare found

PV12 and OP 21

No glare found

PV12 and OP 22

No glare found

PV12 and OP 23

No glare found

PV12 and OP 24

No glare found

PV12 and OP 25

No glare found

PV12 and OP 26

No glare found

PV12 and 32-ATCT

No glare found

PV: PV13 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01	0	0.0	0	0.0
Route02	0	0.0	0	0.0
Route03	0	0.0	0	0.0
Route07	0	0.0	0	0.0
Route09	0	0.0	0	0.0
Route12	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route15	0	0.0	0	0.0
Route16	0	0.0	0	0.0
Route17	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route21	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
Route33	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV13 and Route: Route01

No glare found

PV13 and Route: Route02

No glare found

PV13 and Route: Route03

No glare found

PV13 and Route: Route07

No glare found

PV13 and Route: Route09

No glare found

PV13 and Route: Route12

No glare found

PV13 and Route: Route14

No glare found

PV13 and Route: Route15

No glare found

PV13 and Route: Route16

No glare found

PV13 and Route: Route17

No glare found

PV13 and Route: Route18

No glare found

PV13 and Route: Route21

No glare found

PV13 and Route: Route23

No glare found

PV13 and Route: Route27

No glare found

PV13 and Route: Route31

No glare found

PV13 and Route: Route32

No glare found

PV13 and Route: Route33

No glare found

PV13 and FP: MASP 12

No glare found

PV13 and FP: MASP 22

No glare found

PV13 and FP: MASP 26

No glare found

PV13 and FP: MASP 30

No glare found

PV13 and FP: MASP 4

No glare found

PV13 and FP: MASP 8

No glare found

PV13 and OP 1

No glare found

PV13 and OP 2

No glare found

PV13 and OP 3

No glare found

PV13 and OP 4

No glare found

PV13 and OP 5

No glare found

PV13 and OP 6

No glare found

PV13 and OP 7

No glare found

PV13 and OP 8

No glare found

PV13 and OP 9

No glare found

PV13 and OP 10

No glare found

PV13 and OP 11

No glare found

PV13 and OP 12

No glare found

PV13 and OP 13

No glare found

PV13 and OP 14

No glare found

PV13 and OP 15

No glare found

PV13 and OP 16

No glare found

PV13 and OP 17

No glare found

PV13 and OP 18

No glare found

PV13 and OP 19

No glare found

PV13 and OP 20

No glare found

PV13 and OP 21

No glare found

PV13 and OP 22

No glare found

PV13 and OP 23

No glare found

PV13 and OP 24

No glare found

PV13 and OP 25

No glare found

PV13 and OP 26

No glare found

PV13 and 32-ATCT

No glare found

PV: PV14 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01	0	0.0	0	0.0
Route02	0	0.0	0	0.0
Route03	0	0.0	0	0.0
Route07	0	0.0	0	0.0
Route09	0	0.0	0	0.0
Route12	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route15	0	0.0	0	0.0
Route16	0	0.0	0	0.0
Route17	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route21	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
Route33	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV14 and Route: Route01

No glare found

PV14 and Route: Route02

No glare found

PV14 and Route: Route03

No glare found

PV14 and Route: Route07

No glare found

PV14 and Route: Route09

No glare found

PV14 and Route: Route12

No glare found

PV14 and Route: Route14

No glare found

PV14 and Route: Route15

No glare found

PV14 and Route: Route16

No glare found

PV14 and Route: Route17

No glare found

PV14 and Route: Route18

No glare found

PV14 and Route: Route21

No glare found

PV14 and Route: Route23

No glare found

PV14 and Route: Route27

No glare found

PV14 and Route: Route31

No glare found

PV14 and Route: Route32

No glare found

PV14 and Route: Route33

No glare found

PV14 and FP: MASP 12

No glare found

PV14 and FP: MASP 22

No glare found

PV14 and FP: MASP 26

No glare found

PV14 and FP: MASP 30

No glare found

PV14 and FP: MASP 4

No glare found

PV14 and FP: MASP 8

No glare found

PV14 and OP 1

No glare found

PV14 and OP 2

No glare found

PV14 and OP 3

No glare found

PV14 and OP 4

No glare found

PV14 and OP 5

No glare found

PV14 and OP 6

No glare found

PV14 and OP 7

No glare found

PV14 and OP 8

No glare found

PV14 and OP 9

No glare found

PV14 and OP 10

No glare found

PV14 and OP 11

No glare found

PV14 and OP 12

No glare found

PV14 and OP 13

No glare found

PV14 and OP 14

No glare found

PV14 and OP 15

No glare found

PV14 and OP 16

No glare found

PV14 and OP 17

No glare found

PV14 and OP 18

No glare found

PV14 and OP 19

No glare found

PV14 and OP 20

No glare found

PV14 and OP 21

No glare found

PV14 and OP 22

No glare found

PV14 and OP 23

No glare found

PV14 and OP 24

No glare found

PV14 and OP 25

No glare found

PV14 and OP 26

No glare found

PV14 and 32-ATCT

No glare found

PV: PV15 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01	0	0.0	0	0.0
Route02	0	0.0	0	0.0
Route03	0	0.0	0	0.0
Route07	0	0.0	0	0.0
Route09	0	0.0	0	0.0
Route12	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route15	0	0.0	0	0.0
Route16	0	0.0	0	0.0
Route17	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route21	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
Route33	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV15 and Route: Route01

No glare found

PV15 and Route: Route02

No glare found

PV15 and Route: Route03

No glare found

PV15 and Route: Route07

No glare found

PV15 and Route: Route09

No glare found

PV15 and Route: Route12

No glare found

PV15 and Route: Route14

No glare found

PV15 and Route: Route15

No glare found

PV15 and Route: Route16

No glare found

PV15 and Route: Route17

No glare found

PV15 and Route: Route18

No glare found

PV15 and Route: Route21

No glare found

PV15 and Route: Route23

No glare found

PV15 and Route: Route27

No glare found

PV15 and Route: Route31

No glare found

PV15 and Route: Route32

No glare found

PV15 and Route: Route33

No glare found

PV15 and FP: MASP 12

No glare found

PV15 and FP: MASP 22

No glare found

PV15 and FP: MASP 26

No glare found

PV15 and FP: MASP 30

No glare found

PV15 and FP: MASP 4

No glare found

PV15 and FP: MASP 8

No glare found

PV15 and OP 1

No glare found

PV15 and OP 2

No glare found

PV15 and OP 3

No glare found

PV15 and OP 4

No glare found

PV15 and OP 5

No glare found

PV15 and OP 6

No glare found

PV15 and OP 7

No glare found

PV15 and OP 8

No glare found

PV15 and OP 9

No glare found

PV15 and OP 10

No glare found

PV15 and OP 11

No glare found

PV15 and OP 12

No glare found

PV15 and OP 13

No glare found

PV15 and OP 14

No glare found

PV15 and OP 15

No glare found

PV15 and OP 16

No glare found

PV15 and OP 17

No glare found

PV15 and OP 18

No glare found

PV15 and OP 19

No glare found

PV15 and OP 20

No glare found

PV15 and OP 21

No glare found

PV15 and OP 22

No glare found

PV15 and OP 23

No glare found

PV15 and OP 24

No glare found

PV15 and OP 25

No glare found

PV15 and OP 26

No glare found

PV15 and 32-ATCT

No glare found

PV: PV16 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01	0	0.0	0	0.0
Route02	0	0.0	0	0.0
Route03	0	0.0	0	0.0
Route07	0	0.0	0	0.0
Route09	0	0.0	0	0.0
Route12	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route15	0	0.0	0	0.0
Route16	0	0.0	0	0.0
Route17	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route21	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
Route33	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV16 and Route: Route01

No glare found

PV16 and Route: Route02

No glare found

PV16 and Route: Route03

No glare found

PV16 and Route: Route07

No glare found

PV16 and Route: Route09

No glare found

PV16 and Route: Route12

No glare found

PV16 and Route: Route14

No glare found

PV16 and Route: Route15

No glare found

PV16 and Route: Route16

No glare found

PV16 and Route: Route17

No glare found

PV16 and Route: Route18

No glare found

PV16 and Route: Route21

No glare found

PV16 and Route: Route23

No glare found

PV16 and Route: Route27

No glare found

PV16 and Route: Route31

No glare found

PV16 and Route: Route32

No glare found

PV16 and Route: Route33

No glare found

PV16 and FP: MASP 12

No glare found

PV16 and FP: MASP 22

No glare found

PV16 and FP: MASP 26

No glare found

PV16 and FP: MASP 30

No glare found

PV16 and FP: MASP 4

No glare found

PV16 and FP: MASP 8

No glare found

PV16 and OP 1

No glare found

PV16 and OP 2

No glare found

PV16 and OP 3

No glare found

PV16 and OP 4

No glare found

PV16 and OP 5

No glare found

PV16 and OP 6

No glare found

PV16 and OP 7

No glare found

PV16 and OP 8

No glare found

PV16 and OP 9

No glare found

PV16 and OP 10

No glare found

PV16 and OP 11

No glare found

PV16 and OP 12

No glare found

PV16 and OP 13

No glare found

PV16 and OP 14

No glare found

PV16 and OP 15

No glare found

PV16 and OP 16

No glare found

PV16 and OP 17

No glare found

PV16 and OP 18

No glare found

PV16 and OP 19

No glare found

PV16 and OP 20

No glare found

PV16 and OP 21

No glare found

PV16 and OP 22

No glare found

PV16 and OP 23

No glare found

PV16 and OP 24

No glare found

PV16 and OP 25

No glare found

PV16 and OP 26

No glare found

PV16 and 32-ATCT

No glare found

PV: PV17 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01	0	0.0	0	0.0
Route02	0	0.0	0	0.0
Route03	0	0.0	0	0.0
Route07	0	0.0	0	0.0
Route09	0	0.0	0	0.0
Route12	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route15	0	0.0	0	0.0
Route16	0	0.0	0	0.0
Route17	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route21	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
Route33	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV17 and Route: Route01

No glare found

PV17 and Route: Route02

No glare found

PV17 and Route: Route03

No glare found

PV17 and Route: Route07

No glare found

PV17 and Route: Route09

No glare found

PV17 and Route: Route12

No glare found

PV17 and Route: Route14

No glare found

PV17 and Route: Route15

No glare found

PV17 and Route: Route16

No glare found

PV17 and Route: Route17

No glare found

PV17 and Route: Route18

No glare found

PV17 and Route: Route21

No glare found

PV17 and Route: Route23

No glare found

PV17 and Route: Route27

No glare found

PV17 and Route: Route31

No glare found

PV17 and Route: Route32

No glare found

PV17 and Route: Route33

No glare found

PV17 and FP: MASP 12

No glare found

PV17 and FP: MASP 22

No glare found

PV17 and FP: MASP 26

No glare found

PV17 and FP: MASP 30

No glare found

PV17 and FP: MASP 4

No glare found

PV17 and FP: MASP 8

No glare found

PV17 and OP 1

No glare found

PV17 and OP 2

No glare found

PV17 and OP 3

No glare found

PV17 and OP 4

No glare found

PV17 and OP 5

No glare found

PV17 and OP 6

No glare found

PV17 and OP 7

No glare found

PV17 and OP 8

No glare found

PV17 and OP 9

No glare found

PV17 and OP 10

No glare found

PV17 and OP 11

No glare found

PV17 and OP 12

No glare found

PV17 and OP 13

No glare found

PV17 and OP 14

No glare found

PV17 and OP 15

No glare found

PV17 and OP 16

No glare found

PV17 and OP 17

No glare found

PV17 and OP 18

No glare found

PV17 and OP 19

No glare found

PV17 and OP 20

No glare found

PV17 and OP 21

No glare found

PV17 and OP 22

No glare found

PV17 and OP 23

No glare found

PV17 and OP 24

No glare found

PV17 and OP 25

No glare found

PV17 and OP 26

No glare found

PV17 and 32-ATCT

No glare found

PV: PV18 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01	0	0.0	0	0.0
Route02	0	0.0	0	0.0
Route03	0	0.0	0	0.0
Route07	0	0.0	0	0.0
Route09	0	0.0	0	0.0
Route12	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route15	0	0.0	0	0.0
Route16	0	0.0	0	0.0
Route17	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route21	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
Route33	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV18 and Route: Route01

No glare found

PV18 and Route: Route02

No glare found

PV18 and Route: Route03

No glare found

PV18 and Route: Route07

No glare found

PV18 and Route: Route09

No glare found

PV18 and Route: Route12

No glare found

PV18 and Route: Route14

No glare found

PV18 and Route: Route15

No glare found

PV18 and Route: Route16

No glare found

PV18 and Route: Route17

No glare found

PV18 and Route: Route18

No glare found

PV18 and Route: Route21

No glare found

PV18 and Route: Route23

No glare found

PV18 and Route: Route27

No glare found

PV18 and Route: Route31

No glare found

PV18 and Route: Route32

No glare found

PV18 and Route: Route33

No glare found

PV18 and FP: MASP 12

No glare found

PV18 and FP: MASP 22

No glare found

PV18 and FP: MASP 26

No glare found

PV18 and FP: MASP 30

No glare found

PV18 and FP: MASP 4

No glare found

PV18 and FP: MASP 8

No glare found

PV18 and OP 1

No glare found

PV18 and OP 2

No glare found

PV18 and OP 3

No glare found

PV18 and OP 4

No glare found

PV18 and OP 5

No glare found

PV18 and OP 6

No glare found

PV18 and OP 7

No glare found

PV18 and OP 8

No glare found

PV18 and OP 9

No glare found

PV18 and OP 10

No glare found

PV18 and OP 11

No glare found

PV18 and OP 12

No glare found

PV18 and OP 13

No glare found

PV18 and OP 14

No glare found

PV18 and OP 15

No glare found

PV18 and OP 16

No glare found

PV18 and OP 17

No glare found

PV18 and OP 18

No glare found

PV18 and OP 19

No glare found

PV18 and OP 20

No glare found

PV18 and OP 21

No glare found

PV18 and OP 22

No glare found

PV18 and OP 23

No glare found

PV18 and OP 24

No glare found

PV18 and OP 25

No glare found

PV18 and OP 26

No glare found

PV18 and 32-ATCT

No glare found

PV: PV19 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01	0	0.0	0	0.0
Route02	0	0.0	0	0.0
Route03	0	0.0	0	0.0
Route07	0	0.0	0	0.0
Route09	0	0.0	0	0.0
Route12	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route15	0	0.0	0	0.0
Route16	0	0.0	0	0.0
Route17	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route21	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
Route33	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV19 and Route: Route01

No glare found

PV19 and Route: Route02

No glare found

PV19 and Route: Route03

No glare found

PV19 and Route: Route07

No glare found

PV19 and Route: Route09

No glare found

PV19 and Route: Route12

No glare found

PV19 and Route: Route14

No glare found

PV19 and Route: Route15

No glare found

PV19 and Route: Route16

No glare found

PV19 and Route: Route17

No glare found

PV19 and Route: Route18

No glare found

PV19 and Route: Route21

No glare found

PV19 and Route: Route23

No glare found

PV19 and Route: Route27

No glare found

PV19 and Route: Route31

No glare found

PV19 and Route: Route32

No glare found

PV19 and Route: Route33

No glare found

PV19 and FP: MASP 12

No glare found

PV19 and FP: MASP 22

No glare found

PV19 and FP: MASP 26

No glare found

PV19 and FP: MASP 30

No glare found

PV19 and FP: MASP 4

No glare found

PV19 and FP: MASP 8

No glare found

PV19 and OP 1

No glare found

PV19 and OP 2

No glare found

PV19 and OP 3

No glare found

PV19 and OP 4

No glare found

PV19 and OP 5

No glare found

PV19 and OP 6

No glare found

PV19 and OP 7

No glare found

PV19 and OP 8

No glare found

PV19 and OP 9

No glare found

PV19 and OP 10

No glare found

PV19 and OP 11

No glare found

PV19 and OP 12

No glare found

PV19 and OP 13

No glare found

PV19 and OP 14

No glare found

PV19 and OP 15

No glare found

PV19 and OP 16

No glare found

PV19 and OP 17

No glare found

PV19 and OP 18

No glare found

PV19 and OP 19

No glare found

PV19 and OP 20

No glare found

PV19 and OP 21

No glare found

PV19 and OP 22

No glare found

PV19 and OP 23

No glare found

PV19 and OP 24

No glare found

PV19 and OP 25

No glare found

PV19 and OP 26

No glare found

PV19 and 32-ATCT

No glare found

PV: PV20 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01	0	0.0	0	0.0
Route02	0	0.0	0	0.0
Route03	0	0.0	0	0.0
Route07	0	0.0	0	0.0
Route09	0	0.0	0	0.0
Route12	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route15	0	0.0	0	0.0
Route16	0	0.0	0	0.0
Route17	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route21	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
Route33	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV20 and Route: Route01

No glare found

PV20 and Route: Route02

No glare found

PV20 and Route: Route03

No glare found

PV20 and Route: Route07

No glare found

PV20 and Route: Route09

No glare found

PV20 and Route: Route12

No glare found

PV20 and Route: Route14

No glare found

PV20 and Route: Route15

No glare found

PV20 and Route: Route16

No glare found

PV20 and Route: Route17

No glare found

PV20 and Route: Route18

No glare found

PV20 and Route: Route21

No glare found

PV20 and Route: Route23

No glare found

PV20 and Route: Route27

No glare found

PV20 and Route: Route31

No glare found

PV20 and Route: Route32

No glare found

PV20 and Route: Route33

No glare found

PV20 and FP: MASP 12

No glare found

PV20 and FP: MASP 22

No glare found

PV20 and FP: MASP 26

No glare found

PV20 and FP: MASP 30

No glare found

PV20 and FP: MASP 4

No glare found

PV20 and FP: MASP 8

No glare found

PV20 and OP 1

No glare found

PV20 and OP 2

No glare found

PV20 and OP 3

No glare found

PV20 and OP 4

No glare found

PV20 and OP 5

No glare found

PV20 and OP 6

No glare found

PV20 and OP 7

No glare found

PV20 and OP 8

No glare found

PV20 and OP 9

No glare found

PV20 and OP 10

No glare found

PV20 and OP 11

No glare found

PV20 and OP 12

No glare found

PV20 and OP 13

No glare found

PV20 and OP 14

No glare found

PV20 and OP 15

No glare found

PV20 and OP 16

No glare found

PV20 and OP 17

No glare found

PV20 and OP 18

No glare found

PV20 and OP 19

No glare found

PV20 and OP 20

No glare found

PV20 and OP 21

No glare found

PV20 and OP 22

No glare found

PV20 and OP 23

No glare found

PV20 and OP 24

No glare found

PV20 and OP 25

No glare found

PV20 and OP 26

No glare found

PV20 and 32-ATCT

No glare found

Assumptions

"Green" glare is glare with low potential to cause an after-image (flash blindness) when observed prior to a typical blink response time.
"Yellow" glare is glare with potential to cause an after-image (flash blindness) when observed prior to a typical blink response time.
Times associated with glare are denoted in Standard time. For Daylight Savings, add one hour.
The algorithm does not rigorously represent the detailed geometry of a system; detailed features such as gaps between modules, variable height of the PV array, and support structures may impact actual glare results. However, we have validated our models against several systems, including a PV array causing glare to the air-traffic control tower at Manchester-Boston Regional Airport and several sites in Albuquerque, and the tool accurately predicted the occurrence and intensity of glare at different times and days of the year.
Several V1 calculations utilize the PV array centroid, rather than the actual glare spot location, due to algorithm limitations. This may affect results for large PV footprints. Additional analyses of array sub-sections can provide additional information on expected glare. This primarily affects V1 analyses of path receptors.
Random number computations are utilized by various steps of the annual hazard analysis algorithm. Predicted minutes of glare can vary between runs as a result. This limitation primarily affects analyses of Observation Point receptors, including ATCTs. Note that the SGHAT/ ForgeSolar methodology has always relied on an analytical, qualitative approach to accurately determine the overall hazard (i.e. green vs. yellow) of expected glare on an annual basis.
The analysis does not automatically consider obstacles (either man-made or natural) between the observation points and the prescribed solar installation that may obstruct observed glare, such as trees, hills, buildings, etc.
The subtended source angle (glare spot size) is constrained by the PV array footprint size. Partitioning large arrays into smaller sections will reduce the maximum potential subtended angle, potentially impacting results if actual glare spots are larger than the sub-array size. Additional analyses of the combined area of adjacent sub-arrays can provide more information on potential glare hazards. (See previous point on related limitations.)
The variable direct normal irradiance (DNI) feature (if selected) scales the user-prescribed peak DNI using a typical clear-day irradiance profile. This profile has a lower DNI in the mornings and evenings and a maximum at solar noon. The scaling uses a clear-day irradiance profile based on a normalized time relative to sunrise, solar noon, and sunset, which are prescribed by a sun-position algorithm and the latitude and longitude obtained from Google maps. The actual DNI on any given day can be affected by cloud cover, atmospheric attenuation, and other environmental factors.
The ocular hazard predicted by the tool depends on a number of environmental, optical, and human factors, which can be uncertain. We provide input fields and typical ranges of values for these factors so that the user can vary these parameters to see if they have an impact on the results. The speed of SGHAT allows expedited sensitivity and parametric analyses.
The system output calculation is a DNI-based approximation that assumes clear, sunny skies year-round. It should not be used in place of more rigorous modeling methods.
Hazard zone boundaries shown in the Glare Hazard plot are an approximation and visual aid based on aggregated research data. Actual ocular impact outcomes encompass a continuous, not discrete, spectrum.
Glare locations displayed on receptor plots are approximate. Actual glare-spot locations may differ.
Refer to the Help page at **www.forgesolar.com/help/** for assumptions and limitations not listed here.

Default glare analysis parameters and observer eye characteristics (for reference only):

- Analysis time interval: 1 minute
- Ocular transmission coefficient: 0.5
- Pupil diameter: 0.002 meters
- Eye focal length: 0.017 meters
- Sun subtended angle: 9.3 milliradians

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FORGESOLAR GLARE ANALYSIS

Project: **Enterprise Solar North**
Site configuration: **Enterprise Solar Site 3A**

Created 30 Jun, 2023
Updated 30 Jun, 2023
Time-step 1 minute
Timezone offset UTC-8
Minimum sun altitude 0.0 deg
DNI peaks at 1,000.0 W/m^2
Category 100 MW to 1 GW
Site ID 94281.16538

Ocular transmission coefficient 0.5
Pupil diameter 0.002 m
Eye focal length 0.017 m
Sun subtended angle 9.3 mrad
PV analysis methodology V2

Summary of Results No glare predicted

PV Array	Tilt	Orient	Annual Green Glare		Annual Yellow Glare		Energy
	°	°	min	hr	min	hr	kWh
PV21	SA tracking	SA tracking	0	0.0	0	0.0	-
PV22	SA tracking	SA tracking	0	0.0	0	0.0	-
PV23	SA tracking	SA tracking	0	0.0	0	0.0	-
PV24	SA tracking	SA tracking	0	0.0	0	0.0	-
PV25	SA tracking	SA tracking	0	0.0	0	0.0	-
PV26	SA tracking	SA tracking	0	0.0	0	0.0	-
PV27	SA tracking	SA tracking	0	0.0	0	0.0	-
PV28	SA tracking	SA tracking	0	0.0	0	0.0	-
PV29	SA tracking	SA tracking	0	0.0	0	0.0	-
PV30	SA tracking	SA tracking	0	0.0	0	0.0	-
PV31	SA tracking	SA tracking	0	0.0	0	0.0	-
PV32	SA tracking	SA tracking	0	0.0	0	0.0	-
PV33	SA tracking	SA tracking	0	0.0	0	0.0	-
PV34	SA tracking	SA tracking	0	0.0	0	0.0	-
PV35	SA tracking	SA tracking	0	0.0	0	0.0	-
PV36	SA tracking	SA tracking	0	0.0	0	0.0	-
PV37	SA tracking	SA tracking	0	0.0	0	0.0	-
PV38	SA tracking	SA tracking	0	0.0	0	0.0	-
PV39	SA tracking	SA tracking	0	0.0	0	0.0	-
PV40	SA tracking	SA tracking	0	0.0	0	0.0	-

Total glare received by each receptor; may include duplicate times of glare from multiple reflective surfaces.

Route01	0	0.0	0	0.0
Route03	0	0.0	0	0.0

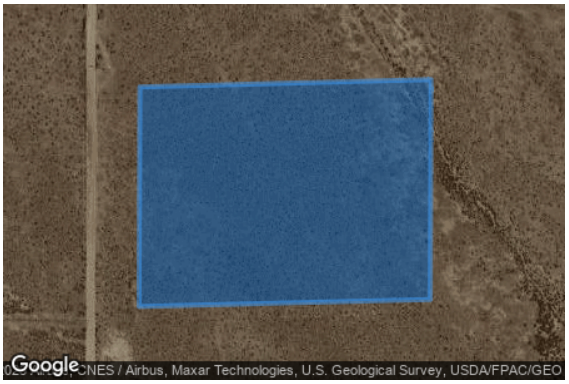
Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route05	0	0.0	0	0.0
Route07	0	0.0	0	0.0
Route10	0	0.0	0	0.0
Route11	0	0.0	0	0.0
Route12	0	0.0	0	0.0
Route13	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route20	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route25	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route28	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route30	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
Route33	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

Component Data

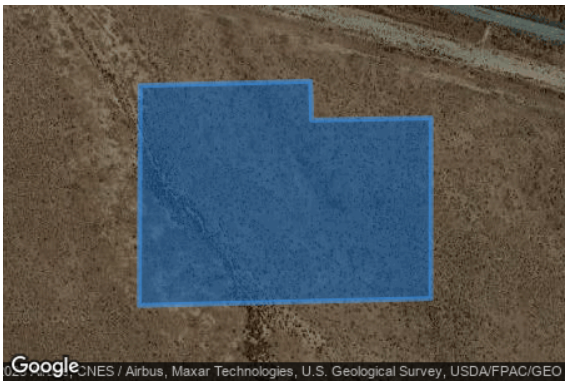
PV Arrays

Name: PV21
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



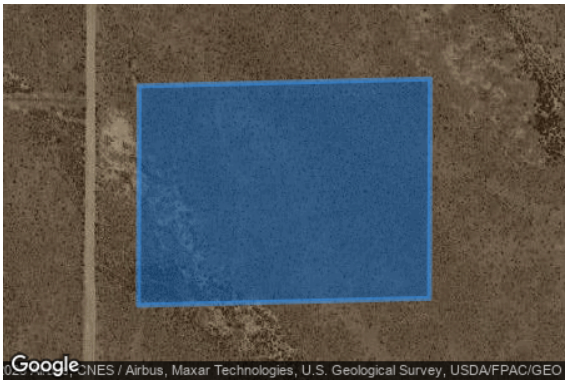
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.031426	-118.111099	2612.10	6.00	2618.10
2	35.031377	-118.113601	2617.87	6.00	2623.87
3	35.032915	-118.113594	2621.53	6.00	2627.53
4	35.032967	-118.111093	2616.35	6.00	2622.35
5	35.031426	-118.111099	2612.10	6.00	2618.10

Name: PV22
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



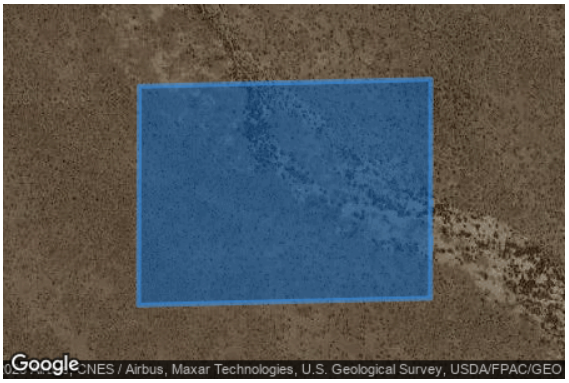
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.031475	-118.108594	2608.10	6.00	2614.10
2	35.031426	-118.111099	2612.10	6.00	2618.10
3	35.032967	-118.111093	2616.35	6.00	2622.35
4	35.032998	-118.109628	2615.45	6.00	2621.45
5	35.032726	-118.109619	2613.81	6.00	2619.81
6	35.032741	-118.108592	2613.25	6.00	2619.25
7	35.031475	-118.108594	2608.10	6.00	2614.10

Name: PV23
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



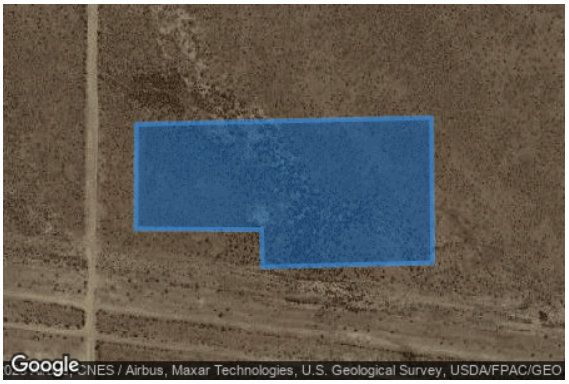
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.031377	-118.113601	2617.87	6.00	2623.87
2	35.031426	-118.111099	2612.10	6.00	2618.10
3	35.029887	-118.111106	2610.09	6.00	2616.09
4	35.029839	-118.113608	2614.38	6.00	2620.38
5	35.031377	-118.113601	2617.87	6.00	2623.87

Name: PV24
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



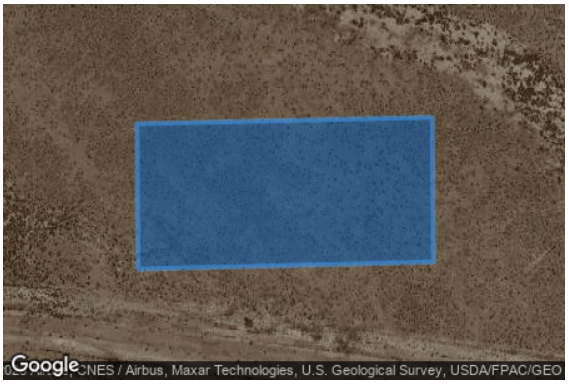
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.031426	-118.111099	2612.10	6.00	2618.10
2	35.031475	-118.108594	2608.10	6.00	2614.10
3	35.029936	-118.108597	2606.44	6.00	2612.44
4	35.029887	-118.111106	2610.09	6.00	2616.09
5	35.031426	-118.111099	2612.10	6.00	2618.10

Name: PV25
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.028792	-118.111099	2607.70	6.00	2613.70
2	35.028764	-118.112562	2610.07	6.00	2616.07
3	35.029024	-118.112571	2610.45	6.00	2616.45
4	35.029030	-118.113650	2612.61	6.00	2618.61
5	35.029765	-118.113647	2615.16	6.00	2621.16
6	35.029811	-118.111109	2609.78	6.00	2615.78
7	35.029303	-118.111104	2608.17	6.00	2614.17
8	35.028792	-118.111099	2607.70	6.00	2613.70

Name: PV26
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.028792	-118.111099	2607.70	6.00	2613.70
2	35.029303	-118.111104	2608.17	6.00	2614.17
3	35.029811	-118.111109	2609.78	6.00	2615.78
4	35.029858	-118.108571	2606.99	6.00	2612.99
5	35.028842	-118.108561	2603.87	6.00	2609.87
6	35.028792	-118.111099	2607.70	6.00	2613.70

Name: PV27
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



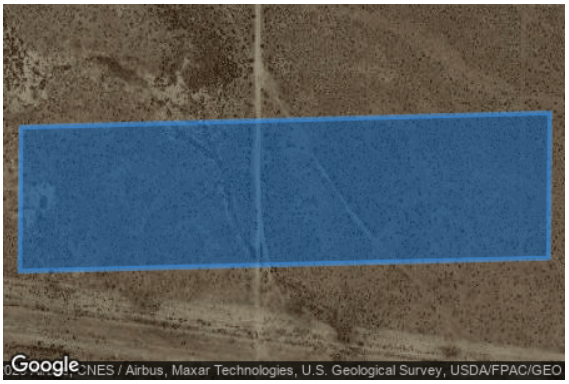
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.030461	-118.102347	2597.08	6.00	2603.08
2	35.029438	-118.102317	2596.19	6.00	2602.19
3	35.029325	-118.107185	2603.12	6.00	2609.12
4	35.032124	-118.107189	2607.15	6.00	2613.15
5	35.032135	-118.106341	2606.27	6.00	2612.27
6	35.031397	-118.106340	2604.92	6.00	2610.92
7	35.031461	-118.103134	2601.94	6.00	2607.94
8	35.031188	-118.103134	2600.32	6.00	2606.32
9	35.031168	-118.102372	2599.80	6.00	2605.80
10	35.030461	-118.102347	2597.08	6.00	2603.08

Name: PV28
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



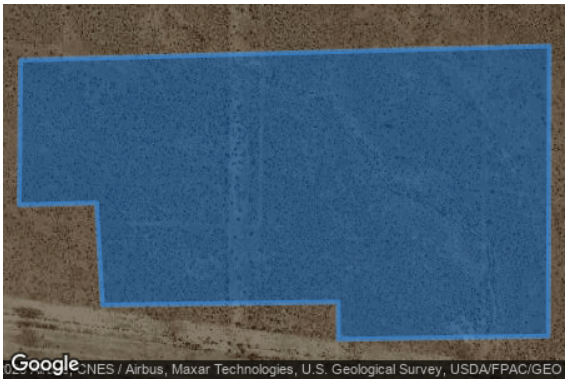
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.029438	-118.102317	2596.19	6.00	2602.19
2	35.030461	-118.102347	2597.08	6.00	2603.08
3	35.030524	-118.099153	2596.70	6.00	2602.70
4	35.030252	-118.099140	2596.24	6.00	2602.24
5	35.030262	-118.098624	2594.41	6.00	2600.41
6	35.029525	-118.098611	2594.87	6.00	2600.87
7	35.029438	-118.102317	2596.19	6.00	2602.19

Name: PV29
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.028316	-118.102614	2595.50	6.00	2601.50
2	35.028224	-118.107159	2600.68	6.00	2606.68
3	35.029234	-118.107148	2602.87	6.00	2608.87
4	35.029334	-118.102603	2597.47	6.00	2603.47
5	35.028316	-118.102614	2595.50	6.00	2601.50

Name: PV30
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



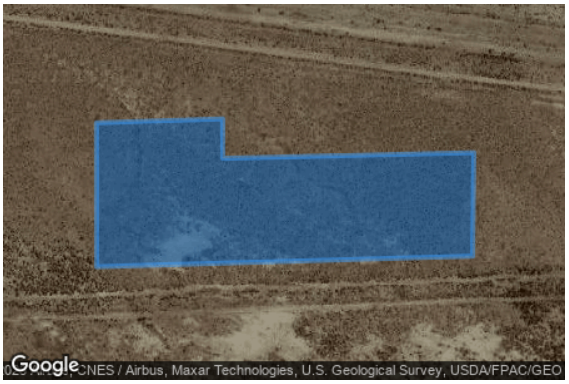
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.028316	-118.102614	2595.50	6.00	2601.50
2	35.029334	-118.102603	2597.47	6.00	2603.47
3	35.029434	-118.098058	2593.34	6.00	2599.34
4	35.027393	-118.098068	2587.31	6.00	2593.31
5	35.027371	-118.099874	2588.80	6.00	2594.80
6	35.027634	-118.099874	2590.20	6.00	2596.20
7	35.027612	-118.101901	2593.04	6.00	2599.04
8	35.028329	-118.101951	2594.40	6.00	2600.40
9	35.028316	-118.102614	2595.50	6.00	2601.50

Name: PV31
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.026209	-118.110372	2601.80	6.00	2607.80
2	35.026134	-118.113601	2608.15	6.00	2614.15
3	35.027136	-118.113603	2606.72	6.00	2612.72
4	35.027218	-118.110373	2605.23	6.00	2611.23
5	35.026710	-118.110372	2602.32	6.00	2608.32
6	35.026209	-118.110372	2601.80	6.00	2607.80

Name: PV32
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



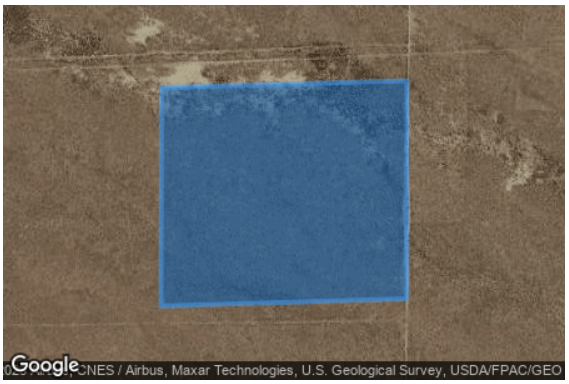
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.026209	-118.110372	2601.80	6.00	2607.80
2	35.026710	-118.110372	2602.32	6.00	2608.32
3	35.027218	-118.110373	2605.23	6.00	2611.23
4	35.027245	-118.109288	2602.29	6.00	2608.29
5	35.026968	-118.109288	2601.63	6.00	2607.63
6	35.027008	-118.107131	2599.16	6.00	2605.16
7	35.026283	-118.107142	2596.59	6.00	2602.59
8	35.026209	-118.110372	2601.80	6.00	2607.80

Name: PV33
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



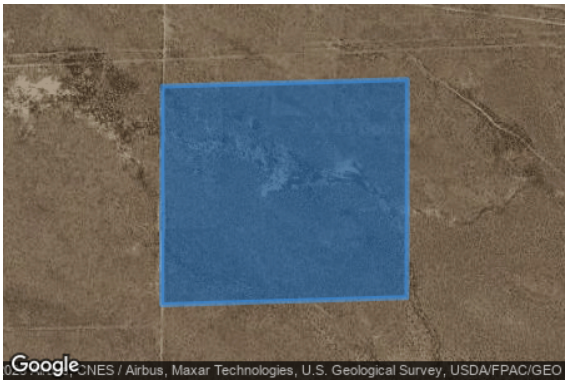
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.022506	-118.109378	2600.43	6.00	2606.43
2	35.022404	-118.113585	2599.89	6.00	2605.89
3	35.024465	-118.113599	2607.23	6.00	2613.23
4	35.024515	-118.111256	2601.08	6.00	2607.08
5	35.025535	-118.111246	2603.12	6.00	2609.12
6	35.025578	-118.109370	2598.72	6.00	2604.72
7	35.022506	-118.109378	2600.43	6.00	2606.43

Name: PV34
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



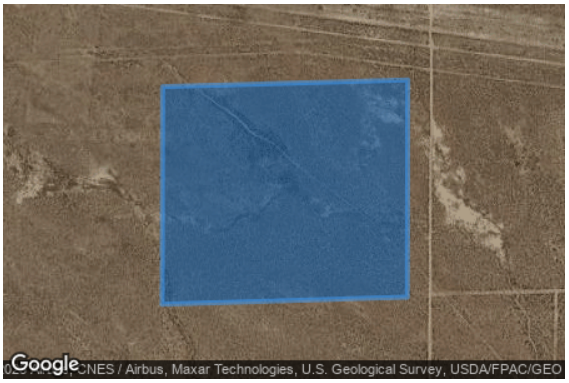
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.022506	-118.109378	2600.43	6.00	2606.43
2	35.025578	-118.109370	2598.72	6.00	2604.72
3	35.025673	-118.105152	2592.62	6.00	2598.62
4	35.022607	-118.105159	2591.01	6.00	2597.01
5	35.022506	-118.109378	2600.43	6.00	2606.43

Name: PV35
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



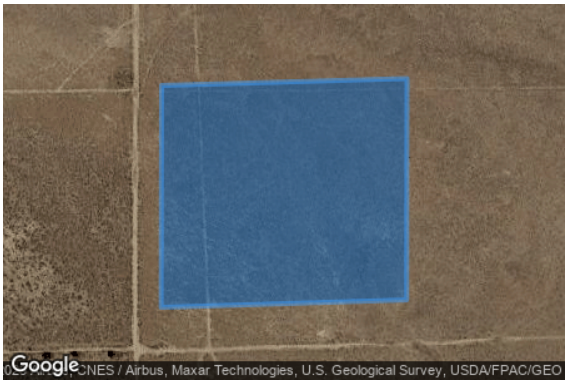
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.022709	-118.100947	2583.15	6.00	2589.15
2	35.022607	-118.105159	2591.01	6.00	2597.01
3	35.025673	-118.105152	2592.62	6.00	2598.62
4	35.025768	-118.100939	2586.68	6.00	2592.68
5	35.022709	-118.100947	2583.15	6.00	2589.15

Name: PV36
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



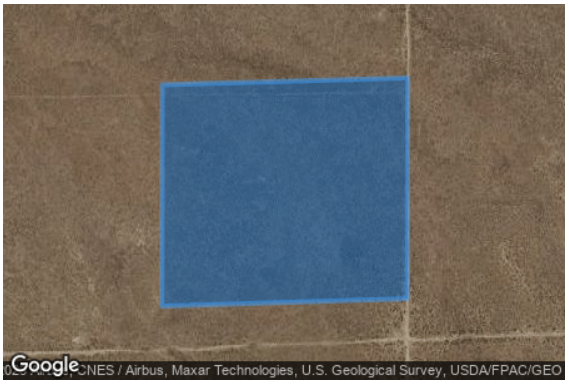
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.022709	-118.100947	2583.15	6.00	2589.15
2	35.024354	-118.100943	2586.15	6.00	2592.15
3	35.025768	-118.100939	2586.68	6.00	2592.68
4	35.025863	-118.096726	2582.50	6.00	2588.50
5	35.022810	-118.096734	2578.68	6.00	2584.68
6	35.022709	-118.100947	2583.15	6.00	2589.15

Name: PV37
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



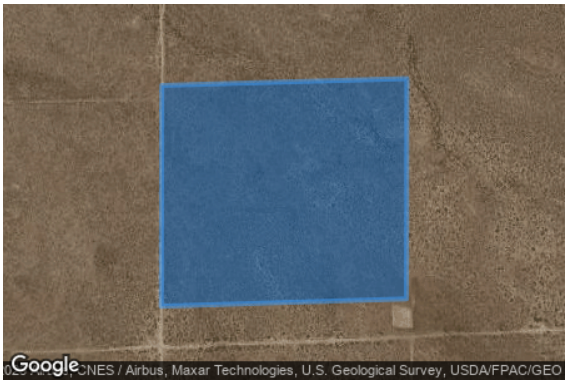
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.019302	-118.109385	2587.06	6.00	2593.06
2	35.019199	-118.113603	2604.02	6.00	2610.02
3	35.022309	-118.113596	2599.26	6.00	2605.26
4	35.022406	-118.109378	2600.46	6.00	2606.46
5	35.020912	-118.109381	2592.20	6.00	2598.20
6	35.019302	-118.109385	2587.06	6.00	2593.06

Name: PV38
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



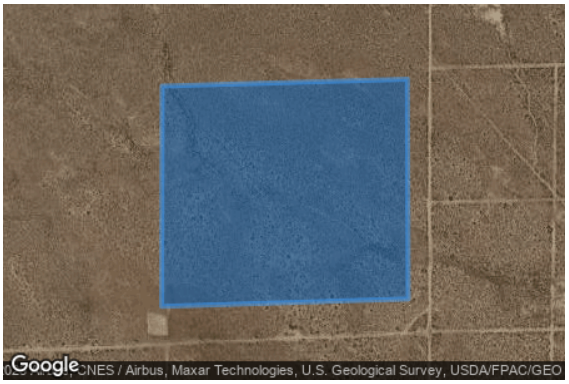
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.019302	-118.109385	2587.06	6.00	2593.06
2	35.020912	-118.109381	2592.20	6.00	2598.20
3	35.022406	-118.109378	2600.46	6.00	2606.46
4	35.022502	-118.105160	2591.20	6.00	2597.20
5	35.021011	-118.105163	2587.75	6.00	2593.75
6	35.019406	-118.105167	2586.67	6.00	2592.67
7	35.019302	-118.109385	2587.06	6.00	2593.06

Name: PV39
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.019510	-118.100955	2581.43	6.00	2587.43
2	35.019406	-118.105167	2586.67	6.00	2592.67
3	35.021011	-118.105163	2587.75	6.00	2593.75
4	35.022502	-118.105160	2591.20	6.00	2597.20
5	35.022599	-118.100947	2583.14	6.00	2589.14
6	35.019510	-118.100955	2581.43	6.00	2587.43

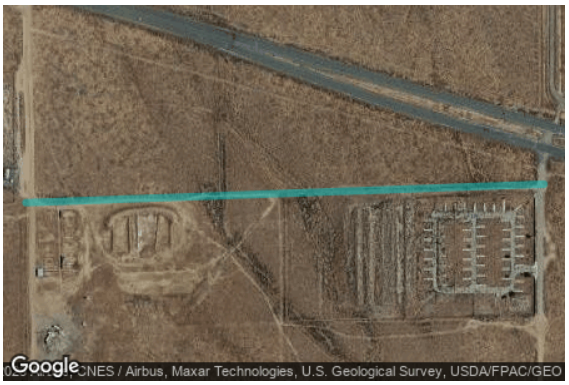
Name: PV40
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.019510	-118.100955	2581.43	6.00	2587.43
2	35.022599	-118.100947	2583.14	6.00	2589.14
3	35.022695	-118.096734	2578.68	6.00	2584.68
4	35.019614	-118.096719	2578.39	6.00	2584.39
5	35.019510	-118.100955	2581.43	6.00	2587.43

Route Receptors

Name: Route01
Path type: Two-way
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.039709	-118.149508	2692.31	3.50	2695.81
2	35.039786	-118.146850	2688.25	3.50	2691.75
3	35.039858	-118.144386	2683.89	3.50	2687.39
4	35.039952	-118.141138	2679.77	3.50	2683.27
5	35.039967	-118.140607	2680.15	3.50	2683.65

Name: Route03
Path type: Two-way
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.034033	-118.156782	2681.24	14.00	2695.24
2	35.033504	-118.155530	2678.08	14.00	2692.08
3	35.032485	-118.153847	2672.61	14.00	2686.61
4	35.030056	-118.150444	2665.27	14.00	2679.27
5	35.028485	-118.148260	2657.69	14.00	2671.69
6	35.025018	-118.143464	2641.83	14.00	2655.83
7	35.023170	-118.140898	2636.29	14.00	2650.29
8	35.021094	-118.138019	2629.19	14.00	2643.19
9	35.018750	-118.134756	2618.86	14.00	2632.86
10	35.016664	-118.131900	2612.85	14.00	2626.85
11	35.014911	-118.129473	2608.55	14.00	2622.55
12	35.012911	-118.126664	2601.79	14.00	2615.79
13	35.011110	-118.124157	2597.76	14.00	2611.76
14	35.008595	-118.120674	2590.69	14.00	2604.69
15	35.007042	-118.118538	2588.15	14.00	2602.15
16	35.005438	-118.116328	2585.22	14.00	2599.22

Name: Route05
Path type: Two-way
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	34.999075	-118.024203	2552.71	14.00	2566.71
2	34.999637	-118.026882	2551.21	14.00	2565.21
3	35.000333	-118.030406	2550.28	14.00	2564.28
4	35.000952	-118.033363	2541.11	14.00	2555.11
5	35.001705	-118.037120	2537.11	14.00	2551.11
6	35.002314	-118.040100	2530.67	14.00	2544.67
7	35.002857	-118.042709	2528.41	14.00	2542.41
8	35.003686	-118.046745	2523.19	14.00	2537.19
9	35.004333	-118.050096	2527.63	14.00	2541.63
10	35.004876	-118.052798	2528.52	14.00	2542.52
11	35.005913	-118.058074	2531.44	14.00	2545.44
12	35.006551	-118.061321	2533.24	14.00	2547.24
13	35.007092	-118.064088	2537.21	14.00	2551.21

Name: Route07
Path type: Two-way
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.031949	-118.168513	2692.18	3.50	2695.68
2	35.031894	-118.173384	2703.23	3.50	2706.73
3	35.031842	-118.176690	2716.09	3.50	2719.59
4	35.031814	-118.179183	2726.72	3.50	2730.22
5	35.031748	-118.183808	2744.44	3.50	2747.94
6	35.031745	-118.185548	2751.13	3.50	2754.63
7	35.031614	-118.185765	2751.35	3.50	2754.85
8	35.031549	-118.189041	2768.11	3.50	2771.61
9	35.031507	-118.193333	2793.48	3.50	2796.98
10	35.031430	-118.196682	2808.94	3.50	2812.44
11	35.031378	-118.198900	2817.34	3.50	2820.84

Name: Route10
Path type: Two-way
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.046248	-118.027562	2546.95	3.50	2550.45
2	35.045341	-118.027048	2555.26	3.50	2558.76
3	35.044668	-118.026851	2561.15	3.50	2564.65
4	35.044106	-118.026814	2566.92	3.50	2570.42
5	35.042766	-118.026850	2576.55	3.50	2580.05
6	35.041249	-118.026857	2584.15	3.50	2587.65
7	35.038673	-118.026878	2591.83	3.50	2595.33
8	35.035177	-118.026912	2608.11	3.50	2611.61
9	35.031423	-118.026942	2619.40	3.50	2622.90
10	35.028938	-118.027022	2610.30	3.50	2613.80
11	35.028398	-118.027474	2608.46	3.50	2611.96
12	35.028165	-118.028182	2606.14	3.50	2609.64
13	35.028025	-118.033582	2582.87	3.50	2586.37
14	35.023994	-118.033614	2579.82	3.50	2583.32
15	35.022900	-118.033263	2580.80	3.50	2584.30
16	35.022468	-118.033271	2581.03	3.50	2584.53
17	35.021514	-118.033474	2581.91	3.50	2585.41

Name: Route11
Path type: Two-way
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.052109	-118.041973	2545.00	3.50	2548.50
2	35.054017	-118.042511	2547.41	3.50	2550.91
3	35.055770	-118.041134	2550.45	3.50	2553.95
4	35.056176	-118.040844	2545.12	3.50	2548.62
5	35.056343	-118.040888	2544.06	3.50	2547.56
6	35.056510	-118.041018	2543.83	3.50	2547.33
7	35.056557	-118.041250	2543.47	3.50	2546.97
8	35.056486	-118.041540	2543.93	3.50	2547.43
9	35.056295	-118.042077	2545.79	3.50	2549.29
10	35.055531	-118.044179	2583.50	3.50	2587.00
11	35.054302	-118.045658	2550.60	3.50	2554.10

Name: Route12
Path type: Two-way
Observer view angle: 50.0°



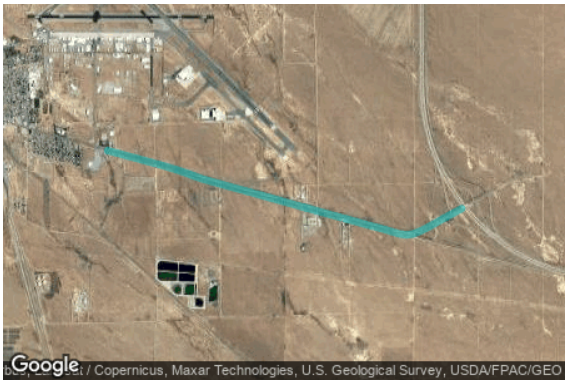
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.040368	-118.140624	2681.72	3.50	2685.22
2	35.040139	-118.140667	2680.42	3.50	2683.92
3	35.038329	-118.140681	2674.20	3.50	2677.70
4	35.037005	-118.140679	2667.47	3.50	2670.97
5	35.035781	-118.140685	2666.66	3.50	2670.16
6	35.034887	-118.140667	2664.38	3.50	2667.88
7	35.032798	-118.140689	2655.84	3.50	2659.34
8	35.032504	-118.140654	2653.89	3.50	2657.39
9	35.032383	-118.140549	2653.92	3.50	2657.42
10	35.032297	-118.140288	2654.38	3.50	2657.88
11	35.032197	-118.140262	2654.31	3.50	2657.81
12	35.031811	-118.140383	2652.49	3.50	2655.99
13	35.031074	-118.140469	2651.09	3.50	2654.59

Name: Route13
Path type: Two-way
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.093689	-118.134063	2836.92	14.00	2850.92
2	35.092179	-118.136080	2842.38	14.00	2856.38
3	35.090861	-118.137912	2845.42	14.00	2859.42
4	35.089714	-118.139535	2848.77	14.00	2862.77
5	35.088300	-118.141436	2849.83	14.00	2863.83
6	35.086599	-118.143754	2850.69	14.00	2864.69
7	35.085605	-118.145145	2852.58	14.00	2866.58
8	35.084382	-118.146907	2855.99	14.00	2869.99

Name: Route14
Path type: Two-way
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.037772	-118.107515	2648.38	7.60	2655.98
2	35.036787	-118.109729	2646.58	7.60	2654.18
3	35.035765	-118.111943	2627.76	7.60	2635.36
4	35.035277	-118.113091	2626.00	7.60	2633.60
5	35.034904	-118.114239	2629.08	7.60	2636.68
6	35.034808	-118.115190	2631.55	7.60	2639.15
7	35.034969	-118.116292	2632.51	7.60	2640.11
8	35.035330	-118.117742	2635.15	7.60	2642.75
9	35.035900	-118.120318	2640.47	7.60	2648.07
10	35.036954	-118.124982	2650.18	7.60	2657.78
11	35.038132	-118.130204	2660.80	7.60	2668.40
12	35.038891	-118.133499	2668.04	7.60	2675.64
13	35.040220	-118.139383	2680.46	7.60	2688.06
14	35.040828	-118.142063	2686.12	7.60	2693.72
15	35.041084	-118.143154	2688.52	7.60	2696.12
16	35.041949	-118.146125	2696.35	7.60	2703.95
17	35.042632	-118.148852	2703.92	7.60	2711.52
18	35.043562	-118.152972	2713.48	7.60	2721.08
19	35.044264	-118.156175	2719.34	7.60	2726.94

Name: Route18
Path type: Two-way
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.024698	-118.165092	2678.56	3.50	2682.06
2	35.024708	-118.164466	2675.88	3.50	2679.38
3	35.024770	-118.161439	2669.95	3.50	2673.45
4	35.024850	-118.158540	2664.58	3.50	2668.08
5	35.024911	-118.155455	2658.73	3.50	2662.23
6	35.024992	-118.151860	2652.80	3.50	2656.30
7	35.025042	-118.150097	2651.77	3.50	2655.27
8	35.025004	-118.149610	2651.31	3.50	2654.81
9	35.024890	-118.149494	2649.91	3.50	2653.41

Name: Route20
Path type: Two-way
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.046908	-118.155894	2726.92	3.50	2730.42
2	35.047005	-118.151081	2719.24	3.50	2722.74
3	35.047133	-118.146520	2711.73	3.50	2715.23
4	35.047417	-118.137988	2697.09	3.50	2700.59

Name: Route23
Path type: One-way (toward increasing index)
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.004682	-118.160128	2651.02	7.60	2658.62
2	35.007744	-118.160491	2658.44	7.60	2666.04
3	35.008967	-118.160650	2660.32	7.60	2667.92
4	35.010398	-118.161079	2661.68	7.60	2669.28
5	35.011671	-118.161473	2661.42	7.60	2669.02
6	35.014174	-118.162269	2675.28	7.60	2682.88
7	35.016592	-118.163065	2681.28	7.60	2688.88
8	35.018652	-118.163739	2678.87	7.60	2686.47
9	35.021362	-118.164605	2676.80	7.60	2684.40
10	35.024702	-118.165691	2679.26	7.60	2686.86
11	35.027477	-118.166609	2682.76	7.60	2690.36
12	35.028936	-118.167108	2685.17	7.60	2692.77
13	35.031246	-118.167852	2690.35	7.60	2697.95
14	35.032648	-118.168290	2693.80	7.60	2701.40
15	35.034515	-118.168920	2698.35	7.60	2705.95
16	35.035695	-118.169349	2714.21	7.60	2721.81
17	35.037405	-118.169713	2736.62	7.60	2744.22

Name: Route25
Path type: Two-way
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.098406	-118.144721	2943.70	7.60	2951.30
2	35.093727	-118.148311	2920.95	7.60	2928.55
3	35.093035	-118.148832	2919.12	7.60	2926.72
4	35.092677	-118.149180	2918.71	7.60	2926.31
5	35.090145	-118.151874	2914.66	7.60	2922.26
6	35.087685	-118.154568	2914.33	7.60	2921.93
7	35.085381	-118.157118	2912.12	7.60	2919.72

Name: Route27
Path type: One-way (toward increasing index)
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.037411	-118.169805	2738.77	7.60	2746.37
2	35.036288	-118.169724	2726.45	7.60	2734.05
3	35.035051	-118.169391	2706.14	7.60	2713.74
4	35.031911	-118.168367	2692.88	7.60	2700.48
5	35.029615	-118.167632	2688.93	7.60	2696.53
6	35.027884	-118.167071	2685.42	7.60	2693.02
7	35.025310	-118.166214	2680.85	7.60	2688.45
8	35.023450	-118.165610	2677.92	7.60	2685.52
9	35.021533	-118.164997	2677.74	7.60	2685.34
10	35.019888	-118.164463	2678.93	7.60	2686.53
11	35.017149	-118.163579	2681.31	7.60	2688.91
12	35.015440	-118.163028	2679.78	7.60	2687.38
13	35.012772	-118.162162	2669.07	7.60	2676.67
14	35.011349	-118.161707	2663.84	7.60	2671.44
15	35.009918	-118.161269	2661.83	7.60	2669.43
16	35.009167	-118.161015	2660.49	7.60	2668.09
17	35.008473	-118.160875	2659.21	7.60	2666.81
18	35.008323	-118.160852	2658.91	7.60	2666.51

Name: Route28
Path type: Two-way
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.098479	-118.143662	2905.89	7.60	2913.49
2	35.093889	-118.133754	2836.33	7.60	2843.93
3	35.091139	-118.128363	2820.90	7.60	2828.50
4	35.087528	-118.122344	2780.55	7.60	2788.15
5	35.082980	-118.118219	2757.17	7.60	2764.77
6	35.078527	-118.115406	2743.41	7.60	2751.01
7	35.072706	-118.113452	2726.39	7.60	2733.99
8	35.068452	-118.112980	2715.77	7.60	2723.37
9	35.062556	-118.112945	2699.01	7.60	2706.61
10	35.057194	-118.112921	2680.69	7.60	2688.29
11	35.052080	-118.112939	2678.08	7.60	2685.68
12	35.050561	-118.112879	2673.03	7.60	2680.63
13	35.047584	-118.112405	2660.57	7.60	2668.17
14	35.043843	-118.111197	2644.93	7.60	2652.53
15	35.040884	-118.109439	2635.04	7.60	2642.64
16	35.039306	-118.108327	2633.17	7.60	2640.77
17	35.037962	-118.107122	2625.68	7.60	2633.28

Name: Route29
Path type: Two-way
Observer view angle: 50.0°



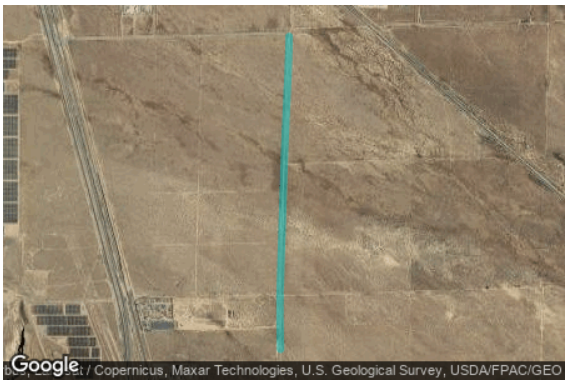
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.037962	-118.107122	2625.68	7.60	2633.28
2	35.036614	-118.105689	2620.36	7.60	2627.96
3	35.034386	-118.102715	2612.60	7.60	2620.20
4	35.032532	-118.099378	2602.75	7.60	2610.35
5	35.031237	-118.096102	2597.16	7.60	2604.76
6	35.030281	-118.092496	2589.56	7.60	2597.16
7	35.029384	-118.086780	2581.36	7.60	2588.96
8	35.028274	-118.079558	2570.47	7.60	2578.07
9	35.027071	-118.071579	2558.86	7.60	2566.46
10	35.026268	-118.066221	2553.25	7.60	2560.85
11	35.025268	-118.059848	2548.02	7.60	2555.62
12	35.024048	-118.051734	2541.66	7.60	2549.26
13	35.023052	-118.045084	2545.17	7.60	2552.77
14	35.021757	-118.036691	2567.39	7.60	2574.99
15	35.020696	-118.029670	2603.92	7.60	2611.52
16	35.020115	-118.025994	2633.18	7.60	2640.78
17	35.019843	-118.024280	2649.71	7.60	2657.31
18	35.019569	-118.022222	2655.43	7.60	2663.03
19	35.019462	-118.020337	2658.73	7.60	2666.33

Name: Route30
Path type: One-way (toward increasing index)
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.037008	-118.108836	2650.38	7.60	2657.98
2	35.036769	-118.108639	2646.35	7.60	2653.95
3	35.036359	-118.108348	2643.79	7.60	2651.39
4	35.036112	-118.108070	2642.67	7.60	2650.27
5	35.035883	-118.107594	2639.61	7.60	2647.21
6	35.035540	-118.106561	2632.55	7.60	2640.15
7	35.034779	-118.104205	2616.98	7.60	2624.58
8	35.034513	-118.103532	2613.65	7.60	2621.25
9	35.034417	-118.103300	2615.05	7.60	2622.65

Name: Route31
Path type: Two-way
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.024890	-118.149494	2649.91	3.50	2653.41
2	35.024508	-118.149493	2649.68	3.50	2653.18
3	35.022733	-118.149571	2645.88	3.50	2649.38
4	35.020148	-118.149717	2642.77	3.50	2646.27
5	35.018154	-118.149818	2640.29	3.50	2643.79
6	35.016169	-118.149895	2640.05	3.50	2643.55
7	35.014462	-118.149962	2641.25	3.50	2644.75
8	35.012572	-118.150040	2636.74	3.50	2640.24
9	35.010416	-118.150117	2633.44	3.50	2636.94
10	35.008493	-118.150113	2630.14	3.50	2633.64
11	35.007291	-118.150088	2629.53	3.50	2633.03

Name: Route32
Path type: Two-way
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	34.993461	-118.155078	2631.04	14.00	2645.04
2	34.997382	-118.156361	2639.79	14.00	2653.79
3	35.002401	-118.158008	2643.04	14.00	2657.04
4	35.006025	-118.159174	2643.43	14.00	2657.43
5	35.009064	-118.160137	2655.99	14.00	2669.99
6	35.010495	-118.160603	2658.54	14.00	2672.54
7	35.013189	-118.161507	2668.56	14.00	2682.56
8	35.018744	-118.163330	2677.33	14.00	2691.33
9	35.024727	-118.165241	2678.70	14.00	2692.70
10	35.030240	-118.167027	2687.13	14.00	2701.13
11	35.032233	-118.167680	2691.78	14.00	2705.78
12	35.034458	-118.168415	2696.20	14.00	2710.20
13	35.036696	-118.169151	2702.17	14.00	2716.17
14	35.037891	-118.169518	2707.02	14.00	2721.02

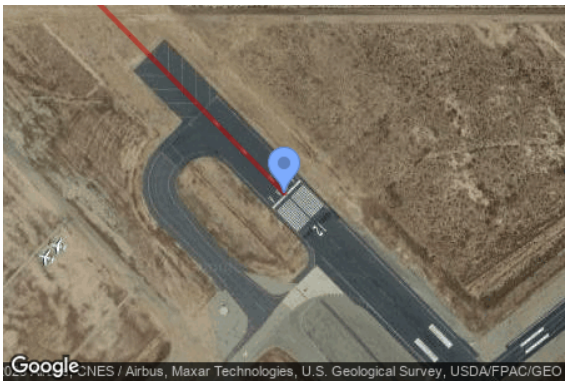
Name: Route33
Path type: Two-way
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.043679	-118.166001	2721.98	3.50	2725.48
2	35.043388	-118.164800	2720.75	3.50	2724.25
3	35.043167	-118.163799	2719.68	3.50	2723.18
4	35.042954	-118.162746	2718.43	3.50	2721.93
5	35.042577	-118.161084	2716.77	3.50	2720.27
6	35.042257	-118.159700	2714.36	3.50	2717.86

Flight Path Receptors

Name: MASP 12
Description: None
Threshold height: 50 ft
Direction: 135.6°
Glide slope: 3.0°
Pilot view restricted? Yes
Vertical view: 30.0°
Azimuthal view: 50.0°



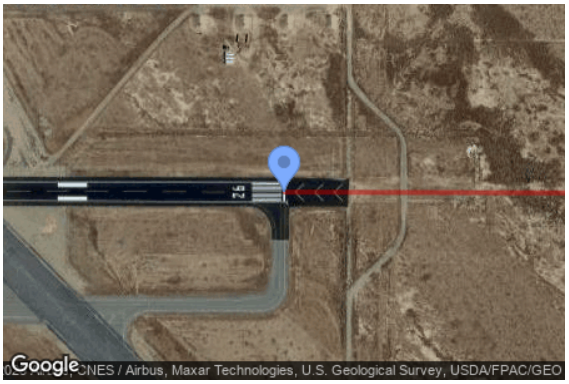
Point	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
Threshold	35.067997	-118.159056	2793.00	50.00	2843.00
Two-mile	35.088637	-118.183823	3014.80	381.60	3396.40

Name: MASP 22
Description: None
Threshold height: 50 ft
Direction: 232.5°
Glide slope: 3.0°
Pilot view restricted? Yes
Vertical view: 30.0°
Azimuthal view: 50.0°



Point	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
Threshold	35.067800	-118.151866	2778.90	50.00	2828.90
Two-mile	35.085397	-118.123804	2778.10	604.20	3382.30

Name: MASP 26
Description: None
Threshold height: 50 ft
Direction: 270.2°
Glide slope: 3.0°
Pilot view restricted? Yes
Vertical view: 30.0°
Azimuthal view: 50.0°



Point	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
Threshold	35.059183	-118.142549	2730.80	50.00	2780.80
Two-mile	35.059102	-118.107186	2677.40	656.90	3334.30

Name: MASP 30
Description: None
Threshold height: 50 ft
Direction: 314.8°
Glide slope: 3.0°
Pilot view restricted? Yes
Vertical view: 30.0°
Azimuthal view: 50.0°



Point	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
Threshold	35.046580	-118.133135	2681.00	50.00	2731.00
Two-mile	35.026204	-118.108051	2594.70	689.70	3284.40

Name: MASP 4
Description: None
Threshold height: 50 ft
Direction: 51.1°
Glide slope: 3.0°
Pilot view restricted? Yes
Vertical view: 30.0°
Azimuthal view: 50.0°



Point	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
Threshold	35.059748	-118.164297	2777.80	50.00	2827.80
Two-mile	35.041580	-118.191806	2772.90	608.30	3381.20

Name: MASP 8
Description: None
Threshold height: 50 ft
Direction: 90.1°
Glide slope: 3.0°
Pilot view restricted? Yes
Vertical view: 30.0°
Azimuthal view: 50.0°

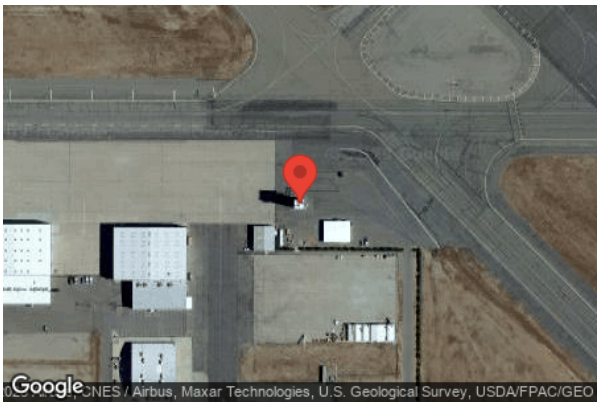


Point	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
Threshold	35.059242	-118.166076	2778.50	50.00	2828.50
Two-mile	35.059272	-118.201439	2921.10	460.80	3381.90

Discrete Observation Point Receptors

Name	ID	Latitude (°)	Longitude (°)	Elevation (ft)	Height (ft)
OP 1	1	35.065098	-118.180928	2843.42	5.50
OP 2	2	35.065057	-118.182564	2849.00	5.50
OP 3	3	35.064511	-118.184362	2856.49	5.50
OP 4	4	35.061390	-118.185376	2836.28	5.50
OP 5	5	35.061201	-118.193962	2873.23	5.50
OP 7	7	35.060619	-118.189032	2846.51	5.50
OP 8	8	35.057993	-118.195225	2864.50	5.50
OP 13	13	35.052665	-118.187952	2786.84	5.50
OP 14	14	35.049394	-118.186277	2764.30	5.50
OP 15	15	35.049271	-118.188858	2775.43	5.50
OP 16	16	35.046436	-118.190359	2774.83	5.50
OP 17	17	35.046422	-118.192157	2782.95	5.50
OP 18	18	35.044898	-118.156588	2722.34	5.50
OP 19	19	35.043859	-118.166033	2723.17	5.50
OP 20	20	35.043399	-118.164002	2721.70	5.50
OP 21	21	35.042923	-118.161898	2717.78	5.50
OP 22	22	35.042417	-118.159757	2713.08	5.50
OP 23	23	35.038382	-118.167332	2704.07	5.50
OP 24	24	35.030481	-118.187314	2764.59	5.50
OP 25	25	35.029317	-118.187126	2766.42	5.50
OP 26	26	35.027578	-118.189024	2776.05	5.50
OP 27	27	35.002810	-118.152089	2625.07	5.50
32-ATCT	32	35.057003	-118.149446	2742.00	85.00

Map image of 32-ATCT



Glare Analysis Results

Summary of Results No glare predicted

PV Array	Tilt	Orient	Annual Green Glare		Annual Yellow Glare		Energy
	°	°	min	hr	min	hr	kWh
PV21	SA tracking	SA tracking	0	0.0	0	0.0	-
PV22	SA tracking	SA tracking	0	0.0	0	0.0	-
PV23	SA tracking	SA tracking	0	0.0	0	0.0	-
PV24	SA tracking	SA tracking	0	0.0	0	0.0	-
PV25	SA tracking	SA tracking	0	0.0	0	0.0	-
PV26	SA tracking	SA tracking	0	0.0	0	0.0	-
PV27	SA tracking	SA tracking	0	0.0	0	0.0	-
PV28	SA tracking	SA tracking	0	0.0	0	0.0	-
PV29	SA tracking	SA tracking	0	0.0	0	0.0	-
PV30	SA tracking	SA tracking	0	0.0	0	0.0	-
PV31	SA tracking	SA tracking	0	0.0	0	0.0	-
PV32	SA tracking	SA tracking	0	0.0	0	0.0	-
PV33	SA tracking	SA tracking	0	0.0	0	0.0	-
PV34	SA tracking	SA tracking	0	0.0	0	0.0	-
PV35	SA tracking	SA tracking	0	0.0	0	0.0	-
PV36	SA tracking	SA tracking	0	0.0	0	0.0	-
PV37	SA tracking	SA tracking	0	0.0	0	0.0	-
PV38	SA tracking	SA tracking	0	0.0	0	0.0	-
PV39	SA tracking	SA tracking	0	0.0	0	0.0	-
PV40	SA tracking	SA tracking	0	0.0	0	0.0	-

Total glare received by each receptor; may include duplicate times of glare from multiple reflective surfaces.

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01	0	0.0	0	0.0
Route03	0	0.0	0	0.0
Route05	0	0.0	0	0.0
Route07	0	0.0	0	0.0
Route10	0	0.0	0	0.0
Route11	0	0.0	0	0.0
Route12	0	0.0	0	0.0
Route13	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route20	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route25	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route28	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route30	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
Route33	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV: PV21 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01	0	0.0	0	0.0
Route03	0	0.0	0	0.0
Route05	0	0.0	0	0.0
Route07	0	0.0	0	0.0
Route10	0	0.0	0	0.0
Route11	0	0.0	0	0.0
Route12	0	0.0	0	0.0
Route13	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route20	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route25	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route28	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route30	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
Route33	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV21 and Route: Route01

No glare found

PV21 and Route: Route03

No glare found

PV21 and Route: Route05

No glare found

PV21 and Route: Route07

No glare found

PV21 and Route: Route10

No glare found

PV21 and Route: Route11

No glare found

PV21 and Route: Route12

No glare found

PV21 and Route: Route13

No glare found

PV21 and Route: Route14

No glare found

PV21 and Route: Route18

No glare found

PV21 and Route: Route20

No glare found

PV21 and Route: Route23

No glare found

PV21 and Route: Route25

No glare found

PV21 and Route: Route27

No glare found

PV21 and Route: Route28

No glare found

PV21 and Route: Route29

No glare found

PV21 and Route: Route30

No glare found

PV21 and Route: Route31

No glare found

PV21 and Route: Route32

No glare found

PV21 and Route: Route33

No glare found

PV21 and FP: MASP 12

No glare found

PV21 and FP: MASP 22

No glare found

PV21 and FP: MASP 26

No glare found

PV21 and FP: MASP 30

No glare found

PV21 and FP: MASP 4

No glare found

PV21 and FP: MASP 8

No glare found

PV21 and OP 1

No glare found

PV21 and OP 2

No glare found

PV21 and OP 3

No glare found

PV21 and OP 4

No glare found

PV21 and OP 5

No glare found

PV21 and OP 7

No glare found

PV21 and OP 8

No glare found

PV21 and OP 13

No glare found

PV21 and OP 14

No glare found

PV21 and OP 15

No glare found

PV21 and OP 16

No glare found

PV21 and OP 17

No glare found

PV21 and OP 18

No glare found

PV21 and OP 19

No glare found

PV21 and OP 20

No glare found

PV21 and OP 21

No glare found

PV21 and OP 22

No glare found

PV21 and OP 23

No glare found

PV21 and OP 24

No glare found

PV21 and OP 25

No glare found

PV21 and OP 26

No glare found

PV21 and OP 27

No glare found

PV21 and 32-ATCT

No glare found

PV: PV22 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01	0	0.0	0	0.0
Route03	0	0.0	0	0.0
Route05	0	0.0	0	0.0
Route07	0	0.0	0	0.0
Route10	0	0.0	0	0.0
Route11	0	0.0	0	0.0
Route12	0	0.0	0	0.0
Route13	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route20	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route25	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route28	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route30	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
Route33	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV22 and Route: Route01

No glare found

PV22 and Route: Route03

No glare found

PV22 and Route: Route05

No glare found

PV22 and Route: Route07

No glare found

PV22 and Route: Route10

No glare found

PV22 and Route: Route11

No glare found

PV22 and Route: Route12

No glare found

PV22 and Route: Route13

No glare found

PV22 and Route: Route14

No glare found

PV22 and Route: Route18

No glare found

PV22 and Route: Route20

No glare found

PV22 and Route: Route23

No glare found

PV22 and Route: Route25

No glare found

PV22 and Route: Route27

No glare found

PV22 and Route: Route28

No glare found

PV22 and Route: Route29

No glare found

PV22 and Route: Route30

No glare found

PV22 and Route: Route31

No glare found

PV22 and Route: Route32

No glare found

PV22 and Route: Route33

No glare found

PV22 and FP: MASP 12

No glare found

PV22 and FP: MASP 22

No glare found

PV22 and FP: MASP 26

No glare found

PV22 and FP: MASP 30

No glare found

PV22 and FP: MASP 4

No glare found

PV22 and FP: MASP 8

No glare found

PV22 and OP 1

No glare found

PV22 and OP 2

No glare found

PV22 and OP 3

No glare found

PV22 and OP 4

No glare found

PV22 and OP 5

No glare found

PV22 and OP 7

No glare found

PV22 and OP 8

No glare found

PV22 and OP 13

No glare found

PV22 and OP 14

No glare found

PV22 and OP 15

No glare found

PV22 and OP 16

No glare found

PV22 and OP 17

No glare found

PV22 and OP 18

No glare found

PV22 and OP 19

No glare found

PV22 and OP 20

No glare found

PV22 and OP 21

No glare found

PV22 and OP 22

No glare found

PV22 and OP 23

No glare found

PV22 and OP 24

No glare found

PV22 and OP 25

No glare found

PV22 and OP 26

No glare found

PV22 and OP 27

No glare found

PV22 and 32-ATCT

No glare found

PV: PV23 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01	0	0.0	0	0.0
Route03	0	0.0	0	0.0
Route05	0	0.0	0	0.0
Route07	0	0.0	0	0.0
Route10	0	0.0	0	0.0
Route11	0	0.0	0	0.0
Route12	0	0.0	0	0.0
Route13	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route20	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route25	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route28	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route30	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
Route33	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV23 and Route: Route01

No glare found

PV23 and Route: Route03

No glare found

PV23 and Route: Route05

No glare found

PV23 and Route: Route07

No glare found

PV23 and Route: Route10

No glare found

PV23 and Route: Route11

No glare found

PV23 and Route: Route12

No glare found

PV23 and Route: Route13

No glare found

PV23 and Route: Route14

No glare found

PV23 and Route: Route18

No glare found

PV23 and Route: Route20

No glare found

PV23 and Route: Route23

No glare found

PV23 and Route: Route25

No glare found

PV23 and Route: Route27

No glare found

PV23 and Route: Route28

No glare found

PV23 and Route: Route29

No glare found

PV23 and Route: Route30

No glare found

PV23 and Route: Route31

No glare found

PV23 and Route: Route32

No glare found

PV23 and Route: Route33

No glare found

PV23 and FP: MASP 12

No glare found

PV23 and FP: MASP 22

No glare found

PV23 and FP: MASP 26

No glare found

PV23 and FP: MASP 30

No glare found

PV23 and FP: MASP 4

No glare found

PV23 and FP: MASP 8

No glare found

PV23 and OP 1

No glare found

PV23 and OP 2

No glare found

PV23 and OP 3

No glare found

PV23 and OP 4

No glare found

PV23 and OP 5

No glare found

PV23 and OP 7

No glare found

PV23 and OP 8

No glare found

PV23 and OP 13

No glare found

PV23 and OP 14

No glare found

PV23 and OP 15

No glare found

PV23 and OP 16

No glare found

PV23 and OP 17

No glare found

PV23 and OP 18

No glare found

PV23 and OP 19

No glare found

PV23 and OP 20

No glare found

PV23 and OP 21

No glare found

PV23 and OP 22

No glare found

PV23 and OP 23

No glare found

PV23 and OP 24

No glare found

PV23 and OP 25

No glare found

PV23 and OP 26

No glare found

PV23 and OP 27

No glare found

PV23 and 32-ATCT

No glare found

PV: PV24 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01	0	0.0	0	0.0
Route03	0	0.0	0	0.0
Route05	0	0.0	0	0.0
Route07	0	0.0	0	0.0
Route10	0	0.0	0	0.0
Route11	0	0.0	0	0.0
Route12	0	0.0	0	0.0
Route13	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route20	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route25	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route28	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route30	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
Route33	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV24 and Route: Route01

No glare found

PV24 and Route: Route03

No glare found

PV24 and Route: Route05

No glare found

PV24 and Route: Route07

No glare found

PV24 and Route: Route10

No glare found

PV24 and Route: Route11

No glare found

PV24 and Route: Route12

No glare found

PV24 and Route: Route13

No glare found

PV24 and Route: Route14

No glare found

PV24 and Route: Route18

No glare found

PV24 and Route: Route20

No glare found

PV24 and Route: Route23

No glare found

PV24 and Route: Route25

No glare found

PV24 and Route: Route27

No glare found

PV24 and Route: Route28

No glare found

PV24 and Route: Route29

No glare found

PV24 and Route: Route30

No glare found

PV24 and Route: Route31

No glare found

PV24 and Route: Route32

No glare found

PV24 and Route: Route33

No glare found

PV24 and FP: MASP 12

No glare found

PV24 and FP: MASP 22

No glare found

PV24 and FP: MASP 26

No glare found

PV24 and FP: MASP 30

No glare found

PV24 and FP: MASP 4

No glare found

PV24 and FP: MASP 8

No glare found

PV24 and OP 1

No glare found

PV24 and OP 2

No glare found

PV24 and OP 3

No glare found

PV24 and OP 4

No glare found

PV24 and OP 5

No glare found

PV24 and OP 7

No glare found

PV24 and OP 8

No glare found

PV24 and OP 13

No glare found

PV24 and OP 14

No glare found

PV24 and OP 15

No glare found

PV24 and OP 16

No glare found

PV24 and OP 17

No glare found

PV24 and OP 18

No glare found

PV24 and OP 19

No glare found

PV24 and OP 20

No glare found

PV24 and OP 21

No glare found

PV24 and OP 22

No glare found

PV24 and OP 23

No glare found

PV24 and OP 24

No glare found

PV24 and OP 25

No glare found

PV24 and OP 26

No glare found

PV24 and OP 27

No glare found

PV24 and 32-ATCT

No glare found

PV: PV25 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01	0	0.0	0	0.0
Route03	0	0.0	0	0.0
Route05	0	0.0	0	0.0
Route07	0	0.0	0	0.0
Route10	0	0.0	0	0.0
Route11	0	0.0	0	0.0
Route12	0	0.0	0	0.0
Route13	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route20	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route25	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route28	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route30	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
Route33	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV25 and Route: Route01

No glare found

PV25 and Route: Route03

No glare found

PV25 and Route: Route05

No glare found

PV25 and Route: Route07

No glare found

PV25 and Route: Route10

No glare found

PV25 and Route: Route11

No glare found

PV25 and Route: Route12

No glare found

PV25 and Route: Route13

No glare found

PV25 and Route: Route14

No glare found

PV25 and Route: Route18

No glare found

PV25 and Route: Route20

No glare found

PV25 and Route: Route23

No glare found

PV25 and Route: Route25

No glare found

PV25 and Route: Route27

No glare found

PV25 and Route: Route28

No glare found

PV25 and Route: Route29

No glare found

PV25 and Route: Route30

No glare found

PV25 and Route: Route31

No glare found

PV25 and Route: Route32

No glare found

PV25 and Route: Route33

No glare found

PV25 and FP: MASP 12

No glare found

PV25 and FP: MASP 22

No glare found

PV25 and FP: MASP 26

No glare found

PV25 and FP: MASP 30

No glare found

PV25 and FP: MASP 4

No glare found

PV25 and FP: MASP 8

No glare found

PV25 and OP 1

No glare found

PV25 and OP 2

No glare found

PV25 and OP 3

No glare found

PV25 and OP 4

No glare found

PV25 and OP 5

No glare found

PV25 and OP 7

No glare found

PV25 and OP 8

No glare found

PV25 and OP 13

No glare found

PV25 and OP 14

No glare found

PV25 and OP 15

No glare found

PV25 and OP 16

No glare found

PV25 and OP 17

No glare found

PV25 and OP 18

No glare found

PV25 and OP 19

No glare found

PV25 and OP 20

No glare found

PV25 and OP 21

No glare found

PV25 and OP 22

No glare found

PV25 and OP 23

No glare found

PV25 and OP 24

No glare found

PV25 and OP 25

No glare found

PV25 and OP 26

No glare found

PV25 and OP 27

No glare found

PV25 and 32-ATCT

No glare found

PV: PV26 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01	0	0.0	0	0.0
Route03	0	0.0	0	0.0
Route05	0	0.0	0	0.0
Route07	0	0.0	0	0.0
Route10	0	0.0	0	0.0
Route11	0	0.0	0	0.0
Route12	0	0.0	0	0.0
Route13	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route20	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route25	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route28	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route30	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
Route33	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV26 and Route: Route01

No glare found

PV26 and Route: Route03

No glare found

PV26 and Route: Route05

No glare found

PV26 and Route: Route07

No glare found

PV26 and Route: Route10

No glare found

PV26 and Route: Route11

No glare found

PV26 and Route: Route12

No glare found

PV26 and Route: Route13

No glare found

PV26 and Route: Route14

No glare found

PV26 and Route: Route18

No glare found

PV26 and Route: Route20

No glare found

PV26 and Route: Route23

No glare found

PV26 and Route: Route25

No glare found

PV26 and Route: Route27

No glare found

PV26 and Route: Route28

No glare found

PV26 and Route: Route29

No glare found

PV26 and Route: Route30

No glare found

PV26 and Route: Route31

No glare found

PV26 and Route: Route32

No glare found

PV26 and Route: Route33

No glare found

PV26 and FP: MASP 12

No glare found

PV26 and FP: MASP 22

No glare found

PV26 and FP: MASP 26

No glare found

PV26 and FP: MASP 30

No glare found

PV26 and FP: MASP 4

No glare found

PV26 and FP: MASP 8

No glare found

PV26 and OP 1

No glare found

PV26 and OP 2

No glare found

PV26 and OP 3

No glare found

PV26 and OP 4

No glare found

PV26 and OP 5

No glare found

PV26 and OP 7

No glare found

PV26 and OP 8

No glare found

PV26 and OP 13

No glare found

PV26 and OP 14

No glare found

PV26 and OP 15

No glare found

PV26 and OP 16

No glare found

PV26 and OP 17

No glare found

PV26 and OP 18

No glare found

PV26 and OP 19

No glare found

PV26 and OP 20

No glare found

PV26 and OP 21

No glare found

PV26 and OP 22

No glare found

PV26 and OP 23

No glare found

PV26 and OP 24

No glare found

PV26 and OP 25

No glare found

PV26 and OP 26

No glare found

PV26 and OP 27

No glare found

PV26 and 32-ATCT

No glare found

PV: PV27 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01	0	0.0	0	0.0
Route03	0	0.0	0	0.0
Route05	0	0.0	0	0.0
Route07	0	0.0	0	0.0
Route10	0	0.0	0	0.0
Route11	0	0.0	0	0.0
Route12	0	0.0	0	0.0
Route13	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route20	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route25	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route28	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route30	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
Route33	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV27 and Route: Route01

No glare found

PV27 and Route: Route03

No glare found

PV27 and Route: Route05

No glare found

PV27 and Route: Route07

No glare found

PV27 and Route: Route10

No glare found

PV27 and Route: Route11

No glare found

PV27 and Route: Route12

No glare found

PV27 and Route: Route13

No glare found

PV27 and Route: Route14

No glare found

PV27 and Route: Route18

No glare found

PV27 and Route: Route20

No glare found

PV27 and Route: Route23

No glare found

PV27 and Route: Route25

No glare found

PV27 and Route: Route27

No glare found

PV27 and Route: Route28

No glare found

PV27 and Route: Route29

No glare found

PV27 and Route: Route30

No glare found

PV27 and Route: Route31

No glare found

PV27 and Route: Route32

No glare found

PV27 and Route: Route33

No glare found

PV27 and FP: MASP 12

No glare found

PV27 and FP: MASP 22

No glare found

PV27 and FP: MASP 26

No glare found

PV27 and FP: MASP 30

No glare found

PV27 and FP: MASP 4

No glare found

PV27 and FP: MASP 8

No glare found

PV27 and OP 1

No glare found

PV27 and OP 2

No glare found

PV27 and OP 3

No glare found

PV27 and OP 4

No glare found

PV27 and OP 5

No glare found

PV27 and OP 7

No glare found

PV27 and OP 8

No glare found

PV27 and OP 13

No glare found

PV27 and OP 14

No glare found

PV27 and OP 15

No glare found

PV27 and OP 16

No glare found

PV27 and OP 17

No glare found

PV27 and OP 18

No glare found

PV27 and OP 19

No glare found

PV27 and OP 20

No glare found

PV27 and OP 21

No glare found

PV27 and OP 22

No glare found

PV27 and OP 23

No glare found

PV27 and OP 24

No glare found

PV27 and OP 25

No glare found

PV27 and OP 26

No glare found

PV27 and OP 27

No glare found

PV27 and 32-ATCT

No glare found

PV: PV28 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01	0	0.0	0	0.0
Route03	0	0.0	0	0.0
Route05	0	0.0	0	0.0
Route07	0	0.0	0	0.0
Route10	0	0.0	0	0.0
Route11	0	0.0	0	0.0
Route12	0	0.0	0	0.0
Route13	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route20	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route25	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route28	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route30	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
Route33	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV28 and Route: Route01

No glare found

PV28 and Route: Route03

No glare found

PV28 and Route: Route05

No glare found

PV28 and Route: Route07

No glare found

PV28 and Route: Route10

No glare found

PV28 and Route: Route11

No glare found

PV28 and Route: Route12

No glare found

PV28 and Route: Route13

No glare found

PV28 and Route: Route14

No glare found

PV28 and Route: Route18

No glare found

PV28 and Route: Route20

No glare found

PV28 and Route: Route23

No glare found

PV28 and Route: Route25

No glare found

PV28 and Route: Route27

No glare found

PV28 and Route: Route28

No glare found

PV28 and Route: Route29

No glare found

PV28 and Route: Route30

No glare found

PV28 and Route: Route31

No glare found

PV28 and Route: Route32

No glare found

PV28 and Route: Route33

No glare found

PV28 and FP: MASP 12

No glare found

PV28 and FP: MASP 22

No glare found

PV28 and FP: MASP 26

No glare found

PV28 and FP: MASP 30

No glare found

PV28 and FP: MASP 4

No glare found

PV28 and FP: MASP 8

No glare found

PV28 and OP 1

No glare found

PV28 and OP 2

No glare found

PV28 and OP 3

No glare found

PV28 and OP 4

No glare found

PV28 and OP 5

No glare found

PV28 and OP 7

No glare found

PV28 and OP 8

No glare found

PV28 and OP 13

No glare found

PV28 and OP 14

No glare found

PV28 and OP 15

No glare found

PV28 and OP 16

No glare found

PV28 and OP 17

No glare found

PV28 and OP 18

No glare found

PV28 and OP 19

No glare found

PV28 and OP 20

No glare found

PV28 and OP 21

No glare found

PV28 and OP 22

No glare found

PV28 and OP 23

No glare found

PV28 and OP 24

No glare found

PV28 and OP 25

No glare found

PV28 and OP 26

No glare found

PV28 and OP 27

No glare found

PV28 and 32-ATCT

No glare found

PV: PV29 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01	0	0.0	0	0.0
Route03	0	0.0	0	0.0
Route05	0	0.0	0	0.0
Route07	0	0.0	0	0.0
Route10	0	0.0	0	0.0
Route11	0	0.0	0	0.0
Route12	0	0.0	0	0.0
Route13	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route20	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route25	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route28	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route30	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
Route33	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV29 and Route: Route01

No glare found

PV29 and Route: Route03

No glare found

PV29 and Route: Route05

No glare found

PV29 and Route: Route07

No glare found

PV29 and Route: Route10

No glare found

PV29 and Route: Route11

No glare found

PV29 and Route: Route12

No glare found

PV29 and Route: Route13

No glare found

PV29 and Route: Route14

No glare found

PV29 and Route: Route18

No glare found

PV29 and Route: Route20

No glare found

PV29 and Route: Route23

No glare found

PV29 and Route: Route25

No glare found

PV29 and Route: Route27

No glare found

PV29 and Route: Route28

No glare found

PV29 and Route: Route29

No glare found

PV29 and Route: Route30

No glare found

PV29 and Route: Route31

No glare found

PV29 and Route: Route32

No glare found

PV29 and Route: Route33

No glare found

PV29 and FP: MASP 12

No glare found

PV29 and FP: MASP 22

No glare found

PV29 and FP: MASP 26

No glare found

PV29 and FP: MASP 30

No glare found

PV29 and FP: MASP 4

No glare found

PV29 and FP: MASP 8

No glare found

PV29 and OP 1

No glare found

PV29 and OP 2

No glare found

PV29 and OP 3

No glare found

PV29 and OP 4

No glare found

PV29 and OP 5

No glare found

PV29 and OP 7

No glare found

PV29 and OP 8

No glare found

PV29 and OP 13

No glare found

PV29 and OP 14

No glare found

PV29 and OP 15

No glare found

PV29 and OP 16

No glare found

PV29 and OP 17

No glare found

PV29 and OP 18

No glare found

PV29 and OP 19

No glare found

PV29 and OP 20

No glare found

PV29 and OP 21

No glare found

PV29 and OP 22

No glare found

PV29 and OP 23

No glare found

PV29 and OP 24

No glare found

PV29 and OP 25

No glare found

PV29 and OP 26

No glare found

PV29 and OP 27

No glare found

PV29 and 32-ATCT

No glare found

PV: PV30 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01	0	0.0	0	0.0
Route03	0	0.0	0	0.0
Route05	0	0.0	0	0.0
Route07	0	0.0	0	0.0
Route10	0	0.0	0	0.0
Route11	0	0.0	0	0.0
Route12	0	0.0	0	0.0
Route13	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route20	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route25	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route28	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route30	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
Route33	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV30 and Route: Route01

No glare found

PV30 and Route: Route03

No glare found

PV30 and Route: Route05

No glare found

PV30 and Route: Route07

No glare found

PV30 and Route: Route10

No glare found

PV30 and Route: Route11

No glare found

PV30 and Route: Route12

No glare found

PV30 and Route: Route13

No glare found

PV30 and Route: Route14

No glare found

PV30 and Route: Route18

No glare found

PV30 and Route: Route20

No glare found

PV30 and Route: Route23

No glare found

PV30 and Route: Route25

No glare found

PV30 and Route: Route27

No glare found

PV30 and Route: Route28

No glare found

PV30 and Route: Route29

No glare found

PV30 and Route: Route30

No glare found

PV30 and Route: Route31

No glare found

PV30 and Route: Route32

No glare found

PV30 and Route: Route33

No glare found

PV30 and FP: MASP 12

No glare found

PV30 and FP: MASP 22

No glare found

PV30 and FP: MASP 26

No glare found

PV30 and FP: MASP 30

No glare found

PV30 and FP: MASP 4

No glare found

PV30 and FP: MASP 8

No glare found

PV30 and OP 1

No glare found

PV30 and OP 2

No glare found

PV30 and OP 3

No glare found

PV30 and OP 4

No glare found

PV30 and OP 5

No glare found

PV30 and OP 7

No glare found

PV30 and OP 8

No glare found

PV30 and OP 13

No glare found

PV30 and OP 14

No glare found

PV30 and OP 15

No glare found

PV30 and OP 16

No glare found

PV30 and OP 17

No glare found

PV30 and OP 18

No glare found

PV30 and OP 19

No glare found

PV30 and OP 20

No glare found

PV30 and OP 21

No glare found

PV30 and OP 22

No glare found

PV30 and OP 23

No glare found

PV30 and OP 24

No glare found

PV30 and OP 25

No glare found

PV30 and OP 26

No glare found

PV30 and OP 27

No glare found

PV30 and 32-ATCT

No glare found

PV: PV31 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01	0	0.0	0	0.0
Route03	0	0.0	0	0.0
Route05	0	0.0	0	0.0
Route07	0	0.0	0	0.0
Route10	0	0.0	0	0.0
Route11	0	0.0	0	0.0
Route12	0	0.0	0	0.0
Route13	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route20	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route25	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route28	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route30	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
Route33	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV31 and Route: Route01

No glare found

PV31 and Route: Route03

No glare found

PV31 and Route: Route05

No glare found

PV31 and Route: Route07

No glare found

PV31 and Route: Route10

No glare found

PV31 and Route: Route11

No glare found

PV31 and Route: Route12

No glare found

PV31 and Route: Route13

No glare found

PV31 and Route: Route14

No glare found

PV31 and Route: Route18

No glare found

PV31 and Route: Route20

No glare found

PV31 and Route: Route23

No glare found

PV31 and Route: Route25

No glare found

PV31 and Route: Route27

No glare found

PV31 and Route: Route28

No glare found

PV31 and Route: Route29

No glare found

PV31 and Route: Route30

No glare found

PV31 and Route: Route31

No glare found

PV31 and Route: Route32

No glare found

PV31 and Route: Route33

No glare found

PV31 and FP: MASP 12

No glare found

PV31 and FP: MASP 22

No glare found

PV31 and FP: MASP 26

No glare found

PV31 and FP: MASP 30

No glare found

PV31 and FP: MASP 4

No glare found

PV31 and FP: MASP 8

No glare found

PV31 and OP 1

No glare found

PV31 and OP 2

No glare found

PV31 and OP 3

No glare found

PV31 and OP 4

No glare found

PV31 and OP 5

No glare found

PV31 and OP 7

No glare found

PV31 and OP 8

No glare found

PV31 and OP 13

No glare found

PV31 and OP 14

No glare found

PV31 and OP 15

No glare found

PV31 and OP 16

No glare found

PV31 and OP 17

No glare found

PV31 and OP 18

No glare found

PV31 and OP 19

No glare found

PV31 and OP 20

No glare found

PV31 and OP 21

No glare found

PV31 and OP 22

No glare found

PV31 and OP 23

No glare found

PV31 and OP 24

No glare found

PV31 and OP 25

No glare found

PV31 and OP 26

No glare found

PV31 and OP 27

No glare found

PV31 and 32-ATCT

No glare found

PV: PV32 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01	0	0.0	0	0.0
Route03	0	0.0	0	0.0
Route05	0	0.0	0	0.0
Route07	0	0.0	0	0.0
Route10	0	0.0	0	0.0
Route11	0	0.0	0	0.0
Route12	0	0.0	0	0.0
Route13	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route20	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route25	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route28	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route30	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
Route33	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV32 and Route: Route01

No glare found

PV32 and Route: Route03

No glare found

PV32 and Route: Route05

No glare found

PV32 and Route: Route07

No glare found

PV32 and Route: Route10

No glare found

PV32 and Route: Route11

No glare found

PV32 and Route: Route12

No glare found

PV32 and Route: Route13

No glare found

PV32 and Route: Route14

No glare found

PV32 and Route: Route18

No glare found

PV32 and Route: Route20

No glare found

PV32 and Route: Route23

No glare found

PV32 and Route: Route25

No glare found

PV32 and Route: Route27

No glare found

PV32 and Route: Route28

No glare found

PV32 and Route: Route29

No glare found

PV32 and Route: Route30

No glare found

PV32 and Route: Route31

No glare found

PV32 and Route: Route32

No glare found

PV32 and Route: Route33

No glare found

PV32 and FP: MASP 12

No glare found

PV32 and FP: MASP 22

No glare found

PV32 and FP: MASP 26

No glare found

PV32 and FP: MASP 30

No glare found

PV32 and FP: MASP 4

No glare found

PV32 and FP: MASP 8

No glare found

PV32 and OP 1

No glare found

PV32 and OP 2

No glare found

PV32 and OP 3

No glare found

PV32 and OP 4

No glare found

PV32 and OP 5

No glare found

PV32 and OP 7

No glare found

PV32 and OP 8

No glare found

PV32 and OP 13

No glare found

PV32 and OP 14

No glare found

PV32 and OP 15

No glare found

PV32 and OP 16

No glare found

PV32 and OP 17

No glare found

PV32 and OP 18

No glare found

PV32 and OP 19

No glare found

PV32 and OP 20

No glare found

PV32 and OP 21

No glare found

PV32 and OP 22

No glare found

PV32 and OP 23

No glare found

PV32 and OP 24

No glare found

PV32 and OP 25

No glare found

PV32 and OP 26

No glare found

PV32 and OP 27

No glare found

PV32 and 32-ATCT

No glare found

PV: PV33 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01	0	0.0	0	0.0
Route03	0	0.0	0	0.0
Route05	0	0.0	0	0.0
Route07	0	0.0	0	0.0
Route10	0	0.0	0	0.0
Route11	0	0.0	0	0.0
Route12	0	0.0	0	0.0
Route13	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route20	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route25	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route28	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route30	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
Route33	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV33 and Route: Route01

No glare found

PV33 and Route: Route03

No glare found

PV33 and Route: Route05

No glare found

PV33 and Route: Route07

No glare found

PV33 and Route: Route10

No glare found

PV33 and Route: Route11

No glare found

PV33 and Route: Route12

No glare found

PV33 and Route: Route13

No glare found

PV33 and Route: Route14

No glare found

PV33 and Route: Route18

No glare found

PV33 and Route: Route20

No glare found

PV33 and Route: Route23

No glare found

PV33 and Route: Route25

No glare found

PV33 and Route: Route27

No glare found

PV33 and Route: Route28

No glare found

PV33 and Route: Route29

No glare found

PV33 and Route: Route30

No glare found

PV33 and Route: Route31

No glare found

PV33 and Route: Route32

No glare found

PV33 and Route: Route33

No glare found

PV33 and FP: MASP 12

No glare found

PV33 and FP: MASP 22

No glare found

PV33 and FP: MASP 26

No glare found

PV33 and FP: MASP 30

No glare found

PV33 and FP: MASP 4

No glare found

PV33 and FP: MASP 8

No glare found

PV33 and OP 1

No glare found

PV33 and OP 2

No glare found

PV33 and OP 3

No glare found

PV33 and OP 4

No glare found

PV33 and OP 5

No glare found

PV33 and OP 7

No glare found

PV33 and OP 8

No glare found

PV33 and OP 13

No glare found

PV33 and OP 14

No glare found

PV33 and OP 15

No glare found

PV33 and OP 16

No glare found

PV33 and OP 17

No glare found

PV33 and OP 18

No glare found

PV33 and OP 19

No glare found

PV33 and OP 20

No glare found

PV33 and OP 21

No glare found

PV33 and OP 22

No glare found

PV33 and OP 23

No glare found

PV33 and OP 24

No glare found

PV33 and OP 25

No glare found

PV33 and OP 26

No glare found

PV33 and OP 27

No glare found

PV33 and 32-ATCT

No glare found

PV: PV34 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01	0	0.0	0	0.0
Route03	0	0.0	0	0.0
Route05	0	0.0	0	0.0
Route07	0	0.0	0	0.0
Route10	0	0.0	0	0.0
Route11	0	0.0	0	0.0
Route12	0	0.0	0	0.0
Route13	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route20	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route25	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route28	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route30	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
Route33	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV34 and Route: Route01

No glare found

PV34 and Route: Route03

No glare found

PV34 and Route: Route05

No glare found

PV34 and Route: Route07

No glare found

PV34 and Route: Route10

No glare found

PV34 and Route: Route11

No glare found

PV34 and Route: Route12

No glare found

PV34 and Route: Route13

No glare found

PV34 and Route: Route14

No glare found

PV34 and Route: Route18

No glare found

PV34 and Route: Route20

No glare found

PV34 and Route: Route23

No glare found

PV34 and Route: Route25

No glare found

PV34 and Route: Route27

No glare found

PV34 and Route: Route28

No glare found

PV34 and Route: Route29

No glare found

PV34 and Route: Route30

No glare found

PV34 and Route: Route31

No glare found

PV34 and Route: Route32

No glare found

PV34 and Route: Route33

No glare found

PV34 and FP: MASP 12

No glare found

PV34 and FP: MASP 22

No glare found

PV34 and FP: MASP 26

No glare found

PV34 and FP: MASP 30

No glare found

PV34 and FP: MASP 4

No glare found

PV34 and FP: MASP 8

No glare found

PV34 and OP 1

No glare found

PV34 and OP 2

No glare found

PV34 and OP 3

No glare found

PV34 and OP 4

No glare found

PV34 and OP 5

No glare found

PV34 and OP 7

No glare found

PV34 and OP 8

No glare found

PV34 and OP 13

No glare found

PV34 and OP 14

No glare found

PV34 and OP 15

No glare found

PV34 and OP 16

No glare found

PV34 and OP 17

No glare found

PV34 and OP 18

No glare found

PV34 and OP 19

No glare found

PV34 and OP 20

No glare found

PV34 and OP 21

No glare found

PV34 and OP 22

No glare found

PV34 and OP 23

No glare found

PV34 and OP 24

No glare found

PV34 and OP 25

No glare found

PV34 and OP 26

No glare found

PV34 and OP 27

No glare found

PV34 and 32-ATCT

No glare found

PV: PV35 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01	0	0.0	0	0.0
Route03	0	0.0	0	0.0
Route05	0	0.0	0	0.0
Route07	0	0.0	0	0.0
Route10	0	0.0	0	0.0
Route11	0	0.0	0	0.0
Route12	0	0.0	0	0.0
Route13	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route20	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route25	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route28	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route30	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
Route33	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV35 and Route: Route01

No glare found

PV35 and Route: Route03

No glare found

PV35 and Route: Route05

No glare found

PV35 and Route: Route07

No glare found

PV35 and Route: Route10

No glare found

PV35 and Route: Route11

No glare found

PV35 and Route: Route12

No glare found

PV35 and Route: Route13

No glare found

PV35 and Route: Route14

No glare found

PV35 and Route: Route18

No glare found

PV35 and Route: Route20

No glare found

PV35 and Route: Route23

No glare found

PV35 and Route: Route25

No glare found

PV35 and Route: Route27

No glare found

PV35 and Route: Route28

No glare found

PV35 and Route: Route29

No glare found

PV35 and Route: Route30

No glare found

PV35 and Route: Route31

No glare found

PV35 and Route: Route32

No glare found

PV35 and Route: Route33

No glare found

PV35 and FP: MASP 12

No glare found

PV35 and FP: MASP 22

No glare found

PV35 and FP: MASP 26

No glare found

PV35 and FP: MASP 30

No glare found

PV35 and FP: MASP 4

No glare found

PV35 and FP: MASP 8

No glare found

PV35 and OP 1

No glare found

PV35 and OP 2

No glare found

PV35 and OP 3

No glare found

PV35 and OP 4

No glare found

PV35 and OP 5

No glare found

PV35 and OP 7

No glare found

PV35 and OP 8

No glare found

PV35 and OP 13

No glare found

PV35 and OP 14

No glare found

PV35 and OP 15

No glare found

PV35 and OP 16

No glare found

PV35 and OP 17

No glare found

PV35 and OP 18

No glare found

PV35 and OP 19

No glare found

PV35 and OP 20

No glare found

PV35 and OP 21

No glare found

PV35 and OP 22

No glare found

PV35 and OP 23

No glare found

PV35 and OP 24

No glare found

PV35 and OP 25

No glare found

PV35 and OP 26

No glare found

PV35 and OP 27

No glare found

PV35 and 32-ATCT

No glare found

PV: PV36 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01	0	0.0	0	0.0
Route03	0	0.0	0	0.0
Route05	0	0.0	0	0.0
Route07	0	0.0	0	0.0
Route10	0	0.0	0	0.0
Route11	0	0.0	0	0.0
Route12	0	0.0	0	0.0
Route13	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route20	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route25	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route28	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route30	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
Route33	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV36 and Route: Route01

No glare found

PV36 and Route: Route03

No glare found

PV36 and Route: Route05

No glare found

PV36 and Route: Route07

No glare found

PV36 and Route: Route10

No glare found

PV36 and Route: Route11

No glare found

PV36 and Route: Route12

No glare found

PV36 and Route: Route13

No glare found

PV36 and Route: Route14

No glare found

PV36 and Route: Route18

No glare found

PV36 and Route: Route20

No glare found

PV36 and Route: Route23

No glare found

PV36 and Route: Route25

No glare found

PV36 and Route: Route27

No glare found

PV36 and Route: Route28

No glare found

PV36 and Route: Route29

No glare found

PV36 and Route: Route30

No glare found

PV36 and Route: Route31

No glare found

PV36 and Route: Route32

No glare found

PV36 and Route: Route33

No glare found

PV36 and FP: MASP 12

No glare found

PV36 and FP: MASP 22

No glare found

PV36 and FP: MASP 26

No glare found

PV36 and FP: MASP 30

No glare found

PV36 and FP: MASP 4

No glare found

PV36 and FP: MASP 8

No glare found

PV36 and OP 1

No glare found

PV36 and OP 2

No glare found

PV36 and OP 3

No glare found

PV36 and OP 4

No glare found

PV36 and OP 5

No glare found

PV36 and OP 7

No glare found

PV36 and OP 8

No glare found

PV36 and OP 13

No glare found

PV36 and OP 14

No glare found

PV36 and OP 15

No glare found

PV36 and OP 16

No glare found

PV36 and OP 17

No glare found

PV36 and OP 18

No glare found

PV36 and OP 19

No glare found

PV36 and OP 20

No glare found

PV36 and OP 21

No glare found

PV36 and OP 22

No glare found

PV36 and OP 23

No glare found

PV36 and OP 24

No glare found

PV36 and OP 25

No glare found

PV36 and OP 26

No glare found

PV36 and OP 27

No glare found

PV36 and 32-ATCT

No glare found

PV: PV37 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01	0	0.0	0	0.0
Route03	0	0.0	0	0.0
Route05	0	0.0	0	0.0
Route07	0	0.0	0	0.0
Route10	0	0.0	0	0.0
Route11	0	0.0	0	0.0
Route12	0	0.0	0	0.0
Route13	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route20	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route25	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route28	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route30	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
Route33	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV37 and Route: Route01

No glare found

PV37 and Route: Route03

No glare found

PV37 and Route: Route05

No glare found

PV37 and Route: Route07

No glare found

PV37 and Route: Route10

No glare found

PV37 and Route: Route11

No glare found

PV37 and Route: Route12

No glare found

PV37 and Route: Route13

No glare found

PV37 and Route: Route14

No glare found

PV37 and Route: Route18

No glare found

PV37 and Route: Route20

No glare found

PV37 and Route: Route23

No glare found

PV37 and Route: Route25

No glare found

PV37 and Route: Route27

No glare found

PV37 and Route: Route28

No glare found

PV37 and Route: Route29

No glare found

PV37 and Route: Route30

No glare found

PV37 and Route: Route31

No glare found

PV37 and Route: Route32

No glare found

PV37 and Route: Route33

No glare found

PV37 and FP: MASP 12

No glare found

PV37 and FP: MASP 22

No glare found

PV37 and FP: MASP 26

No glare found

PV37 and FP: MASP 30

No glare found

PV37 and FP: MASP 4

No glare found

PV37 and FP: MASP 8

No glare found

PV37 and OP 1

No glare found

PV37 and OP 2

No glare found

PV37 and OP 3

No glare found

PV37 and OP 4

No glare found

PV37 and OP 5

No glare found

PV37 and OP 7

No glare found

PV37 and OP 8

No glare found

PV37 and OP 13

No glare found

PV37 and OP 14

No glare found

PV37 and OP 15

No glare found

PV37 and OP 16

No glare found

PV37 and OP 17

No glare found

PV37 and OP 18

No glare found

PV37 and OP 19

No glare found

PV37 and OP 20

No glare found

PV37 and OP 21

No glare found

PV37 and OP 22

No glare found

PV37 and OP 23

No glare found

PV37 and OP 24

No glare found

PV37 and OP 25

No glare found

PV37 and OP 26

No glare found

PV37 and OP 27

No glare found

PV37 and 32-ATCT

No glare found

PV: PV38 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01	0	0.0	0	0.0
Route03	0	0.0	0	0.0
Route05	0	0.0	0	0.0
Route07	0	0.0	0	0.0
Route10	0	0.0	0	0.0
Route11	0	0.0	0	0.0
Route12	0	0.0	0	0.0
Route13	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route20	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route25	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route28	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route30	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
Route33	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV38 and Route: Route01

No glare found

PV38 and Route: Route03

No glare found

PV38 and Route: Route05

No glare found

PV38 and Route: Route07

No glare found

PV38 and Route: Route10

No glare found

PV38 and Route: Route11

No glare found

PV38 and Route: Route12

No glare found

PV38 and Route: Route13

No glare found

PV38 and Route: Route14

No glare found

PV38 and Route: Route18

No glare found

PV38 and Route: Route20

No glare found

PV38 and Route: Route23

No glare found

PV38 and Route: Route25

No glare found

PV38 and Route: Route27

No glare found

PV38 and Route: Route28

No glare found

PV38 and Route: Route29

No glare found

PV38 and Route: Route30

No glare found

PV38 and Route: Route31

No glare found

PV38 and Route: Route32

No glare found

PV38 and Route: Route33

No glare found

PV38 and FP: MASP 12

No glare found

PV38 and FP: MASP 22

No glare found

PV38 and FP: MASP 26

No glare found

PV38 and FP: MASP 30

No glare found

PV38 and FP: MASP 4

No glare found

PV38 and FP: MASP 8

No glare found

PV38 and OP 1

No glare found

PV38 and OP 2

No glare found

PV38 and OP 3

No glare found

PV38 and OP 4

No glare found

PV38 and OP 5

No glare found

PV38 and OP 7

No glare found

PV38 and OP 8

No glare found

PV38 and OP 13

No glare found

PV38 and OP 14

No glare found

PV38 and OP 15

No glare found

PV38 and OP 16

No glare found

PV38 and OP 17

No glare found

PV38 and OP 18

No glare found

PV38 and OP 19

No glare found

PV38 and OP 20

No glare found

PV38 and OP 21

No glare found

PV38 and OP 22

No glare found

PV38 and OP 23

No glare found

PV38 and OP 24

No glare found

PV38 and OP 25

No glare found

PV38 and OP 26

No glare found

PV38 and OP 27

No glare found

PV38 and 32-ATCT

No glare found

PV: PV39 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01	0	0.0	0	0.0
Route03	0	0.0	0	0.0
Route05	0	0.0	0	0.0
Route07	0	0.0	0	0.0
Route10	0	0.0	0	0.0
Route11	0	0.0	0	0.0
Route12	0	0.0	0	0.0
Route13	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route20	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route25	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route28	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route30	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
Route33	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV39 and Route: Route01

No glare found

PV39 and Route: Route03

No glare found

PV39 and Route: Route05

No glare found

PV39 and Route: Route07

No glare found

PV39 and Route: Route10

No glare found

PV39 and Route: Route11

No glare found

PV39 and Route: Route12

No glare found

PV39 and Route: Route13

No glare found

PV39 and Route: Route14

No glare found

PV39 and Route: Route18

No glare found

PV39 and Route: Route20

No glare found

PV39 and Route: Route23

No glare found

PV39 and Route: Route25

No glare found

PV39 and Route: Route27

No glare found

PV39 and Route: Route28

No glare found

PV39 and Route: Route29

No glare found

PV39 and Route: Route30

No glare found

PV39 and Route: Route31

No glare found

PV39 and Route: Route32

No glare found

PV39 and Route: Route33

No glare found

PV39 and FP: MASP 12

No glare found

PV39 and FP: MASP 22

No glare found

PV39 and FP: MASP 26

No glare found

PV39 and FP: MASP 30

No glare found

PV39 and FP: MASP 4

No glare found

PV39 and FP: MASP 8

No glare found

PV39 and OP 1

No glare found

PV39 and OP 2

No glare found

PV39 and OP 3

No glare found

PV39 and OP 4

No glare found

PV39 and OP 5

No glare found

PV39 and OP 7

No glare found

PV39 and OP 8

No glare found

PV39 and OP 13

No glare found

PV39 and OP 14

No glare found

PV39 and OP 15

No glare found

PV39 and OP 16

No glare found

PV39 and OP 17

No glare found

PV39 and OP 18

No glare found

PV39 and OP 19

No glare found

PV39 and OP 20

No glare found

PV39 and OP 21

No glare found

PV39 and OP 22

No glare found

PV39 and OP 23

No glare found

PV39 and OP 24

No glare found

PV39 and OP 25

No glare found

PV39 and OP 26

No glare found

PV39 and OP 27

No glare found

PV39 and 32-ATCT

No glare found

PV: PV40 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01	0	0.0	0	0.0
Route03	0	0.0	0	0.0
Route05	0	0.0	0	0.0
Route07	0	0.0	0	0.0
Route10	0	0.0	0	0.0
Route11	0	0.0	0	0.0
Route12	0	0.0	0	0.0
Route13	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route20	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route25	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route28	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route30	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
Route33	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV40 and Route: Route01

No glare found

PV40 and Route: Route03

No glare found

PV40 and Route: Route05

No glare found

PV40 and Route: Route07

No glare found

PV40 and Route: Route10

No glare found

PV40 and Route: Route11

No glare found

PV40 and Route: Route12

No glare found

PV40 and Route: Route13

No glare found

PV40 and Route: Route14

No glare found

PV40 and Route: Route18

No glare found

PV40 and Route: Route20

No glare found

PV40 and Route: Route23

No glare found

PV40 and Route: Route25

No glare found

PV40 and Route: Route27

No glare found

PV40 and Route: Route28

No glare found

PV40 and Route: Route29

No glare found

PV40 and Route: Route30

No glare found

PV40 and Route: Route31

No glare found

PV40 and Route: Route32

No glare found

PV40 and Route: Route33

No glare found

PV40 and FP: MASP 12

No glare found

PV40 and FP: MASP 22

No glare found

PV40 and FP: MASP 26

No glare found

PV40 and FP: MASP 30

No glare found

PV40 and FP: MASP 4

No glare found

PV40 and FP: MASP 8

No glare found

PV40 and OP 1

No glare found

PV40 and OP 2

No glare found

PV40 and OP 3

No glare found

PV40 and OP 4

No glare found

PV40 and OP 5

No glare found

PV40 and OP 7

No glare found

PV40 and OP 8

No glare found

PV40 and OP 13

No glare found

PV40 and OP 14

No glare found

PV40 and OP 15

No glare found

PV40 and OP 16

No glare found

PV40 and OP 17

No glare found

PV40 and OP 18

No glare found

PV40 and OP 19

No glare found

PV40 and OP 20

No glare found

PV40 and OP 21

No glare found

PV40 and OP 22

No glare found

PV40 and OP 23

No glare found

PV40 and OP 24

No glare found

PV40 and OP 25

No glare found

PV40 and OP 26

No glare found

PV40 and OP 27

No glare found

PV40 and 32-ATCT

No glare found

Assumptions

"Green" glare is glare with low potential to cause an after-image (flash blindness) when observed prior to a typical blink response time.
"Yellow" glare is glare with potential to cause an after-image (flash blindness) when observed prior to a typical blink response time.
Times associated with glare are denoted in Standard time. For Daylight Savings, add one hour.
The algorithm does not rigorously represent the detailed geometry of a system; detailed features such as gaps between modules, variable height of the PV array, and support structures may impact actual glare results. However, we have validated our models against several systems, including a PV array causing glare to the air-traffic control tower at Manchester-Boston Regional Airport and several sites in Albuquerque, and the tool accurately predicted the occurrence and intensity of glare at different times and days of the year.
Several V1 calculations utilize the PV array centroid, rather than the actual glare spot location, due to algorithm limitations. This may affect results for large PV footprints. Additional analyses of array sub-sections can provide additional information on expected glare. This primarily affects V1 analyses of path receptors.
Random number computations are utilized by various steps of the annual hazard analysis algorithm. Predicted minutes of glare can vary between runs as a result. This limitation primarily affects analyses of Observation Point receptors, including ATCTs. Note that the SGHAT/ ForgeSolar methodology has always relied on an analytical, qualitative approach to accurately determine the overall hazard (i.e. green vs. yellow) of expected glare on an annual basis.
The analysis does not automatically consider obstacles (either man-made or natural) between the observation points and the prescribed solar installation that may obstruct observed glare, such as trees, hills, buildings, etc.
The subtended source angle (glare spot size) is constrained by the PV array footprint size. Partitioning large arrays into smaller sections will reduce the maximum potential subtended angle, potentially impacting results if actual glare spots are larger than the sub-array size. Additional analyses of the combined area of adjacent sub-arrays can provide more information on potential glare hazards. (See previous point on related limitations.)
The variable direct normal irradiance (DNI) feature (if selected) scales the user-prescribed peak DNI using a typical clear-day irradiance profile. This profile has a lower DNI in the mornings and evenings and a maximum at solar noon. The scaling uses a clear-day irradiance profile based on a normalized time relative to sunrise, solar noon, and sunset, which are prescribed by a sun-position algorithm and the latitude and longitude obtained from Google maps. The actual DNI on any given day can be affected by cloud cover, atmospheric attenuation, and other environmental factors.
The ocular hazard predicted by the tool depends on a number of environmental, optical, and human factors, which can be uncertain. We provide input fields and typical ranges of values for these factors so that the user can vary these parameters to see if they have an impact on the results. The speed of SGHAT allows expedited sensitivity and parametric analyses.
The system output calculation is a DNI-based approximation that assumes clear, sunny skies year-round. It should not be used in place of more rigorous modeling methods.
Hazard zone boundaries shown in the Glare Hazard plot are an approximation and visual aid based on aggregated research data. Actual ocular impact outcomes encompass a continuous, not discrete, spectrum.
Glare locations displayed on receptor plots are approximate. Actual glare-spot locations may differ.
Refer to the Help page at **www.forgesolar.com/help/** for assumptions and limitations not listed here.

Default glare analysis parameters and observer eye characteristics (for reference only):

- Analysis time interval: 1 minute
- Ocular transmission coefficient: 0.5
- Pupil diameter: 0.002 meters
- Eye focal length: 0.017 meters
- Sun subtended angle: 9.3 milliradians

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FORGESOLAR GLARE ANALYSIS

Project: **Enterprise Solar South**
Site configuration: **Enterprise Solar Site 3B**

Created 30 Jun, 2023
Updated 30 Jun, 2023
Time-step 1 minute
Timezone offset UTC-8
Minimum sun altitude 0.0 deg
DNI peaks at 1,000.0 W/m^2
Category 100 MW to 1 GW
Site ID 94285.16540

Ocular transmission coefficient 0.5
Pupil diameter 0.002 m
Eye focal length 0.017 m
Sun subtended angle 9.3 mrad
PV analysis methodology V2

Summary of Results No glare predicted

PV Array	Tilt	Orient	Annual Green Glare		Annual Yellow Glare		Energy
	°	°	min	hr	min	hr	kWh
PV41	SA tracking	SA tracking	0	0.0	0	0.0	-
PV42	SA tracking	SA tracking	0	0.0	0	0.0	-
PV43	SA tracking	SA tracking	0	0.0	0	0.0	-
PV44	SA tracking	SA tracking	0	0.0	0	0.0	-
PV45	SA tracking	SA tracking	0	0.0	0	0.0	-
PV46	SA tracking	SA tracking	0	0.0	0	0.0	-
PV47	SA tracking	SA tracking	0	0.0	0	0.0	-
PV48	SA tracking	SA tracking	0	0.0	0	0.0	-
PV49	SA tracking	SA tracking	0	0.0	0	0.0	-
PV50	SA tracking	SA tracking	0	0.0	0	0.0	-
PV51	SA tracking	SA tracking	0	0.0	0	0.0	-
PV52	SA tracking	SA tracking	0	0.0	0	0.0	-
PV53	SA tracking	SA tracking	0	0.0	0	0.0	-
PV54	SA tracking	SA tracking	0	0.0	0	0.0	-
PV55	SA tracking	SA tracking	0	0.0	0	0.0	-
PV56	SA tracking	SA tracking	0	0.0	0	0.0	-
PV57	SA tracking	SA tracking	0	0.0	0	0.0	-
PV58	SA tracking	SA tracking	0	0.0	0	0.0	-
PV59	SA tracking	SA tracking	0	0.0	0	0.0	-
PV60	SA tracking	SA tracking	0	0.0	0	0.0	-

Total glare received by each receptor; may include duplicate times of glare from multiple reflective surfaces.

Route01	0	0.0	0	0.0
Route03	0	0.0	0	0.0

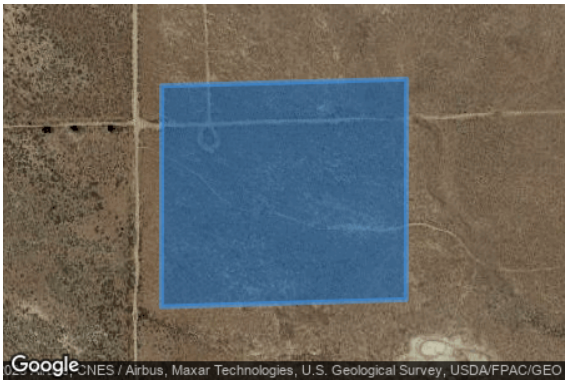
Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route05	0	0.0	0	0.0
Route07	0	0.0	0	0.0
Route10	0	0.0	0	0.0
Route11	0	0.0	0	0.0
Route12	0	0.0	0	0.0
Route13	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route20	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route25	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route28	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route30	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
Route33	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

Component Data

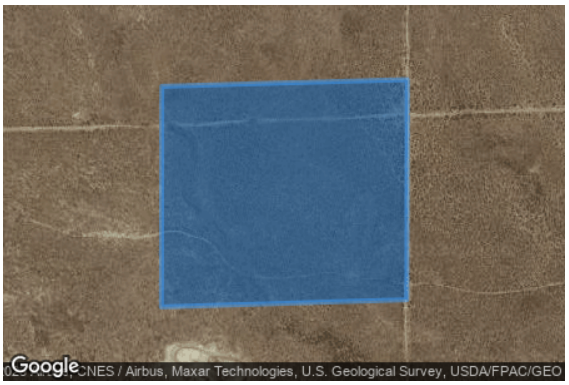
PV Arrays

Name: PV41
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



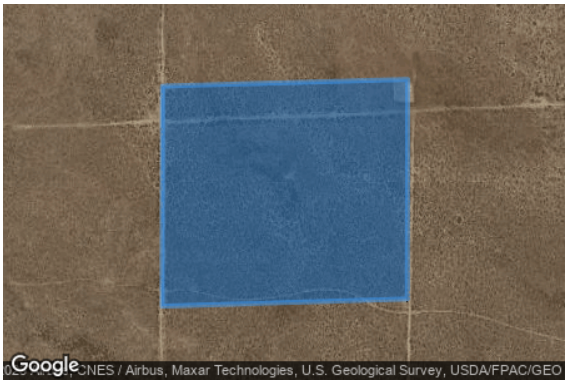
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.016142	-118.109393	2587.43	6.00	2593.43
2	35.016041	-118.113599	2589.16	6.00	2595.16
3	35.019141	-118.113592	2603.19	6.00	2609.19
4	35.019235	-118.109386	2586.81	6.00	2592.81
5	35.016142	-118.109393	2587.43	6.00	2593.43

Name: PV42
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



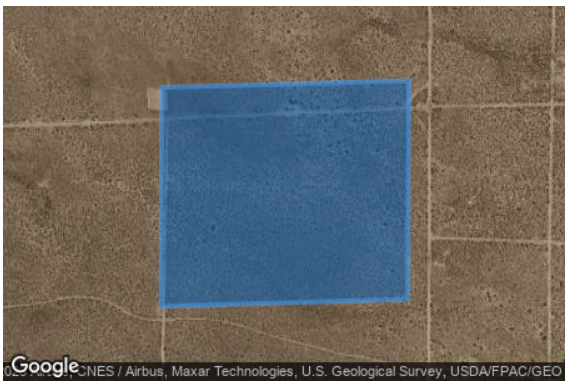
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.016142	-118.109393	2587.43	6.00	2593.43
2	35.019235	-118.109386	2586.81	6.00	2592.81
3	35.019330	-118.105167	2586.39	6.00	2592.39
4	35.016244	-118.105175	2584.04	6.00	2590.04
5	35.016142	-118.109393	2587.43	6.00	2593.43

Name: PV43
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



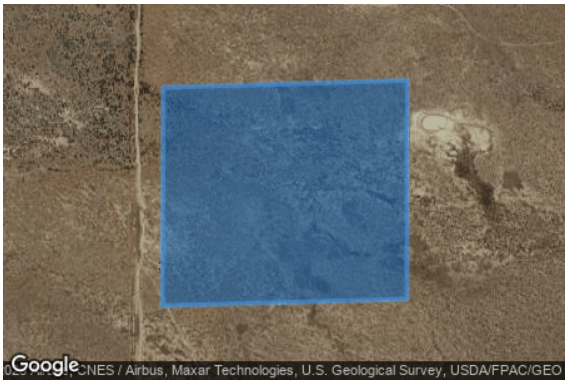
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.016345	-118.100963	2579.93	6.00	2585.93
2	35.016244	-118.105175	2584.04	6.00	2590.04
3	35.019330	-118.105167	2586.39	6.00	2592.39
4	35.019424	-118.100955	2581.59	6.00	2587.59
5	35.016345	-118.100963	2579.93	6.00	2585.93

Name: PV44
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



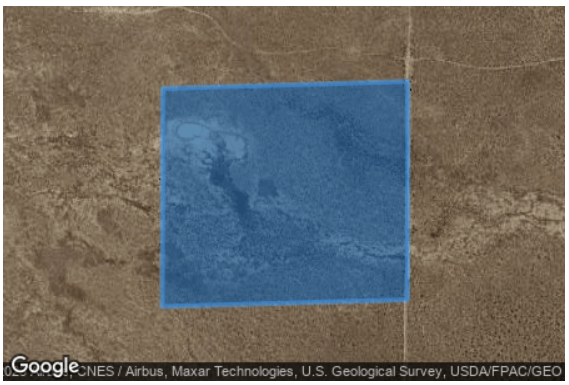
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.016345	-118.100963	2579.93	6.00	2585.93
2	35.019424	-118.100955	2581.59	6.00	2587.59
3	35.019518	-118.096707	2577.80	6.00	2583.80
4	35.016446	-118.096727	2572.86	6.00	2578.86
5	35.016345	-118.100963	2579.93	6.00	2585.93

Name: PV45
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



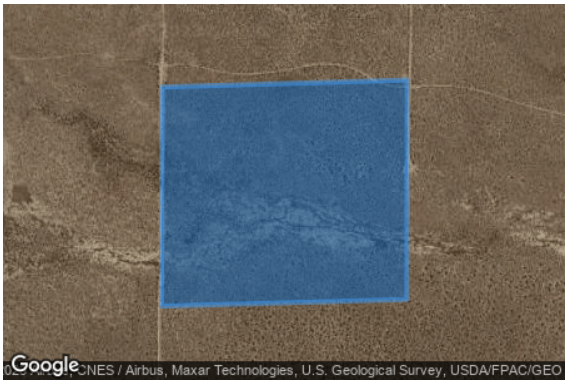
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.012987	-118.109401	2589.35	6.00	2595.35
2	35.012892	-118.113606	2588.87	6.00	2594.87
3	35.015955	-118.113587	2589.01	6.00	2595.01
4	35.016054	-118.109393	2586.70	6.00	2592.70
5	35.012987	-118.109401	2589.35	6.00	2595.35

Name: PV46
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



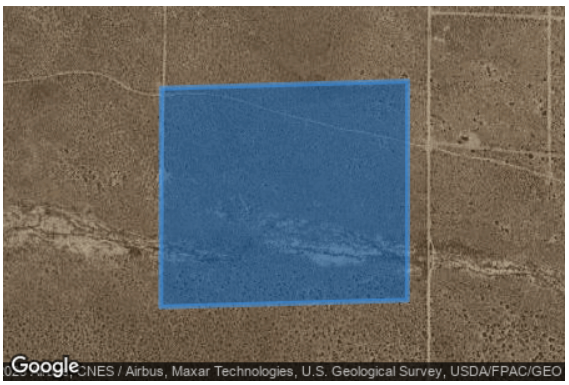
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.012987	-118.109401	2589.35	6.00	2595.35
2	35.016054	-118.109393	2586.70	6.00	2592.70
3	35.016153	-118.105175	2584.03	6.00	2590.03
4	35.013081	-118.105183	2589.31	6.00	2595.31
5	35.012987	-118.109401	2589.35	6.00	2595.35

Name: PV47
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



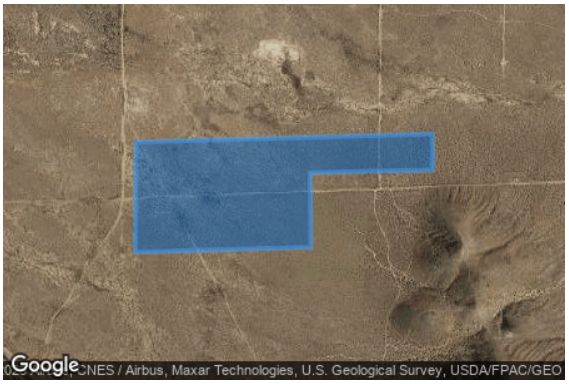
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.013175	-118.100971	2580.08	6.00	2586.08
2	35.013081	-118.105183	2589.31	6.00	2595.31
3	35.016153	-118.105175	2584.03	6.00	2590.03
4	35.016252	-118.100963	2578.81	6.00	2584.81
5	35.013175	-118.100971	2580.08	6.00	2586.08

Name: PV48
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



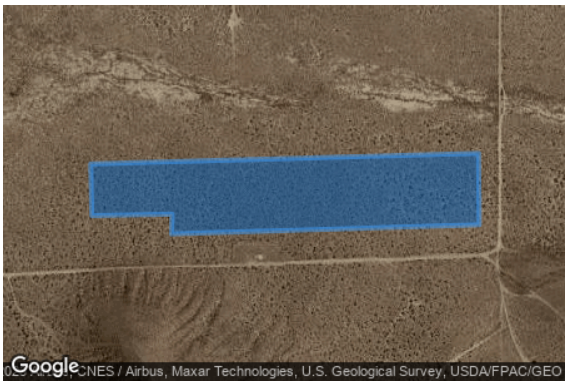
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.013175	-118.100971	2580.08	6.00	2586.08
2	35.016252	-118.100963	2578.81	6.00	2584.81
3	35.016351	-118.096727	2572.69	6.00	2578.69
4	35.013269	-118.096735	2570.05	6.00	2576.05
5	35.013175	-118.100971	2580.08	6.00	2586.08

Name: PV49
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



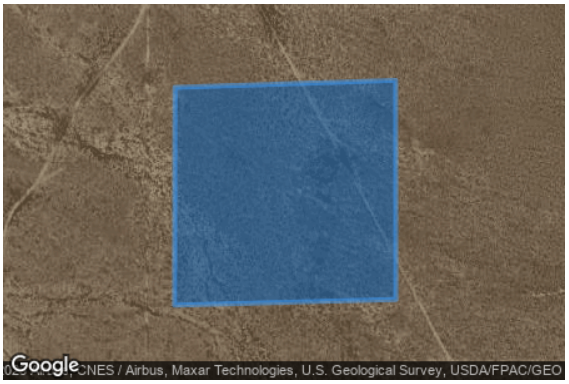
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.012291	-118.103378	2605.66	6.00	2611.66
2	35.012005	-118.103389	2615.45	6.00	2621.45
3	35.011971	-118.105185	2612.81	6.00	2618.81
4	35.011925	-118.107598	2600.14	6.00	2606.14
5	35.009835	-118.107573	2618.40	6.00	2624.40
6	35.009696	-118.113602	2583.98	6.00	2589.98
7	35.012787	-118.113595	2588.37	6.00	2594.37
8	35.012976	-118.105183	2591.04	6.00	2597.04
9	35.013016	-118.103398	2589.88	6.00	2595.88
10	35.012291	-118.103378	2605.66	6.00	2611.66

Name: PV50
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



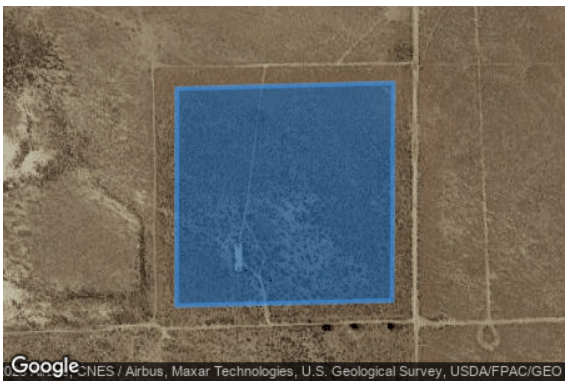
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.012291	-118.103378	2605.66	6.00	2611.66
2	35.013016	-118.103398	2589.88	6.00	2595.88
3	35.013165	-118.096735	2570.53	6.00	2576.53
4	35.012163	-118.096722	2581.74	6.00	2587.74
5	35.012034	-118.102009	2604.45	6.00	2610.45
6	35.012311	-118.101998	2598.07	6.00	2604.07
7	35.012291	-118.103378	2605.66	6.00	2611.66

Name: PV51
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



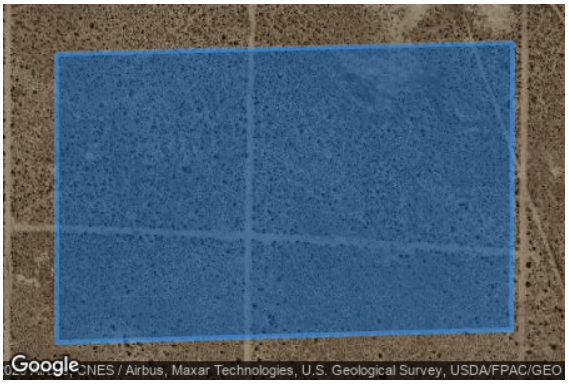
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.009611	-118.113602	2583.90	6.00	2589.90
2	35.009709	-118.109810	2594.34	6.00	2600.34
3	35.006637	-118.109806	2584.33	6.00	2590.33
4	35.006558	-118.113609	2579.30	6.00	2585.30
5	35.009611	-118.113602	2583.90	6.00	2589.90

Name: PV52
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



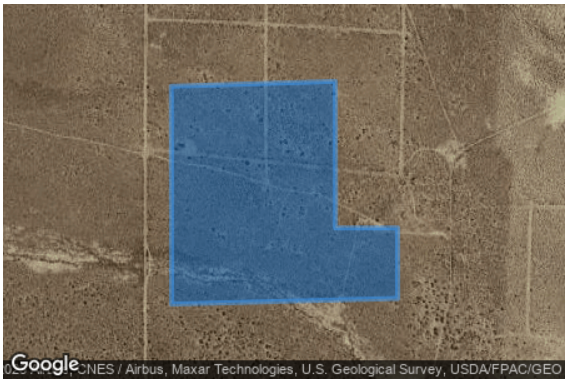
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.021887	-118.118142	2615.62	6.00	2621.62
2	35.021967	-118.114419	2604.99	6.00	2610.99
3	35.018904	-118.114438	2599.45	6.00	2605.45
4	35.018834	-118.118149	2601.36	6.00	2607.36
5	35.021887	-118.118142	2615.62	6.00	2621.62

Name: PV53
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



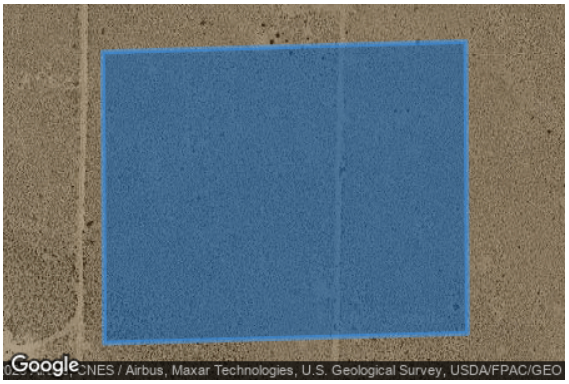
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.018519	-118.095933	2573.02	6.00	2579.02
2	35.018598	-118.092013	2569.92	6.00	2575.92
3	35.016585	-118.092023	2566.60	6.00	2572.60
4	35.016496	-118.095930	2573.48	6.00	2579.48
5	35.018519	-118.095933	2573.02	6.00	2579.02

Name: PV54
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



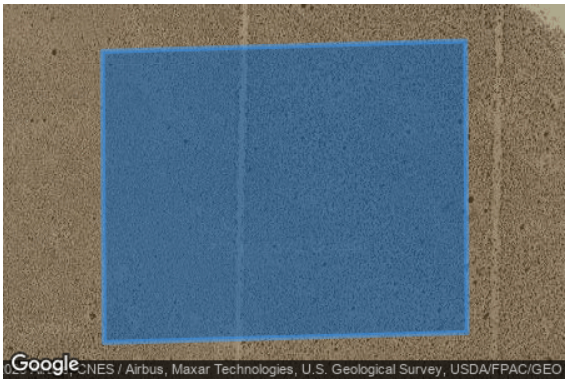
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.016372	-118.095919	2571.93	6.00	2577.93
2	35.016441	-118.093101	2573.12	6.00	2579.12
3	35.014381	-118.093099	2571.13	6.00	2577.13
4	35.014381	-118.092032	2576.01	6.00	2582.01
5	35.013389	-118.092031	2572.87	6.00	2578.87
6	35.013310	-118.095915	2570.94	6.00	2576.94
7	35.016372	-118.095919	2571.93	6.00	2577.93

Name: PV55
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



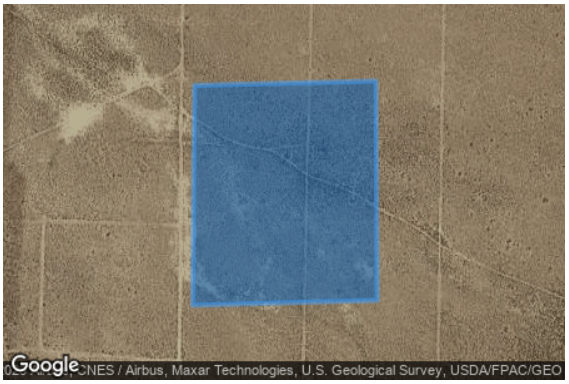
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.016753	-118.084033	2560.61	6.00	2566.61
2	35.016684	-118.087152	2564.48	6.00	2570.48
3	35.018726	-118.087166	2564.99	6.00	2570.99
4	35.018800	-118.084046	2562.40	6.00	2568.40
5	35.016753	-118.084033	2560.61	6.00	2566.61

Name: PV56
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



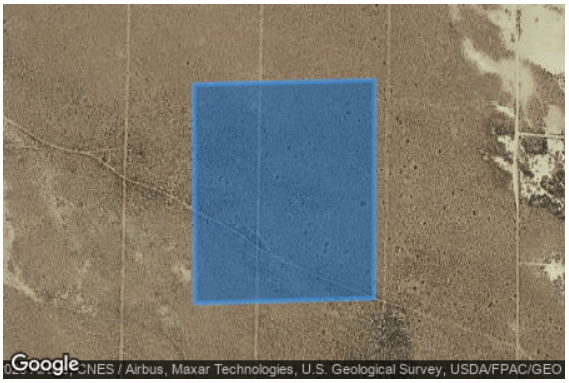
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.016753	-118.084033	2560.61	6.00	2566.61
2	35.018800	-118.084046	2562.40	6.00	2568.40
3	35.018873	-118.080927	2559.87	6.00	2565.87
4	35.016822	-118.080913	2559.28	6.00	2565.28
5	35.016753	-118.084033	2560.61	6.00	2566.61

Name: PV57
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



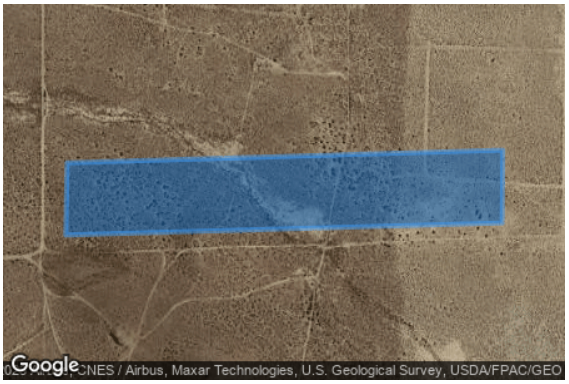
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.013568	-118.084011	2557.69	6.00	2563.69
2	35.013498	-118.087184	2559.91	6.00	2565.91
3	35.016579	-118.087152	2564.76	6.00	2570.76
4	35.016644	-118.084032	2559.85	6.00	2565.85
5	35.013568	-118.084011	2557.69	6.00	2563.69

Name: PV58
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



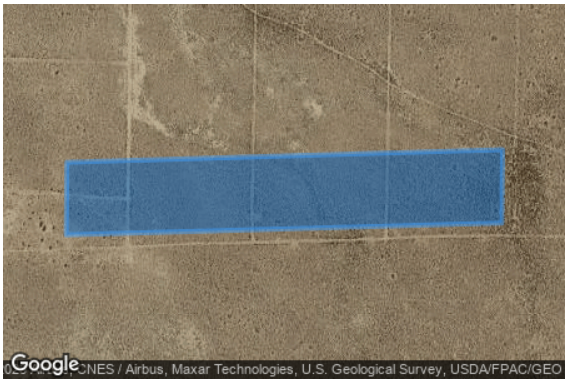
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.013568	-118.084011	2557.69	6.00	2563.69
2	35.016644	-118.084032	2559.85	6.00	2565.85
3	35.016708	-118.080925	2559.26	6.00	2565.26
4	35.013636	-118.080933	2554.16	6.00	2560.16
5	35.013568	-118.084011	2557.69	6.00	2563.69

Name: PV59
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.012209	-118.088475	2559.38	6.00	2565.38
2	35.012041	-118.095972	2580.41	6.00	2586.41
3	35.013052	-118.095950	2575.27	6.00	2581.27
4	35.013230	-118.088465	2559.10	6.00	2565.10
5	35.012209	-118.088475	2559.38	6.00	2565.38

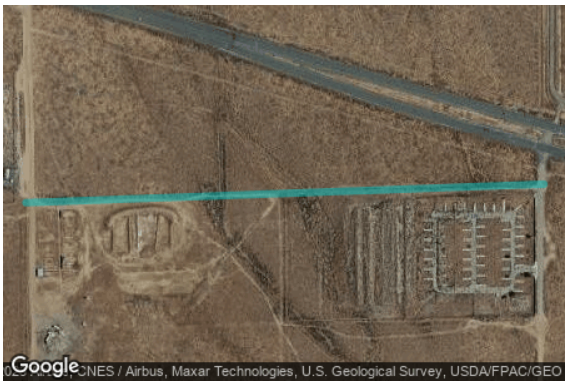
Name: PV60
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.012209	-118.088475	2559.38	6.00	2565.38
2	35.013230	-118.088465	2559.10	6.00	2565.10
3	35.013407	-118.080980	2553.92	6.00	2559.92
4	35.012376	-118.080990	2553.84	6.00	2559.84
5	35.012209	-118.088475	2559.38	6.00	2565.38

Route Receptors

Name: Route01
Path type: Two-way
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.039709	-118.149508	2692.31	3.50	2695.81
2	35.039786	-118.146850	2688.25	3.50	2691.75
3	35.039858	-118.144386	2683.89	3.50	2687.39
4	35.039952	-118.141138	2679.77	3.50	2683.27
5	35.039967	-118.140607	2680.15	3.50	2683.65

Name: Route03
Path type: Two-way
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.034033	-118.156782	2681.24	14.00	2695.24
2	35.033504	-118.155530	2678.08	14.00	2692.08
3	35.032485	-118.153847	2672.61	14.00	2686.61
4	35.030056	-118.150444	2665.27	14.00	2679.27
5	35.028485	-118.148260	2657.69	14.00	2671.69
6	35.025018	-118.143464	2641.83	14.00	2655.83
7	35.023170	-118.140898	2636.29	14.00	2650.29
8	35.021094	-118.138019	2629.19	14.00	2643.19
9	35.018750	-118.134756	2618.86	14.00	2632.86
10	35.016664	-118.131900	2612.85	14.00	2626.85
11	35.014911	-118.129473	2608.55	14.00	2622.55
12	35.012911	-118.126664	2601.79	14.00	2615.79
13	35.011110	-118.124157	2597.76	14.00	2611.76
14	35.008595	-118.120674	2590.69	14.00	2604.69
15	35.007042	-118.118538	2588.15	14.00	2602.15
16	35.005438	-118.116328	2585.22	14.00	2599.22

Name: Route05
Path type: Two-way
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	34.999075	-118.024203	2552.71	14.00	2566.71
2	34.999637	-118.026882	2551.21	14.00	2565.21
3	35.000333	-118.030406	2550.28	14.00	2564.28
4	35.000952	-118.033363	2541.11	14.00	2555.11
5	35.001705	-118.037120	2537.11	14.00	2551.11
6	35.002314	-118.040100	2530.67	14.00	2544.67
7	35.002857	-118.042709	2528.41	14.00	2542.41
8	35.003686	-118.046745	2523.19	14.00	2537.19
9	35.004333	-118.050096	2527.63	14.00	2541.63
10	35.004876	-118.052798	2528.52	14.00	2542.52
11	35.005913	-118.058074	2531.44	14.00	2545.44
12	35.006551	-118.061321	2533.24	14.00	2547.24
13	35.007092	-118.064088	2537.21	14.00	2551.21

Name: Route07
Path type: Two-way
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.031949	-118.168513	2692.18	3.50	2695.68
2	35.031894	-118.173384	2703.23	3.50	2706.73
3	35.031842	-118.176690	2716.09	3.50	2719.59
4	35.031814	-118.179183	2726.72	3.50	2730.22
5	35.031748	-118.183808	2744.44	3.50	2747.94
6	35.031745	-118.185548	2751.13	3.50	2754.63
7	35.031614	-118.185765	2751.35	3.50	2754.85
8	35.031549	-118.189041	2768.11	3.50	2771.61
9	35.031507	-118.193333	2793.48	3.50	2796.98
10	35.031430	-118.196682	2808.94	3.50	2812.44
11	35.031378	-118.198900	2817.34	3.50	2820.84

Name: Route10
Path type: Two-way
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.046248	-118.027562	2546.95	3.50	2550.45
2	35.045341	-118.027048	2555.26	3.50	2558.76
3	35.044668	-118.026851	2561.15	3.50	2564.65
4	35.044106	-118.026814	2566.92	3.50	2570.42
5	35.042766	-118.026850	2576.55	3.50	2580.05
6	35.041249	-118.026857	2584.15	3.50	2587.65
7	35.038673	-118.026878	2591.83	3.50	2595.33
8	35.035177	-118.026912	2608.11	3.50	2611.61
9	35.031423	-118.026942	2619.40	3.50	2622.90
10	35.028938	-118.027022	2610.30	3.50	2613.80
11	35.028398	-118.027474	2608.46	3.50	2611.96
12	35.028165	-118.028182	2606.14	3.50	2609.64
13	35.028025	-118.033582	2582.87	3.50	2586.37
14	35.023994	-118.033614	2579.82	3.50	2583.32
15	35.022900	-118.033263	2580.80	3.50	2584.30
16	35.022468	-118.033271	2581.03	3.50	2584.53
17	35.021514	-118.033474	2581.91	3.50	2585.41

Name: Route11
Path type: Two-way
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.052109	-118.041973	2545.00	3.50	2548.50
2	35.054017	-118.042511	2547.41	3.50	2550.91
3	35.055770	-118.041134	2550.45	3.50	2553.95
4	35.056176	-118.040844	2545.12	3.50	2548.62
5	35.056343	-118.040888	2544.06	3.50	2547.56
6	35.056510	-118.041018	2543.83	3.50	2547.33
7	35.056557	-118.041250	2543.47	3.50	2546.97
8	35.056486	-118.041540	2543.93	3.50	2547.43
9	35.056295	-118.042077	2545.79	3.50	2549.29
10	35.055531	-118.044179	2583.50	3.50	2587.00
11	35.054302	-118.045658	2550.60	3.50	2554.10

Name: Route12
Path type: Two-way
Observer view angle: 50.0°



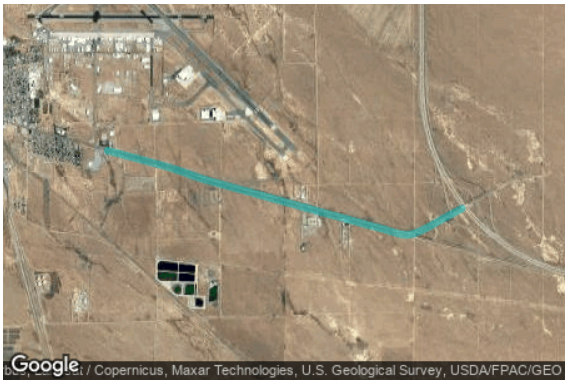
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.040368	-118.140624	2681.72	3.50	2685.22
2	35.040139	-118.140667	2680.42	3.50	2683.92
3	35.038329	-118.140681	2674.20	3.50	2677.70
4	35.037005	-118.140679	2667.47	3.50	2670.97
5	35.035781	-118.140685	2666.66	3.50	2670.16
6	35.034887	-118.140667	2664.38	3.50	2667.88
7	35.032798	-118.140689	2655.84	3.50	2659.34
8	35.032504	-118.140654	2653.89	3.50	2657.39
9	35.032383	-118.140549	2653.92	3.50	2657.42
10	35.032297	-118.140288	2654.38	3.50	2657.88
11	35.032197	-118.140262	2654.31	3.50	2657.81
12	35.031811	-118.140383	2652.49	3.50	2655.99
13	35.031074	-118.140469	2651.09	3.50	2654.59

Name: Route13
Path type: Two-way
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.093689	-118.134063	2836.92	14.00	2850.92
2	35.092179	-118.136080	2842.38	14.00	2856.38
3	35.090861	-118.137912	2845.42	14.00	2859.42
4	35.089714	-118.139535	2848.77	14.00	2862.77
5	35.088300	-118.141436	2849.83	14.00	2863.83
6	35.086599	-118.143754	2850.69	14.00	2864.69
7	35.085605	-118.145145	2852.58	14.00	2866.58
8	35.084382	-118.146907	2855.99	14.00	2869.99

Name: Route14
Path type: Two-way
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.037772	-118.107515	2648.38	7.60	2655.98
2	35.036787	-118.109729	2646.58	7.60	2654.18
3	35.035765	-118.111943	2627.76	7.60	2635.36
4	35.035277	-118.113091	2626.00	7.60	2633.60
5	35.034904	-118.114239	2629.08	7.60	2636.68
6	35.034808	-118.115190	2631.55	7.60	2639.15
7	35.034969	-118.116292	2632.51	7.60	2640.11
8	35.035330	-118.117742	2635.15	7.60	2642.75
9	35.035900	-118.120318	2640.47	7.60	2648.07
10	35.036954	-118.124982	2650.18	7.60	2657.78
11	35.038132	-118.130204	2660.80	7.60	2668.40
12	35.038891	-118.133499	2668.04	7.60	2675.64
13	35.040220	-118.139383	2680.46	7.60	2688.06
14	35.040828	-118.142063	2686.12	7.60	2693.72
15	35.041084	-118.143154	2688.52	7.60	2696.12
16	35.041949	-118.146125	2696.35	7.60	2703.95
17	35.042632	-118.148852	2703.92	7.60	2711.52
18	35.043562	-118.152972	2713.48	7.60	2721.08
19	35.044264	-118.156175	2719.34	7.60	2726.94

Name: Route18
Path type: Two-way
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.024698	-118.165092	2678.56	3.50	2682.06
2	35.024708	-118.164466	2675.88	3.50	2679.38
3	35.024770	-118.161439	2669.95	3.50	2673.45
4	35.024850	-118.158540	2664.58	3.50	2668.08
5	35.024911	-118.155455	2658.73	3.50	2662.23
6	35.024992	-118.151860	2652.80	3.50	2656.30
7	35.025042	-118.150097	2651.77	3.50	2655.27
8	35.025004	-118.149610	2651.31	3.50	2654.81
9	35.024890	-118.149494	2649.91	3.50	2653.41

Name: Route20
Path type: Two-way
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.046908	-118.155894	2726.92	3.50	2730.42
2	35.047005	-118.151081	2719.24	3.50	2722.74
3	35.047133	-118.146520	2711.73	3.50	2715.23
4	35.047417	-118.137988	2697.09	3.50	2700.59

Name: Route23
Path type: One-way (toward increasing index)
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.004682	-118.160128	2651.02	7.60	2658.62
2	35.007744	-118.160491	2658.44	7.60	2666.04
3	35.008967	-118.160650	2660.32	7.60	2667.92
4	35.010398	-118.161079	2661.68	7.60	2669.28
5	35.011671	-118.161473	2661.42	7.60	2669.02
6	35.014174	-118.162269	2675.28	7.60	2682.88
7	35.016592	-118.163065	2681.28	7.60	2688.88
8	35.018652	-118.163739	2678.87	7.60	2686.47
9	35.021362	-118.164605	2676.80	7.60	2684.40
10	35.024702	-118.165691	2679.26	7.60	2686.86
11	35.027477	-118.166609	2682.76	7.60	2690.36
12	35.028936	-118.167108	2685.17	7.60	2692.77
13	35.031246	-118.167852	2690.35	7.60	2697.95
14	35.032648	-118.168290	2693.80	7.60	2701.40
15	35.034515	-118.168920	2698.35	7.60	2705.95
16	35.035695	-118.169349	2714.21	7.60	2721.81
17	35.037405	-118.169713	2736.62	7.60	2744.22

Name: Route25
Path type: Two-way
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.098406	-118.144721	2943.70	7.60	2951.30
2	35.093727	-118.148311	2920.95	7.60	2928.55
3	35.093035	-118.148832	2919.12	7.60	2926.72
4	35.092677	-118.149180	2918.71	7.60	2926.31
5	35.090145	-118.151874	2914.66	7.60	2922.26
6	35.087685	-118.154568	2914.33	7.60	2921.93
7	35.085381	-118.157118	2912.12	7.60	2919.72

Name: Route27
Path type: One-way (toward increasing index)
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.037411	-118.169805	2738.77	7.60	2746.37
2	35.036288	-118.169724	2726.45	7.60	2734.05
3	35.035051	-118.169391	2706.14	7.60	2713.74
4	35.031911	-118.168367	2692.88	7.60	2700.48
5	35.029615	-118.167632	2688.93	7.60	2696.53
6	35.027884	-118.167071	2685.42	7.60	2693.02
7	35.025310	-118.166214	2680.85	7.60	2688.45
8	35.023450	-118.165610	2677.92	7.60	2685.52
9	35.021533	-118.164997	2677.74	7.60	2685.34
10	35.019888	-118.164463	2678.93	7.60	2686.53
11	35.017149	-118.163579	2681.31	7.60	2688.91
12	35.015440	-118.163028	2679.78	7.60	2687.38
13	35.012772	-118.162162	2669.07	7.60	2676.67
14	35.011349	-118.161707	2663.84	7.60	2671.44
15	35.009918	-118.161269	2661.83	7.60	2669.43
16	35.009167	-118.161015	2660.49	7.60	2668.09
17	35.008473	-118.160875	2659.21	7.60	2666.81
18	35.008323	-118.160852	2658.91	7.60	2666.51

Name: Route28
Path type: Two-way
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.098479	-118.143662	2905.89	7.60	2913.49
2	35.093889	-118.133754	2836.33	7.60	2843.93
3	35.091139	-118.128363	2820.90	7.60	2828.50
4	35.087528	-118.122344	2780.55	7.60	2788.15
5	35.082980	-118.118219	2757.17	7.60	2764.77
6	35.078527	-118.115406	2743.41	7.60	2751.01
7	35.072706	-118.113452	2726.39	7.60	2733.99
8	35.068452	-118.112980	2715.77	7.60	2723.37
9	35.062556	-118.112945	2699.01	7.60	2706.61
10	35.057194	-118.112921	2680.69	7.60	2688.29
11	35.052080	-118.112939	2678.08	7.60	2685.68
12	35.050561	-118.112879	2673.03	7.60	2680.63
13	35.047584	-118.112405	2660.57	7.60	2668.17
14	35.043843	-118.111197	2644.93	7.60	2652.53
15	35.040884	-118.109439	2635.04	7.60	2642.64
16	35.039306	-118.108327	2633.17	7.60	2640.77
17	35.037962	-118.107122	2625.68	7.60	2633.28

Name: Route29
Path type: Two-way
Observer view angle: 50.0°



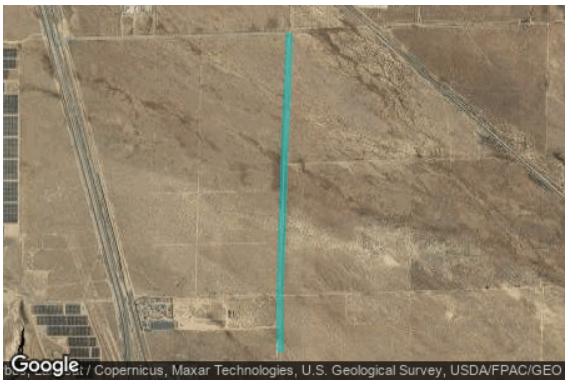
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.037962	-118.107122	2625.68	7.60	2633.28
2	35.036614	-118.105689	2620.36	7.60	2627.96
3	35.034386	-118.102715	2612.60	7.60	2620.20
4	35.032532	-118.099378	2602.75	7.60	2610.35
5	35.031237	-118.096102	2597.16	7.60	2604.76
6	35.030281	-118.092496	2589.56	7.60	2597.16
7	35.029384	-118.086780	2581.36	7.60	2588.96
8	35.028274	-118.079558	2570.47	7.60	2578.07
9	35.027071	-118.071579	2558.86	7.60	2566.46
10	35.026268	-118.066221	2553.25	7.60	2560.85
11	35.025268	-118.059848	2548.02	7.60	2555.62
12	35.024048	-118.051734	2541.66	7.60	2549.26
13	35.023052	-118.045084	2545.17	7.60	2552.77
14	35.021757	-118.036691	2567.39	7.60	2574.99
15	35.020696	-118.029670	2603.92	7.60	2611.52
16	35.020115	-118.025994	2633.18	7.60	2640.78
17	35.019843	-118.024280	2649.71	7.60	2657.31
18	35.019569	-118.022222	2655.43	7.60	2663.03
19	35.019462	-118.020337	2658.73	7.60	2666.33

Name: Route30
Path type: One-way (toward increasing index)
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.037008	-118.108836	2650.38	7.60	2657.98
2	35.036769	-118.108639	2646.35	7.60	2653.95
3	35.036359	-118.108348	2643.79	7.60	2651.39
4	35.036112	-118.108070	2642.67	7.60	2650.27
5	35.035883	-118.107594	2639.61	7.60	2647.21
6	35.035540	-118.106561	2632.55	7.60	2640.15
7	35.034779	-118.104205	2616.98	7.60	2624.58
8	35.034513	-118.103532	2613.65	7.60	2621.25
9	35.034417	-118.103300	2615.05	7.60	2622.65

Name: Route31
Path type: Two-way
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.024890	-118.149494	2649.91	3.50	2653.41
2	35.024508	-118.149493	2649.68	3.50	2653.18
3	35.022733	-118.149571	2645.88	3.50	2649.38
4	35.020148	-118.149717	2642.77	3.50	2646.27
5	35.018154	-118.149818	2640.29	3.50	2643.79
6	35.016169	-118.149895	2640.05	3.50	2643.55
7	35.014462	-118.149962	2641.25	3.50	2644.75
8	35.012572	-118.150040	2636.74	3.50	2640.24
9	35.010416	-118.150117	2633.44	3.50	2636.94
10	35.008493	-118.150113	2630.14	3.50	2633.64
11	35.007291	-118.150088	2629.53	3.50	2633.03

Name: Route32
Path type: Two-way
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	34.993461	-118.155078	2631.04	14.00	2645.04
2	34.997382	-118.156361	2639.79	14.00	2653.79
3	35.002401	-118.158008	2643.04	14.00	2657.04
4	35.006025	-118.159174	2643.43	14.00	2657.43
5	35.009064	-118.160137	2655.99	14.00	2669.99
6	35.010495	-118.160603	2658.54	14.00	2672.54
7	35.013189	-118.161507	2668.56	14.00	2682.56
8	35.018744	-118.163330	2677.33	14.00	2691.33
9	35.024727	-118.165241	2678.70	14.00	2692.70
10	35.030240	-118.167027	2687.13	14.00	2701.13
11	35.032233	-118.167680	2691.78	14.00	2705.78
12	35.034458	-118.168415	2696.20	14.00	2710.20
13	35.036696	-118.169151	2702.17	14.00	2716.17
14	35.037891	-118.169518	2707.02	14.00	2721.02

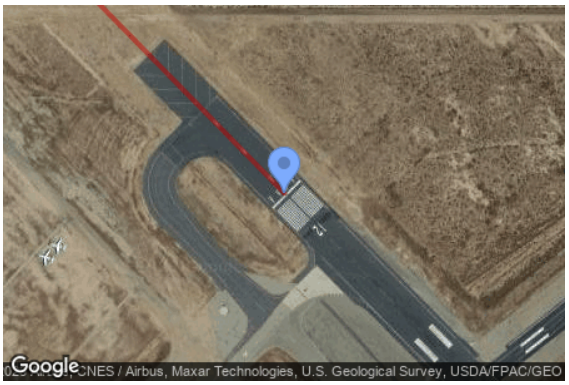
Name: Route33
Path type: Two-way
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.043679	-118.166001	2721.98	3.50	2725.48
2	35.043388	-118.164800	2720.75	3.50	2724.25
3	35.043167	-118.163799	2719.68	3.50	2723.18
4	35.042954	-118.162746	2718.43	3.50	2721.93
5	35.042577	-118.161084	2716.77	3.50	2720.27
6	35.042257	-118.159700	2714.36	3.50	2717.86

Flight Path Receptors

Name: MASP 12
Description: None
Threshold height: 50 ft
Direction: 135.6°
Glide slope: 3.0°
Pilot view restricted? Yes
Vertical view: 30.0°
Azimuthal view: 50.0°



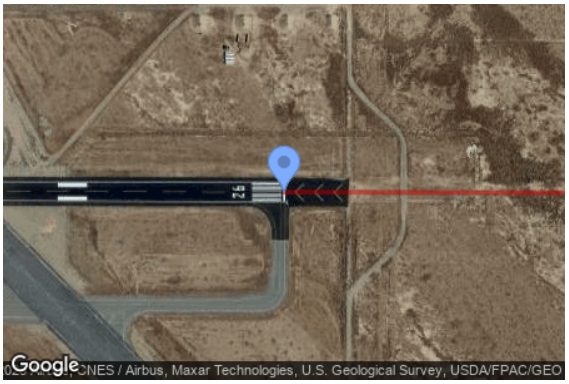
Point	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
Threshold	35.067997	-118.159056	2793.00	50.00	2843.00
Two-mile	35.088637	-118.183823	3014.80	381.60	3396.40

Name: MASP 22
Description: None
Threshold height: 50 ft
Direction: 232.5°
Glide slope: 3.0°
Pilot view restricted? Yes
Vertical view: 30.0°
Azimuthal view: 50.0°



Point	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
Threshold	35.067800	-118.151866	2778.90	50.00	2828.90
Two-mile	35.085397	-118.123804	2778.10	604.20	3382.30

Name: MASP 26
Description: None
Threshold height: 50 ft
Direction: 270.2°
Glide slope: 3.0°
Pilot view restricted? Yes
Vertical view: 30.0°
Azimuthal view: 50.0°



Point	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
Threshold	35.059183	-118.142549	2730.80	50.00	2780.80
Two-mile	35.059102	-118.107186	2677.40	656.90	3334.30

Name: MASP 30
Description: None
Threshold height: 50 ft
Direction: 314.8°
Glide slope: 3.0°
Pilot view restricted? Yes
Vertical view: 30.0°
Azimuthal view: 50.0°



Point	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
Threshold	35.046580	-118.133135	2681.00	50.00	2731.00
Two-mile	35.026204	-118.108051	2594.70	689.70	3284.40

Name: MASP 4
Description: None
Threshold height: 50 ft
Direction: 51.1°
Glide slope: 3.0°
Pilot view restricted? Yes
Vertical view: 30.0°
Azimuthal view: 50.0°



Point	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
Threshold	35.059748	-118.164297	2777.80	50.00	2827.80
Two-mile	35.041580	-118.191806	2772.90	608.30	3381.20

Name: MASP 8
Description: None
Threshold height: 50 ft
Direction: 90.1°
Glide slope: 3.0°
Pilot view restricted? Yes
Vertical view: 30.0°
Azimuthal view: 50.0°

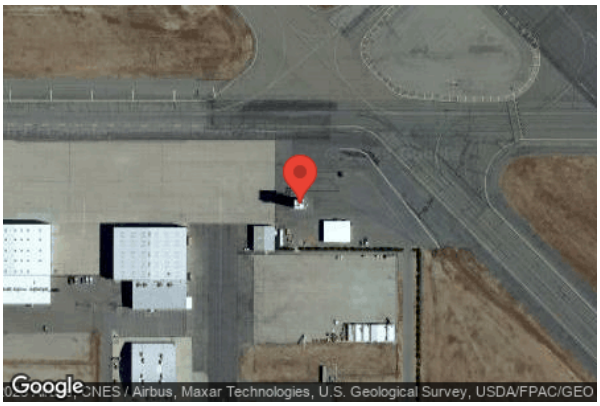


Point	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
Threshold	35.059242	-118.166076	2778.50	50.00	2828.50
Two-mile	35.059272	-118.201439	2921.10	460.80	3381.90

Discrete Observation Point Receptors

Name	ID	Latitude (°)	Longitude (°)	Elevation (ft)	Height (ft)
OP 1	1	35.065098	-118.180928	2843.42	5.50
OP 2	2	35.065057	-118.182564	2849.00	5.50
OP 3	3	35.064511	-118.184362	2856.49	5.50
OP 4	4	35.061390	-118.185376	2836.28	5.50
OP 5	5	35.061201	-118.193962	2873.23	5.50
OP 7	7	35.060619	-118.189032	2846.51	5.50
OP 8	8	35.057993	-118.195225	2864.50	5.50
OP 13	13	35.052665	-118.187952	2786.84	5.50
OP 14	14	35.049394	-118.186277	2764.30	5.50
OP 15	15	35.049271	-118.188858	2775.43	5.50
OP 16	16	35.046436	-118.190359	2774.83	5.50
OP 17	17	35.046422	-118.192157	2782.95	5.50
OP 18	18	35.044898	-118.156588	2722.34	5.50
OP 19	19	35.043859	-118.166033	2723.17	5.50
OP 20	20	35.043399	-118.164002	2721.70	5.50
OP 21	21	35.042923	-118.161898	2717.78	5.50
OP 22	22	35.042417	-118.159757	2713.08	5.50
OP 23	23	35.038382	-118.167332	2704.07	5.50
OP 24	24	35.030481	-118.187314	2764.59	5.50
OP 25	25	35.029317	-118.187126	2766.42	5.50
OP 26	26	35.027578	-118.189024	2776.05	5.50
OP 27	27	35.002810	-118.152089	2625.07	5.50
32-ATCT	32	35.057003	-118.149446	2742.00	85.00

Map image of 32-ATCT



Glare Analysis Results

Summary of Results No glare predicted

PV Array	Tilt	Orient	Annual Green Glare		Annual Yellow Glare		Energy
	°	°	min	hr	min	hr	kWh
PV41	SA tracking	SA tracking	0	0.0	0	0.0	-
PV42	SA tracking	SA tracking	0	0.0	0	0.0	-
PV43	SA tracking	SA tracking	0	0.0	0	0.0	-
PV44	SA tracking	SA tracking	0	0.0	0	0.0	-
PV45	SA tracking	SA tracking	0	0.0	0	0.0	-
PV46	SA tracking	SA tracking	0	0.0	0	0.0	-
PV47	SA tracking	SA tracking	0	0.0	0	0.0	-
PV48	SA tracking	SA tracking	0	0.0	0	0.0	-
PV49	SA tracking	SA tracking	0	0.0	0	0.0	-
PV50	SA tracking	SA tracking	0	0.0	0	0.0	-
PV51	SA tracking	SA tracking	0	0.0	0	0.0	-
PV52	SA tracking	SA tracking	0	0.0	0	0.0	-
PV53	SA tracking	SA tracking	0	0.0	0	0.0	-
PV54	SA tracking	SA tracking	0	0.0	0	0.0	-
PV55	SA tracking	SA tracking	0	0.0	0	0.0	-
PV56	SA tracking	SA tracking	0	0.0	0	0.0	-
PV57	SA tracking	SA tracking	0	0.0	0	0.0	-
PV58	SA tracking	SA tracking	0	0.0	0	0.0	-
PV59	SA tracking	SA tracking	0	0.0	0	0.0	-
PV60	SA tracking	SA tracking	0	0.0	0	0.0	-

Total glare received by each receptor; may include duplicate times of glare from multiple reflective surfaces.

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01	0	0.0	0	0.0
Route03	0	0.0	0	0.0
Route05	0	0.0	0	0.0
Route07	0	0.0	0	0.0
Route10	0	0.0	0	0.0
Route11	0	0.0	0	0.0
Route12	0	0.0	0	0.0
Route13	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route20	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route25	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route28	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route30	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
Route33	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV: PV41 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01	0	0.0	0	0.0
Route03	0	0.0	0	0.0
Route05	0	0.0	0	0.0
Route07	0	0.0	0	0.0
Route10	0	0.0	0	0.0
Route11	0	0.0	0	0.0
Route12	0	0.0	0	0.0
Route13	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route20	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route25	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route28	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route30	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
Route33	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV41 and Route: Route01

No glare found

PV41 and Route: Route03

No glare found

PV41 and Route: Route05

No glare found

PV41 and Route: Route07

No glare found

PV41 and Route: Route10

No glare found

PV41 and Route: Route11

No glare found

PV41 and Route: Route12

No glare found

PV41 and Route: Route13

No glare found

PV41 and Route: Route14

No glare found

PV41 and Route: Route18

No glare found

PV41 and Route: Route20

No glare found

PV41 and Route: Route23

No glare found

PV41 and Route: Route25

No glare found

PV41 and Route: Route27

No glare found

PV41 and Route: Route28

No glare found

PV41 and Route: Route29

No glare found

PV41 and Route: Route30

No glare found

PV41 and Route: Route31

No glare found

PV41 and Route: Route32

No glare found

PV41 and Route: Route33

No glare found

PV41 and FP: MASP 12

No glare found

PV41 and FP: MASP 22

No glare found

PV41 and FP: MASP 26

No glare found

PV41 and FP: MASP 30

No glare found

PV41 and FP: MASP 4

No glare found

PV41 and FP: MASP 8

No glare found

PV41 and OP 1

No glare found

PV41 and OP 2

No glare found

PV41 and OP 3

No glare found

PV41 and OP 4

No glare found

PV41 and OP 5

No glare found

PV41 and OP 7

No glare found

PV41 and OP 8

No glare found

PV41 and OP 13

No glare found

PV41 and OP 14

No glare found

PV41 and OP 15

No glare found

PV41 and OP 16

No glare found

PV41 and OP 17

No glare found

PV41 and OP 18

No glare found

PV41 and OP 19

No glare found

PV41 and OP 20

No glare found

PV41 and OP 21

No glare found

PV41 and OP 22

No glare found

PV41 and OP 23

No glare found

PV41 and OP 24

No glare found

PV41 and OP 25

No glare found

PV41 and OP 26

No glare found

PV41 and OP 27

No glare found

PV41 and 32-ATCT

No glare found

PV: PV42 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01	0	0.0	0	0.0
Route03	0	0.0	0	0.0
Route05	0	0.0	0	0.0
Route07	0	0.0	0	0.0
Route10	0	0.0	0	0.0
Route11	0	0.0	0	0.0
Route12	0	0.0	0	0.0
Route13	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route20	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route25	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route28	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route30	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
Route33	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV42 and Route: Route01

No glare found

PV42 and Route: Route03

No glare found

PV42 and Route: Route05

No glare found

PV42 and Route: Route07

No glare found

PV42 and Route: Route10

No glare found

PV42 and Route: Route11

No glare found

PV42 and Route: Route12

No glare found

PV42 and Route: Route13

No glare found

PV42 and Route: Route14

No glare found

PV42 and Route: Route18

No glare found

PV42 and Route: Route20

No glare found

PV42 and Route: Route23

No glare found

PV42 and Route: Route25

No glare found

PV42 and Route: Route27

No glare found

PV42 and Route: Route28

No glare found

PV42 and Route: Route29

No glare found

PV42 and Route: Route30

No glare found

PV42 and Route: Route31

No glare found

PV42 and Route: Route32

No glare found

PV42 and Route: Route33

No glare found

PV42 and FP: MASP 12

No glare found

PV42 and FP: MASP 22

No glare found

PV42 and FP: MASP 26

No glare found

PV42 and FP: MASP 30

No glare found

PV42 and FP: MASP 4

No glare found

PV42 and FP: MASP 8

No glare found

PV42 and OP 1

No glare found

PV42 and OP 2

No glare found

PV42 and OP 3

No glare found

PV42 and OP 4

No glare found

PV42 and OP 5

No glare found

PV42 and OP 7

No glare found

PV42 and OP 8

No glare found

PV42 and OP 13

No glare found

PV42 and OP 14

No glare found

PV42 and OP 15

No glare found

PV42 and OP 16

No glare found

PV42 and OP 17

No glare found

PV42 and OP 18

No glare found

PV42 and OP 19

No glare found

PV42 and OP 20

No glare found

PV42 and OP 21

No glare found

PV42 and OP 22

No glare found

PV42 and OP 23

No glare found

PV42 and OP 24

No glare found

PV42 and OP 25

No glare found

PV42 and OP 26

No glare found

PV42 and OP 27

No glare found

PV42 and 32-ATCT

No glare found

PV: PV43 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01	0	0.0	0	0.0
Route03	0	0.0	0	0.0
Route05	0	0.0	0	0.0
Route07	0	0.0	0	0.0
Route10	0	0.0	0	0.0
Route11	0	0.0	0	0.0
Route12	0	0.0	0	0.0
Route13	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route20	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route25	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route28	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route30	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
Route33	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV43 and Route: Route01

No glare found

PV43 and Route: Route03

No glare found

PV43 and Route: Route05

No glare found

PV43 and Route: Route07

No glare found

PV43 and Route: Route10

No glare found

PV43 and Route: Route11

No glare found

PV43 and Route: Route12

No glare found

PV43 and Route: Route13

No glare found

PV43 and Route: Route14

No glare found

PV43 and Route: Route18

No glare found

PV43 and Route: Route20

No glare found

PV43 and Route: Route23

No glare found

PV43 and Route: Route25

No glare found

PV43 and Route: Route27

No glare found

PV43 and Route: Route28

No glare found

PV43 and Route: Route29

No glare found

PV43 and Route: Route30

No glare found

PV43 and Route: Route31

No glare found

PV43 and Route: Route32

No glare found

PV43 and Route: Route33

No glare found

PV43 and FP: MASP 12

No glare found

PV43 and FP: MASP 22

No glare found

PV43 and FP: MASP 26

No glare found

PV43 and FP: MASP 30

No glare found

PV43 and FP: MASP 4

No glare found

PV43 and FP: MASP 8

No glare found

PV43 and OP 1

No glare found

PV43 and OP 2

No glare found

PV43 and OP 3

No glare found

PV43 and OP 4

No glare found

PV43 and OP 5

No glare found

PV43 and OP 7

No glare found

PV43 and OP 8

No glare found

PV43 and OP 13

No glare found

PV43 and OP 14

No glare found

PV43 and OP 15

No glare found

PV43 and OP 16

No glare found

PV43 and OP 17

No glare found

PV43 and OP 18

No glare found

PV43 and OP 19

No glare found

PV43 and OP 20

No glare found

PV43 and OP 21

No glare found

PV43 and OP 22

No glare found

PV43 and OP 23

No glare found

PV43 and OP 24

No glare found

PV43 and OP 25

No glare found

PV43 and OP 26

No glare found

PV43 and OP 27

No glare found

PV43 and 32-ATCT

No glare found

PV: PV44 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01	0	0.0	0	0.0
Route03	0	0.0	0	0.0
Route05	0	0.0	0	0.0
Route07	0	0.0	0	0.0
Route10	0	0.0	0	0.0
Route11	0	0.0	0	0.0
Route12	0	0.0	0	0.0
Route13	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route20	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route25	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route28	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route30	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
Route33	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV44 and Route: Route01

No glare found

PV44 and Route: Route03

No glare found

PV44 and Route: Route05

No glare found

PV44 and Route: Route07

No glare found

PV44 and Route: Route10

No glare found

PV44 and Route: Route11

No glare found

PV44 and Route: Route12

No glare found

PV44 and Route: Route13

No glare found

PV44 and Route: Route14

No glare found

PV44 and Route: Route18

No glare found

PV44 and Route: Route20

No glare found

PV44 and Route: Route23

No glare found

PV44 and Route: Route25

No glare found

PV44 and Route: Route27

No glare found

PV44 and Route: Route28

No glare found

PV44 and Route: Route29

No glare found

PV44 and Route: Route30

No glare found

PV44 and Route: Route31

No glare found

PV44 and Route: Route32

No glare found

PV44 and Route: Route33

No glare found

PV44 and FP: MASP 12

No glare found

PV44 and FP: MASP 22

No glare found

PV44 and FP: MASP 26

No glare found

PV44 and FP: MASP 30

No glare found

PV44 and FP: MASP 4

No glare found

PV44 and FP: MASP 8

No glare found

PV44 and OP 1

No glare found

PV44 and OP 2

No glare found

PV44 and OP 3

No glare found

PV44 and OP 4

No glare found

PV44 and OP 5

No glare found

PV44 and OP 7

No glare found

PV44 and OP 8

No glare found

PV44 and OP 13

No glare found

PV44 and OP 14

No glare found

PV44 and OP 15

No glare found

PV44 and OP 16

No glare found

PV44 and OP 17

No glare found

PV44 and OP 18

No glare found

PV44 and OP 19

No glare found

PV44 and OP 20

No glare found

PV44 and OP 21

No glare found

PV44 and OP 22

No glare found

PV44 and OP 23

No glare found

PV44 and OP 24

No glare found

PV44 and OP 25

No glare found

PV44 and OP 26

No glare found

PV44 and OP 27

No glare found

PV44 and 32-ATCT

No glare found

PV: PV45 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01	0	0.0	0	0.0
Route03	0	0.0	0	0.0
Route05	0	0.0	0	0.0
Route07	0	0.0	0	0.0
Route10	0	0.0	0	0.0
Route11	0	0.0	0	0.0
Route12	0	0.0	0	0.0
Route13	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route20	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route25	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route28	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route30	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
Route33	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV45 and Route: Route01

No glare found

PV45 and Route: Route03

No glare found

PV45 and Route: Route05

No glare found

PV45 and Route: Route07

No glare found

PV45 and Route: Route10

No glare found

PV45 and Route: Route11

No glare found

PV45 and Route: Route12

No glare found

PV45 and Route: Route13

No glare found

PV45 and Route: Route14

No glare found

PV45 and Route: Route18

No glare found

PV45 and Route: Route20

No glare found

PV45 and Route: Route23

No glare found

PV45 and Route: Route25

No glare found

PV45 and Route: Route27

No glare found

PV45 and Route: Route28

No glare found

PV45 and Route: Route29

No glare found

PV45 and Route: Route30

No glare found

PV45 and Route: Route31

No glare found

PV45 and Route: Route32

No glare found

PV45 and Route: Route33

No glare found

PV45 and FP: MASP 12

No glare found

PV45 and FP: MASP 22

No glare found

PV45 and FP: MASP 26

No glare found

PV45 and FP: MASP 30

No glare found

PV45 and FP: MASP 4

No glare found

PV45 and FP: MASP 8

No glare found

PV45 and OP 1

No glare found

PV45 and OP 2

No glare found

PV45 and OP 3

No glare found

PV45 and OP 4

No glare found

PV45 and OP 5

No glare found

PV45 and OP 7

No glare found

PV45 and OP 8

No glare found

PV45 and OP 13

No glare found

PV45 and OP 14

No glare found

PV45 and OP 15

No glare found

PV45 and OP 16

No glare found

PV45 and OP 17

No glare found

PV45 and OP 18

No glare found

PV45 and OP 19

No glare found

PV45 and OP 20

No glare found

PV45 and OP 21

No glare found

PV45 and OP 22

No glare found

PV45 and OP 23

No glare found

PV45 and OP 24

No glare found

PV45 and OP 25

No glare found

PV45 and OP 26

No glare found

PV45 and OP 27

No glare found

PV45 and 32-ATCT

No glare found

PV: PV46 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01	0	0.0	0	0.0
Route03	0	0.0	0	0.0
Route05	0	0.0	0	0.0
Route07	0	0.0	0	0.0
Route10	0	0.0	0	0.0
Route11	0	0.0	0	0.0
Route12	0	0.0	0	0.0
Route13	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route20	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route25	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route28	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route30	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
Route33	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV46 and Route: Route01

No glare found

PV46 and Route: Route03

No glare found

PV46 and Route: Route05

No glare found

PV46 and Route: Route07

No glare found

PV46 and Route: Route10

No glare found

PV46 and Route: Route11

No glare found

PV46 and Route: Route12

No glare found

PV46 and Route: Route13

No glare found

PV46 and Route: Route14

No glare found

PV46 and Route: Route18

No glare found

PV46 and Route: Route20

No glare found

PV46 and Route: Route23

No glare found

PV46 and Route: Route25

No glare found

PV46 and Route: Route27

No glare found

PV46 and Route: Route28

No glare found

PV46 and Route: Route29

No glare found

PV46 and Route: Route30

No glare found

PV46 and Route: Route31

No glare found

PV46 and Route: Route32

No glare found

PV46 and Route: Route33

No glare found

PV46 and FP: MASP 12

No glare found

PV46 and FP: MASP 22

No glare found

PV46 and FP: MASP 26

No glare found

PV46 and FP: MASP 30

No glare found

PV46 and FP: MASP 4

No glare found

PV46 and FP: MASP 8

No glare found

PV46 and OP 1

No glare found

PV46 and OP 2

No glare found

PV46 and OP 3

No glare found

PV46 and OP 4

No glare found

PV46 and OP 5

No glare found

PV46 and OP 7

No glare found

PV46 and OP 8

No glare found

PV46 and OP 13

No glare found

PV46 and OP 14

No glare found

PV46 and OP 15

No glare found

PV46 and OP 16

No glare found

PV46 and OP 17

No glare found

PV46 and OP 18

No glare found

PV46 and OP 19

No glare found

PV46 and OP 20

No glare found

PV46 and OP 21

No glare found

PV46 and OP 22

No glare found

PV46 and OP 23

No glare found

PV46 and OP 24

No glare found

PV46 and OP 25

No glare found

PV46 and OP 26

No glare found

PV46 and OP 27

No glare found

PV46 and 32-ATCT

No glare found

PV: PV47 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01	0	0.0	0	0.0
Route03	0	0.0	0	0.0
Route05	0	0.0	0	0.0
Route07	0	0.0	0	0.0
Route10	0	0.0	0	0.0
Route11	0	0.0	0	0.0
Route12	0	0.0	0	0.0
Route13	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route20	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route25	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route28	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route30	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
Route33	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV47 and Route: Route01

No glare found

PV47 and Route: Route03

No glare found

PV47 and Route: Route05

No glare found

PV47 and Route: Route07

No glare found

PV47 and Route: Route10

No glare found

PV47 and Route: Route11

No glare found

PV47 and Route: Route12

No glare found

PV47 and Route: Route13

No glare found

PV47 and Route: Route14

No glare found

PV47 and Route: Route18

No glare found

PV47 and Route: Route20

No glare found

PV47 and Route: Route23

No glare found

PV47 and Route: Route25

No glare found

PV47 and Route: Route27

No glare found

PV47 and Route: Route28

No glare found

PV47 and Route: Route29

No glare found

PV47 and Route: Route30

No glare found

PV47 and Route: Route31

No glare found

PV47 and Route: Route32

No glare found

PV47 and Route: Route33

No glare found

PV47 and FP: MASP 12

No glare found

PV47 and FP: MASP 22

No glare found

PV47 and FP: MASP 26

No glare found

PV47 and FP: MASP 30

No glare found

PV47 and FP: MASP 4

No glare found

PV47 and FP: MASP 8

No glare found

PV47 and OP 1

No glare found

PV47 and OP 2

No glare found

PV47 and OP 3

No glare found

PV47 and OP 4

No glare found

PV47 and OP 5

No glare found

PV47 and OP 7

No glare found

PV47 and OP 8

No glare found

PV47 and OP 13

No glare found

PV47 and OP 14

No glare found

PV47 and OP 15

No glare found

PV47 and OP 16

No glare found

PV47 and OP 17

No glare found

PV47 and OP 18

No glare found

PV47 and OP 19

No glare found

PV47 and OP 20

No glare found

PV47 and OP 21

No glare found

PV47 and OP 22

No glare found

PV47 and OP 23

No glare found

PV47 and OP 24

No glare found

PV47 and OP 25

No glare found

PV47 and OP 26

No glare found

PV47 and OP 27

No glare found

PV47 and 32-ATCT

No glare found

PV: PV48 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01	0	0.0	0	0.0
Route03	0	0.0	0	0.0
Route05	0	0.0	0	0.0
Route07	0	0.0	0	0.0
Route10	0	0.0	0	0.0
Route11	0	0.0	0	0.0
Route12	0	0.0	0	0.0
Route13	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route20	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route25	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route28	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route30	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
Route33	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV48 and Route: Route01

No glare found

PV48 and Route: Route03

No glare found

PV48 and Route: Route05

No glare found

PV48 and Route: Route07

No glare found

PV48 and Route: Route10

No glare found

PV48 and Route: Route11

No glare found

PV48 and Route: Route12

No glare found

PV48 and Route: Route13

No glare found

PV48 and Route: Route14

No glare found

PV48 and Route: Route18

No glare found

PV48 and Route: Route20

No glare found

PV48 and Route: Route23

No glare found

PV48 and Route: Route25

No glare found

PV48 and Route: Route27

No glare found

PV48 and Route: Route28

No glare found

PV48 and Route: Route29

No glare found

PV48 and Route: Route30

No glare found

PV48 and Route: Route31

No glare found

PV48 and Route: Route32

No glare found

PV48 and Route: Route33

No glare found

PV48 and FP: MASP 12

No glare found

PV48 and FP: MASP 22

No glare found

PV48 and FP: MASP 26

No glare found

PV48 and FP: MASP 30

No glare found

PV48 and FP: MASP 4

No glare found

PV48 and FP: MASP 8

No glare found

PV48 and OP 1

No glare found

PV48 and OP 2

No glare found

PV48 and OP 3

No glare found

PV48 and OP 4

No glare found

PV48 and OP 5

No glare found

PV48 and OP 7

No glare found

PV48 and OP 8

No glare found

PV48 and OP 13

No glare found

PV48 and OP 14

No glare found

PV48 and OP 15

No glare found

PV48 and OP 16

No glare found

PV48 and OP 17

No glare found

PV48 and OP 18

No glare found

PV48 and OP 19

No glare found

PV48 and OP 20

No glare found

PV48 and OP 21

No glare found

PV48 and OP 22

No glare found

PV48 and OP 23

No glare found

PV48 and OP 24

No glare found

PV48 and OP 25

No glare found

PV48 and OP 26

No glare found

PV48 and OP 27

No glare found

PV48 and 32-ATCT

No glare found

PV: PV49 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01	0	0.0	0	0.0
Route03	0	0.0	0	0.0
Route05	0	0.0	0	0.0
Route07	0	0.0	0	0.0
Route10	0	0.0	0	0.0
Route11	0	0.0	0	0.0
Route12	0	0.0	0	0.0
Route13	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route20	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route25	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route28	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route30	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
Route33	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV49 and Route: Route01

No glare found

PV49 and Route: Route03

No glare found

PV49 and Route: Route05

No glare found

PV49 and Route: Route07

No glare found

PV49 and Route: Route10

No glare found

PV49 and Route: Route11

No glare found

PV49 and Route: Route12

No glare found

PV49 and Route: Route13

No glare found

PV49 and Route: Route14

No glare found

PV49 and Route: Route18

No glare found

PV49 and Route: Route20

No glare found

PV49 and Route: Route23

No glare found

PV49 and Route: Route25

No glare found

PV49 and Route: Route27

No glare found

PV49 and Route: Route28

No glare found

PV49 and Route: Route29

No glare found

PV49 and Route: Route30

No glare found

PV49 and Route: Route31

No glare found

PV49 and Route: Route32

No glare found

PV49 and Route: Route33

No glare found

PV49 and FP: MASP 12

No glare found

PV49 and FP: MASP 22

No glare found

PV49 and FP: MASP 26

No glare found

PV49 and FP: MASP 30

No glare found

PV49 and FP: MASP 4

No glare found

PV49 and FP: MASP 8

No glare found

PV49 and OP 1

No glare found

PV49 and OP 2

No glare found

PV49 and OP 3

No glare found

PV49 and OP 4

No glare found

PV49 and OP 5

No glare found

PV49 and OP 7

No glare found

PV49 and OP 8

No glare found

PV49 and OP 13

No glare found

PV49 and OP 14

No glare found

PV49 and OP 15

No glare found

PV49 and OP 16

No glare found

PV49 and OP 17

No glare found

PV49 and OP 18

No glare found

PV49 and OP 19

No glare found

PV49 and OP 20

No glare found

PV49 and OP 21

No glare found

PV49 and OP 22

No glare found

PV49 and OP 23

No glare found

PV49 and OP 24

No glare found

PV49 and OP 25

No glare found

PV49 and OP 26

No glare found

PV49 and OP 27

No glare found

PV49 and 32-ATCT

No glare found

PV: PV50 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01	0	0.0	0	0.0
Route03	0	0.0	0	0.0
Route05	0	0.0	0	0.0
Route07	0	0.0	0	0.0
Route10	0	0.0	0	0.0
Route11	0	0.0	0	0.0
Route12	0	0.0	0	0.0
Route13	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route20	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route25	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route28	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route30	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
Route33	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV50 and Route: Route01

No glare found

PV50 and Route: Route03

No glare found

PV50 and Route: Route05

No glare found

PV50 and Route: Route07

No glare found

PV50 and Route: Route10

No glare found

PV50 and Route: Route11

No glare found

PV50 and Route: Route12

No glare found

PV50 and Route: Route13

No glare found

PV50 and Route: Route14

No glare found

PV50 and Route: Route18

No glare found

PV50 and Route: Route20

No glare found

PV50 and Route: Route23

No glare found

PV50 and Route: Route25

No glare found

PV50 and Route: Route27

No glare found

PV50 and Route: Route28

No glare found

PV50 and Route: Route29

No glare found

PV50 and Route: Route30

No glare found

PV50 and Route: Route31

No glare found

PV50 and Route: Route32

No glare found

PV50 and Route: Route33

No glare found

PV50 and FP: MASP 12

No glare found

PV50 and FP: MASP 22

No glare found

PV50 and FP: MASP 26

No glare found

PV50 and FP: MASP 30

No glare found

PV50 and FP: MASP 4

No glare found

PV50 and FP: MASP 8

No glare found

PV50 and OP 1

No glare found

PV50 and OP 2

No glare found

PV50 and OP 3

No glare found

PV50 and OP 4

No glare found

PV50 and OP 5

No glare found

PV50 and OP 7

No glare found

PV50 and OP 8

No glare found

PV50 and OP 13

No glare found

PV50 and OP 14

No glare found

PV50 and OP 15

No glare found

PV50 and OP 16

No glare found

PV50 and OP 17

No glare found

PV50 and OP 18

No glare found

PV50 and OP 19

No glare found

PV50 and OP 20

No glare found

PV50 and OP 21

No glare found

PV50 and OP 22

No glare found

PV50 and OP 23

No glare found

PV50 and OP 24

No glare found

PV50 and OP 25

No glare found

PV50 and OP 26

No glare found

PV50 and OP 27

No glare found

PV50 and 32-ATCT

No glare found

PV: PV51 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01	0	0.0	0	0.0
Route03	0	0.0	0	0.0
Route05	0	0.0	0	0.0
Route07	0	0.0	0	0.0
Route10	0	0.0	0	0.0
Route11	0	0.0	0	0.0
Route12	0	0.0	0	0.0
Route13	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route20	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route25	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route28	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route30	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
Route33	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV51 and Route: Route01

No glare found

PV51 and Route: Route03

No glare found

PV51 and Route: Route05

No glare found

PV51 and Route: Route07

No glare found

PV51 and Route: Route10

No glare found

PV51 and Route: Route11

No glare found

PV51 and Route: Route12

No glare found

PV51 and Route: Route13

No glare found

PV51 and Route: Route14

No glare found

PV51 and Route: Route18

No glare found

PV51 and Route: Route20

No glare found

PV51 and Route: Route23

No glare found

PV51 and Route: Route25

No glare found

PV51 and Route: Route27

No glare found

PV51 and Route: Route28

No glare found

PV51 and Route: Route29

No glare found

PV51 and Route: Route30

No glare found

PV51 and Route: Route31

No glare found

PV51 and Route: Route32

No glare found

PV51 and Route: Route33

No glare found

PV51 and FP: MASP 12

No glare found

PV51 and FP: MASP 22

No glare found

PV51 and FP: MASP 26

No glare found

PV51 and FP: MASP 30

No glare found

PV51 and FP: MASP 4

No glare found

PV51 and FP: MASP 8

No glare found

PV51 and OP 1

No glare found

PV51 and OP 2

No glare found

PV51 and OP 3

No glare found

PV51 and OP 4

No glare found

PV51 and OP 5

No glare found

PV51 and OP 7

No glare found

PV51 and OP 8

No glare found

PV51 and OP 13

No glare found

PV51 and OP 14

No glare found

PV51 and OP 15

No glare found

PV51 and OP 16

No glare found

PV51 and OP 17

No glare found

PV51 and OP 18

No glare found

PV51 and OP 19

No glare found

PV51 and OP 20

No glare found

PV51 and OP 21

No glare found

PV51 and OP 22

No glare found

PV51 and OP 23

No glare found

PV51 and OP 24

No glare found

PV51 and OP 25

No glare found

PV51 and OP 26

No glare found

PV51 and OP 27

No glare found

PV51 and 32-ATCT

No glare found

PV: PV52 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01	0	0.0	0	0.0
Route03	0	0.0	0	0.0
Route05	0	0.0	0	0.0
Route07	0	0.0	0	0.0
Route10	0	0.0	0	0.0
Route11	0	0.0	0	0.0
Route12	0	0.0	0	0.0
Route13	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route20	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route25	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route28	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route30	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
Route33	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV52 and Route: Route01

No glare found

PV52 and Route: Route03

No glare found

PV52 and Route: Route05

No glare found

PV52 and Route: Route07

No glare found

PV52 and Route: Route10

No glare found

PV52 and Route: Route11

No glare found

PV52 and Route: Route12

No glare found

PV52 and Route: Route13

No glare found

PV52 and Route: Route14

No glare found

PV52 and Route: Route18

No glare found

PV52 and Route: Route20

No glare found

PV52 and Route: Route23

No glare found

PV52 and Route: Route25

No glare found

PV52 and Route: Route27

No glare found

PV52 and Route: Route28

No glare found

PV52 and Route: Route29

No glare found

PV52 and Route: Route30

No glare found

PV52 and Route: Route31

No glare found

PV52 and Route: Route32

No glare found

PV52 and Route: Route33

No glare found

PV52 and FP: MASP 12

No glare found

PV52 and FP: MASP 22

No glare found

PV52 and FP: MASP 26

No glare found

PV52 and FP: MASP 30

No glare found

PV52 and FP: MASP 4

No glare found

PV52 and FP: MASP 8

No glare found

PV52 and OP 1

No glare found

PV52 and OP 2

No glare found

PV52 and OP 3

No glare found

PV52 and OP 4

No glare found

PV52 and OP 5

No glare found

PV52 and OP 7

No glare found

PV52 and OP 8

No glare found

PV52 and OP 13

No glare found

PV52 and OP 14

No glare found

PV52 and OP 15

No glare found

PV52 and OP 16

No glare found

PV52 and OP 17

No glare found

PV52 and OP 18

No glare found

PV52 and OP 19

No glare found

PV52 and OP 20

No glare found

PV52 and OP 21

No glare found

PV52 and OP 22

No glare found

PV52 and OP 23

No glare found

PV52 and OP 24

No glare found

PV52 and OP 25

No glare found

PV52 and OP 26

No glare found

PV52 and OP 27

No glare found

PV52 and 32-ATCT

No glare found

PV: PV53 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01	0	0.0	0	0.0
Route03	0	0.0	0	0.0
Route05	0	0.0	0	0.0
Route07	0	0.0	0	0.0
Route10	0	0.0	0	0.0
Route11	0	0.0	0	0.0
Route12	0	0.0	0	0.0
Route13	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route20	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route25	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route28	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route30	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
Route33	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV53 and Route: Route01

No glare found

PV53 and Route: Route03

No glare found

PV53 and Route: Route05

No glare found

PV53 and Route: Route07

No glare found

PV53 and Route: Route10

No glare found

PV53 and Route: Route11

No glare found

PV53 and Route: Route12

No glare found

PV53 and Route: Route13

No glare found

PV53 and Route: Route14

No glare found

PV53 and Route: Route18

No glare found

PV53 and Route: Route20

No glare found

PV53 and Route: Route23

No glare found

PV53 and Route: Route25

No glare found

PV53 and Route: Route27

No glare found

PV53 and Route: Route28

No glare found

PV53 and Route: Route29

No glare found

PV53 and Route: Route30

No glare found

PV53 and Route: Route31

No glare found

PV53 and Route: Route32

No glare found

PV53 and Route: Route33

No glare found

PV53 and FP: MASP 12

No glare found

PV53 and FP: MASP 22

No glare found

PV53 and FP: MASP 26

No glare found

PV53 and FP: MASP 30

No glare found

PV53 and FP: MASP 4

No glare found

PV53 and FP: MASP 8

No glare found

PV53 and OP 1

No glare found

PV53 and OP 2

No glare found

PV53 and OP 3

No glare found

PV53 and OP 4

No glare found

PV53 and OP 5

No glare found

PV53 and OP 7

No glare found

PV53 and OP 8

No glare found

PV53 and OP 13

No glare found

PV53 and OP 14

No glare found

PV53 and OP 15

No glare found

PV53 and OP 16

No glare found

PV53 and OP 17

No glare found

PV53 and OP 18

No glare found

PV53 and OP 19

No glare found

PV53 and OP 20

No glare found

PV53 and OP 21

No glare found

PV53 and OP 22

No glare found

PV53 and OP 23

No glare found

PV53 and OP 24

No glare found

PV53 and OP 25

No glare found

PV53 and OP 26

No glare found

PV53 and OP 27

No glare found

PV53 and 32-ATCT

No glare found

PV: PV54 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01	0	0.0	0	0.0
Route03	0	0.0	0	0.0
Route05	0	0.0	0	0.0
Route07	0	0.0	0	0.0
Route10	0	0.0	0	0.0
Route11	0	0.0	0	0.0
Route12	0	0.0	0	0.0
Route13	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route20	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route25	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route28	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route30	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
Route33	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV54 and Route: Route01

No glare found

PV54 and Route: Route03

No glare found

PV54 and Route: Route05

No glare found

PV54 and Route: Route07

No glare found

PV54 and Route: Route10

No glare found

PV54 and Route: Route11

No glare found

PV54 and Route: Route12

No glare found

PV54 and Route: Route13

No glare found

PV54 and Route: Route14

No glare found

PV54 and Route: Route18

No glare found

PV54 and Route: Route20

No glare found

PV54 and Route: Route23

No glare found

PV54 and Route: Route25

No glare found

PV54 and Route: Route27

No glare found

PV54 and Route: Route28

No glare found

PV54 and Route: Route29

No glare found

PV54 and Route: Route30

No glare found

PV54 and Route: Route31

No glare found

PV54 and Route: Route32

No glare found

PV54 and Route: Route33

No glare found

PV54 and FP: MASP 12

No glare found

PV54 and FP: MASP 22

No glare found

PV54 and FP: MASP 26

No glare found

PV54 and FP: MASP 30

No glare found

PV54 and FP: MASP 4

No glare found

PV54 and FP: MASP 8

No glare found

PV54 and OP 1

No glare found

PV54 and OP 2

No glare found

PV54 and OP 3

No glare found

PV54 and OP 4

No glare found

PV54 and OP 5

No glare found

PV54 and OP 7

No glare found

PV54 and OP 8

No glare found

PV54 and OP 13

No glare found

PV54 and OP 14

No glare found

PV54 and OP 15

No glare found

PV54 and OP 16

No glare found

PV54 and OP 17

No glare found

PV54 and OP 18

No glare found

PV54 and OP 19

No glare found

PV54 and OP 20

No glare found

PV54 and OP 21

No glare found

PV54 and OP 22

No glare found

PV54 and OP 23

No glare found

PV54 and OP 24

No glare found

PV54 and OP 25

No glare found

PV54 and OP 26

No glare found

PV54 and OP 27

No glare found

PV54 and 32-ATCT

No glare found

PV: PV55 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01	0	0.0	0	0.0
Route03	0	0.0	0	0.0
Route05	0	0.0	0	0.0
Route07	0	0.0	0	0.0
Route10	0	0.0	0	0.0
Route11	0	0.0	0	0.0
Route12	0	0.0	0	0.0
Route13	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route20	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route25	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route28	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route30	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
Route33	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV55 and Route: Route01

No glare found

PV55 and Route: Route03

No glare found

PV55 and Route: Route05

No glare found

PV55 and Route: Route07

No glare found

PV55 and Route: Route10

No glare found

PV55 and Route: Route11

No glare found

PV55 and Route: Route12

No glare found

PV55 and Route: Route13

No glare found

PV55 and Route: Route14

No glare found

PV55 and Route: Route18

No glare found

PV55 and Route: Route20

No glare found

PV55 and Route: Route23

No glare found

PV55 and Route: Route25

No glare found

PV55 and Route: Route27

No glare found

PV55 and Route: Route28

No glare found

PV55 and Route: Route29

No glare found

PV55 and Route: Route30

No glare found

PV55 and Route: Route31

No glare found

PV55 and Route: Route32

No glare found

PV55 and Route: Route33

No glare found

PV55 and FP: MASP 12

No glare found

PV55 and FP: MASP 22

No glare found

PV55 and FP: MASP 26

No glare found

PV55 and FP: MASP 30

No glare found

PV55 and FP: MASP 4

No glare found

PV55 and FP: MASP 8

No glare found

PV55 and OP 1

No glare found

PV55 and OP 2

No glare found

PV55 and OP 3

No glare found

PV55 and OP 4

No glare found

PV55 and OP 5

No glare found

PV55 and OP 7

No glare found

PV55 and OP 8

No glare found

PV55 and OP 13

No glare found

PV55 and OP 14

No glare found

PV55 and OP 15

No glare found

PV55 and OP 16

No glare found

PV55 and OP 17

No glare found

PV55 and OP 18

No glare found

PV55 and OP 19

No glare found

PV55 and OP 20

No glare found

PV55 and OP 21

No glare found

PV55 and OP 22

No glare found

PV55 and OP 23

No glare found

PV55 and OP 24

No glare found

PV55 and OP 25

No glare found

PV55 and OP 26

No glare found

PV55 and OP 27

No glare found

PV55 and 32-ATCT

No glare found

PV: PV56 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01	0	0.0	0	0.0
Route03	0	0.0	0	0.0
Route05	0	0.0	0	0.0
Route07	0	0.0	0	0.0
Route10	0	0.0	0	0.0
Route11	0	0.0	0	0.0
Route12	0	0.0	0	0.0
Route13	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route20	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route25	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route28	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route30	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
Route33	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV56 and Route: Route01

No glare found

PV56 and Route: Route03

No glare found

PV56 and Route: Route05

No glare found

PV56 and Route: Route07

No glare found

PV56 and Route: Route10

No glare found

PV56 and Route: Route11

No glare found

PV56 and Route: Route12

No glare found

PV56 and Route: Route13

No glare found

PV56 and Route: Route14

No glare found

PV56 and Route: Route18

No glare found

PV56 and Route: Route20

No glare found

PV56 and Route: Route23

No glare found

PV56 and Route: Route25

No glare found

PV56 and Route: Route27

No glare found

PV56 and Route: Route28

No glare found

PV56 and Route: Route29

No glare found

PV56 and Route: Route30

No glare found

PV56 and Route: Route31

No glare found

PV56 and Route: Route32

No glare found

PV56 and Route: Route33

No glare found

PV56 and FP: MASP 12

No glare found

PV56 and FP: MASP 22

No glare found

PV56 and FP: MASP 26

No glare found

PV56 and FP: MASP 30

No glare found

PV56 and FP: MASP 4

No glare found

PV56 and FP: MASP 8

No glare found

PV56 and OP 1

No glare found

PV56 and OP 2

No glare found

PV56 and OP 3

No glare found

PV56 and OP 4

No glare found

PV56 and OP 5

No glare found

PV56 and OP 7

No glare found

PV56 and OP 8

No glare found

PV56 and OP 13

No glare found

PV56 and OP 14

No glare found

PV56 and OP 15

No glare found

PV56 and OP 16

No glare found

PV56 and OP 17

No glare found

PV56 and OP 18

No glare found

PV56 and OP 19

No glare found

PV56 and OP 20

No glare found

PV56 and OP 21

No glare found

PV56 and OP 22

No glare found

PV56 and OP 23

No glare found

PV56 and OP 24

No glare found

PV56 and OP 25

No glare found

PV56 and OP 26

No glare found

PV56 and OP 27

No glare found

PV56 and 32-ATCT

No glare found

PV: PV57 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01	0	0.0	0	0.0
Route03	0	0.0	0	0.0
Route05	0	0.0	0	0.0
Route07	0	0.0	0	0.0
Route10	0	0.0	0	0.0
Route11	0	0.0	0	0.0
Route12	0	0.0	0	0.0
Route13	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route20	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route25	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route28	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route30	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
Route33	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV57 and Route: Route01

No glare found

PV57 and Route: Route03

No glare found

PV57 and Route: Route05

No glare found

PV57 and Route: Route07

No glare found

PV57 and Route: Route10

No glare found

PV57 and Route: Route11

No glare found

PV57 and Route: Route12

No glare found

PV57 and Route: Route13

No glare found

PV57 and Route: Route14

No glare found

PV57 and Route: Route18

No glare found

PV57 and Route: Route20

No glare found

PV57 and Route: Route23

No glare found

PV57 and Route: Route25

No glare found

PV57 and Route: Route27

No glare found

PV57 and Route: Route28

No glare found

PV57 and Route: Route29

No glare found

PV57 and Route: Route30

No glare found

PV57 and Route: Route31

No glare found

PV57 and Route: Route32

No glare found

PV57 and Route: Route33

No glare found

PV57 and FP: MASP 12

No glare found

PV57 and FP: MASP 22

No glare found

PV57 and FP: MASP 26

No glare found

PV57 and FP: MASP 30

No glare found

PV57 and FP: MASP 4

No glare found

PV57 and FP: MASP 8

No glare found

PV57 and OP 1

No glare found

PV57 and OP 2

No glare found

PV57 and OP 3

No glare found

PV57 and OP 4

No glare found

PV57 and OP 5

No glare found

PV57 and OP 7

No glare found

PV57 and OP 8

No glare found

PV57 and OP 13

No glare found

PV57 and OP 14

No glare found

PV57 and OP 15

No glare found

PV57 and OP 16

No glare found

PV57 and OP 17

No glare found

PV57 and OP 18

No glare found

PV57 and OP 19

No glare found

PV57 and OP 20

No glare found

PV57 and OP 21

No glare found

PV57 and OP 22

No glare found

PV57 and OP 23

No glare found

PV57 and OP 24

No glare found

PV57 and OP 25

No glare found

PV57 and OP 26

No glare found

PV57 and OP 27

No glare found

PV57 and 32-ATCT

No glare found

PV: PV58 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01	0	0.0	0	0.0
Route03	0	0.0	0	0.0
Route05	0	0.0	0	0.0
Route07	0	0.0	0	0.0
Route10	0	0.0	0	0.0
Route11	0	0.0	0	0.0
Route12	0	0.0	0	0.0
Route13	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route20	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route25	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route28	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route30	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
Route33	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV58 and Route: Route01

No glare found

PV58 and Route: Route03

No glare found

PV58 and Route: Route05

No glare found

PV58 and Route: Route07

No glare found

PV58 and Route: Route10

No glare found

PV58 and Route: Route11

No glare found

PV58 and Route: Route12

No glare found

PV58 and Route: Route13

No glare found

PV58 and Route: Route14

No glare found

PV58 and Route: Route18

No glare found

PV58 and Route: Route20

No glare found

PV58 and Route: Route23

No glare found

PV58 and Route: Route25

No glare found

PV58 and Route: Route27

No glare found

PV58 and Route: Route28

No glare found

PV58 and Route: Route29

No glare found

PV58 and Route: Route30

No glare found

PV58 and Route: Route31

No glare found

PV58 and Route: Route32

No glare found

PV58 and Route: Route33

No glare found

PV58 and FP: MASP 12

No glare found

PV58 and FP: MASP 22

No glare found

PV58 and FP: MASP 26

No glare found

PV58 and FP: MASP 30

No glare found

PV58 and FP: MASP 4

No glare found

PV58 and FP: MASP 8

No glare found

PV58 and OP 1

No glare found

PV58 and OP 2

No glare found

PV58 and OP 3

No glare found

PV58 and OP 4

No glare found

PV58 and OP 5

No glare found

PV58 and OP 7

No glare found

PV58 and OP 8

No glare found

PV58 and OP 13

No glare found

PV58 and OP 14

No glare found

PV58 and OP 15

No glare found

PV58 and OP 16

No glare found

PV58 and OP 17

No glare found

PV58 and OP 18

No glare found

PV58 and OP 19

No glare found

PV58 and OP 20

No glare found

PV58 and OP 21

No glare found

PV58 and OP 22

No glare found

PV58 and OP 23

No glare found

PV58 and OP 24

No glare found

PV58 and OP 25

No glare found

PV58 and OP 26

No glare found

PV58 and OP 27

No glare found

PV58 and 32-ATCT

No glare found

PV: PV59 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01	0	0.0	0	0.0
Route03	0	0.0	0	0.0
Route05	0	0.0	0	0.0
Route07	0	0.0	0	0.0
Route10	0	0.0	0	0.0
Route11	0	0.0	0	0.0
Route12	0	0.0	0	0.0
Route13	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route20	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route25	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route28	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route30	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
Route33	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV59 and Route: Route01

No glare found

PV59 and Route: Route03

No glare found

PV59 and Route: Route05

No glare found

PV59 and Route: Route07

No glare found

PV59 and Route: Route10

No glare found

PV59 and Route: Route11

No glare found

PV59 and Route: Route12

No glare found

PV59 and Route: Route13

No glare found

PV59 and Route: Route14

No glare found

PV59 and Route: Route18

No glare found

PV59 and Route: Route20

No glare found

PV59 and Route: Route23

No glare found

PV59 and Route: Route25

No glare found

PV59 and Route: Route27

No glare found

PV59 and Route: Route28

No glare found

PV59 and Route: Route29

No glare found

PV59 and Route: Route30

No glare found

PV59 and Route: Route31

No glare found

PV59 and Route: Route32

No glare found

PV59 and Route: Route33

No glare found

PV59 and FP: MASP 12

No glare found

PV59 and FP: MASP 22

No glare found

PV59 and FP: MASP 26

No glare found

PV59 and FP: MASP 30

No glare found

PV59 and FP: MASP 4

No glare found

PV59 and FP: MASP 8

No glare found

PV59 and OP 1

No glare found

PV59 and OP 2

No glare found

PV59 and OP 3

No glare found

PV59 and OP 4

No glare found

PV59 and OP 5

No glare found

PV59 and OP 7

No glare found

PV59 and OP 8

No glare found

PV59 and OP 13

No glare found

PV59 and OP 14

No glare found

PV59 and OP 15

No glare found

PV59 and OP 16

No glare found

PV59 and OP 17

No glare found

PV59 and OP 18

No glare found

PV59 and OP 19

No glare found

PV59 and OP 20

No glare found

PV59 and OP 21

No glare found

PV59 and OP 22

No glare found

PV59 and OP 23

No glare found

PV59 and OP 24

No glare found

PV59 and OP 25

No glare found

PV59 and OP 26

No glare found

PV59 and OP 27

No glare found

PV59 and 32-ATCT

No glare found

PV: PV60 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01	0	0.0	0	0.0
Route03	0	0.0	0	0.0
Route05	0	0.0	0	0.0
Route07	0	0.0	0	0.0
Route10	0	0.0	0	0.0
Route11	0	0.0	0	0.0
Route12	0	0.0	0	0.0
Route13	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route20	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route25	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route28	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route30	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
Route33	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV60 and Route: Route01

No glare found

PV60 and Route: Route03

No glare found

PV60 and Route: Route05

No glare found

PV60 and Route: Route07

No glare found

PV60 and Route: Route10

No glare found

PV60 and Route: Route11

No glare found

PV60 and Route: Route12

No glare found

PV60 and Route: Route13

No glare found

PV60 and Route: Route14

No glare found

PV60 and Route: Route18

No glare found

PV60 and Route: Route20

No glare found

PV60 and Route: Route23

No glare found

PV60 and Route: Route25

No glare found

PV60 and Route: Route27

No glare found

PV60 and Route: Route28

No glare found

PV60 and Route: Route29

No glare found

PV60 and Route: Route30

No glare found

PV60 and Route: Route31

No glare found

PV60 and Route: Route32

No glare found

PV60 and Route: Route33

No glare found

PV60 and FP: MASP 12

No glare found

PV60 and FP: MASP 22

No glare found

PV60 and FP: MASP 26

No glare found

PV60 and FP: MASP 30

No glare found

PV60 and FP: MASP 4

No glare found

PV60 and FP: MASP 8

No glare found

PV60 and OP 1

No glare found

PV60 and OP 2

No glare found

PV60 and OP 3

No glare found

PV60 and OP 4

No glare found

PV60 and OP 5

No glare found

PV60 and OP 7

No glare found

PV60 and OP 8

No glare found

PV60 and OP 13

No glare found

PV60 and OP 14

No glare found

PV60 and OP 15

No glare found

PV60 and OP 16

No glare found

PV60 and OP 17

No glare found

PV60 and OP 18

No glare found

PV60 and OP 19

No glare found

PV60 and OP 20

No glare found

PV60 and OP 21

No glare found

PV60 and OP 22

No glare found

PV60 and OP 23

No glare found

PV60 and OP 24

No glare found

PV60 and OP 25

No glare found

PV60 and OP 26

No glare found

PV60 and OP 27

No glare found

PV60 and 32-ATCT

No glare found

Assumptions

"Green" glare is glare with low potential to cause an after-image (flash blindness) when observed prior to a typical blink response time.
"Yellow" glare is glare with potential to cause an after-image (flash blindness) when observed prior to a typical blink response time.
Times associated with glare are denoted in Standard time. For Daylight Savings, add one hour.
The algorithm does not rigorously represent the detailed geometry of a system; detailed features such as gaps between modules, variable height of the PV array, and support structures may impact actual glare results. However, we have validated our models against several systems, including a PV array causing glare to the air-traffic control tower at Manchester-Boston Regional Airport and several sites in Albuquerque, and the tool accurately predicted the occurrence and intensity of glare at different times and days of the year.
Several V1 calculations utilize the PV array centroid, rather than the actual glare spot location, due to algorithm limitations. This may affect results for large PV footprints. Additional analyses of array sub-sections can provide additional information on expected glare. This primarily affects V1 analyses of path receptors.
Random number computations are utilized by various steps of the annual hazard analysis algorithm. Predicted minutes of glare can vary between runs as a result. This limitation primarily affects analyses of Observation Point receptors, including ATCTs. Note that the SGHAT/ ForgeSolar methodology has always relied on an analytical, qualitative approach to accurately determine the overall hazard (i.e. green vs. yellow) of expected glare on an annual basis.
The analysis does not automatically consider obstacles (either man-made or natural) between the observation points and the prescribed solar installation that may obstruct observed glare, such as trees, hills, buildings, etc.
The subtended source angle (glare spot size) is constrained by the PV array footprint size. Partitioning large arrays into smaller sections will reduce the maximum potential subtended angle, potentially impacting results if actual glare spots are larger than the sub-array size. Additional analyses of the combined area of adjacent sub-arrays can provide more information on potential glare hazards. (See previous point on related limitations.)
The variable direct normal irradiance (DNI) feature (if selected) scales the user-prescribed peak DNI using a typical clear-day irradiance profile. This profile has a lower DNI in the mornings and evenings and a maximum at solar noon. The scaling uses a clear-day irradiance profile based on a normalized time relative to sunrise, solar noon, and sunset, which are prescribed by a sun-position algorithm and the latitude and longitude obtained from Google maps. The actual DNI on any given day can be affected by cloud cover, atmospheric attenuation, and other environmental factors.
The ocular hazard predicted by the tool depends on a number of environmental, optical, and human factors, which can be uncertain. We provide input fields and typical ranges of values for these factors so that the user can vary these parameters to see if they have an impact on the results. The speed of SGHAT allows expedited sensitivity and parametric analyses.
The system output calculation is a DNI-based approximation that assumes clear, sunny skies year-round. It should not be used in place of more rigorous modeling methods.
Hazard zone boundaries shown in the Glare Hazard plot are an approximation and visual aid based on aggregated research data. Actual ocular impact outcomes encompass a continuous, not discrete, spectrum.
Glare locations displayed on receptor plots are approximate. Actual glare-spot locations may differ.
Refer to the Help page at **www.forgesolar.com/help/** for assumptions and limitations not listed here.

Default glare analysis parameters and observer eye characteristics (for reference only):

- Analysis time interval: 1 minute
- Ocular transmission coefficient: 0.5
- Pupil diameter: 0.002 meters
- Eye focal length: 0.017 meters
- Sun subtended angle: 9.3 milliradians

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FORGESOLAR GLARE ANALYSIS

Project: **Enterprise Solar South**
Site configuration: **Enterprise Solar Site 4**

Created 30 Jun, 2023
Updated 30 Jun, 2023
Time-step 1 minute
Timezone offset UTC-8
Minimum sun altitude 0.0 deg
DNI peaks at 1,000.0 W/m^2
Category 100 MW to 1 GW
Site ID 94286.16540

Ocular transmission coefficient 0.5
Pupil diameter 0.002 m
Eye focal length 0.017 m
Sun subtended angle 9.3 mrad
PV analysis methodology V2

Summary of Results No glare predicted

PV Array	Tilt	Orient	Annual Green Glare		Annual Yellow Glare		Energy
	°	°	min	hr	min	hr	kWh
PV61	SA tracking	SA tracking	0	0.0	0	0.0	-
PV62	SA tracking	SA tracking	0	0.0	0	0.0	-
PV63	SA tracking	SA tracking	0	0.0	0	0.0	-
PV64	SA tracking	SA tracking	0	0.0	0	0.0	-
PV65	SA tracking	SA tracking	0	0.0	0	0.0	-
PV66	SA tracking	SA tracking	0	0.0	0	0.0	-
PV67	SA tracking	SA tracking	0	0.0	0	0.0	-
PV68	SA tracking	SA tracking	0	0.0	0	0.0	-
PV69	SA tracking	SA tracking	0	0.0	0	0.0	-
PV70	SA tracking	SA tracking	0	0.0	0	0.0	-
PV71	SA tracking	SA tracking	0	0.0	0	0.0	-
PV72	SA tracking	SA tracking	0	0.0	0	0.0	-
PV73	SA tracking	SA tracking	0	0.0	0	0.0	-
PV74	SA tracking	SA tracking	0	0.0	0	0.0	-
PV75	SA tracking	SA tracking	0	0.0	0	0.0	-
PV76	SA tracking	SA tracking	0	0.0	0	0.0	-
PV77	SA tracking	SA tracking	0	0.0	0	0.0	-
PV78	SA tracking	SA tracking	0	0.0	0	0.0	-
PV79	SA tracking	SA tracking	0	0.0	0	0.0	-
PV80	SA tracking	SA tracking	0	0.0	0	0.0	-

Total glare received by each receptor; may include duplicate times of glare from multiple reflective surfaces.

Route03	0	0.0	0	0.0
Route04	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route06	0	0.0	0	0.0
Route08	0	0.0	0	0.0
Route10	0	0.0	0	0.0
Route11	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route19	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route24	0	0.0	0	0.0
Route26	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route28	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route30	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
OP 28	0	0.0	0	0.0
OP 29	0	0.0	0	0.0
OP 30	0	0.0	0	0.0
OP 31	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

Component Data

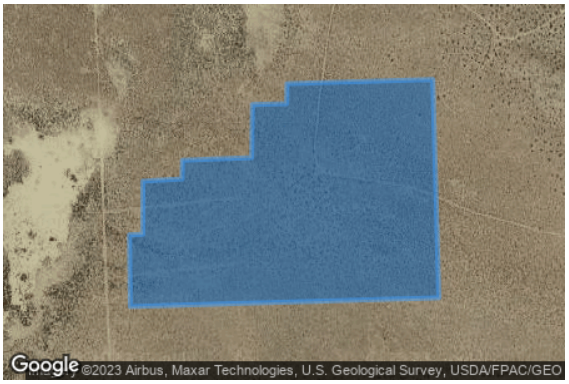
PV Arrays

Name: PV61
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



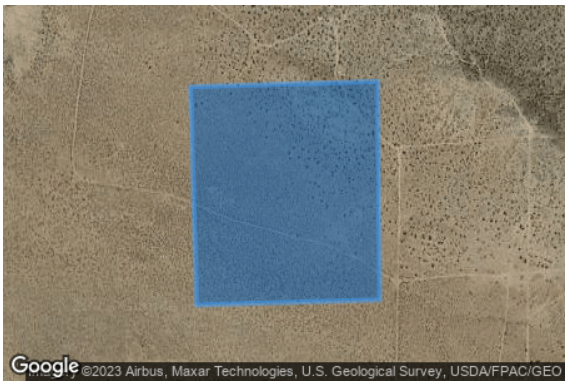
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.002348	-118.075170	2546.86	6.00	2552.86
2	35.003368	-118.075200	2545.85	6.00	2551.85
3	35.003374	-118.075266	2545.00	6.00	2551.00
4	35.004387	-118.075259	2545.72	6.00	2551.72
5	35.004461	-118.071679	2585.31	6.00	2591.31
6	35.003435	-118.071679	2582.72	6.00	2588.72
7	35.003430	-118.071389	2587.59	6.00	2593.59
8	35.003173	-118.071381	2586.85	6.00	2592.85
9	35.003210	-118.069939	2610.26	6.00	2616.26
10	35.002464	-118.069931	2604.33	6.00	2610.33
11	35.002348	-118.075170	2546.86	6.00	2552.86

Name: PV62
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



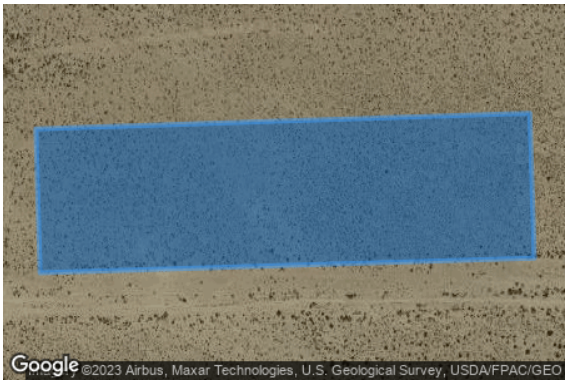
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	34.999225	-118.073039	2561.79	6.00	2567.79
2	34.999102	-118.078341	2544.19	6.00	2550.19
3	35.000110	-118.078357	2542.75	6.00	2548.75
4	35.000116	-118.078125	2543.26	6.00	2549.26
5	35.000862	-118.078126	2543.22	6.00	2549.22
6	35.000892	-118.077452	2544.92	6.00	2550.92
7	35.001154	-118.077445	2544.27	6.00	2550.27
8	35.001191	-118.076256	2546.66	6.00	2552.66
9	35.001936	-118.076243	2544.82	6.00	2550.82
10	35.001948	-118.075656	2546.12	6.00	2552.12
11	35.002229	-118.075649	2545.31	6.00	2551.31
12	35.002287	-118.073144	2561.18	6.00	2567.18
13	34.999225	-118.073039	2561.79	6.00	2567.79

Name: PV63
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



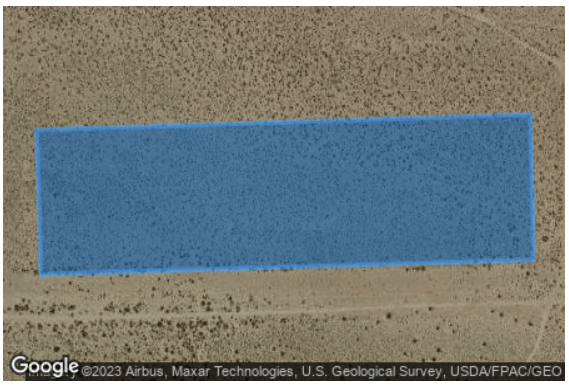
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	34.999225	-118.073039	2561.79	6.00	2567.79
2	35.002287	-118.073144	2561.18	6.00	2567.18
3	35.002363	-118.069924	2603.23	6.00	2609.23
4	34.999298	-118.069892	2568.42	6.00	2574.42
5	34.999225	-118.073039	2561.79	6.00	2567.79

Name: PV64
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	34.998088	-118.074092	2572.62	6.00	2578.62
2	34.997985	-118.078338	2550.71	6.00	2556.71
3	34.998994	-118.078374	2544.68	6.00	2550.68
4	34.999104	-118.074131	2560.20	6.00	2566.20
5	34.998088	-118.074092	2572.62	6.00	2578.62

Name: PV65
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



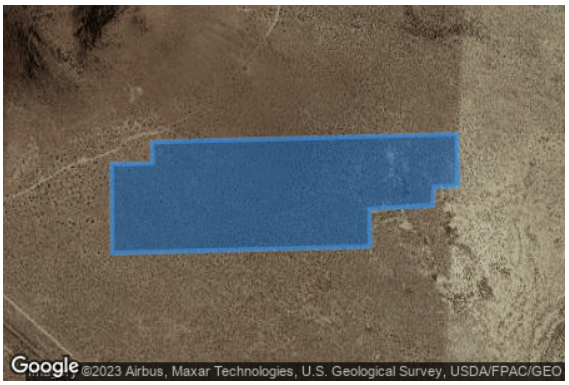
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	34.998088	-118.074092	2572.62	6.00	2578.62
2	34.999104	-118.074131	2560.20	6.00	2566.20
3	34.999214	-118.069887	2568.61	6.00	2574.61
4	34.998191	-118.069861	2573.39	6.00	2579.39
5	34.998088	-118.074092	2572.62	6.00	2578.62

Name: PV66
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	34.994865	-118.094214	2550.32	6.00	2556.32
2	34.995604	-118.094215	2557.66	6.00	2563.66
3	34.995605	-118.093911	2553.60	6.00	2559.60
4	34.995867	-118.093896	2556.81	6.00	2562.81
5	34.995903	-118.093491	2553.31	6.00	2559.31
6	34.996929	-118.093477	2567.38	6.00	2573.38
7	34.997052	-118.088724	2542.43	6.00	2548.43
8	34.996038	-118.088708	2540.76	6.00	2546.76
9	34.996026	-118.088882	2540.20	6.00	2546.20
10	34.994965	-118.088852	2536.87	6.00	2542.87
11	34.994865	-118.094214	2550.32	6.00	2556.32

Name: PV67
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



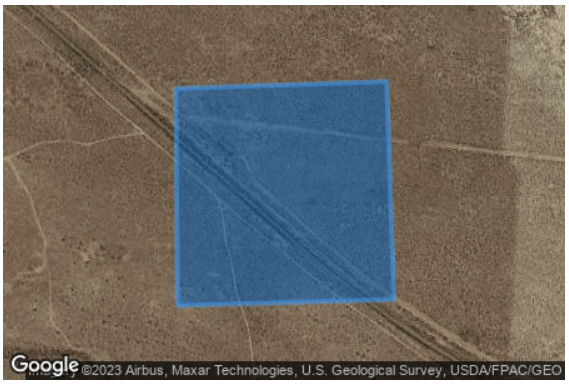
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	34.993280	-118.091625	2533.88	6.00	2539.88
2	34.993186	-118.096054	2553.75	6.00	2559.75
3	34.994434	-118.096068	2567.72	6.00	2573.72
4	34.994447	-118.095358	2559.36	6.00	2565.36
5	34.994745	-118.095373	2561.79	6.00	2567.79
6	34.994856	-118.090127	2535.77	6.00	2541.77
7	34.994129	-118.090112	2534.12	6.00	2540.12
8	34.994117	-118.090532	2534.38	6.00	2540.38
9	34.993854	-118.090547	2534.49	6.00	2540.49
10	34.993806	-118.091633	2534.35	6.00	2540.35
11	34.993280	-118.091625	2533.88	6.00	2539.88

Name: PV68
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	34.993186	-118.096054	2553.75	6.00	2559.75
2	34.993280	-118.091625	2533.88	6.00	2539.88
3	34.992780	-118.091618	2535.14	6.00	2541.14
4	34.992792	-118.091386	2533.83	6.00	2539.83
5	34.992482	-118.091371	2534.44	6.00	2540.44
6	34.992494	-118.091226	2533.69	6.00	2539.69
7	34.991767	-118.091211	2536.46	6.00	2542.46
8	34.991632	-118.096036	2544.96	6.00	2550.96
9	34.993186	-118.096054	2553.75	6.00	2559.75

Name: PV69
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	34.988571	-118.092287	2538.38	6.00	2544.38
2	34.988484	-118.096004	2541.75	6.00	2547.75
3	34.991537	-118.096036	2545.27	6.00	2551.27
4	34.991635	-118.092410	2541.48	6.00	2547.48
5	34.988571	-118.092287	2538.38	6.00	2544.38

Name: PV70
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



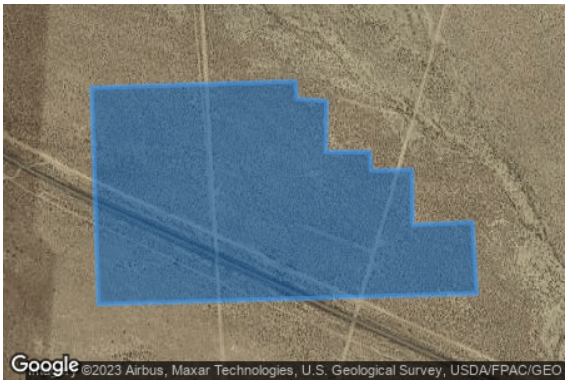
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	34.988571	-118.092287	2538.38	6.00	2544.38
2	34.991635	-118.092410	2541.48	6.00	2547.48
3	34.991696	-118.090167	2533.66	6.00	2539.66
4	34.991410	-118.090153	2535.31	6.00	2541.31
5	34.991422	-118.089805	2533.95	6.00	2539.95
6	34.990671	-118.089775	2535.43	6.00	2541.43
7	34.990695	-118.088761	2532.62	6.00	2538.62
8	34.990409	-118.088731	2534.33	6.00	2540.33
9	34.990421	-118.088369	2533.13	6.00	2539.13
10	34.989694	-118.088339	2532.03	6.00	2538.03
11	34.989707	-118.087339	2529.32	6.00	2535.32
12	34.989432	-118.087325	2530.90	6.00	2536.90
13	34.989420	-118.087122	2528.81	6.00	2534.81
14	34.988693	-118.087078	2531.54	6.00	2537.54
15	34.988571	-118.092287	2538.38	6.00	2544.38

Name: PV71
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



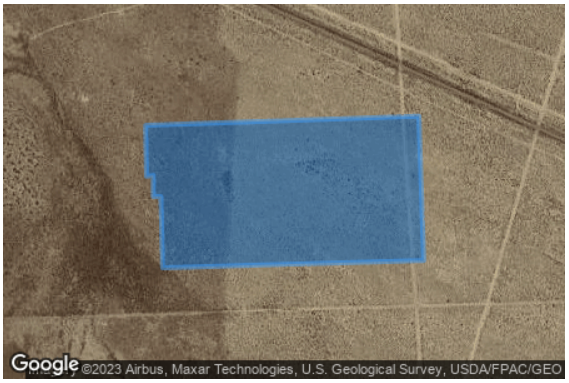
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	34.985492	-118.089321	2530.05	6.00	2536.05
2	34.985422	-118.092378	2537.00	6.00	2543.00
3	34.985672	-118.092392	2536.33	6.00	2542.33
4	34.985696	-118.092639	2535.94	6.00	2541.94
5	34.986435	-118.092654	2538.14	6.00	2544.14
6	34.986435	-118.092712	2538.14	6.00	2544.14
7	34.987449	-118.092728	2541.11	6.00	2547.11
8	34.987363	-118.095944	2540.07	6.00	2546.07
9	34.988364	-118.095960	2541.64	6.00	2547.64
10	34.988532	-118.089440	2534.69	6.00	2540.69
11	34.988532	-118.089436	2534.69	6.00	2540.69
12	34.985492	-118.089321	2530.05	6.00	2536.05

Name: PV72
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	34.985492	-118.089321	2530.05	6.00	2536.05
2	34.988532	-118.089436	2534.69	6.00	2540.69
3	34.988622	-118.085933	2528.96	6.00	2534.96
4	34.988372	-118.085904	2530.22	6.00	2536.22
5	34.988348	-118.085396	2528.25	6.00	2534.25
6	34.987644	-118.085410	2528.71	6.00	2534.71
7	34.987633	-118.085410	2528.81	6.00	2534.81
8	34.987633	-118.084657	2526.67	6.00	2532.67
9	34.987371	-118.084627	2528.21	6.00	2534.21
10	34.987383	-118.083932	2527.66	6.00	2533.66
11	34.986608	-118.083917	2525.65	6.00	2531.65
12	34.986645	-118.082888	2524.02	6.00	2530.02
13	34.985643	-118.082814	2523.40	6.00	2529.40
14	34.985492	-118.089321	2530.05	6.00	2536.05

Name: PV73
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



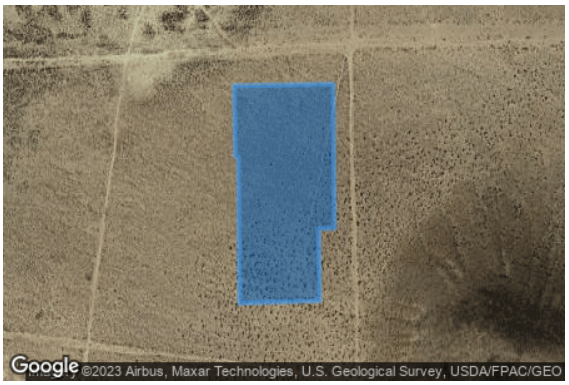
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	34.983409	-118.086883	2523.72	6.00	2529.72
2	34.983306	-118.091368	2530.93	6.00	2536.93
3	34.984307	-118.091398	2532.95	6.00	2538.95
4	34.984307	-118.091529	2532.42	6.00	2538.42
5	34.984605	-118.091529	2532.91	6.00	2538.91
6	34.984593	-118.091645	2533.12	6.00	2539.12
7	34.985309	-118.091660	2534.84	6.00	2540.84
8	34.985437	-118.086965	2525.22	6.00	2531.22
9	34.983409	-118.086883	2523.72	6.00	2529.72

Name: PV74
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



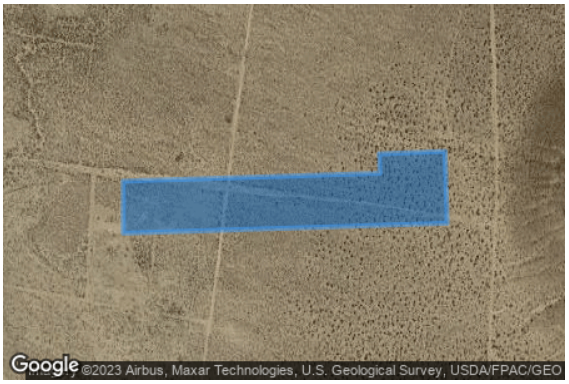
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	34.983409	-118.086883	2523.72	6.00	2529.72
2	34.985437	-118.086965	2525.22	6.00	2531.22
3	34.985566	-118.082271	2521.31	6.00	2527.31
4	34.985304	-118.082242	2521.28	6.00	2527.28
5	34.985292	-118.082111	2520.92	6.00	2526.92
6	34.984552	-118.082081	2519.68	6.00	2525.68
7	34.984553	-118.081487	2518.75	6.00	2524.75
8	34.984279	-118.081458	2519.83	6.00	2525.83
9	34.984267	-118.081212	2518.92	6.00	2524.92
10	34.983539	-118.081197	2516.47	6.00	2522.47
11	34.983409	-118.086883	2523.72	6.00	2529.72

Name: PV75
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	34.997154	-118.080720	2548.49	6.00	2554.49
2	34.997176	-118.079016	2556.19	6.00	2562.19
3	34.995151	-118.078996	2600.01	6.00	2606.01
4	34.995144	-118.079266	2598.23	6.00	2604.23
5	34.994135	-118.079248	2611.52	6.00	2617.52
6	34.994098	-118.080630	2579.12	6.00	2585.12
7	34.996152	-118.080650	2562.28	6.00	2568.28
8	34.996159	-118.080702	2562.28	6.00	2568.28
9	34.997154	-118.080720	2548.49	6.00	2554.49

Name: PV76
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



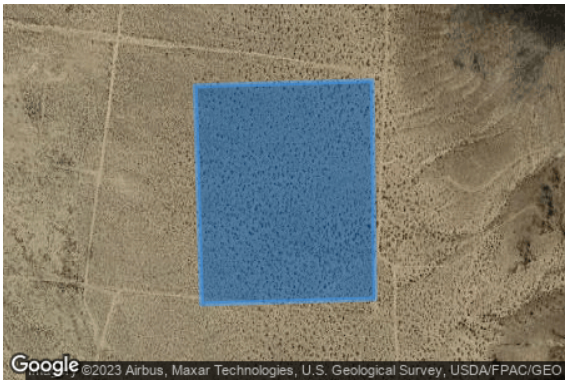
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	34.993984	-118.080630	2577.81	6.00	2583.81
2	34.994021	-118.079500	2608.10	6.00	2614.10
3	34.993012	-118.079464	2605.96	6.00	2611.96
4	34.992872	-118.085029	2531.69	6.00	2537.69
5	34.993602	-118.085029	2536.65	6.00	2542.65
6	34.993712	-118.080621	2577.18	6.00	2583.18
7	34.993984	-118.080630	2577.81	6.00	2583.81

Name: PV77
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



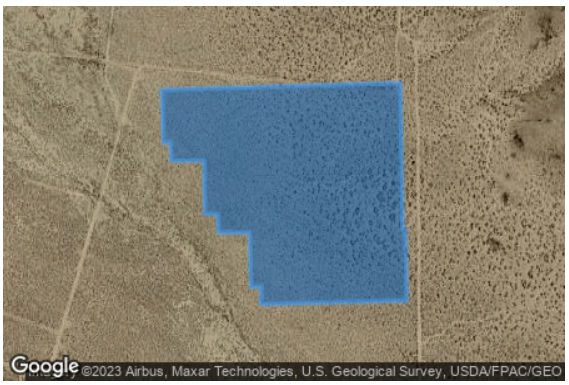
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	34.989786	-118.081797	2543.32	6.00	2549.32
2	34.989746	-118.083478	2527.50	6.00	2533.50
3	34.990018	-118.083478	2528.53	6.00	2534.53
4	34.990032	-118.083643	2527.18	6.00	2533.18
5	34.990762	-118.083661	2529.56	6.00	2535.56
6	34.990762	-118.083983	2527.74	6.00	2533.74
7	34.991027	-118.083992	2528.65	6.00	2534.65
8	34.990967	-118.087192	2530.61	6.00	2536.61
9	34.991690	-118.087218	2532.39	6.00	2538.39
10	34.991749	-118.085010	2529.91	6.00	2535.91
11	34.992772	-118.085028	2531.28	6.00	2537.28
12	34.992846	-118.081905	2554.56	6.00	2560.56
13	34.989786	-118.081797	2543.32	6.00	2549.32

Name: PV78
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



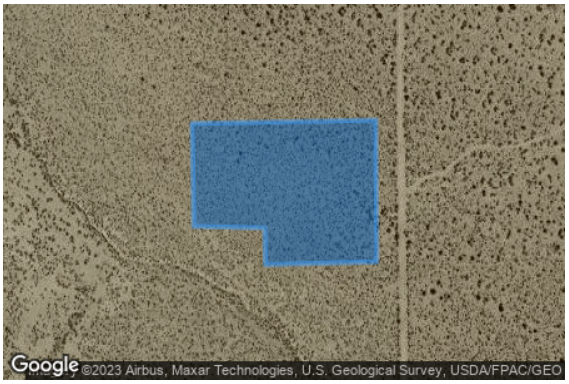
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	34.989786	-118.081797	2543.32	6.00	2549.32
2	34.992846	-118.081905	2554.56	6.00	2560.56
3	34.992919	-118.078864	2620.78	6.00	2626.78
4	34.989857	-118.078818	2582.06	6.00	2588.06
5	34.989786	-118.081797	2543.32	6.00	2549.32

Name: PV79
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	34.989654	-118.082843	2531.63	6.00	2537.63
2	34.989749	-118.078739	2582.59	6.00	2588.59
3	34.987696	-118.078702	2552.81	6.00	2558.81
4	34.987696	-118.078659	2552.81	6.00	2558.81
5	34.986687	-118.078632	2537.60	6.00	2543.60
6	34.986635	-118.081136	2522.80	6.00	2528.80
7	34.986886	-118.081136	2525.16	6.00	2531.16
8	34.986878	-118.081310	2524.27	6.00	2530.27
9	34.987644	-118.081337	2528.11	6.00	2534.11
10	34.987644	-118.081867	2525.11	6.00	2531.11
11	34.987901	-118.081885	2526.74	6.00	2532.74
12	34.987908	-118.082102	2525.66	6.00	2531.66
13	34.988652	-118.082120	2530.78	6.00	2536.78
14	34.988652	-118.082677	2526.60	6.00	2532.60
15	34.988917	-118.082694	2528.30	6.00	2534.30
16	34.988909	-118.082816	2527.44	6.00	2533.44
17	34.989654	-118.082843	2531.63	6.00	2537.63

Name: PV80
Axis tracking: Single-axis rotation
Backtracking: None
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 50.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	34.986551	-118.080214	2528.80	6.00	2534.80
2	34.986576	-118.078635	2535.28	6.00	2541.28
3	34.985580	-118.078627	2522.10	6.00	2528.10
4	34.985562	-118.079583	2519.96	6.00	2525.96
5	34.985818	-118.079590	2522.73	6.00	2528.73
6	34.985830	-118.080199	2520.12	6.00	2526.12
7	34.986551	-118.080214	2528.80	6.00	2534.80

Route Receptors

Name: Route03
Path type: Two-way
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.034033	-118.156782	2681.24	14.00	2695.24
2	35.033504	-118.155530	2678.08	14.00	2692.08
3	35.032485	-118.153847	2672.61	14.00	2686.61
4	35.030056	-118.150444	2665.27	14.00	2679.27
5	35.028485	-118.148260	2657.69	14.00	2671.69
6	35.025018	-118.143464	2641.83	14.00	2655.83
7	35.023170	-118.140898	2636.29	14.00	2650.29
8	35.021094	-118.138019	2629.19	14.00	2643.19
9	35.018750	-118.134756	2618.86	14.00	2632.86
10	35.016664	-118.131900	2612.85	14.00	2626.85
11	35.014911	-118.129473	2608.55	14.00	2622.55
12	35.012911	-118.126664	2601.79	14.00	2615.79
13	35.011110	-118.124157	2597.76	14.00	2611.76
14	35.008595	-118.120674	2590.69	14.00	2604.69
15	35.007042	-118.118538	2588.15	14.00	2602.15
16	35.005438	-118.116328	2585.22	14.00	2599.22

Name: Route04
Path type: Two-way
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.001130	-118.093743	2557.08	14.00	2571.08
2	35.001503	-118.092408	2556.33	14.00	2570.33
3	35.002822	-118.088166	2550.33	14.00	2564.33
4	35.003329	-118.086428	2552.78	14.00	2566.78
5	35.004582	-118.082243	2551.30	14.00	2565.30
6	35.005538	-118.079044	2547.70	14.00	2561.70
7	35.006293	-118.076482	2547.63	14.00	2561.63
8	35.006858	-118.074396	2548.10	14.00	2562.10
9	35.007164	-118.073004	2548.66	14.00	2562.66
10	35.007346	-118.071949	2546.49	14.00	2560.49
11	35.007567	-118.069468	2545.37	14.00	2559.37
12	35.007539	-118.067845	2544.15	14.00	2558.15
13	35.007397	-118.065990	2541.52	14.00	2555.52
14	35.007092	-118.064088	2537.21	14.00	2551.21

Name: Route06
Path type: Two-way
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.005438	-118.116328	2585.22	14.00	2599.22
2	35.004279	-118.114731	2581.20	14.00	2595.20
3	35.003526	-118.113698	2577.63	14.00	2591.63
4	35.002869	-118.112619	2577.33	14.00	2591.33
5	35.002221	-118.111482	2576.12	14.00	2590.12
6	35.001660	-118.110252	2576.70	14.00	2590.70
7	35.001155	-118.108953	2577.01	14.00	2591.01
8	35.000575	-118.107109	2577.07	14.00	2591.07
9	35.000185	-118.105230	2575.06	14.00	2589.06
10	34.999986	-118.103804	2574.07	14.00	2588.07
11	34.999854	-118.102030	2569.61	14.00	2583.61
12	34.999875	-118.100453	2567.06	14.00	2581.06
13	34.999990	-118.099097	2564.95	14.00	2578.95
14	35.000153	-118.097787	2563.68	14.00	2577.68
15	35.000393	-118.096500	2561.75	14.00	2575.75
16	35.000690	-118.095318	2560.63	14.00	2574.63
17	35.001130	-118.093743	2557.08	14.00	2571.08

Name: Route08
Path type: Two-way
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	34.977729	-118.140990	2573.55	3.50	2577.05
2	34.977926	-118.135844	2567.33	3.50	2570.83
3	34.978064	-118.132205	2563.74	3.50	2567.24
4	34.978183	-118.127568	2561.00	3.50	2564.50
5	34.978264	-118.123094	2555.49	3.50	2558.99
6	34.978381	-118.120707	2553.38	3.50	2556.88
7	34.978519	-118.116047	2548.08	3.50	2551.58
8	34.978676	-118.110901	2541.45	3.50	2544.95
9	34.978796	-118.105106	2535.59	3.50	2539.09
10	34.978934	-118.099797	2531.80	3.50	2535.30
11	34.979013	-118.096134	2531.98	3.50	2535.48

Name: Route10
Path type: Two-way
Observer view angle: 50.0°



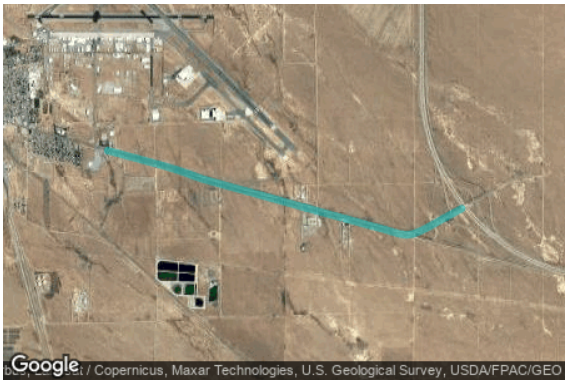
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.046248	-118.027562	2546.95	3.50	2550.45
2	35.045341	-118.027048	2555.26	3.50	2558.76
3	35.044668	-118.026851	2561.15	3.50	2564.65
4	35.044106	-118.026814	2566.92	3.50	2570.42
5	35.042766	-118.026850	2576.55	3.50	2580.05
6	35.041249	-118.026857	2584.15	3.50	2587.65
7	35.038673	-118.026878	2591.83	3.50	2595.33
8	35.035177	-118.026912	2608.11	3.50	2611.61
9	35.031423	-118.026942	2619.40	3.50	2622.90
10	35.028938	-118.027022	2610.30	3.50	2613.80
11	35.028398	-118.027474	2608.46	3.50	2611.96
12	35.028165	-118.028182	2606.14	3.50	2609.64
13	35.028025	-118.033582	2582.87	3.50	2586.37
14	35.023994	-118.033614	2579.82	3.50	2583.32
15	35.022900	-118.033263	2580.80	3.50	2584.30
16	35.022468	-118.033271	2581.03	3.50	2584.53
17	35.021514	-118.033474	2581.91	3.50	2585.41

Name: Route11
Path type: Two-way
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.052109	-118.041973	2545.00	3.50	2548.50
2	35.054017	-118.042511	2547.41	3.50	2550.91
3	35.055770	-118.041134	2550.45	3.50	2553.95
4	35.056176	-118.040844	2545.12	3.50	2548.62
5	35.056343	-118.040888	2544.06	3.50	2547.56
6	35.056510	-118.041018	2543.83	3.50	2547.33
7	35.056557	-118.041250	2543.47	3.50	2546.97
8	35.056486	-118.041540	2543.93	3.50	2547.43
9	35.056295	-118.042077	2545.79	3.50	2549.29
10	35.055531	-118.044179	2583.50	3.50	2587.00
11	35.054302	-118.045658	2550.60	3.50	2554.10

Name: Route14
Path type: Two-way
Observer view angle: 50.0°



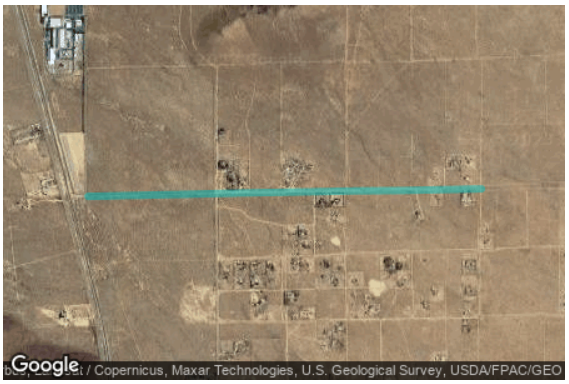
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.037772	-118.107515	2648.38	7.60	2655.98
2	35.036787	-118.109729	2646.58	7.60	2654.18
3	35.035765	-118.111943	2627.76	7.60	2635.36
4	35.035277	-118.113091	2626.00	7.60	2633.60
5	35.034904	-118.114239	2629.08	7.60	2636.68
6	35.034808	-118.115190	2631.55	7.60	2639.15
7	35.034969	-118.116292	2632.51	7.60	2640.11
8	35.035330	-118.117742	2635.15	7.60	2642.75
9	35.035900	-118.120318	2640.47	7.60	2648.07
10	35.036954	-118.124982	2650.18	7.60	2657.78
11	35.038132	-118.130204	2660.80	7.60	2668.40
12	35.038891	-118.133499	2668.04	7.60	2675.64
13	35.040220	-118.139383	2680.46	7.60	2688.06
14	35.040828	-118.142063	2686.12	7.60	2693.72
15	35.041084	-118.143154	2688.52	7.60	2696.12
16	35.041949	-118.146125	2696.35	7.60	2703.95
17	35.042632	-118.148852	2703.92	7.60	2711.52
18	35.043562	-118.152972	2713.48	7.60	2721.08
19	35.044264	-118.156175	2719.34	7.60	2726.94

Name: Route18
Path type: Two-way
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.024698	-118.165092	2678.56	3.50	2682.06
2	35.024708	-118.164466	2675.88	3.50	2679.38
3	35.024770	-118.161439	2669.95	3.50	2673.45
4	35.024850	-118.158540	2664.58	3.50	2668.08
5	35.024911	-118.155455	2658.73	3.50	2662.23
6	35.024992	-118.151860	2652.80	3.50	2656.30
7	35.025042	-118.150097	2651.77	3.50	2655.27
8	35.025004	-118.149610	2651.31	3.50	2654.81
9	35.024890	-118.149494	2649.91	3.50	2653.41

Name: Route19
Path type: Two-way
Observer view angle: 50.0°



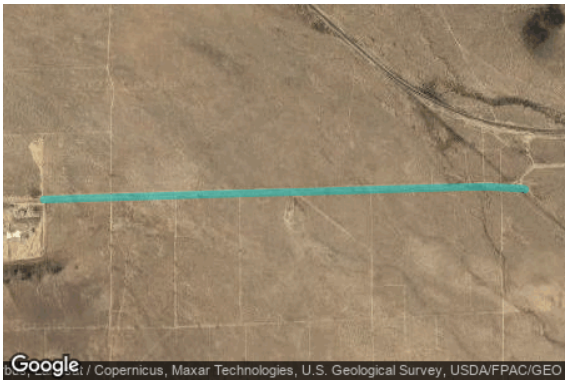
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	34.981303	-118.149917	2592.16	3.50	2595.66
2	34.981418	-118.143310	2582.65	3.50	2586.15
3	34.981494	-118.139384	2575.69	3.50	2579.19
4	34.981546	-118.135486	2573.41	3.50	2576.91
5	34.981610	-118.131675	2568.89	3.50	2572.39
6	34.981638	-118.128097	2564.47	3.50	2567.97
7	34.981727	-118.122881	2563.68	3.50	2567.18

Name: Route23
Path type: One-way (toward increasing index)
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.004682	-118.160128	2651.02	7.60	2658.62
2	35.007744	-118.160491	2658.44	7.60	2666.04
3	35.008967	-118.160650	2660.32	7.60	2667.92
4	35.010398	-118.161079	2661.68	7.60	2669.28
5	35.011671	-118.161473	2661.42	7.60	2669.02
6	35.014174	-118.162269	2675.28	7.60	2682.88
7	35.016592	-118.163065	2681.28	7.60	2688.88
8	35.018652	-118.163739	2678.87	7.60	2686.47
9	35.021362	-118.164605	2676.80	7.60	2684.40
10	35.024702	-118.165691	2679.26	7.60	2686.86
11	35.027477	-118.166609	2682.76	7.60	2690.36
12	35.028936	-118.167108	2685.17	7.60	2692.77
13	35.031246	-118.167852	2690.35	7.60	2697.95
14	35.032648	-118.168290	2693.80	7.60	2701.40
15	35.034515	-118.168920	2698.35	7.60	2705.95
16	35.035695	-118.169349	2714.21	7.60	2721.81
17	35.037405	-118.169713	2736.62	7.60	2744.22

Name: Route24
Path type: Two-way
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	34.996074	-118.136750	2598.88	3.50	2602.38
2	34.996269	-118.129133	2591.82	3.50	2595.32
3	34.996418	-118.123273	2574.02	3.50	2577.52
4	34.996523	-118.118316	2571.50	3.50	2575.00
5	34.996642	-118.113412	2567.43	3.50	2570.93
6	34.996761	-118.108561	2563.28	3.50	2566.78
7	34.996792	-118.106213	2563.21	3.50	2566.71
8	34.996679	-118.103760	2563.48	3.50	2566.98
9	34.996643	-118.103655	2562.27	3.50	2565.77

Name: Route26
Path type: One-way (toward increasing index)
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	34.972570	-118.159397	2630.61	7.60	2638.21
2	34.975154	-118.159193	2629.18	7.60	2636.78
3	34.977451	-118.159006	2619.34	7.60	2626.94
4	34.979655	-118.158837	2622.17	7.60	2629.77
5	34.980478	-118.158795	2624.34	7.60	2631.94
6	34.981358	-118.158788	2626.14	7.60	2633.74
7	34.982402	-118.158816	2628.34	7.60	2635.94
8	34.984248	-118.158906	2631.41	7.60	2639.01
9	34.987668	-118.159096	2638.62	7.60	2646.22
10	34.989650	-118.159204	2641.46	7.60	2649.06
11	34.992619	-118.159366	2644.94	7.60	2652.54
12	34.994637	-118.159466	2647.24	7.60	2654.84
13	34.998587	-118.159656	2649.61	7.60	2657.21
14	34.999810	-118.159719	2649.17	7.60	2656.77
15	35.002300	-118.159880	2647.63	7.60	2655.23
16	35.004425	-118.160119	2650.01	7.60	2657.61
17	35.004682	-118.160128	2651.02	7.60	2658.62

Name: Route27
Path type: One-way (toward increasing index)
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.037411	-118.169805	2738.77	7.60	2746.37
2	35.036288	-118.169724	2726.45	7.60	2734.05
3	35.035051	-118.169391	2706.14	7.60	2713.74
4	35.031911	-118.168367	2692.88	7.60	2700.48
5	35.029615	-118.167632	2688.93	7.60	2696.53
6	35.027884	-118.167071	2685.42	7.60	2693.02
7	35.025310	-118.166214	2680.85	7.60	2688.45
8	35.023450	-118.165610	2677.92	7.60	2685.52
9	35.021533	-118.164997	2677.74	7.60	2685.34
10	35.019888	-118.164463	2678.93	7.60	2686.53
11	35.017149	-118.163579	2681.31	7.60	2688.91
12	35.015440	-118.163028	2679.78	7.60	2687.38
13	35.012772	-118.162162	2669.07	7.60	2676.67
14	35.011349	-118.161707	2663.84	7.60	2671.44
15	35.009918	-118.161269	2661.83	7.60	2669.43
16	35.009167	-118.161015	2660.49	7.60	2668.09
17	35.008473	-118.160875	2659.21	7.60	2666.81
18	35.008323	-118.160852	2658.91	7.60	2666.51

Name: Route28
Path type: Two-way
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.098479	-118.143662	2905.89	7.60	2913.49
2	35.093889	-118.133754	2836.33	7.60	2843.93
3	35.091139	-118.128363	2820.90	7.60	2828.50
4	35.087528	-118.122344	2780.55	7.60	2788.15
5	35.082980	-118.118219	2757.17	7.60	2764.77
6	35.078527	-118.115406	2743.41	7.60	2751.01
7	35.072706	-118.113452	2726.39	7.60	2733.99
8	35.068452	-118.112980	2715.77	7.60	2723.37
9	35.062556	-118.112945	2699.01	7.60	2706.61
10	35.057194	-118.112921	2680.69	7.60	2688.29
11	35.052080	-118.112939	2678.08	7.60	2685.68
12	35.050561	-118.112879	2673.03	7.60	2680.63
13	35.047584	-118.112405	2660.57	7.60	2668.17
14	35.043843	-118.111197	2644.93	7.60	2652.53
15	35.040884	-118.109439	2635.04	7.60	2642.64
16	35.039306	-118.108327	2633.17	7.60	2640.77
17	35.037962	-118.107122	2625.68	7.60	2633.28

Name: Route29
Path type: Two-way
Observer view angle: 50.0°



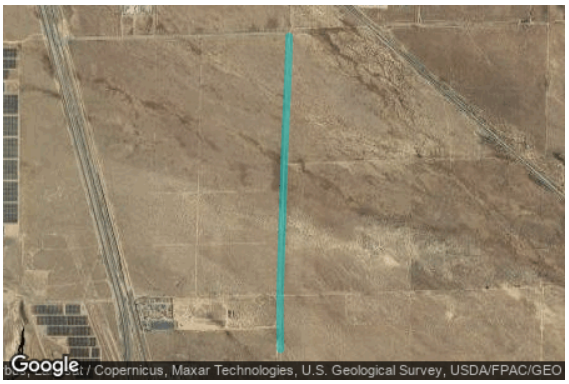
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.037962	-118.107122	2625.68	7.60	2633.28
2	35.036614	-118.105689	2620.36	7.60	2627.96
3	35.034386	-118.102715	2612.60	7.60	2620.20
4	35.032532	-118.099378	2602.75	7.60	2610.35
5	35.031237	-118.096102	2597.16	7.60	2604.76
6	35.030281	-118.092496	2589.56	7.60	2597.16
7	35.029384	-118.086780	2581.36	7.60	2588.96
8	35.028274	-118.079558	2570.47	7.60	2578.07
9	35.027071	-118.071579	2558.86	7.60	2566.46
10	35.026268	-118.066221	2553.25	7.60	2560.85
11	35.025268	-118.059848	2548.02	7.60	2555.62
12	35.024048	-118.051734	2541.66	7.60	2549.26
13	35.023052	-118.045084	2545.17	7.60	2552.77
14	35.021757	-118.036691	2567.39	7.60	2574.99
15	35.020696	-118.029670	2603.92	7.60	2611.52
16	35.020115	-118.025994	2633.18	7.60	2640.78
17	35.019843	-118.024280	2649.71	7.60	2657.31
18	35.019569	-118.022222	2655.43	7.60	2663.03
19	35.019462	-118.020337	2658.73	7.60	2666.33

Name: Route30
Path type: One-way (toward increasing index)
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.037008	-118.108836	2650.38	7.60	2657.98
2	35.036769	-118.108639	2646.35	7.60	2653.95
3	35.036359	-118.108348	2643.79	7.60	2651.39
4	35.036112	-118.108070	2642.67	7.60	2650.27
5	35.035883	-118.107594	2639.61	7.60	2647.21
6	35.035540	-118.106561	2632.55	7.60	2640.15
7	35.034779	-118.104205	2616.98	7.60	2624.58
8	35.034513	-118.103532	2613.65	7.60	2621.25
9	35.034417	-118.103300	2615.05	7.60	2622.65

Name: Route31
Path type: Two-way
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	35.024890	-118.149494	2649.91	3.50	2653.41
2	35.024508	-118.149493	2649.68	3.50	2653.18
3	35.022733	-118.149571	2645.88	3.50	2649.38
4	35.020148	-118.149717	2642.77	3.50	2646.27
5	35.018154	-118.149818	2640.29	3.50	2643.79
6	35.016169	-118.149895	2640.05	3.50	2643.55
7	35.014462	-118.149962	2641.25	3.50	2644.75
8	35.012572	-118.150040	2636.74	3.50	2640.24
9	35.010416	-118.150117	2633.44	3.50	2636.94
10	35.008493	-118.150113	2630.14	3.50	2633.64
11	35.007291	-118.150088	2629.53	3.50	2633.03

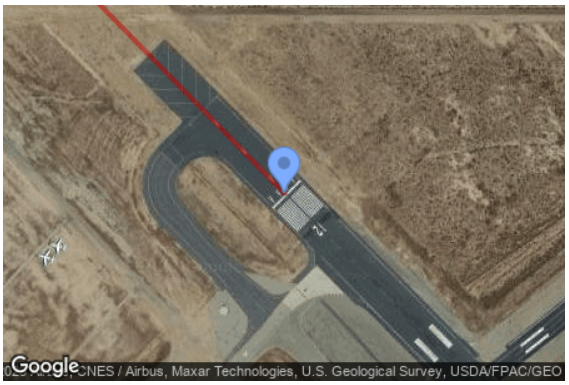
Name: Route32
Path type: Two-way
Observer view angle: 50.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	34.993461	-118.155078	2631.04	14.00	2645.04
2	34.997382	-118.156361	2639.79	14.00	2653.79
3	35.002401	-118.158008	2643.04	14.00	2657.04
4	35.006025	-118.159174	2643.43	14.00	2657.43
5	35.009064	-118.160137	2655.99	14.00	2669.99
6	35.010495	-118.160603	2658.54	14.00	2672.54
7	35.013189	-118.161507	2668.56	14.00	2682.56
8	35.018744	-118.163330	2677.33	14.00	2691.33
9	35.024727	-118.165241	2678.70	14.00	2692.70
10	35.030240	-118.167027	2687.13	14.00	2701.13
11	35.032233	-118.167680	2691.78	14.00	2705.78
12	35.034458	-118.168415	2696.20	14.00	2710.20
13	35.036696	-118.169151	2702.17	14.00	2716.17
14	35.037891	-118.169518	2707.02	14.00	2721.02

Flight Path Receptors

Name: MASP 12
Description: None
Threshold height: 50 ft
Direction: 135.6°
Glide slope: 3.0°
Pilot view restricted? Yes
Vertical view: 30.0°
Azimuthal view: 50.0°



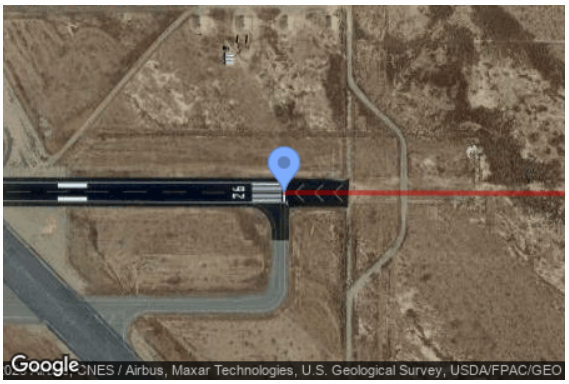
Point	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
Threshold	35.067997	-118.159056	2793.00	50.00	2843.00
Two-mile	35.088637	-118.183823	3014.80	381.60	3396.40

Name: MASP 22
Description: None
Threshold height: 50 ft
Direction: 232.5°
Glide slope: 3.0°
Pilot view restricted? Yes
Vertical view: 30.0°
Azimuthal view: 50.0°



Point	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
Threshold	35.067800	-118.151866	2778.90	50.00	2828.90
Two-mile	35.085397	-118.123804	2778.10	604.20	3382.30

Name: MASP 26
Description: None
Threshold height: 50 ft
Direction: 270.2°
Glide slope: 3.0°
Pilot view restricted? Yes
Vertical view: 30.0°
Azimuthal view: 50.0°



Point	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
Threshold	35.059183	-118.142549	2730.80	50.00	2780.80
Two-mile	35.059102	-118.107186	2677.40	656.90	3334.30

Name: MASP 30
Description: None
Threshold height: 50 ft
Direction: 314.8°
Glide slope: 3.0°
Pilot view restricted? Yes
Vertical view: 30.0°
Azimuthal view: 50.0°



Point	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
Threshold	35.046580	-118.133135	2681.00	50.00	2731.00
Two-mile	35.026204	-118.108051	2594.70	689.70	3284.40

Name: MASP 4
Description: None
Threshold height: 50 ft
Direction: 51.1°
Glide slope: 3.0°
Pilot view restricted? Yes
Vertical view: 30.0°
Azimuthal view: 50.0°



Point	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
Threshold	35.059748	-118.164297	2777.80	50.00	2827.80
Two-mile	35.041580	-118.191806	2772.90	608.30	3381.20

Name: MASP 8
Description: None
Threshold height: 50 ft
Direction: 90.1°
Glide slope: 3.0°
Pilot view restricted? Yes
Vertical view: 30.0°
Azimuthal view: 50.0°

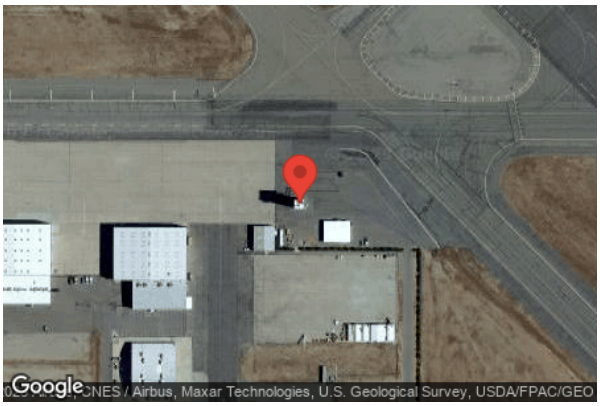


Point	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
Threshold	35.059242	-118.166076	2778.50	50.00	2828.50
Two-mile	35.059272	-118.201439	2921.10	460.80	3381.90

Discrete Observation Point Receptors

Name	ID	Latitude (°)	Longitude (°)	Elevation (ft)	Height (ft)
OP 27	27	35.002810	-118.152089	2625.07	5.50
OP 28	28	34.993743	-118.175576	2714.36	5.50
OP 29	29	34.983147	-118.124635	2571.61	5.50
OP 30	30	34.982955	-118.136111	2574.96	5.50
OP 31	31	34.977801	-118.101938	2541.27	5.50
32-ATCT	32	35.057003	-118.149446	2742.00	85.00

Map image of 32-ATCT



Glare Analysis Results

Summary of Results No glare predicted

PV Array	Tilt	Orient	Annual Green Glare		Annual Yellow Glare		Energy
	°	°	min	hr	min	hr	kWh
PV61	SA tracking	SA tracking	0	0.0	0	0.0	-
PV62	SA tracking	SA tracking	0	0.0	0	0.0	-
PV63	SA tracking	SA tracking	0	0.0	0	0.0	-
PV64	SA tracking	SA tracking	0	0.0	0	0.0	-
PV65	SA tracking	SA tracking	0	0.0	0	0.0	-
PV66	SA tracking	SA tracking	0	0.0	0	0.0	-
PV67	SA tracking	SA tracking	0	0.0	0	0.0	-
PV68	SA tracking	SA tracking	0	0.0	0	0.0	-
PV69	SA tracking	SA tracking	0	0.0	0	0.0	-
PV70	SA tracking	SA tracking	0	0.0	0	0.0	-
PV71	SA tracking	SA tracking	0	0.0	0	0.0	-
PV72	SA tracking	SA tracking	0	0.0	0	0.0	-
PV73	SA tracking	SA tracking	0	0.0	0	0.0	-
PV74	SA tracking	SA tracking	0	0.0	0	0.0	-
PV75	SA tracking	SA tracking	0	0.0	0	0.0	-
PV76	SA tracking	SA tracking	0	0.0	0	0.0	-
PV77	SA tracking	SA tracking	0	0.0	0	0.0	-
PV78	SA tracking	SA tracking	0	0.0	0	0.0	-
PV79	SA tracking	SA tracking	0	0.0	0	0.0	-
PV80	SA tracking	SA tracking	0	0.0	0	0.0	-

Total glare received by each receptor; may include duplicate times of glare from multiple reflective surfaces.

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route03	0	0.0	0	0.0
Route04	0	0.0	0	0.0
Route06	0	0.0	0	0.0
Route08	0	0.0	0	0.0
Route10	0	0.0	0	0.0
Route11	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route19	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route24	0	0.0	0	0.0
Route26	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route28	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route30	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
OP 28	0	0.0	0	0.0
OP 29	0	0.0	0	0.0
OP 30	0	0.0	0	0.0
OP 31	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV: PV61 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route03	0	0.0	0	0.0
Route04	0	0.0	0	0.0
Route06	0	0.0	0	0.0
Route08	0	0.0	0	0.0
Route10	0	0.0	0	0.0
Route11	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route19	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route24	0	0.0	0	0.0
Route26	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route28	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route30	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
OP 28	0	0.0	0	0.0
OP 29	0	0.0	0	0.0
OP 30	0	0.0	0	0.0
OP 31	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV61 and Route: Route03

No glare found

PV61 and Route: Route04

No glare found

PV61 and Route: Route06

No glare found

PV61 and Route: Route08

No glare found

PV61 and Route: Route10

No glare found

PV61 and Route: Route11

No glare found

PV61 and Route: Route14

No glare found

PV61 and Route: Route18

No glare found

PV61 and Route: Route19

No glare found

PV61 and Route: Route23

No glare found

PV61 and Route: Route24

No glare found

PV61 and Route: Route26

No glare found

PV61 and Route: Route27

No glare found

PV61 and Route: Route28

No glare found

PV61 and Route: Route29

No glare found

PV61 and Route: Route30

No glare found

PV61 and Route: Route31

No glare found

PV61 and Route: Route32

No glare found

PV61 and FP: MASP 12

No glare found

PV61 and FP: MASP 22

No glare found

PV61 and FP: MASP 26

No glare found

PV61 and FP: MASP 30

No glare found

PV61 and FP: MASP 4

No glare found

PV61 and FP: MASP 8

No glare found

PV61 and OP 27

No glare found

PV61 and OP 28

No glare found

PV61 and OP 29

No glare found

PV61 and OP 30

No glare found

PV61 and OP 31

No glare found

PV61 and 32-ATCT

No glare found

PV: PV62 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route03	0	0.0	0	0.0
Route04	0	0.0	0	0.0
Route06	0	0.0	0	0.0
Route08	0	0.0	0	0.0
Route10	0	0.0	0	0.0
Route11	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route19	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route24	0	0.0	0	0.0
Route26	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route28	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route30	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
OP 28	0	0.0	0	0.0
OP 29	0	0.0	0	0.0
OP 30	0	0.0	0	0.0
OP 31	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV62 and Route: Route03

No glare found

PV62 and Route: Route04

No glare found

PV62 and Route: Route06

No glare found

PV62 and Route: Route08

No glare found

PV62 and Route: Route10

No glare found

PV62 and Route: Route11

No glare found

PV62 and Route: Route14

No glare found

PV62 and Route: Route18

No glare found

PV62 and Route: Route19

No glare found

PV62 and Route: Route23

No glare found

PV62 and Route: Route24

No glare found

PV62 and Route: Route26

No glare found

PV62 and Route: Route27

No glare found

PV62 and Route: Route28

No glare found

PV62 and Route: Route29

No glare found

PV62 and Route: Route30

No glare found

PV62 and Route: Route31

No glare found

PV62 and Route: Route32

No glare found

PV62 and FP: MASP 12

No glare found

PV62 and FP: MASP 22

No glare found

PV62 and FP: MASP 26

No glare found

PV62 and FP: MASP 30

No glare found

PV62 and FP: MASP 4

No glare found

PV62 and FP: MASP 8

No glare found

PV62 and OP 27

No glare found

PV62 and OP 28

No glare found

PV62 and OP 29

No glare found

PV62 and OP 30

No glare found

PV62 and OP 31

No glare found

PV62 and 32-ATCT

No glare found

PV: PV63 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route03	0	0.0	0	0.0
Route04	0	0.0	0	0.0
Route06	0	0.0	0	0.0
Route08	0	0.0	0	0.0
Route10	0	0.0	0	0.0
Route11	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route19	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route24	0	0.0	0	0.0
Route26	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route28	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route30	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
OP 28	0	0.0	0	0.0
OP 29	0	0.0	0	0.0
OP 30	0	0.0	0	0.0
OP 31	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV63 and Route: Route03

No glare found

PV63 and Route: Route04

No glare found

PV63 and Route: Route06

No glare found

PV63 and Route: Route08

No glare found

PV63 and Route: Route10

No glare found

PV63 and Route: Route11

No glare found

PV63 and Route: Route14

No glare found

PV63 and Route: Route18

No glare found

PV63 and Route: Route19

No glare found

PV63 and Route: Route23

No glare found

PV63 and Route: Route24

No glare found

PV63 and Route: Route26

No glare found

PV63 and Route: Route27

No glare found

PV63 and Route: Route28

No glare found

PV63 and Route: Route29

No glare found

PV63 and Route: Route30

No glare found

PV63 and Route: Route31

No glare found

PV63 and Route: Route32

No glare found

PV63 and FP: MASP 12

No glare found

PV63 and FP: MASP 22

No glare found

PV63 and FP: MASP 26

No glare found

PV63 and FP: MASP 30

No glare found

PV63 and FP: MASP 4

No glare found

PV63 and FP: MASP 8

No glare found

PV63 and OP 27

No glare found

PV63 and OP 28

No glare found

PV63 and OP 29

No glare found

PV63 and OP 30

No glare found

PV63 and OP 31

No glare found

PV63 and 32-ATCT

No glare found

PV: PV64 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route03	0	0.0	0	0.0
Route04	0	0.0	0	0.0
Route06	0	0.0	0	0.0
Route08	0	0.0	0	0.0
Route10	0	0.0	0	0.0
Route11	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route19	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route24	0	0.0	0	0.0
Route26	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route28	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route30	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
OP 28	0	0.0	0	0.0
OP 29	0	0.0	0	0.0
OP 30	0	0.0	0	0.0
OP 31	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV64 and Route: Route03

No glare found

PV64 and Route: Route04

No glare found

PV64 and Route: Route06

No glare found

PV64 and Route: Route08

No glare found

PV64 and Route: Route10

No glare found

PV64 and Route: Route11

No glare found

PV64 and Route: Route14

No glare found

PV64 and Route: Route18

No glare found

PV64 and Route: Route19

No glare found

PV64 and Route: Route23

No glare found

PV64 and Route: Route24

No glare found

PV64 and Route: Route26

No glare found

PV64 and Route: Route27

No glare found

PV64 and Route: Route28

No glare found

PV64 and Route: Route29

No glare found

PV64 and Route: Route30

No glare found

PV64 and Route: Route31

No glare found

PV64 and Route: Route32

No glare found

PV64 and FP: MASP 12

No glare found

PV64 and FP: MASP 22

No glare found

PV64 and FP: MASP 26

No glare found

PV64 and FP: MASP 30

No glare found

PV64 and FP: MASP 4

No glare found

PV64 and FP: MASP 8

No glare found

PV64 and OP 27

No glare found

PV64 and OP 28

No glare found

PV64 and OP 29

No glare found

PV64 and OP 30

No glare found

PV64 and OP 31

No glare found

PV64 and 32-ATCT

No glare found

PV: PV65 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route03	0	0.0	0	0.0
Route04	0	0.0	0	0.0
Route06	0	0.0	0	0.0
Route08	0	0.0	0	0.0
Route10	0	0.0	0	0.0
Route11	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route19	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route24	0	0.0	0	0.0
Route26	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route28	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route30	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
OP 28	0	0.0	0	0.0
OP 29	0	0.0	0	0.0
OP 30	0	0.0	0	0.0
OP 31	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV65 and Route: Route03

No glare found

PV65 and Route: Route04

No glare found

PV65 and Route: Route06

No glare found

PV65 and Route: Route08

No glare found

PV65 and Route: Route10

No glare found

PV65 and Route: Route11

No glare found

PV65 and Route: Route14

No glare found

PV65 and Route: Route18

No glare found

PV65 and Route: Route19

No glare found

PV65 and Route: Route23

No glare found

PV65 and Route: Route24

No glare found

PV65 and Route: Route26

No glare found

PV65 and Route: Route27

No glare found

PV65 and Route: Route28

No glare found

PV65 and Route: Route29

No glare found

PV65 and Route: Route30

No glare found

PV65 and Route: Route31

No glare found

PV65 and Route: Route32

No glare found

PV65 and FP: MASP 12

No glare found

PV65 and FP: MASP 22

No glare found

PV65 and FP: MASP 26

No glare found

PV65 and FP: MASP 30

No glare found

PV65 and FP: MASP 4

No glare found

PV65 and FP: MASP 8

No glare found

PV65 and OP 27

No glare found

PV65 and OP 28

No glare found

PV65 and OP 29

No glare found

PV65 and OP 30

No glare found

PV65 and OP 31

No glare found

PV65 and 32-ATCT

No glare found

PV: PV66 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route03	0	0.0	0	0.0
Route04	0	0.0	0	0.0
Route06	0	0.0	0	0.0
Route08	0	0.0	0	0.0
Route10	0	0.0	0	0.0
Route11	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route19	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route24	0	0.0	0	0.0
Route26	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route28	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route30	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
OP 28	0	0.0	0	0.0
OP 29	0	0.0	0	0.0
OP 30	0	0.0	0	0.0
OP 31	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV66 and Route: Route03

No glare found

PV66 and Route: Route04

No glare found

PV66 and Route: Route06

No glare found

PV66 and Route: Route08

No glare found

PV66 and Route: Route10

No glare found

PV66 and Route: Route11

No glare found

PV66 and Route: Route14

No glare found

PV66 and Route: Route18

No glare found

PV66 and Route: Route19

No glare found

PV66 and Route: Route23

No glare found

PV66 and Route: Route24

No glare found

PV66 and Route: Route26

No glare found

PV66 and Route: Route27

No glare found

PV66 and Route: Route28

No glare found

PV66 and Route: Route29

No glare found

PV66 and Route: Route30

No glare found

PV66 and Route: Route31

No glare found

PV66 and Route: Route32

No glare found

PV66 and FP: MASP 12

No glare found

PV66 and FP: MASP 22

No glare found

PV66 and FP: MASP 26

No glare found

PV66 and FP: MASP 30

No glare found

PV66 and FP: MASP 4

No glare found

PV66 and FP: MASP 8

No glare found

PV66 and OP 27

No glare found

PV66 and OP 28

No glare found

PV66 and OP 29

No glare found

PV66 and OP 30

No glare found

PV66 and OP 31

No glare found

PV66 and 32-ATCT

No glare found

PV: PV67 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route03	0	0.0	0	0.0
Route04	0	0.0	0	0.0
Route06	0	0.0	0	0.0
Route08	0	0.0	0	0.0
Route10	0	0.0	0	0.0
Route11	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route19	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route24	0	0.0	0	0.0
Route26	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route28	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route30	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
OP 28	0	0.0	0	0.0
OP 29	0	0.0	0	0.0
OP 30	0	0.0	0	0.0
OP 31	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV67 and Route: Route03

No glare found

PV67 and Route: Route04

No glare found

PV67 and Route: Route06

No glare found

PV67 and Route: Route08

No glare found

PV67 and Route: Route10

No glare found

PV67 and Route: Route11

No glare found

PV67 and Route: Route14

No glare found

PV67 and Route: Route18

No glare found

PV67 and Route: Route19

No glare found

PV67 and Route: Route23

No glare found

PV67 and Route: Route24

No glare found

PV67 and Route: Route26

No glare found

PV67 and Route: Route27

No glare found

PV67 and Route: Route28

No glare found

PV67 and Route: Route29

No glare found

PV67 and Route: Route30

No glare found

PV67 and Route: Route31

No glare found

PV67 and Route: Route32

No glare found

PV67 and FP: MASP 12

No glare found

PV67 and FP: MASP 22

No glare found

PV67 and FP: MASP 26

No glare found

PV67 and FP: MASP 30

No glare found

PV67 and FP: MASP 4

No glare found

PV67 and FP: MASP 8

No glare found

PV67 and OP 27

No glare found

PV67 and OP 28

No glare found

PV67 and OP 29

No glare found

PV67 and OP 30

No glare found

PV67 and OP 31

No glare found

PV67 and 32-ATCT

No glare found

PV: PV68 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route03	0	0.0	0	0.0
Route04	0	0.0	0	0.0
Route06	0	0.0	0	0.0
Route08	0	0.0	0	0.0
Route10	0	0.0	0	0.0
Route11	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route19	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route24	0	0.0	0	0.0
Route26	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route28	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route30	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
OP 28	0	0.0	0	0.0
OP 29	0	0.0	0	0.0
OP 30	0	0.0	0	0.0
OP 31	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV68 and Route: Route03

No glare found

PV68 and Route: Route04

No glare found

PV68 and Route: Route06

No glare found

PV68 and Route: Route08

No glare found

PV68 and Route: Route10

No glare found

PV68 and Route: Route11

No glare found

PV68 and Route: Route14

No glare found

PV68 and Route: Route18

No glare found

PV68 and Route: Route19

No glare found

PV68 and Route: Route23

No glare found

PV68 and Route: Route24

No glare found

PV68 and Route: Route26

No glare found

PV68 and Route: Route27

No glare found

PV68 and Route: Route28

No glare found

PV68 and Route: Route29

No glare found

PV68 and Route: Route30

No glare found

PV68 and Route: Route31

No glare found

PV68 and Route: Route32

No glare found

PV68 and FP: MASP 12

No glare found

PV68 and FP: MASP 22

No glare found

PV68 and FP: MASP 26

No glare found

PV68 and FP: MASP 30

No glare found

PV68 and FP: MASP 4

No glare found

PV68 and FP: MASP 8

No glare found

PV68 and OP 27

No glare found

PV68 and OP 28

No glare found

PV68 and OP 29

No glare found

PV68 and OP 30

No glare found

PV68 and OP 31

No glare found

PV68 and 32-ATCT

No glare found

PV: PV69 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route03	0	0.0	0	0.0
Route04	0	0.0	0	0.0
Route06	0	0.0	0	0.0
Route08	0	0.0	0	0.0
Route10	0	0.0	0	0.0
Route11	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route19	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route24	0	0.0	0	0.0
Route26	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route28	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route30	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
OP 28	0	0.0	0	0.0
OP 29	0	0.0	0	0.0
OP 30	0	0.0	0	0.0
OP 31	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV69 and Route: Route03

No glare found

PV69 and Route: Route04

No glare found

PV69 and Route: Route06

No glare found

PV69 and Route: Route08

No glare found

PV69 and Route: Route10

No glare found

PV69 and Route: Route11

No glare found

PV69 and Route: Route14

No glare found

PV69 and Route: Route18

No glare found

PV69 and Route: Route19

No glare found

PV69 and Route: Route23

No glare found

PV69 and Route: Route24

No glare found

PV69 and Route: Route26

No glare found

PV69 and Route: Route27

No glare found

PV69 and Route: Route28

No glare found

PV69 and Route: Route29

No glare found

PV69 and Route: Route30

No glare found

PV69 and Route: Route31

No glare found

PV69 and Route: Route32

No glare found

PV69 and FP: MASP 12

No glare found

PV69 and FP: MASP 22

No glare found

PV69 and FP: MASP 26

No glare found

PV69 and FP: MASP 30

No glare found

PV69 and FP: MASP 4

No glare found

PV69 and FP: MASP 8

No glare found

PV69 and OP 27

No glare found

PV69 and OP 28

No glare found

PV69 and OP 29

No glare found

PV69 and OP 30

No glare found

PV69 and OP 31

No glare found

PV69 and 32-ATCT

No glare found

PV: PV70 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route03	0	0.0	0	0.0
Route04	0	0.0	0	0.0
Route06	0	0.0	0	0.0
Route08	0	0.0	0	0.0
Route10	0	0.0	0	0.0
Route11	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route19	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route24	0	0.0	0	0.0
Route26	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route28	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route30	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
OP 28	0	0.0	0	0.0
OP 29	0	0.0	0	0.0
OP 30	0	0.0	0	0.0
OP 31	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV70 and Route: Route03

No glare found

PV70 and Route: Route04

No glare found

PV70 and Route: Route06

No glare found

PV70 and Route: Route08

No glare found

PV70 and Route: Route10

No glare found

PV70 and Route: Route11

No glare found

PV70 and Route: Route14

No glare found

PV70 and Route: Route18

No glare found

PV70 and Route: Route19

No glare found

PV70 and Route: Route23

No glare found

PV70 and Route: Route24

No glare found

PV70 and Route: Route26

No glare found

PV70 and Route: Route27

No glare found

PV70 and Route: Route28

No glare found

PV70 and Route: Route29

No glare found

PV70 and Route: Route30

No glare found

PV70 and Route: Route31

No glare found

PV70 and Route: Route32

No glare found

PV70 and FP: MASP 12

No glare found

PV70 and FP: MASP 22

No glare found

PV70 and FP: MASP 26

No glare found

PV70 and FP: MASP 30

No glare found

PV70 and FP: MASP 4

No glare found

PV70 and FP: MASP 8

No glare found

PV70 and OP 27

No glare found

PV70 and OP 28

No glare found

PV70 and OP 29

No glare found

PV70 and OP 30

No glare found

PV70 and OP 31

No glare found

PV70 and 32-ATCT

No glare found

PV: PV71 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route03	0	0.0	0	0.0
Route04	0	0.0	0	0.0
Route06	0	0.0	0	0.0
Route08	0	0.0	0	0.0
Route10	0	0.0	0	0.0
Route11	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route19	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route24	0	0.0	0	0.0
Route26	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route28	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route30	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
OP 28	0	0.0	0	0.0
OP 29	0	0.0	0	0.0
OP 30	0	0.0	0	0.0
OP 31	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV71 and Route: Route03

No glare found

PV71 and Route: Route04

No glare found

PV71 and Route: Route06

No glare found

PV71 and Route: Route08

No glare found

PV71 and Route: Route10

No glare found

PV71 and Route: Route11

No glare found

PV71 and Route: Route14

No glare found

PV71 and Route: Route18

No glare found

PV71 and Route: Route19

No glare found

PV71 and Route: Route23

No glare found

PV71 and Route: Route24

No glare found

PV71 and Route: Route26

No glare found

PV71 and Route: Route27

No glare found

PV71 and Route: Route28

No glare found

PV71 and Route: Route29

No glare found

PV71 and Route: Route30

No glare found

PV71 and Route: Route31

No glare found

PV71 and Route: Route32

No glare found

PV71 and FP: MASP 12

No glare found

PV71 and FP: MASP 22

No glare found

PV71 and FP: MASP 26

No glare found

PV71 and FP: MASP 30

No glare found

PV71 and FP: MASP 4

No glare found

PV71 and FP: MASP 8

No glare found

PV71 and OP 27

No glare found

PV71 and OP 28

No glare found

PV71 and OP 29

No glare found

PV71 and OP 30

No glare found

PV71 and OP 31

No glare found

PV71 and 32-ATCT

No glare found

PV: PV72 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route03	0	0.0	0	0.0
Route04	0	0.0	0	0.0
Route06	0	0.0	0	0.0
Route08	0	0.0	0	0.0
Route10	0	0.0	0	0.0
Route11	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route19	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route24	0	0.0	0	0.0
Route26	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route28	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route30	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
OP 28	0	0.0	0	0.0
OP 29	0	0.0	0	0.0
OP 30	0	0.0	0	0.0
OP 31	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV72 and Route: Route03

No glare found

PV72 and Route: Route04

No glare found

PV72 and Route: Route06

No glare found

PV72 and Route: Route08

No glare found

PV72 and Route: Route10

No glare found

PV72 and Route: Route11

No glare found

PV72 and Route: Route14

No glare found

PV72 and Route: Route18

No glare found

PV72 and Route: Route19

No glare found

PV72 and Route: Route23

No glare found

PV72 and Route: Route24

No glare found

PV72 and Route: Route26

No glare found

PV72 and Route: Route27

No glare found

PV72 and Route: Route28

No glare found

PV72 and Route: Route29

No glare found

PV72 and Route: Route30

No glare found

PV72 and Route: Route31

No glare found

PV72 and Route: Route32

No glare found

PV72 and FP: MASP 12

No glare found

PV72 and FP: MASP 22

No glare found

PV72 and FP: MASP 26

No glare found

PV72 and FP: MASP 30

No glare found

PV72 and FP: MASP 4

No glare found

PV72 and FP: MASP 8

No glare found

PV72 and OP 27

No glare found

PV72 and OP 28

No glare found

PV72 and OP 29

No glare found

PV72 and OP 30

No glare found

PV72 and OP 31

No glare found

PV72 and 32-ATCT

No glare found

PV: PV73 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route03	0	0.0	0	0.0
Route04	0	0.0	0	0.0
Route06	0	0.0	0	0.0
Route08	0	0.0	0	0.0
Route10	0	0.0	0	0.0
Route11	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route19	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route24	0	0.0	0	0.0
Route26	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route28	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route30	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
OP 28	0	0.0	0	0.0
OP 29	0	0.0	0	0.0
OP 30	0	0.0	0	0.0
OP 31	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV73 and Route: Route03

No glare found

PV73 and Route: Route04

No glare found

PV73 and Route: Route06

No glare found

PV73 and Route: Route08

No glare found

PV73 and Route: Route10

No glare found

PV73 and Route: Route11

No glare found

PV73 and Route: Route14

No glare found

PV73 and Route: Route18

No glare found

PV73 and Route: Route19

No glare found

PV73 and Route: Route23

No glare found

PV73 and Route: Route24

No glare found

PV73 and Route: Route26

No glare found

PV73 and Route: Route27

No glare found

PV73 and Route: Route28

No glare found

PV73 and Route: Route29

No glare found

PV73 and Route: Route30

No glare found

PV73 and Route: Route31

No glare found

PV73 and Route: Route32

No glare found

PV73 and FP: MASP 12

No glare found

PV73 and FP: MASP 22

No glare found

PV73 and FP: MASP 26

No glare found

PV73 and FP: MASP 30

No glare found

PV73 and FP: MASP 4

No glare found

PV73 and FP: MASP 8

No glare found

PV73 and OP 27

No glare found

PV73 and OP 28

No glare found

PV73 and OP 29

No glare found

PV73 and OP 30

No glare found

PV73 and OP 31

No glare found

PV73 and 32-ATCT

No glare found

PV: PV74 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route03	0	0.0	0	0.0
Route04	0	0.0	0	0.0
Route06	0	0.0	0	0.0
Route08	0	0.0	0	0.0
Route10	0	0.0	0	0.0
Route11	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route19	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route24	0	0.0	0	0.0
Route26	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route28	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route30	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
OP 28	0	0.0	0	0.0
OP 29	0	0.0	0	0.0
OP 30	0	0.0	0	0.0
OP 31	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV74 and Route: Route03

No glare found

PV74 and Route: Route04

No glare found

PV74 and Route: Route06

No glare found

PV74 and Route: Route08

No glare found

PV74 and Route: Route10

No glare found

PV74 and Route: Route11

No glare found

PV74 and Route: Route14

No glare found

PV74 and Route: Route18

No glare found

PV74 and Route: Route19

No glare found

PV74 and Route: Route23

No glare found

PV74 and Route: Route24

No glare found

PV74 and Route: Route26

No glare found

PV74 and Route: Route27

No glare found

PV74 and Route: Route28

No glare found

PV74 and Route: Route29

No glare found

PV74 and Route: Route30

No glare found

PV74 and Route: Route31

No glare found

PV74 and Route: Route32

No glare found

PV74 and FP: MASP 12

No glare found

PV74 and FP: MASP 22

No glare found

PV74 and FP: MASP 26

No glare found

PV74 and FP: MASP 30

No glare found

PV74 and FP: MASP 4

No glare found

PV74 and FP: MASP 8

No glare found

PV74 and OP 27

No glare found

PV74 and OP 28

No glare found

PV74 and OP 29

No glare found

PV74 and OP 30

No glare found

PV74 and OP 31

No glare found

PV74 and 32-ATCT

No glare found

PV: PV75 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route03	0	0.0	0	0.0
Route04	0	0.0	0	0.0
Route06	0	0.0	0	0.0
Route08	0	0.0	0	0.0
Route10	0	0.0	0	0.0
Route11	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route19	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route24	0	0.0	0	0.0
Route26	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route28	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route30	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
OP 28	0	0.0	0	0.0
OP 29	0	0.0	0	0.0
OP 30	0	0.0	0	0.0
OP 31	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV75 and Route: Route03

No glare found

PV75 and Route: Route04

No glare found

PV75 and Route: Route06

No glare found

PV75 and Route: Route08

No glare found

PV75 and Route: Route10

No glare found

PV75 and Route: Route11

No glare found

PV75 and Route: Route14

No glare found

PV75 and Route: Route18

No glare found

PV75 and Route: Route19

No glare found

PV75 and Route: Route23

No glare found

PV75 and Route: Route24

No glare found

PV75 and Route: Route26

No glare found

PV75 and Route: Route27

No glare found

PV75 and Route: Route28

No glare found

PV75 and Route: Route29

No glare found

PV75 and Route: Route30

No glare found

PV75 and Route: Route31

No glare found

PV75 and Route: Route32

No glare found

PV75 and FP: MASP 12

No glare found

PV75 and FP: MASP 22

No glare found

PV75 and FP: MASP 26

No glare found

PV75 and FP: MASP 30

No glare found

PV75 and FP: MASP 4

No glare found

PV75 and FP: MASP 8

No glare found

PV75 and OP 27

No glare found

PV75 and OP 28

No glare found

PV75 and OP 29

No glare found

PV75 and OP 30

No glare found

PV75 and OP 31

No glare found

PV75 and 32-ATCT

No glare found

PV: PV76 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route03	0	0.0	0	0.0
Route04	0	0.0	0	0.0
Route06	0	0.0	0	0.0
Route08	0	0.0	0	0.0
Route10	0	0.0	0	0.0
Route11	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route19	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route24	0	0.0	0	0.0
Route26	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route28	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route30	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
OP 28	0	0.0	0	0.0
OP 29	0	0.0	0	0.0
OP 30	0	0.0	0	0.0
OP 31	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV76 and Route: Route03

No glare found

PV76 and Route: Route04

No glare found

PV76 and Route: Route06

No glare found

PV76 and Route: Route08

No glare found

PV76 and Route: Route10

No glare found

PV76 and Route: Route11

No glare found

PV76 and Route: Route14

No glare found

PV76 and Route: Route18

No glare found

PV76 and Route: Route19

No glare found

PV76 and Route: Route23

No glare found

PV76 and Route: Route24

No glare found

PV76 and Route: Route26

No glare found

PV76 and Route: Route27

No glare found

PV76 and Route: Route28

No glare found

PV76 and Route: Route29

No glare found

PV76 and Route: Route30

No glare found

PV76 and Route: Route31

No glare found

PV76 and Route: Route32

No glare found

PV76 and FP: MASP 12

No glare found

PV76 and FP: MASP 22

No glare found

PV76 and FP: MASP 26

No glare found

PV76 and FP: MASP 30

No glare found

PV76 and FP: MASP 4

No glare found

PV76 and FP: MASP 8

No glare found

PV76 and OP 27

No glare found

PV76 and OP 28

No glare found

PV76 and OP 29

No glare found

PV76 and OP 30

No glare found

PV76 and OP 31

No glare found

PV76 and 32-ATCT

No glare found

PV: PV77 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route03	0	0.0	0	0.0
Route04	0	0.0	0	0.0
Route06	0	0.0	0	0.0
Route08	0	0.0	0	0.0
Route10	0	0.0	0	0.0
Route11	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route19	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route24	0	0.0	0	0.0
Route26	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route28	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route30	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
OP 28	0	0.0	0	0.0
OP 29	0	0.0	0	0.0
OP 30	0	0.0	0	0.0
OP 31	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV77 and Route: Route03

No glare found

PV77 and Route: Route04

No glare found

PV77 and Route: Route06

No glare found

PV77 and Route: Route08

No glare found

PV77 and Route: Route10

No glare found

PV77 and Route: Route11

No glare found

PV77 and Route: Route14

No glare found

PV77 and Route: Route18

No glare found

PV77 and Route: Route19

No glare found

PV77 and Route: Route23

No glare found

PV77 and Route: Route24

No glare found

PV77 and Route: Route26

No glare found

PV77 and Route: Route27

No glare found

PV77 and Route: Route28

No glare found

PV77 and Route: Route29

No glare found

PV77 and Route: Route30

No glare found

PV77 and Route: Route31

No glare found

PV77 and Route: Route32

No glare found

PV77 and FP: MASP 12

No glare found

PV77 and FP: MASP 22

No glare found

PV77 and FP: MASP 26

No glare found

PV77 and FP: MASP 30

No glare found

PV77 and FP: MASP 4

No glare found

PV77 and FP: MASP 8

No glare found

PV77 and OP 27

No glare found

PV77 and OP 28

No glare found

PV77 and OP 29

No glare found

PV77 and OP 30

No glare found

PV77 and OP 31

No glare found

PV77 and 32-ATCT

No glare found

PV: PV78 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route03	0	0.0	0	0.0
Route04	0	0.0	0	0.0
Route06	0	0.0	0	0.0
Route08	0	0.0	0	0.0
Route10	0	0.0	0	0.0
Route11	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route19	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route24	0	0.0	0	0.0
Route26	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route28	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route30	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
OP 28	0	0.0	0	0.0
OP 29	0	0.0	0	0.0
OP 30	0	0.0	0	0.0
OP 31	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV78 and Route: Route03

No glare found

PV78 and Route: Route04

No glare found

PV78 and Route: Route06

No glare found

PV78 and Route: Route08

No glare found

PV78 and Route: Route10

No glare found

PV78 and Route: Route11

No glare found

PV78 and Route: Route14

No glare found

PV78 and Route: Route18

No glare found

PV78 and Route: Route19

No glare found

PV78 and Route: Route23

No glare found

PV78 and Route: Route24

No glare found

PV78 and Route: Route26

No glare found

PV78 and Route: Route27

No glare found

PV78 and Route: Route28

No glare found

PV78 and Route: Route29

No glare found

PV78 and Route: Route30

No glare found

PV78 and Route: Route31

No glare found

PV78 and Route: Route32

No glare found

PV78 and FP: MASP 12

No glare found

PV78 and FP: MASP 22

No glare found

PV78 and FP: MASP 26

No glare found

PV78 and FP: MASP 30

No glare found

PV78 and FP: MASP 4

No glare found

PV78 and FP: MASP 8

No glare found

PV78 and OP 27

No glare found

PV78 and OP 28

No glare found

PV78 and OP 29

No glare found

PV78 and OP 30

No glare found

PV78 and OP 31

No glare found

PV78 and 32-ATCT

No glare found

PV: PV79 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route03	0	0.0	0	0.0
Route04	0	0.0	0	0.0
Route06	0	0.0	0	0.0
Route08	0	0.0	0	0.0
Route10	0	0.0	0	0.0
Route11	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route19	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route24	0	0.0	0	0.0
Route26	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route28	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route30	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
OP 28	0	0.0	0	0.0
OP 29	0	0.0	0	0.0
OP 30	0	0.0	0	0.0
OP 31	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV79 and Route: Route03

No glare found

PV79 and Route: Route04

No glare found

PV79 and Route: Route06

No glare found

PV79 and Route: Route08

No glare found

PV79 and Route: Route10

No glare found

PV79 and Route: Route11

No glare found

PV79 and Route: Route14

No glare found

PV79 and Route: Route18

No glare found

PV79 and Route: Route19

No glare found

PV79 and Route: Route23

No glare found

PV79 and Route: Route24

No glare found

PV79 and Route: Route26

No glare found

PV79 and Route: Route27

No glare found

PV79 and Route: Route28

No glare found

PV79 and Route: Route29

No glare found

PV79 and Route: Route30

No glare found

PV79 and Route: Route31

No glare found

PV79 and Route: Route32

No glare found

PV79 and FP: MASP 12

No glare found

PV79 and FP: MASP 22

No glare found

PV79 and FP: MASP 26

No glare found

PV79 and FP: MASP 30

No glare found

PV79 and FP: MASP 4

No glare found

PV79 and FP: MASP 8

No glare found

PV79 and OP 27

No glare found

PV79 and OP 28

No glare found

PV79 and OP 29

No glare found

PV79 and OP 30

No glare found

PV79 and OP 31

No glare found

PV79 and 32-ATCT

No glare found

PV: PV80 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route03	0	0.0	0	0.0
Route04	0	0.0	0	0.0
Route06	0	0.0	0	0.0
Route08	0	0.0	0	0.0
Route10	0	0.0	0	0.0
Route11	0	0.0	0	0.0
Route14	0	0.0	0	0.0
Route18	0	0.0	0	0.0
Route19	0	0.0	0	0.0
Route23	0	0.0	0	0.0
Route24	0	0.0	0	0.0
Route26	0	0.0	0	0.0
Route27	0	0.0	0	0.0
Route28	0	0.0	0	0.0
Route29	0	0.0	0	0.0
Route30	0	0.0	0	0.0
Route31	0	0.0	0	0.0
Route32	0	0.0	0	0.0
MASP 12	0	0.0	0	0.0
MASP 22	0	0.0	0	0.0
MASP 26	0	0.0	0	0.0
MASP 30	0	0.0	0	0.0
MASP 4	0	0.0	0	0.0
MASP 8	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
OP 28	0	0.0	0	0.0
OP 29	0	0.0	0	0.0
OP 30	0	0.0	0	0.0
OP 31	0	0.0	0	0.0
32-ATCT	0	0.0	0	0.0

PV80 and Route: Route03

No glare found

PV80 and Route: Route04

No glare found

PV80 and Route: Route06

No glare found

PV80 and Route: Route08

No glare found

PV80 and Route: Route10

No glare found

PV80 and Route: Route11

No glare found

PV80 and Route: Route14

No glare found

PV80 and Route: Route18

No glare found

PV80 and Route: Route19

No glare found

PV80 and Route: Route23

No glare found

PV80 and Route: Route24

No glare found

PV80 and Route: Route26

No glare found

PV80 and Route: Route27

No glare found

PV80 and Route: Route28

No glare found

PV80 and Route: Route29

No glare found

PV80 and Route: Route30

No glare found

PV80 and Route: Route31

No glare found

PV80 and Route: Route32

No glare found

PV80 and FP: MASP 12

No glare found

PV80 and FP: MASP 22

No glare found

PV80 and FP: MASP 26

No glare found

PV80 and FP: MASP 30

No glare found

PV80 and FP: MASP 4

No glare found

PV80 and FP: MASP 8

No glare found

PV80 and OP 27

No glare found

PV80 and OP 28

No glare found

PV80 and OP 29

No glare found

PV80 and OP 30

No glare found

PV80 and OP 31

No glare found

PV80 and 32-ATCT

No glare found

Assumptions

"Green" glare is glare with low potential to cause an after-image (flash blindness) when observed prior to a typical blink response time.
"Yellow" glare is glare with potential to cause an after-image (flash blindness) when observed prior to a typical blink response time.
Times associated with glare are denoted in Standard time. For Daylight Savings, add one hour.
The algorithm does not rigorously represent the detailed geometry of a system; detailed features such as gaps between modules, variable height of the PV array, and support structures may impact actual glare results. However, we have validated our models against several systems, including a PV array causing glare to the air-traffic control tower at Manchester-Boston Regional Airport and several sites in Albuquerque, and the tool accurately predicted the occurrence and intensity of glare at different times and days of the year.
Several V1 calculations utilize the PV array centroid, rather than the actual glare spot location, due to algorithm limitations. This may affect results for large PV footprints. Additional analyses of array sub-sections can provide additional information on expected glare. This primarily affects V1 analyses of path receptors.
Random number computations are utilized by various steps of the annual hazard analysis algorithm. Predicted minutes of glare can vary between runs as a result. This limitation primarily affects analyses of Observation Point receptors, including ATCTs. Note that the SGHAT/ ForgeSolar methodology has always relied on an analytical, qualitative approach to accurately determine the overall hazard (i.e. green vs. yellow) of expected glare on an annual basis.
The analysis does not automatically consider obstacles (either man-made or natural) between the observation points and the prescribed solar installation that may obstruct observed glare, such as trees, hills, buildings, etc.
The subtended source angle (glare spot size) is constrained by the PV array footprint size. Partitioning large arrays into smaller sections will reduce the maximum potential subtended angle, potentially impacting results if actual glare spots are larger than the sub-array size. Additional analyses of the combined area of adjacent sub-arrays can provide more information on potential glare hazards. (See previous point on related limitations.)
The variable direct normal irradiance (DNI) feature (if selected) scales the user-prescribed peak DNI using a typical clear-day irradiance profile. This profile has a lower DNI in the mornings and evenings and a maximum at solar noon. The scaling uses a clear-day irradiance profile based on a normalized time relative to sunrise, solar noon, and sunset, which are prescribed by a sun-position algorithm and the latitude and longitude obtained from Google maps. The actual DNI on any given day can be affected by cloud cover, atmospheric attenuation, and other environmental factors.
The ocular hazard predicted by the tool depends on a number of environmental, optical, and human factors, which can be uncertain. We provide input fields and typical ranges of values for these factors so that the user can vary these parameters to see if they have an impact on the results. The speed of SGHAT allows expedited sensitivity and parametric analyses.
The system output calculation is a DNI-based approximation that assumes clear, sunny skies year-round. It should not be used in place of more rigorous modeling methods.
Hazard zone boundaries shown in the Glare Hazard plot are an approximation and visual aid based on aggregated research data. Actual ocular impact outcomes encompass a continuous, not discrete, spectrum.
Glare locations displayed on receptor plots are approximate. Actual glare-spot locations may differ.
Refer to the Help page at **www.forgesolar.com/help/** for assumptions and limitations not listed here.

Default glare analysis parameters and observer eye characteristics (for reference only):

- Analysis time interval: 1 minute
- Ocular transmission coefficient: 0.5
- Pupil diameter: 0.002 meters
- Eye focal length: 0.017 meters
- Sun subtended angle: 9.3 milliradians

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Appendix C
10-Year Farming History Memorandum

Jacobs

Memorandum

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Subject	Draft 10-Year Farming History Memorandum
Project Name	Enterprise Solar Storage Project
From	Lindsey Xayachack/Jacobs
Date	March 26, 2023
Copies to	Jerry Salamy, Jessica Otten/Jacobs

1. Introduction

The purpose of this memorandum is to provide the previous ten-year farming history for the Enterprise Solar Storage Project (Project) proposed by Enterprise Solar Storage, LLC (Applicant). The Project is located on approximately 2,300 acres adjacent to the County-approved Sanborn Solar Project that is currently under construction. The Project is in an unincorporated area in southeastern Kern County, California, at the western edge of the Antelope Valley and south of the community of Mojave as shown on Figure 1. Based on this evaluation, no agricultural activity has occurred within the Project site within the last ten years, and the area is designated by the DOC as Nonagricultural or Natural Vegetation.

2. Project Description

Enterprise Solar Storage, LLC (Enterprise Solar or Applicant) is proposing to construct the Enterprise Solar Storage Project (Project). The proposed Project consists of a photovoltaic (PV) solar energy generation facility with battery energy storage capacity. The Project includes approximately 600-megawatts (MW) of solar energy and up to 4 gigawatt-hours of battery energy storage capacity. The Project is located on approximately 2,300 acres adjacent to the County-approved Sanborn Solar Project that is currently under construction.

The Project will interconnect to the Windhub Substation, which is owned and operated by Southern California Edison (SCE). The interconnect will be via a newly constructed gen-tie line that will be co-located within a portion of the Sanborn Solar gen-tie corridor (which was reviewed for California Environmental Quality Act purposes by the Kern County Planning and Natural Resources Department as part of the Sanborn Solar Conditional Use Permit in 2019) to the Windhub Substation. A new 230 kilovolt (kV) to 500 kV substation, up to 15 acres in size, will be constructed north of the Windhub Substation on private land and would interconnect to SCE's facilitates from the north.

The Project is requesting CEQA coverage for additional substation areas and an alternate gen-tie line route that may extend from the new substation to the southern portion of the Windhub substation along the eastern perimeter. Additionally, SCE will relocate approximately 1 mile of existing 66 kV Coram-Goldtown

transmission line to avoid interrupting the Project solar array. The Project will not physically interconnect into this line.

2.1 Project Location

The Project is located in an unincorporated area in southeastern Kern County, California, at the western edge of the Antelope Valley and south of the community of Mojave. The Project is generally located on undeveloped land, some of which has been used for grazing, and consists entirely of privately owned parcels. The Project site boundary is depicted in Figure 1. The Project site lies within the Sanborn, Mojave, and Bissell U.S. Geological Survey 7.5-minute quadrangles:

- Section 6, Township 10 North, Range 11 West
- Section 17, Township 11 North, Range 13 West
- Sections 20-26, Section 28 and Section 36, Township 11 North, Range 12-13 West
- Section 30 and Section 32, Township 11 North, Range 11 West

Elevations across the Project site are relatively flat, ranging from approximately 2,520 feet above mean sea level in the southeast corner, to approximately 2,715 feet above mean sea level in the northwest portion of the site.

3. Farming History

No farming has occurred within the last 10 years on the Project site (between the years 2012 and 2021), based on review of historic publicly available aerial imagery dating back to 2012 (Google Earth, 2022). In addition, the available Kern County Department of Agricultural and Measurement Standards published permit and use data indicates that there were no agricultural-related permits issued for the Project site in the since 2016 (Kern County 2022a).

4. Farmland

4.1 California Department of Conservation Farmland Mapping and Monitoring Program

According to the California Department of Conservation (DOC) Farmland Mapping and Monitoring Program, the Project site is designated as Grazing Land or Nonagricultural or Natural Vegetation, as shown on Figures 2a and 2b. Outside of the Project boundary, most of the areas adjacent to the site are also designated as Grazing Land or Nonagricultural or Natural Vegetation, with small areas of Semi-Agricultural and Rural Commercial Land and Vacant or Disturbed Land scattered throughout the vicinity. There are no areas within the Project designated by the DOC as Prime Farmland, Farmland of Statewide Importance, or Unique Farmland (DOC, 2022).

4.2 California Land Conservation Act (Williamson Act)

The Project site is not subject to a Williamson Act Contract, and there are no areas included in Kern County's agricultural preserve. Outside of the Project boundary, no adjacent areas are subject to an active Williamson Act Contract (Kern County 2022b).

5. Conclusion

In conclusion, no agricultural activity has occurred within the last ten years on the Project site, and the area is designated by the DOC as Nonagricultural or Natural Vegetation.

6. References

California Department of Conservation (DOC). 2022. California Important Farmland Finder (GIS Tool). https://maps.conservation.ca.gov/DLRP/CIFF/.

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Kern County. 2022a. Agricultural and Measurement Standards. Kern County Spatial Data. Available: http://www.kernag.com/gis/gis-data.asp. Accessed 11/1/2022.

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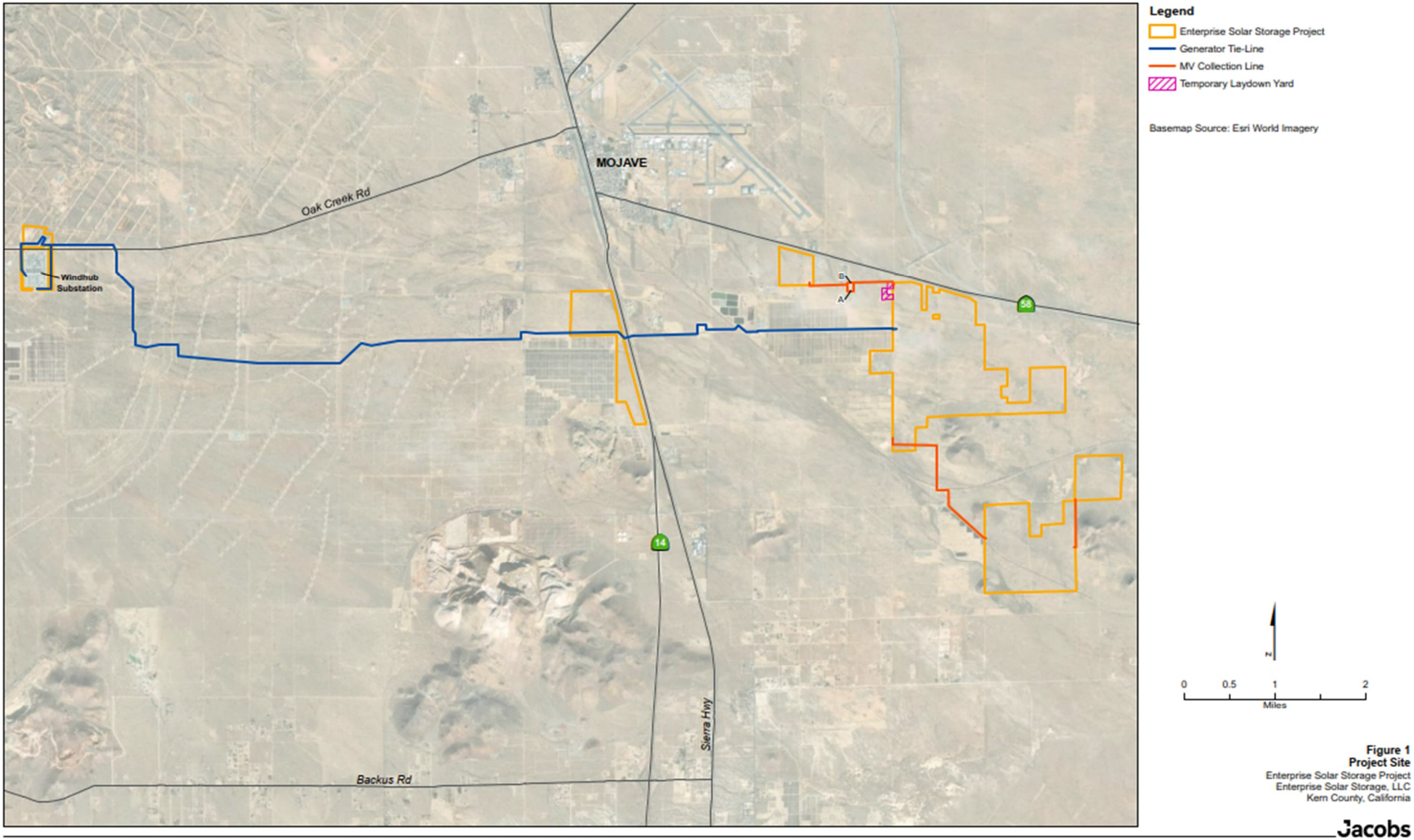

Figure 1
Project Site
Enterprise Solar Storage Project
Enterprise Solar Storage, LLC
Kern County, California

Jacobs

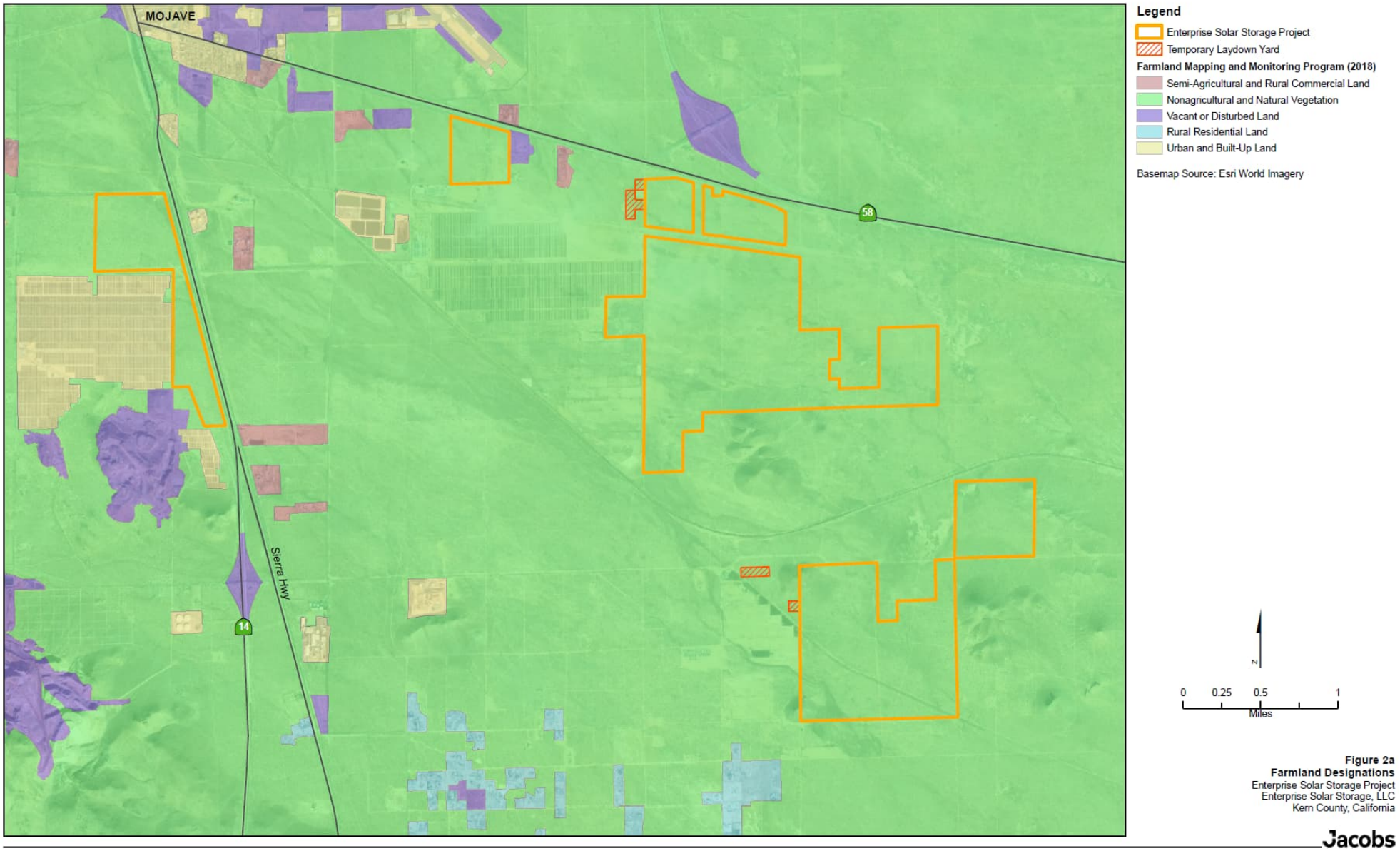

Figure 2a
Farmland Designations
Enterprise Solar Storage Project
Enterprise Solar Storage, LLC
Kern County, California

Jacobs

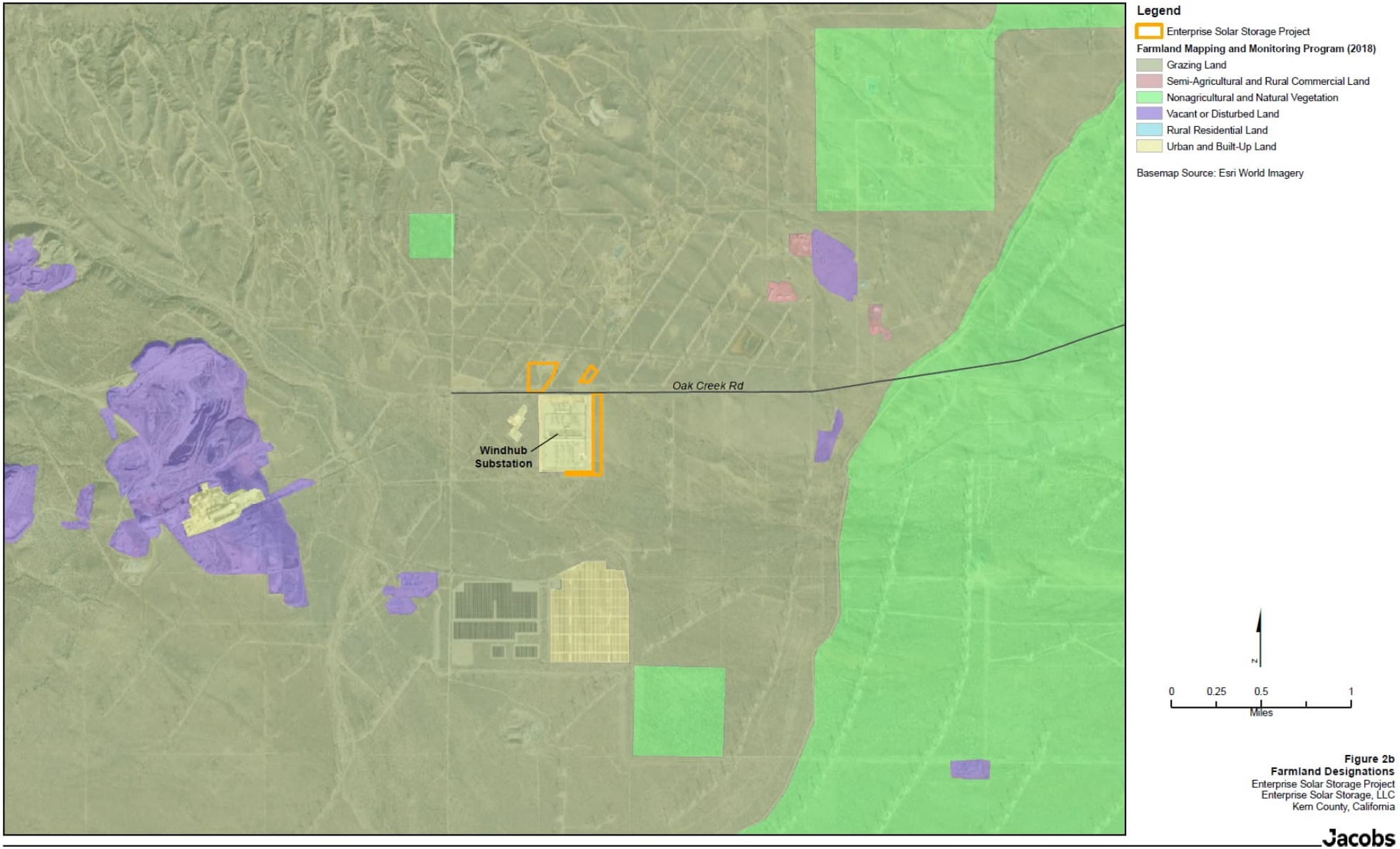

Figure 2b
Farmland Designations
Enterprise Solar Storage Project
Enterprise Solar Storage, LLC
Kern County, California

Jacobs

Appendix D
Air Quality and Greenhouse Gas Technical Report

Jacobs

Enterprise Solar Storage Project

Draft Air Quality and Greenhouse Gas Technical Report

August 2023

Enterprise Solar Storage, LLC



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Acronyms and Abbreviations

µg/m^3	microgram(s) per cubic meter
AB	Assembly Bill
BNSF	Burlington Northern Santa Fe
CAAQS	California Ambient Air Quality Standards
CalEEMod	California Emissions Estimator Model
CalOSHA	California Occupational Safety and Health Administration
CARB	California Air Resources Board
CEQA	California Environmental Quality Act
CH_4	methane
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
CPUC	California Public Utilities Commission
CTI	California Toxics Inventory
CUP	Conditional Use Permit
DPM	diesel particulate matter
EIR	Environmental Impact Report
EKAPCD	Eastern Kern Air Pollution Control District
EPA	U.S. Environmental Protection Agency
GHG	greenhouse gas
HEPA	High-Efficiency Particulate Air
HFC	hydrofluorocarbon
HRA	Health Risk Assessment
KCOG	Kern Council of Governments
Kern County	Kern County Planning and Natural Resources Department
kV	kilovolt
lb/day	pound(s) per day
LOS	Level of Service
MDAB	Mojave Desert Air Basin
MPUD	Mojave Public Utility District
MM	Mitigation Measure
MW	megawatt(s)
N_2O	nitrous oxide

NAAQS	National Ambient Air Quality Standards
NF_3	nitrogen trifluoride
NIOSH	National Institute for Occupational Safety and Health
NO_2	nitrogen dioxide
NO_X	oxides of nitrogen
NSR	New Source Review
PFC	perfluorocarbon
Plan	Valley Fever Dust Management Plan
PM	total particulate matter
$PM_{2.5}$	particulate matter with aerodynamic diameter less than or equal to 2.5 microns
PM_{10}	particulate matter with aerodynamic diameter less than or equal to 10 microns
ppb	part(s) per billion
ppm	part(s) per million (by volume)
Project	Enterprise Solar Storage Project
PV	photovoltaic
RACT	Reasonably Available Control Technology
ROG	reactive organic gases
Sanborn Solar	Sanborn Solar, LLC
SB	Senate Bill
SCE	Southern California Edison
SF_6	sulfur hexafluoride
SIP	State Implementation Plan
SJVAPCD	San Joaquin Valley Air Pollution Control District
SO_2	sulfur dioxide
SO_X	oxides of sulfur
SR-14	State Route 14
SR-58	State Route 58
TAC	toxic air contaminants
TOG	total organic gases
tpy	ton(s) per year

1. Introduction

Enterprise Solar Storage, LLC (Enterprise Solar or Applicant) is proposing to construct the Enterprise Solar Storage Project (Project). The proposed Project consists of a photovoltaic (PV) solar energy generation facility with battery energy storage capacity. The Project includes approximately 600-megawatts (MW) of solar energy and up to 4 gigawatt-hours of battery energy storage capacity. The Project is located on approximately 2,300 acres adjacent to the County-approved Sanborn Solar Project that is currently under construction.

The Project will interconnect to the Windhub Substation, which is owned and operated by Southern California Edison (SCE). The interconnect will be via a newly constructed gen-tie line that will be co-located within a portion of the Sanborn Solar gen-tie corridor (which was reviewed for California Environmental Quality Act [CEQA] purposes by the Kern County Planning and Natural Resources Department as part of the Sanborn Solar Conditional Use Permit in 2019) to the Windhub Substation. A new 230 kilovolt (kV) to 500 kV substation, up to 15 acres in size, will be constructed north of the Windhub Substation on private land and would interconnect to SCE's facilities from the north.

The Project is requesting CEQA coverage for additional substation areas and an alternate gen-tie line route that may extend from the new substation to the southern portion of the Windhub Substation along the eastern perimeter. Additionally, SCE will relocate approximately 1 mile of existing 66 kV Coram-Goldtown transmission line to avoid interrupting the Project solar array. The Project will not physically interconnect into this line.

Emergency backup generators for the Project's substations or the battery energy storage systems may be required by the Authority Having Jurisdiction (AHJ). If required, there would be diesel-fired battery energy storage generators and natural gas-fired substation generators, each needing to be intermittently run for maintenance and testing purposes. These generators would be the only stationary sources of emissions for the Project. Therefore, this analysis includes potential emissions from emergency generators, in addition to mobile sources from daily operational Project emissions.

This air quality and greenhouse gas (GHG) technical report was prepared to evaluate the potential air quality and GHG impacts associated with the proposed Project. This evaluation includes an estimate of potential air emissions associated with Project construction and operation, an air quality impact assessment, and a health risk assessment (HRA). As addressed in Section 5.3, the Project would result in potentially significant and unavoidable impacts as a result of particulate matter emissions from construction activities. However, the Project would help California meet its renewable energy and GHG emission reduction goals.

1.1 Project Location

The Project is located in an unincorporated area in southeastern Kern County, California, at the western edge of the Antelope Valley and south of the community of Mojave (see Figure 1). The Project is generally located on undeveloped land, some of which has been used for grazing, and consists entirely of privately owned parcels.

The Project lies within the Sanborn, Mojave, and Bissell U.S. Geological Survey 7.5-minute quadrangles:

- Section 6, Township 10 North, Range 11 West
- Sections 17 and 20 of Township 11 North, Range 13 West
- Sections 20- 26, Section 28 and Section 36, Township 11 North, Range 12 West
- Section 30 and Section 32, Township 11 North, Range 11 West

The Project site consists of four separate areas plus land north of SCE's Windhub Substation for the 230 kV to 500 kV substation (see Figure 2). The western area is generally located west of State Route (SR-) 14,

south of Camelot Boulevard, east of 25th Street West, and north of Purdy Avenue. The eastern area is located west of 30th Street, east of 10th Street, south of State Route (SR-) 58, and north of E Silver Queen Road. The northern area is located immediately south of State Route (SR-) 58, generally west of 10th Street and north of Purdy Avenue. The southern area is located west of 15th Street, south of the Burlington Northern Santa Fe (BNSF) Railway, and east of a network on unnamed dirt road, and north of Trotter Avenue. A large portion of the area is located south of Silver Queen Road. The Windhub Substation area is located immediately east and north of the current substation at 7878 Oak Creek Road.

The Project is south of State Route (SR-) 58 and the Mojave Air and Space Port, and north of Edwards Air Force Base (AFB). The Project is adjacent to various solar projects and a network of unnamed dirt roads surround the Project. The site can be accessed by Silver Queen Road, Camelot Boulevard, Purdy Avenue, Decatur Avenue, and Lone Butte Road.

Elevations across the Project site are relatively flat, ranging from approximately 2,520 feet above mean sea level in the southeast corner, to approximately 2,715 feet above mean sea level in the northwest portion of the site.





Legend

- Enterprise Solar Storage Project
- Generator Tie-Line
- MV Collection Line

Basemap Source: Esri World Street Map

0 1 2 3
Miles

N

Figure 1
Project Site
Enterprise Solar Storage Project
Enterprise Solar Storage, LLC
Kern County, California

Jacobs

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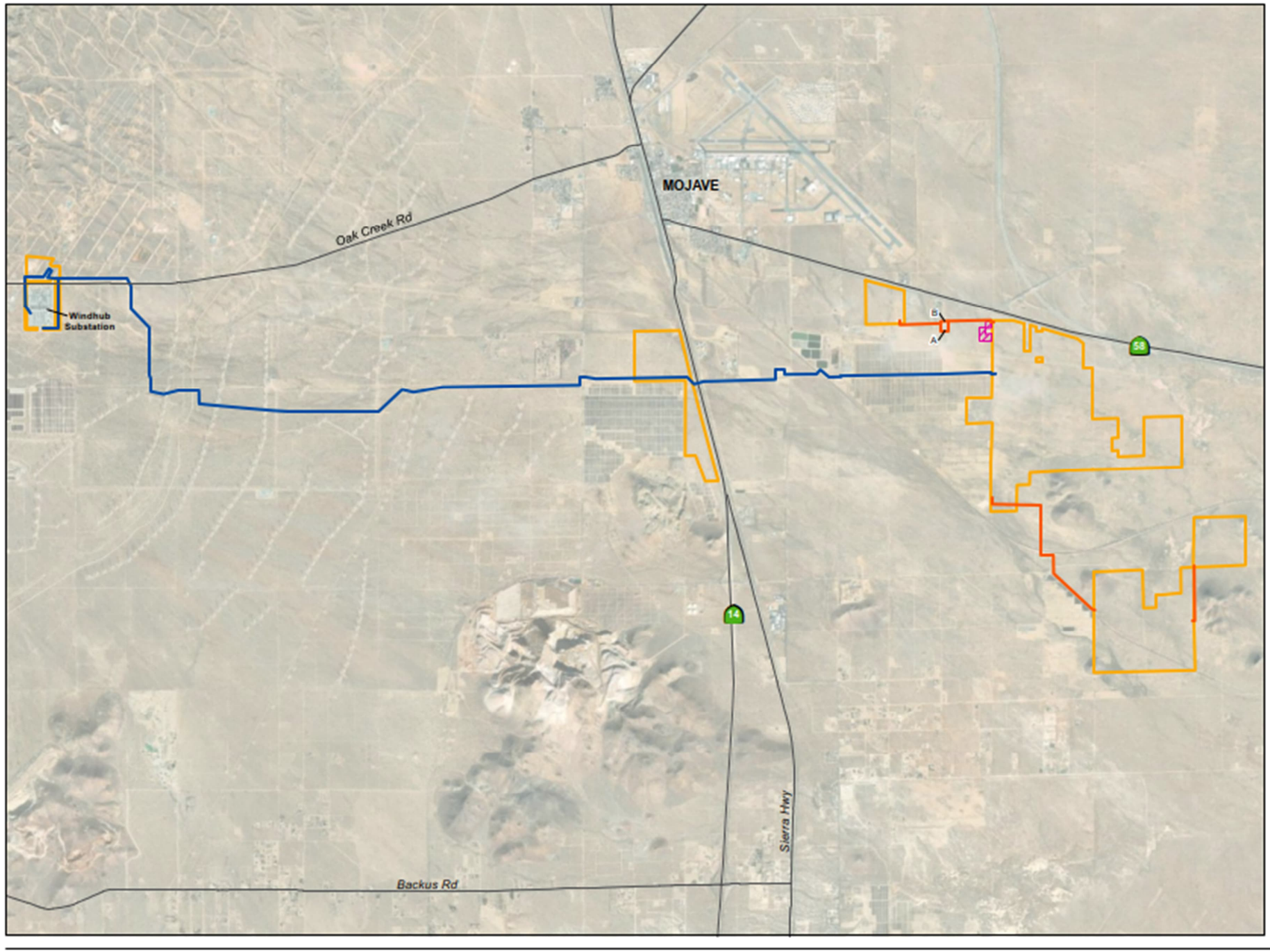


Figure 2
Project Boundary
Enterprise Solar Storage Project
Enterprise Solar Storage, LLC
Kern County, California

Jacobs

2. Environmental Setting

2.1 Climate and Topography

The Project area is within the Mojave Desert Air Basin (MDAB), under the jurisdiction of the Eastern Kern Air Pollution Control District (EKAPCD). This area is separated from populated valleys and coastal areas to the west and south by several mountain ranges, which contain a limited number of passes serving as "transport corridors". These passes include Tehachapi Pass, connecting the western MDAB to the southern San Joaquin Valley, and Soledad Pass and Cajon Pass connecting to the South Coast Air Basin (EKAPCD 2017).

It is common for pollutants to be transported between air basins, especially into a basin that is downwind. Transport from an upwind area (like San Joaquin Valley) to a downwind area (like the MDAB) occurs when winds are of sufficient magnitude, direction, and duration; transport can take place from the surface up to several thousand feet of elevation. Air quality in the Kern County portion of the western MDAB is influenced primarily by pollutant transport from upwind populated valleys and coastal areas through the Tehachapi Pass corridor, with some potential influence through Soledad Pass (EKAPCD 2017).

Relative humidity in the MDAB is very low in the summer, with an average humidity below 10 percent during the hottest part of the day. Temperatures can be in excess of 100 degrees Fahrenheit (°F) for sixty to seventy days per year between the months of May and September with almost no rainfall. This combination of dry hot, clear days results in intense solar radiation, which contributes to the formation of photochemical ozone. Concurrence of these meteorological conditions are favorable to overwhelming transport of ozone into the EKAPCD's jurisdiction (EKAPCD 2017).

2.2 Ambient Air Quality

2.2.1 Criteria Air Pollutants

The U.S. Environmental Protection Agency (EPA) has established National Ambient Air Quality Standards (NAAQS) for the following seven pollutants, termed criteria air pollutants: ozone[1], nitrogen dioxide (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), particulate matter with aerodynamic diameter less than or equal to 10 microns (PM_{10}), particulate matter with aerodynamic diameter less than or equal to 2.5 microns ($PM_{2.5}$), and airborne lead. The NAAQS represent levels established to avoid specific adverse health and welfare effects associated with each pollutant with a margin of safety. Similarly, the California Air Resources Board (CARB) has established California Ambient Air Quality Standards (CAAQS) for the seven pollutants listed above and for visibility reducing particles, sulfates, hydrogen sulfide, and vinyl chloride. In general, the CAAQS are more stringent than the corresponding NAAQS. The standards currently in effect in California are shown in Table 1. A summary of these pollutants, as well as their associated health effects, can be found in Appendix A.

[1] Ozone is not emitted directly, but rather created by a chemical reaction between oxides of nitrogen (NO_X) and reactive organic gases (ROG) in the presence of sunlight. As a result, NO_X and ROG are often referred to as ozone precursors and are regulated as a means of minimizing ground-level ozone formation.

Table 1. Ambient Air Quality Standards

Pollutant	Averaging Time	CAAQS [a]	NAAQS [b]	
			Primary [c]	Secondary [d]
Ozone [e]	1-hour 8-hour	0.09 ppm 0.070 ppm	-- 0.070 ppm	-- 0.070 ppm
PM_{10}	24-hour Annual Arithmetic Mean	50 µg/m^3 20 µg/m^3	150 µg/m^3 --	150 µg/m^3 --
$PM_{2.5}$	24-hour Annual Arithmetic Mean	-- 12 µg/m^3	35 µg/m^3 12 µg/m^3 [f]	35 µg/m^3 15 µg/m^3
CO	1-hour 8-hour	20 ppm 9.0 ppm	35 ppm 9 ppm	-- --
NO_2	1-hour Annual Arithmetic Mean	0.18 ppm 0.030 ppm	0.100 ppm [g] 0.053 ppm	-- 0.053 ppm
SO_2	1-hour 3-hour 24-hour Annual Arithmetic Mean [i]	0.25 ppm -- 0.04 ppm --	0.075 ppm [h] -- -- --	-- 0.5 ppm -- --
Lead [j]	30-day Average Calendar Quarter Rolling 3-month Average	1.5 µg/m^3 -- --	-- 1.5 µg/m^3 0.15 µg/m^3	-- 1.5 µg/m^3 0.15 µg/m^3
Visibility Reducing Particles	8-hour	[k]	--	--
Sulfates	24-hour	25 µg/m^3	--	--
Hydrogen Sulfide	1-hour	0.03 ppm	--	--
Vinyl Chloride [j]	24-hour	0.01 ppm	--	--

Table 1. Ambient Air Quality Standards

Pollutant	Averaging Time	CAAQS [a]	NAAQS [b]	
			Primary [c]	Secondary [d]

Notes:

-- = No standard has been adopted for this averaging time

µg/m^3 = microgram(s) per cubic meter

ppm = part(s) per million (by volume)

[a] CAAQS for ozone, CO, SO_2 (1- and 24-hour), NO_2, PM_{10}, $PM_{2.5}$, and visibility reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded.

[b] NAAQS (other than ozone, particulate matter, and those based on annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over 3 years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m^3 is equal to or less than 1. For $PM_{2.5}$, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over 3 years, are equal to or less than the standard.

[c] Primary standards: the levels of air quality necessary, with an adequate margin of safety, to protect the public health.

[d] Secondary standards: the levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

[e] The national 8-hour ozone primary and secondary standards were lowered from 0.075 to 0.070 ppm on October 1, 2015.

[f] The EPA finalized an update to its annual primary NAAQS for $PM_{2.5}$ on December 14, 2012.

[g] To attain the 1-hour national NO_2 standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 0.100 ppm.

[h] To attain the 1-hour national SO_2 standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 0.075 ppm.

[i] The primary SO_2 annual standard was revoked on June 22, 2010, but may still remain in certain areas based upon status of the current 2010 standards. The Project is not located in an area where this standard is applicable.

[j] CARB has identified lead and vinyl chloride as “toxic air contaminants” with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

[k] In 1989, CARB converted the general statewide 10-mile visibility standard to instrumental equivalents, which is “extinction of 0.23 per kilometer.”

Source: CARB 2016

The EPA and CARB have designated counties, regions, and air sheds in California as either in “attainment”, “unclassified”, “maintenance”, or “nonattainment” for each NAAQS and CAAQS, respectively. A region that is meeting the air quality standard for a given pollutant is designated as being in “attainment” for that pollutant. If the region is not meeting the air quality standard, then the region is designated as being in “nonattainment” for that pollutant. An area that was previously designated as a nonattainment area but has recently met the standard and has been reclassified by EPA as “attainment with a maintenance plan” is a “maintenance” area. If sufficient data do not exist for the area to be designated “attainment” or “nonattainment”, then the region is designated as being “unclassified”. An “unclassified” designation is typically considered the same as attainment for regulatory purposes. The federal and State attainment status for the Project area, located in Kern County, is listed in Table 2.

Table 2. Federal and California Air Quality Attainment Status for Kern County, CA

Pollutant	Averaging Period	California Status	Federal Status
Ozone	1-hour 8-hour	Nonattainment Nonattainment	-- Serious Nonattainment
PM_{10}	24-hour Annual Arithmetic Mean	Nonattainment Nonattainment	Unclassified --
$PM_{2.5}$	24-hour Annual Arithmetic Mean	-- Unclassified	Attainment Attainment
CO	1-hour 8-hour	Unclassified Unclassified	Attainment Attainment
NO_2	1-hour Annual Arithmetic Mean	Attainment Attainment	Unclassified Unclassified
SO_2	1-hour 3-hour 24-hour Annual Arithmetic Mean	Attainment -- Attainment --	Unclassified Unclassified -- --
Lead	30-day Average Calendar Quarter Rolling 3-month Average	Attainment -- --	-- Attainment Attainment
Visibility Reducing Particles	8-hour	Unclassified	--
Sulfates	24-hour	Attainment	--
Hydrogen Sulfide	1-hour	Unclassified	--
Vinyl Chloride	24-hour	Attainment	--

Note:

-- = No standard has been adopted for this averaging time

Sources: EKAPCD 2021 and CARB 2021b

Of the ambient air monitoring stations operating in the MDAB, air quality data statistics from the Mojave – 923 Poole Street ambient air monitoring station were used as representative of the Project area's environmental setting due to the proximity of the monitoring station to the Project (about 0.75 miles north). For pollutants not monitored at the Mojave – 923 Poole Street ambient air monitoring station, data from the next nearest ambient air monitoring location within the MDAB were selected. This station, Lancaster – 43301 Division Street, is located 24 miles south of the Project. Table 3 summarizes the maximum ambient air monitoring data for a recent and available 3-year period.

Table 3. Summary of Ambient Air Monitoring Data in the Project Area [a]

Pollutant	Averaging Time	2018	2019	2020
Ozone (ppm) [b]	1-hour	0.111	0.085	0.108
	8-hour	0.094	0.077	0.100
PM_{10} ($\mu g/m^3$) [b]	24-hour	93.1	248.7	111.9
	Annual Arithmetic Mean	26.7	23.7	26.0
$PM_{2.5}$ ($\mu g/m^3$) [b]	24-hour	39.0	19.8	72.8
	Annual Arithmetic Mean	7.1	6.5	9.3 [d]
CO [c]	1-hour	1.2	1.4	1.6
	8-hour	1.0	0.9	1.1
NO_2 (ppm) [d]	1-hour	0.048	0.050	0.052
	Annual Arithmetic Mean	0.009	0.008	0.008

Notes:

[a] Concentration data presented in this table represent the maximum observed concentration of the federal and State concentration values. Monitored data for SO_2 were not available within the Project area.

[b] Data from the Mojave – 923 Poole Street ambient air monitoring station located at 923 Poole Street, Mojave, Kern County, California. Air quality data statistics obtained from CARB's iADAM database (CARB 2021f).

[c] Data from the Lancaster – 43301 Division Street ambient air monitoring station located at 43301 Division Street, Lancaster, Los Angeles County, California. Air quality data statistics obtained from EPA's Monitor Values Report (EPA 2021d).

[d] Data from the Lancaster – 43301 Division Street ambient air monitoring station located at 43301 Division Street, Lancaster, Los Angeles County, California. Air quality data statistics obtained from CARB's iADAM database (CARB 2021f).

Monitored concentrations of ozone exceeded the State 8-hour standard between 10 and 56 days per year, the federal 2015 8-hour standard between 10 and 53 days per year, and the State 1-hour standard between 0 and 8 days per year during the 2018 through 2020 period. Monitored concentrations of PM_{10} exceeded the State 24-hour standard between 8 and 19 days per year and the federal 24-hour standard between 0 and 2 days per year during the 2018 through 2020 period. Monitored concentrations of $PM_{2.5}$ exceeded the federal 24-hour standard between 0 and 4 days per year during the 2018 through 2020 period. Monitored concentrations of CO and NO_2 did not exceed any federal or State standards between 2018 and 2020.

Annual inventory projections for total organic gases (TOG), reactive organic gases (ROG), CO, oxides of nitrogen (NO_X), oxides of sulfur (SO_X), total particulate matter (PM), PM_{10}, and $PM_{2.5}$ are periodically compiled by CARB. The inventories include projected annual emissions from stationary sources, area sources, mobile sources, and natural sources[2]. The most recent year of actual data published by CARB is for 2017, with all later years projected from the 2017 results. Given this, projected annual emissions for the year 2025 were used for comparison to the Project's emissions as they are the closest future year projections available. Projected annual emissions for the year 2025 for the Kern County portion of the MDAB are presented in Table 4; projected annual emissions for the year 2025 for the entire MDAB are presented in Table 5.

[2] Natural emission sources are non-anthropogenic sources of emissions.

Table 4. 2025 Emissions Projections for the Kern County Portion of the Mojave Desert Air Basin

Source Categories	TOG	ROG	CO	NO_X	SO_X	PM	PM_{10}	$PM_{2.5}$
	(tons per day)							
Stationary Sources	14.5	1.7	13.7	19.2	1.7	5.5	2.6	0.9
Area Sources	3.4	1.8	2.5	0.2	0.0	15.2	7.4	1.4
Mobile Sources	6.3	6.1	34.2	8.0	0.3	3.3	3.2	3.0
Natural Sources	117.8	107.2	222.3	1.0	1.0	21.3	20.4	17.3
Total	142.0	116.8	272.7	28.4	3.1	45.2	33.7	22.6

Source: CARB 2019

Table 5. 2025 Emissions Projections for the Mojave Desert Air Basin

Source Categories	TOG	ROG	CO	NO_X	SO_X	PM	PM_{10}	$PM_{2.5}$
	(tons per day)							
Stationary Sources	89.2	16.4	29.6	44.8	3.8	79.7	30.2	8.7
Area Sources	39.8	15.1	6.8	1.8	0.0	138.9	73.4	12.3
Mobile Sources	19.9	18.5	137.5	58.2	0.7	6.9	6.8	5.1
Natural Sources	184.6	160.7	268.5	2.2	1.4	26.2	25.2	21.3
Total	333.5	210.7	442.4	107.0	5.9	251.7	135.5	47.4

Source: CARB 2019

2.2.2 Air Toxics

Toxic air contaminants (TACs) are air pollutants suspected or known to cause adverse health effects in humans, including increasing the risk of cancer upon exposure, or acute and/or chronic noncancer health effects, such as birth defects, damage to brain and nervous systems, and respiratory disorders. TACs are identified by federal and state agencies based on a review of available scientific evidence and, with the exception of lead, sulfates, vinyl chloride, and hydrogen sulfide, no ambient air quality standards have been established for TACs. However, there are federal and state programs requiring control of certain categories of TACs. Of particular relevance to this Project is CARB's recognition and control of diesel particulate matter (DPM) as a TAC. As more fully described in Appendix A, DPM is part of a complex mixture that makes up diesel exhaust and is typically composed of carbon particles ("soot") and numerous organic compounds.

CARB has historically published the California Toxics Inventory (CTI), which provides TAC emission estimates by stationary, area-wide, on-road mobile, off-road mobile, and natural sources. The most recently published CTI is for calendar year 2010. According to the 2010 CTI, Kern County emitted 754 tons per year (tpy) of acetaldehyde, 43.9 tpy of benzene, 32.1 tpy of 1,3-butadiene, 0.01 tpy of carbon tetrachloride, 0.01 tpy of hexavalent chromium, 4.91 tpy of 1,4-dichlorobenzene, 125 tpy of formaldehyde, 9.03 tpy of methylene chloride, 12.9 tpy of perchloroethylene, and 146 tpy of DPM (CARB 2013).

Point sources are the largest contributor to emissions of hexavalent chromium (96 percent), carbon tetrachloride (100 percent), and perchloroethylene (60 percent), whereas natural sources are the largest contributor to emissions of acetaldehyde (92 percent) and 1,3-butadiene (69 percent). Area sources contribute 68 percent of methylene chloride emissions and 92 percent of 1,4-dichlorobenzene emissions. Mobile sources are the largest contributor to emissions of formaldehyde (94 percent), DPM (83 percent), and benzene (94 percent). (CARB 2013)

2.2.3 Greenhouse Gases

GHGs and climate change are a cumulative global issue, with the EPA and CARB regulating GHG emissions within the United States and the State of California, respectively. Local agencies, such as EKAPCD, also adopt policies for reducing GHG emissions. GHGs include both naturally occurring and anthropogenic gases, such as carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF_6), and nitrogen trifluoride (NF_3). GHGs absorb infrared radiation, trap energy from the sun, and help maintain the temperature of Earth's surface, creating a process known as the "greenhouse effect." A summary of the most common GHGs and their sources, as well as a discussion of other climate forcing substances, can be found in Appendix A.

Although EKAPCD has not published a GHG emissions inventory for Kern County, the San Joaquin Valley Air Pollution Control District (SJVAPCD) has. Table 6 presents the 2020 communitywide GHG emissions inventory projection for Kern County, which includes direct and indirect GHG emissions due to human activities and is the most recently available inventory from SJVAPCD.

Table 6. Kern County 2020 Forecasted GHG Emissions Inventory

End-use Sector	Percent of Total Emissions	CO_2e Emissions (million metric tons/year)
Fossil Fuels Industry	26	7.0
Residential Industrial/Commercial	6	1.7
Electricity/Cogeneration	31	8.6
Industrial Processes	9	2.3
Transportation	18	4.8
Agriculture/Farming	10	2.7
Waste Management	1	0.1
Other Sources	<1	<0.1
Total	100	27.2

Source: SJVAPCD 2012

Note:

CO_2e = carbon dioxide equivalent

2.2.4 Valley Fever

Fungal spores of *coccidioides immitis*, known as "Valley Fever", live within the top 12 inches of soil in many parts of California, including Kern County. When dust disturbing activities occur, these spores can become airborne and increase the risk for exposure. Any workers on sites with dust disturbing activities and or dusty conditions, including wind-blown dust, have an increased risk of infection (CDIR 2017). A summary of valley fever, as well as its associated health effects, can be found in Appendix A.

2.2.5 Asbestos

A review of available geological maps indicates that Project construction is unlikely to encounter ultramafic igneous rocks, which are the typical source of naturally occurring asbestos (NOA) (U.S. Geological Survey 2011). A summary of asbestos, as well as its associated health effects, can be found in Appendix A.

2.3 Sensitive Receptors

Sensitive receptors are defined as people that have an increased sensitivity to air pollution or environmental contaminants. Sensitive receptor locations include schools, parks and playgrounds, day care centers, nursing homes, hospitals, and residential dwelling unit(s). Residences within 1 mile of a project site generally have the highest potential to be affected by project-generated emissions. The community of Mojave is directly north of the Project. The closest residential uses to the Project site are identified as R1 through R5 in Figure 3; R1, R3, and R4 are within groupings of residences. The nearest residences are approximately 0.4-mile north of the Western Project area (R3) and there is a single rural residence located approximately 0.3-mile east of the Northern Project area (R5). Other sensitive receptors in the vicinity of the Project include Mojave High School and Mojave East Park, located 1.2-mile and 1-mile north of the Western Project area, respectively. There are no sensitive receptors within the vicinity of the Windhub Substation. The sensitive receptors noted above are shown in Figure 3, relative to the Project areas.

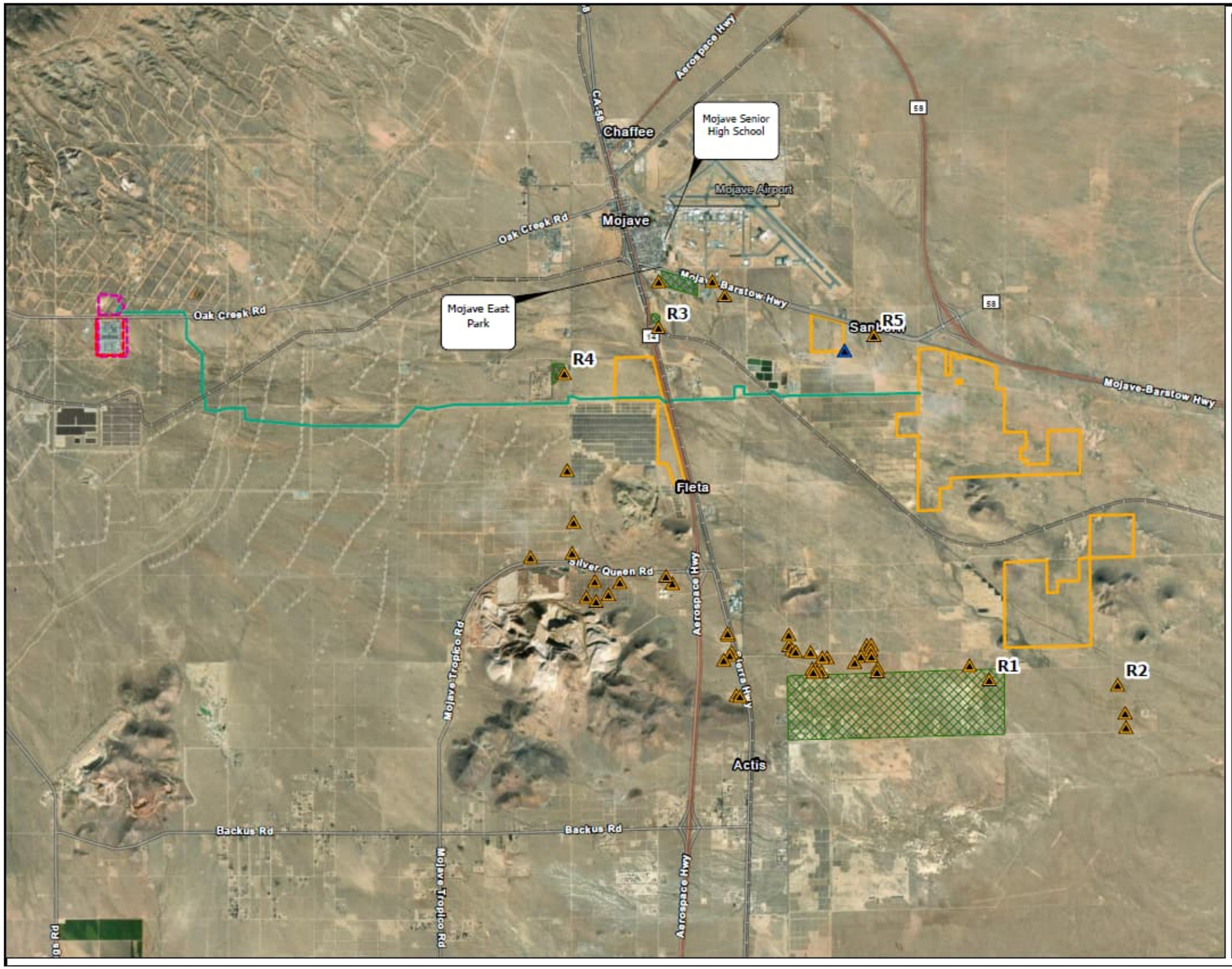
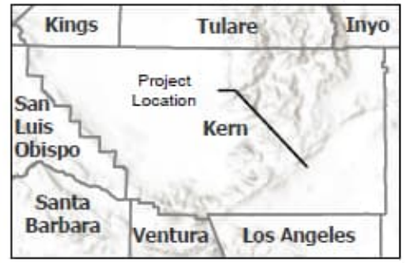


Figure 3
Nearby Sensitive Receptors

Enterprise Solar Storage Project
Kern County, CA



Enterprise Solar Storage Project
Windhub High-voltage Substation (Existing)
High-voltage Facilities
Residential Area
Generator Tie-Line

Residence

Residence
Abandoned Dwelling

*Note: The Project is subject to revision and refinement; proposed features are approximate.

Miles
0 1 2

Scale is 1:70,000 when printed at 11"x17"
Not for Construction

3. Regulatory Setting

Ambient air quality and air pollutant emissions from stationary and mobile sources are managed under a framework of federal, state, and regional or local rules and regulations, as summarized below.

3.1 Federal

3.1.1 Air Quality

Federal air quality policies are regulated through the federal Clean Air Act (CAA). The U.S. Congress adopted the CAA in 1970 and passed amendments to the CAA in 1977 and 1990. In 1990, the CAA was amended to strengthen regulation of both stationary and mobile emission sources. As required by the federal CAA, the EPA has established NAAQS for criteria pollutants that are considered the maximum levels of ambient (background) air pollutants considered safe, with an adequate margin of safety, to protect the public health and welfare and designated counties and air sheds in California as either in "attainment", "unclassified", "maintenance", or "nonattainment" for each NAAQS. The NAAQS and federal attainment status within Kern County were presented in Section 2.2.1. If a region is designated as nonattainment for a NAAQS, the CAA requires the State to develop a State Implementation Plan (SIP) to demonstrate how the standard would be attained, including the establishment of specific requirements for review and approval of new or modified stationary sources of air pollution.

EPA has also adopted technology-based standards which limit the emissions of criteria pollutants from new or modified facilities in specific source categories. These standards are referred to as New Source Performance Standards (NSPS) and are found in 40 Code of Federal Regulations (CFR) Part 60. The applicability of these standards depends on the equipment size or rating; material or fuel process rate; and/or the date of construction, modification, or reconstruction. In the event that emergency backup generators are required for Project facilities by the AHJ, the Project's diesel-fired emergency generators would be subject to Subpart IIII, which establishes emission and operational limits of criteria pollutants for new stationary compression ignition engines. The Project's natural gas-fired emergency generators would be subject to Subpart JJJJ, which establishes emission and operational limits of criteria pollutants for new stationary spark ignition engines. To comply with the requirements of Subpart IIII, the Project's diesel-fired emergency generators would be operated and maintained as per the manufacturer specifications and would be certified to comply with Tier 4 emission rates. The Project's natural gas-fired generators would be confirmed by the manufacturer to meet the respective Subpart JJJJ emission requirements and would be operated and maintained as required by the Subpart.

EPA has promulgated federal regulations for permitting the construction and operation of emission sources that qualify as "major" sources of emissions, as defined in the applicable rules. In most states, EPA has delegated authority to states and local permitting authorities to write regulations and operate federally enforceable permitting programs. Federal regulations for pre-construction review and permitting of new and modified major sources include nonattainment New Source Review (NSR) requirements, applicable to major sources of nonattainment pollutants and/or their precursors in nonattainment areas, and Prevention of Significant Deterioration (PSD) requirements, applicable to any major sources of attainment pollutants or their precursors. The Project does not include large stationary sources (i.e., those emitting at levels above the major source thresholds); therefore, it is not considered a "major" source of emissions and NSR and PSD requirements would not apply.

3.1.2 Air Toxics

In addition to criteria pollutants, EPA also regulates emissions of hazardous air pollutants (HAPs). HAPs or air toxics are pollutants that are known or suspected to cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental effects. Controlling air toxic emissions became a national priority with the passage of the CAA amendments in 1990, when the U.S. Congress mandated that the EPA regulate 188 air toxics. National Emission Standards for Hazardous Air Pollutants (NESHAP) regulate HAPs at major emission sources, aiming to protect public health with an ample margin of safety and to prevent any significant and adverse environmental effects. As stated previously, the Project does not include large stationary sources; therefore, it is not considered a "major" source of emissions and NESHAP requirements would generally not apply.

3.1.3 Greenhouse Gases

Executive Order 13423 signed by President George W. Bush on May 14, 2007, directed the EPA and Department of Transportation (DOT) to establish regulations to reduce GHG emissions from on-road and non-road motor vehicles and non-road engines by 2008. In 2009, the National Highway Traffic Safety Administration (NHTSA) finalized a rule regulating fuel efficiency and GHG emissions from cars and light-duty trucks for model year 2011 and further expanded the rule to model years 2012 through 2016 in 2010.

On December 19 2007, the EPA passed the Energy Independence and Security Act of 2007, that aims to reduce GHG emissions at a national level and strengthen the initiatives established by Executive Order 13423 (EPA 2007). The act's two key measures include the following: 1) increasing the supply of alternative fuel sources through mandatory Renewable Fuel Standards by requiring fuel producers to use at least 36 billion gallons of biofuel in 2022, and 2) establishing a target of 35 miles per gallon of fuel efficiency for a combined fleet of cars and light-duty trucks by model year 2020. The act also required the NHTSA to establish a fuel economy program for both medium and heavy-duty trucks and a fuel economy standard for work trucks.

On October 30, 2009, the EPA published the Mandatory Reporting Rule (codified in 40 Code of Federal Regulations [CFR] Part 98), that requires mandatory reporting of GHG emissions from large sources and suppliers in the U.S. (EPA 2021b). In general, suppliers of fossil fuels or industrial GHGs, manufacturers of vehicles and engines, facilities that inject CO_2 underground, users of electrical transmission and distribution equipment, and facilities that emit 25,000 metric tons or more per year of carbon dioxide equivalent (CO_2e) emissions are required to submit annual reports to the EPA. The Project does not include large stationary sources, supply operations, electrical transmission and distribution equipment containing more than 17,820 pounds of SF_6 and PFCs, or other covered processes. In the event that emergency backup generators are required for Project facilities by the AHJ, they would be exempt from GHG mandatory reporting. Therefore, GHG mandatory reporting would not apply to the Project.

On December 7, 2009, the EPA Administrator signed two findings regarding GHGs in direct response to the U.S. Supreme Court's decision in *Massachusetts v. EPA* (No. 05-1120). The first finds that the current and projected concentrations of the six key well-mixed GHGs in the atmosphere (CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6) threaten the public health and welfare of current and future generations. The second finds that the combined emissions of these well-mixed GHGs from new motor vehicles and new motor vehicle engines contribute to the GHG pollution that threatens public health and welfare (EPA 2021a).

On June 3, 2010, the EPA promulgated the final GHG Tailoring Rule (75 Federal Register [FR] 31514). The GHG Tailoring Rule established clear applicability thresholds for stationary source emitters of GHGs under PSD and Title V regulations. In general, any new stationary source with GHG emissions of 100,000 tons

CO_2e per year or greater became subject to both PSD review and the Title V program. On June 23, 2014, the U.S. Supreme Court issued a decision prohibiting the EPA from considering GHG emissions when determining PSD review and Title V program applicability (*Utility Air Regulatory Group v. EPA*, No. 12-z1146). Per the U.S. Supreme Court decision, the EPA may continue to require GHG emission limitations in PSD and Title V permits, if PSD review and the Title V program are triggered by emissions of criteria pollutants (EPA 2021c). Because stationary sources of this magnitude are not expected for the Project, PSD and Title V regulations would not be expected to apply to the Project.

In 2010, the Obama Administration issued a memorandum directing the DOT, Department of Energy (DOE), EPA, and NHTSA to develop additional standards regarding fuel efficiency and GHG emissions reduction, clean fuels, and advanced vehicle infrastructure. In response to this memorandum, EPA and NHTSA proposed coordinated federal GHG and fuel economy standards for light-duty vehicles for model years 2017 through 2025. The proposed standards are projected to achieve 163 grams per mile of CO_2 in model year 2025, on an industry fleetwide average basis. This standard is equivalent to 54.5 miles per gallon if achieved solely through fuel efficiency. The final rule was adopted in 2012 for model years 2017 through 2021 only. On April 2, 2018, EPA determined that the proposed standards for model years 2022 through 2025 were not appropriate and required revision (EPA 2017). In response, NHTSA finalized new fuel economy standards by increasing fuel efficiency by 8 percent annually for model years 2024 and 2025, and 10 percent annually for model year 2026,- thereby requiring an estimated industry wide fleet average of 49 miles per gallon for model year 2026 (NHTSA 2022). Additionally, in December 2021, EPA revised the light-duty vehicle emissions standards for model years 2023 through 2026 to provide for more stringent emission reductions. These emission reductions would result in an estimated reduction of three billion tons of GHG emissions through 2050 (EPA 2022).

In addition to the cars and light-duty truck regulations described above, the EPA and NHTSA developed fuel economy and GHG standards for medium- and heavy-duty trucks for model years 2014 through 2018 in 2011 (EPA & NHTSA 2022). The standards for CO_2 emissions and fuel consumption are specific to three main vehicle categories: combination tractors, heavy-duty pickup trucks and vans, and vocational vehicles. This regulatory program is expected to reduce GHG emissions and fuel consumption for the affected vehicles by 6 to 23 percent over the 2010 baselines.

In August 2016, EPA and NHTSA adopted the phase two program related to the fuel economy and GHG standards for medium- and heavy-duty trucks. The phase two program will apply to model years 2018 through 2027 vehicles with certain trailers and model years 2021 through 2027 for semi-trucks, large pickup trucks, vans, and all types and sizes of buses and work trucks. The final standards are expected to lower CO_2 emissions by approximately 1.1 billion metric tons and reduce oil consumption by up to 2 billion barrels over the lifetime of the vehicles sold under the program (EPA & NHTSA 2022). Note that this and other mobile source-oriented regulatory policies described in this section will have little effect on the Project as fuel economy requirements are most often implemented at the manufacturer level rather than by the end-user. However, availability of more fuel-efficient vehicles would have the positive effect of lowering criteria air pollutant and GHG emissions associated with vehicle trips.

3.2 State

3.2.1 Air Quality

CARB oversees California's air quality policies. The California CAA was approved in 1988 and amended in 1992 and established the CAAQS. These standards, summarized in Section 2.2.1, are generally more stringent and include more pollutants than the NAAQS. Similar to the EPA, CARB designates counties in California as being in "attainment" or "nonattainment" for CAAQS. The state attainment status for Kern County is listed in Table 2.

CARB has the primary responsibility for producing the SIP for nonattainment pollutants. However, CARB relies on and oversees the efforts of local air districts to adopt and implement air quality regulations and plans, including CARB-suggested control measures and additional emission reduction strategies for sources under their jurisdiction. CARB consolidates statewide implementation plan requirements for mobile sources and consumer products with locally adopted district plans and submits the completed SIP to the EPA. The SIP consists of the emissions standards for vehicular sources and consumer products set by CARB, as well as attainment plans adopted by the air districts and approved by CARB.

On July 26, 2017, Governor Brown signed Assembly Bill (AB) 617 into effect to address air pollution at the community level. AB 617 expands emission inventory requirements for both criteria and toxic air pollutants for stationary sources as well as expands monitoring requirements and risk reduction requirements. The monitoring program is centered around disadvantaged communities, which are defined in an ongoing process, to specifically address air pollution and emissions near each designated community. The Project is not located within or near a currently identified disadvantaged community; the closest is the Arvin/Lamont Community, which is located greater than 250 miles northwest of the Project. Additionally, The Project is not anticipated to be subject to reporting or risk reduction requirements under AB 617.

3.2.2 Air Toxics

In California, TACs or air toxics are primarily regulated through state and local risk management programs, which are designed to eliminate, avoid, or minimize the risk of adverse health effects from exposures to TACs. A chemical becomes a regulated TAC in California based on designation by the Office of Environmental Health Hazard Assessment (OEHHA). For example, OEHHA completed a comprehensive health assessment of diesel exhaust in 1998. The assessment formed the basis for a CARB decision to formally identify particulate matter in diesel exhaust (DPM) as a TAC that may pose a threat to human health. In response, CARB adopted the *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles* (CARB 2000) and a series of Airborne Toxic Control Measures (ATCMs) for mobile and stationary sources, which are intended to reduce overall DPM emissions in California. The recommended measures can be grouped as measures that address on-road vehicles, off-road equipment and vehicles, and stationary and portable engines. Many rules provide for older, more emissive equipment to be replaced with cleaner equipment and fleets over time. The ATCMs which regulate emissions of DPM and are potentially applicable to this Project are described below; many of these ATCMs also regulate emissions of criteria pollutants and other TACs. DPM and other key TACs are summarized in Appendix A, along with their associated health effects.

The Air Toxic "Hot Spots" Information and Assessment Act, also known as AB 2588, identifies TAC hot spots where emissions from specific stationary sources may expose individuals to an elevated risk of adverse health effects, particularly cancer or reproductive harm. Many TACs are also classified as HAPs. AB 2588 requires that a business or other establishment identified as a significant stationary source of toxic emissions provide the affected population with information about health risks posed by its emissions. Diesel particulate matter (DPM)[3] is considered a TAC under AB 2588; therefore, the Project may be subject to AB 2588 due to its DPM-emitting emergency generators (natural gas generators are expected to have minimal TAC emissions). However, DPM emissions from the generators will be intermittent and minimal, with operations estimated at approximately 50 hours per year for maintenance and testing purposes. Emissions will be further controlled based on the engines being Tier 4 equivalent or certified. Any reporting required by AB 2588, if applicable, will be completed through annual reporting to the EKAPCD.

[3] DPM represents the particulate matter found in diesel exhaust.

ATCM for DPM from Portable Engines Rated at 50 Horsepower and Greater. In an effort to reduce DPM emissions throughout the state, CARB has established the ATCM for DPM from Portable Engines Rated at 50 Horsepower and Greater (13 CCR Section 93116). This ATCM requires portable diesel-fueled engines having a maximum rating of 50 hp and greater to meet fleet-average DPM emissions standards.

ATCM for Stationary Compression Ignition Engines. CARB has established the ATCM for Stationary Compression Ignition Engines (17 CCR Section 93115) to reduce DPM and criteria pollutant emissions from stationary diesel-fueled compression ignition engines through fuel requirements, operational restrictions, and emission limits. The ATCM applies to points of sale of stationary compression ignition engines for use in California except portable engines, engines for motive power, auxiliary engines on marine vessels, and agricultural wind machines.

Statewide Portable Equipment Registration Program. Voluntary registration under the Statewide Portable Equipment Registration Program (PERP) allows owners or operators of portable engines to operate their equipment throughout California without having to obtain individual air district permits (13 CCR Sections 2450 through 2465). Diesel engines eligible for PERP registration must not be self-propelling, must be certified to Tier 4 emissions standards, and must not reside in the same location longer than 12 consecutive months. Examples of portable equipment include generators, plate compactors, drills, and welders.

Regulation for In-Use Off-Road Diesel-Fueled Fleets. CARB has established the Regulation for In-Use Off-Road Diesel-Fueled Fleets to reduce NO_X, DPM, and other criteria pollutant emissions from in-use off-road diesel-fueled vehicles (13 CCR Section 2449). This regulation applies to all self-propelled off-road diesel vehicles rated 25 hp or greater, including vehicles that are rented or leased, and requires restricted vehicle idling time, reporting of vehicle use, and compliance with fleet-average emission standards. It also provides a schedule by which lower-tiered engines cannot be added to a vehicle fleet.

3.2.3 Greenhouse Gases

In response to the transportation sector accounting for more than half of California's CO_2 emissions, AB 1493 was passed in July 2002 requiring CARB to establish GHG emission standards for passenger vehicles, light-duty trucks, and other vehicles determined to be vehicles that are primarily used for noncommercial personal transportation within the state. Specifically, AB 1493 required that CARB set GHG emission standards for motor vehicles manufactured in 2009 and all subsequent model years. CARB adopted the standards in September 2004 which will reduce GHG emissions by approximately 22 percent in the near -term (2009 through 2012), as compared to emissions from the 2002 fleet, and by approximately 30 percent in the mid-term (2013 through 2016).

The framework for regulating GHG emissions in California falls under the implementation requirements of the Global Warming Solutions Act of 2006 (referred to as AB 32), which was signed into law by the California State Legislature in 2006 and updated by Senate Bill 32 (SB 32). AB 32 required CARB to design and implement emission limits, regulations, and other measures such that statewide GHG emissions are reduced in a technologically feasible and cost-effective manner to 1990 levels by 2020. The statewide 2020 emissions limit was 431 million metric tons CO_2e; CO_2 emissions account for approximately 90 percent of this value (CARB 2021c). In 2016, SB 32 provided a post-2020 GHG emission reduction target of 40 percent below 1990 levels by 2030. The GHGs regulated by CARB are summarized in Appendix A, along with their associated health effects.

Issued on January 18, 2007, Executive Order S-1-07 sets a declining Low Carbon Fuel Standard for GHG emissions measured in CO_2e grams per unit of fuel energy sold in California. The goal of the Low Carbon Fuel Standard is to reduce the carbon intensity of California passenger vehicle fuels by at least 10 percent

by 2020. Carbon intensity is a measurement of the amount of GHG emissions in the lifecycle of a fuel, including extraction/feedstock production, processing, transportation, and final consumption, per unit of energy delivered. The regulation, adopted by CARB in April 2009, is expected to increase the production of biofuels, including those from alternative sources, such as algae, wood, and agricultural waste. The Low Carbon Fuel Standard was amended in 2011, 2015, and most recently in 2018, all of which strengthen the implementation and carbon benchmarks through 2030 to help achieve the statewide emission targets of AB 32, as described below.

In December 2007, CARB adopted the first regulation pursuant to AB 32, which requires mandatory reporting of GHG emissions from large emitting facilities, suppliers, and electricity providers. This regulation was significantly revised to better align with EPA's Mandatory Reporting Rule; the revised regulation became effective January 1, 2013. The current regulation, which includes additional minor revisions to accommodate the Cap and Trade Program, became effective January 1, 2015 (CARB 2021e). CARB adopted the California Cap and Trade Program on October 20, 2011. Under the California Cap and Trade Program, covered entities have had an obligation to secure GHG allowances and/or offsets since 2013; fuel suppliers have had an obligation to secure GHG allowances and/or offsets since 2015 (CARB 2021d). The California Cap and Trade Program will be in effect until at least December 31, 2030, through the 2017 adoption of AB 398 (Climate Action Reserve 2017). Despite these recent changes to CARB's mandatory reporting regulation, the Project is not expected to be subject to CARB's GHG emissions reporting regulation or the California Cap and Trade Program because it does not include large stationary sources or supply operations, and the Applicant is not considered an electricity provider. In the event that emergency backup generators are required for Project facilities by the AHJ, they would be exempt from CARB's GHG emissions reporting regulation.

In 2008, SB 375 was signed into law, addressing GHG emissions associated with the transportation sector through regional transportation and sustainability plans. Specifically, SB 375 requires CARB to adopt regional GHG reduction targets for the automobile and light-duty truck sector for 2020 and 2035. Once adopted, regional metropolitan planning organizations (MPOs) are responsible for preparing a Sustainable Communities Strategy, to be included within their Regional Transportation Plan, which forecasts a regional development pattern that will achieve, if feasible, SB 375's GHG reduction targets. If a Sustainable Communities Strategy is unable to achieve the GHG reduction target, an MPO must prepare an Alternative Planning Strategy demonstrating how the GHG reduction target would be achieved through alternative development patterns, infrastructure, or additional transportation measures or policies.

The first Climate Change Scoping Plan, a plan required by AB 32, was also approved in 2008. This plan, which is to be updated at least every five years, includes a suite of policies to help the State achieve its GHG targets, in large part leveraging existing programs whose primary goal is to reduce harmful air pollution. The currently operative plan is the 2022 Scoping Plan for Achieving Carbon Neutrality, which was prepared to address climate legislation passed since development of the last scoping plan in 2017. The Plan addresses AB 1279, SB 905, SB 1075, and other legislation and executive orders addressing GHG reductions in various manufacturing sectors and managing natural lands. AB 1279 (California Crisis Act) introduced a statewide policy to "achieve net zero greenhouse gas emissions as soon as possible, but no later than 2045, and achieve and maintain net negative greenhouse gas emissions thereafter, and to ensure that by 2045, statewide anthropogenic greenhouse gas emissions are reduced to at least 85% below the 1990 levels". The bill requires CARB to work with relevant state agencies to ensure that updates to the scoping plan identify and recommend measures to achieve these policy goals and to identify and implement a variety of policies and strategies that enable CO_2 removal solutions and carbon capture, utilization, and storage technologies in California, as specified. SB 905 requires CARB, along with appropriate state and local agencies, to "adopt regulations for a unified permit application for the construction and operation of carbon dioxide capture, removal, or sequestration projects" by January 1, 2025. CARB is further required to develop a public database to track such projects. SB 1075 requires CARB

to specify information relative to the deployment, development, and use of hydrogen as part of the evaluation posted to CARB's internet website by June 1, 2024. Additionally, the California Energy Commission is expected “to study and model potential growth for hydrogen and its role in decarbonizing” as part of the 2023 and 2025 editions of the Integrated Energy Policy Report.

In January 2012, CARB approved the Advanced Clean Cars program, a new emissions-control program for model years 2015 through 2025. The program presents a single coordinated package that includes elements for emission reductions of GHGs and smog- and soot-causing pollutants, promotion of clean cars, and providing fuels for clean cars. To improve air quality, CARB has implemented new emission standards to reduce smog-forming emissions beginning with 2015 model year vehicles. It is estimated that cars will emit 75 percent less smog-forming pollution in 2025 than the average new car sold in 2012. To reduce GHG emissions, CARB, in conjunction with the EPA and NHTSA, has adopted new vehicle GHG standards for model years 2017 through 2025; the new standards are estimated to reduce GHG emissions by 40 percent in 2025, as compared to model year 2012. The Zero Emissions Vehicle (ZEV) program will act as the focused technology of the Advanced Clean Cars program by requiring manufacturers to produce increasing numbers of ZEVs and plug-in hybrid electric vehicles for model years 2018 through 2025. CARB is currently working to develop rules and standards for vehicle model year 2026 and beyond with anticipation of presenting the proposed standards for approval in June 2022 (CARB 2022).

Executive Order B-16-12 was also issued in 2012 and directs state entities under the Governor’s direction and control to support and facilitate the development and distribution of ZEVs. This Executive Order also sets a long-term target of reaching 1.5 million ZEVs on California’s roadways by 2025, effectively reducing GHG emissions from the transportation sector to 80 percent below 1990 levels by 2050. In furtherance of this Executive Order, the Governor convened an Interagency Working Group on ZEVs that has published multiple reports regarding the progress made on the penetration of ZEVs in the statewide vehicle fleet.

In 2015, SB 350 was signed into law, establishing new clean energy, clean air, and GHG reduction goals for 2030 and beyond. Specifically, SB 350 increases California’s renewable electricity procurement goal from 33 percent by 2020 to 50 percent by 2030. SB 100, signed into law in 2018, requires California utilities to reach 50 percent renewable resources by December 31, 2026, and 60 percent by December 31, 2030. SB 100 also establishes policy that renewable energy resources and other zero-carbon resources supply 100 percent of all retail sales of electricity by December 31, 2045. As a renewable energy resource, the Project will support achievement of these goals.

AB 1236, signed into law in October 2015, requires a city, county, or city and county to approve applications for the installation of electric vehicle charging stations. The intent of AB 1236 is to implement the timely and cost-effective installation of electric vehicle charging stations, each of which meets specified statewide standards.

Under AB 32, CARB, as the principal state agency in charge of regulating sources of GHG emissions in California, has been tasked with adopting regulations for the reduction of GHG emissions. Project effects are evaluated based both upon the quantity of GHG emissions and whether the Project implements reduction strategies identified in the 2022 Scoping Plan. If the Project generates GHG emissions below the identified significance thresholds and implements reduction strategies identified in the 2022 Scoping Plan, it could reasonably follow that the Project would not result in a significant contribution to the cumulative impact of global climate change.

3.2.4 Asbestos

CARB has established the Asbestos ATCM for Construction, Grading, Quarrying, and Surface Mining Operations to minimize the generation of asbestos from earth disturbance or construction activities (13

CCR Section 93105). The Asbestos ATCM applies to any project that will include sites to be disturbed in a geographic ultramafic rock unit area or an area where NOA, serpentine, or ultramafic rocks are determined to be present. The Asbestos ATCM establishes notification, management practices, mitigation plans, transport and disposal, and administrative (e.g., recordkeeping and reporting) requirements for subject projects in order to reduce the generation of asbestos from all aspects of construction, grading, quarrying, and mining operations. As stated previously, the Project is not located in an area where NOA is likely to be encountered during construction. However, if NOA is encountered during construction, the Project will comply with the requirements of the Asbestos ATCM.

3.3 Regional and Local

The Project is located in Kern County within the MDAB, which is under the jurisdiction of the EKAPCD. EKAPCD is the agency charged with preparing, adopting, and implementing emission control measures and standards for mobile, stationary, and area sources of air pollution in the MDAB. Other regional agencies which coordinate emission reduction strategies with EKAPCD include the Kern County Planning and Natural Resources Department and the Kern Council of Governments.

3.3.1 Air Quality

Eastern Kern County Air Pollution Control District (EKAPCD)

In 1992, the then Kern County Air Pollution Control District was split into two air districts. The San Joaquin Valley portion of Kern County became part of the SJVAPCD and the eastern, high-desert and Kern River Valley portions of Kern County were renamed the EKAPCD. Even though Eastern Kern is located in the MDAB, EPA continued to consider it part of the San Joaquin Valley Federal Ozone Planning Area. In November 2001, upon EKAPCD's request, EPA formally agreed to consider EKAPCD as a separate ozone planning area. EKAPCD develops plans and implements control measures in their jurisdiction. These controls primarily affect stationary sources such as factories and plants. EKAPCD implements air quality programs required by state and federal mandates, enforces rules and regulations based on air pollution laws, and educates businesses and residents about their role in protecting air quality. EKAPCD is also responsible for managing and permitting existing, new, and modified sources of air emissions within the MDAB portion of Kern County. EKAPCD has primary responsibility for regulating stationary sources of air pollution situated within its jurisdictional boundaries and establishing and enforcing rules and regulations based on federal and state air pollution laws.

In the event that emergency backup generators are required for Project facilities by the AHJ, appropriate air permits will be obtained from EKAPCD. It is also expected that these emergency backup generators, if required, would be CARB-certified to Tier 4 or Tier 4 equivalent emissions standards, as dictated by EKAPCD Best Available Control Technology (BACT) requirements at the time of permitting, and operated in accordance with applicable federal, state, regional, and local ordinances and regulations.

EKAPCD Plans

The *2017 Ozone Attainment Plan for 2008 Federal 75 ppb 8-Hour Ozone Standard* is EKAPCD's contribution to the SIP for demonstrating attainment of the 2008 federal 8-hour ozone standard of 75 parts per billion (ppb) (EKAPCD 2017). In response to the EPA's lowering of the federal 8-hour ozone standard to 70 ppb in 2015 (80 FR 26594), EKAPCD adopted the *Reasonably Available Control Technology (RACT) State Implementation Plan (SIP) for the 2015 Ozone National Ambient Air Quality Standards (NAAQS)* on September 3, 2020 (EKAPCD 2020b). In 2023, EKAPCD adopted the *2023 Ozone Attainment Plan* to satisfy both the 2008 federal 8-hour ozone standard of 75 ppb and the 2015 federal 8-hour ozone standard of 70 ppb (EKAPCD 2023). These plans demonstrate that the EKAPCD's existing

rules reasonably control emissions of ozone precursors from "major sources", and that existing EKAPCD and CARB stationary source, transportation, and mobile source control measures are projected to continue providing emission reductions for many years.

EKAPCD adopted the *Indian Wells Valley Second PM_{10} Maintenance Plan* on May 7, 2020 (EKAPCD 2020a). Even though EPA has revoked the annual PM_{10} standard effective December 18, 2006 (71 FR 61144), the *Indian Wells Valley Second PM_{10} Maintenance Plan* addresses EKAPCD's efforts to achieve or maintain attainment with respect to both the annual and 24-hour PM_{10} standards, since both standards were included in the Amended 2003 PM_{10} Plan that EPA approved into the SIP. As stated in this plan, one of the most effective measures to reduce PM_{10} emissions in the MDAB has been the requirement for large operations to prepare and implement fugitive dust control plans in accordance with EKAPCD's Rule 402.

EKAPCD adopted and later amended its *Guidelines for Implementation of the California Environmental Quality Act (CEQA) of 1970, As Amended* on July 1, 1999 (CEQA Guidelines; EKAPCD 1999). These CEQA Guidelines establish the process by which EKAPCD reviews environmental documents, either as the lead reviewing agency or a responsible or concerned agency, and provide significance thresholds for evaluating a project's significant impacts. According to EKAPCD's CEQA Guidelines, a project will not have significant individual or cumulative air quality impacts if operation of the project will:

- Emit (from all sources subject to EKAPCD Rule 201) less than the offsets trigger levels set forth in EKAPCD Rule 210.1,
- Emit less than 137 pounds per day of NO_X or volatile organic compounds (VOC) from motor vehicle trips,
- Not cause or contribute to an exceedance of a CAAQS or NAAQS,
- Not exceed EKAPCD's health risk public notification thresholds, and
- Be consistent with adopted federal and State air quality attainment plans.

EKAPCD Rules

Rule 106—Land Use. As part of his responsibility to protect the public health and property from the damaging effects of air pollution, it shall be the duty of the Air Pollution Control Officer to review and advise the appropriate planning authorities within the EKAPCD on all new construction or changes in land use which the Air Pollution Control Officer believes could become a source of air pollution problems.

Rule 201—Permitting. Rule 201 establishes permitting requirements for stationary sources, such as emergency generators. Although not a traditional stationary source, in March 12, 2015, the EKAPCD adopted rules requiring commercial solar facilities to obtain Authority to Construct and Permit to Operate approval under Rule 201 to address fugitive dust emissions. Under Rule 201, these projects would be required to submit a Fugitive Dust Emissions Control Plan in accordance with Rule 402. In addition, EKAPCD is requiring a Fugitive Dust Emissions Monitoring Plan with a recommendation for each facility to install upwind and downwind particulate matter air monitoring, utilize an Alternative Air Monitoring Strategy, or join into the EKAPCD regional fugitive dust monitoring network. The monitoring will be used to demonstrate compliance with EKAPCD's Rules and Regulations.

Rule 210.1—New and Modified Stationary Source Review (NSR). Rule 210.1 requires new and modified stationary sources of affected pollutants to go through preconstruction review to ensure emissions will not interfere with attainment of ambient air quality standards. The Rule ensures appropriate new and modified sources of affected pollutants are constructed with BACT and provide for no significant net increase in emissions from new and modified stationary sources for all nonattainment pollutants and their precursors.

Rule 401—Visible Emissions. A person shall not discharge into the atmosphere, from any single source of emission whatsoever, any air contaminant for a period or periods aggregating more than 3 minutes in any one hour which is:

A. As dark or darker in shade as that designated as No. 1 on the Ringelmann Chart, as published by the United States Bureau of Mines, or

B. Of such opacity as to obscure an observer's view to a degree equal to or greater than does smoke described in Subsection A (of the Rules).

Rule 402—Fugitive Dust. Rule 402 applies to specific outdoor fugitive dust producing activities, including construction, excavation, and other earthmoving activities such as land clearing, grubbing, scraping, and onsite travel on unpaved access roads. Regulated activities must limit visible fugitive dust emissions through the implementation of fugitive dust emission control strategies related to earthmoving activities, carryout/trackout, travel on unpaved roads, etc., and comply with the following requirements:

- A person shall not cause or allow emissions of fugitive dust from any active operation to remain visible in the atmosphere beyond the property line of the emission source or results in 20 percent opacity or greater during each observation given the observations total 3 minutes or more of duration in a single hour.

- A person shall utilize one or more Reasonably Available Control Measures (RACM) or Bulk Material Control Measures (BMCM) to minimize fugitive dust emissions from each source type that is part of any active operation, including unpaved roadways.

- No person shall conduct a large operation without filing for and obtaining an approved Fugitive Dust Emission Control Plan. Large operation is defined as "Any construction activity on any site involving 10 or more contiguous acres of disturbed surface area, or any earthmoving activity exceeding a daily volume of 10,000 cubic yards, or relocating more than 2,500 cubic yards per day of bulk materials at least three days per year."

- EKAPCD may require onsite PM_{10} monitoring for any large operation that causes downwind PM_{10} ambient concentrations to increase more than 50 micrograms per cubic meter above upwind concentrations as determined by utilizing high-volume particulate matter samplers, or other EPA-approved equivalent method(s).

Because the Project site is approximately 2,300 acres, it is probable that the Project would involve 10 or more contiguous acres of disturbed surface area despite site preparation activities utilizing construction techniques that minimize soil disturbance and large-scale grading. Therefore, the Project would likely be considered a large operation and require a Fugitive Dust Emissions Control Plan. As part of this plan, the Project would be required to implement fugitive dust emission control strategies, primarily as the BMPs and mitigation measures described in Section 4.

Rule 404.1—Particulate Matter Concentrations. Rule 404.1 pertains to Particulate Matter Concentrations – Desert Basin and states: "A person shall not discharge into the atmosphere from any single source operation, the construction or modification of which commenced after the adoption of this Rule, particulate matter in excess of 0.1 grains per cubic foot of gas at standard conditions."

Rule 412—Gasoline Transfer into Stationary Storage Containers, Delivery Vessels and Bulk Plants. Rule 412 applies to the transfer of gasoline into stationary storage tanks, gasoline delivery vessels and gasoline bulk plants. The rule requires CARB Phase I Vapor Recovery systems among other provisions.

Rule 412.1—Transfer of Gas to Vehicle Fuel Tanks. Rule 412.1 applies to the transfer of gasoline into vehicle fuel tanks from stationary storage containers subject to the requirements of Rule 412 (Gasoline Transfer into Stationary Storage Containers, Delivery Vessels and Bulk Plants). The rule requires CARB Certified Phase II Vapor Recovery Systems.

Rule 419—Nuisance. Rule 419 states that a person shall not discharge from any source whatsoever such quantities of contaminants or other material that cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public or that endanger the comfort, repose, health, or safety of such persons or the public or that cause or have a natural tendency to cause injury or damage to business or property.

Rule 422—New Source Performance Standards. Rule 422 incorporates performance standard provisions of 40 CFR Part 60 for implementation delegation by EKCAPCD. The standards include provisions for storage of petroleum liquids, among others.

Rule 423—National Emission Standards for Hazardous Air Pollutants and Source Categories (NESHAPs). Rule 423 adopts the EPA's NESHAPs by reference, which grants EKAPCD the ability to ensure that all sources of HAPs would comply with applicable standards, criteria, and requirements set forth in 40 CFR Parts 61 and 63, which are in effect as of October 10, 2017.

Kern County

Kern County released a General Plan in 2009 that outlines policies, goals, and implementation measures related to air quality. This plan is not specific to development projects but provides policies and implementation measures to be considered for implementation for any activity (planning, development, etc.) occurring within Kern County. The policies and implementation measures applicable to this Project are included below (Kern County 2009):

Chapter 1. Land Use, Conservation, and Open Space Element; Section 1.10.2. Air Quality

Policies

- Policy 18: The air quality implications of new discretionary land use proposals shall be considered in approval of major developments. Special emphasis will be placed on minimizing air quality degradation in the desert to enable effective military operations and in the valley region to meet attainment goals.
- Policy 19: In considering discretionary projects for which an Environmental Impact Report must be prepared pursuant to the California Environmental Quality Act, the appropriate decision-making body, as part of its deliberations, will ensure that:
  - All feasible mitigation to reduce significant adverse air quality impacts have been adopted; and
  - The benefits of the proposed project outweigh any unavoidable significant adverse effects on air quality found to exist after inclusion of all feasible mitigation. This finding shall be made in a statement of overriding considerations and shall be supported by factual evidence to the extent that such a statement is required pursuant to the California Environmental Quality Act.
- Policy 20: The County shall include fugitive dust control measures as a requirement for discretionary projects and as required by the adopted rules and regulations of the San Joaquin Valley Unified Air Pollution Control District and the Kern County Air Pollution Control District on ministerial permits.
- Policy 21: The County shall support air districts efforts to reduce PM_{10} and $PM_{2.5}$ emissions.

- Policy 22: Kern County shall continue to work with the San Joaquin Valley Unified Air Pollution Control District and the Kern County Air Pollution Control District toward air quality attainment with federal, State, and local standards.

Implementation Measures

- Measure F: All discretionary permits shall be referred to the appropriate air district for review and comment.
- Measure G: Discretionary development projects involving the use of tractor-trailer rigs shall incorporate diesel exhaust reduction strategies including, but not limited to:
  - Minimizing idling time.
  - Electrical overnight plug-ins.
- Measure H: Discretionary projects may use one or more of the following to reduce air quality effects:
  - Pave dirt roads within the development.
  - Pave outside storage areas.
  - Provide additional low Volatile Organic Compounds (VOC) producing trees on landscape plans.
  - Use of alternative fuel fleet vehicles or hybrid vehicles.
  - Use of emission control devices on diesel equipment.
  - Develop residential neighborhoods without fireplaces or with the use of Environmental Protection Agency certified, low emission natural gas fireplaces.
  - Provide bicycle lockers and shower facilities on site.
  - Increasing the amount of landscaping beyond what is required in the Zoning Ordinance (Chapter 19.86).
  - The use and development of park and ride facilities in outlying areas.
  - Other strategies that may be recommended by the local Air Pollution Control Districts.
- Measure J: The County should include PM_{10} control measures as conditions of approval for subdivision maps, site plans, and grading permits.

Chapter 5. Energy Element; Section 5.4.5. Solar Energy Development

Policies

- Policy 1: The County shall encourage domestic and commercial solar energy uses to conserve fossil fuels and improve air quality.
- Policy 3: The County should permit solar energy development in the desert and valley planning regions that do not pose significant environmental or public health and safety hazards.

Kern County released the *Mojave Specific Plan* in 2003 to provide guidance for development within and surrounding the community of Mojave. The *Mojave Specific Plan* addresses issues of importance in the area through its statement of goals, policies, and implementation measures to accommodate growth while protecting community business, transportation, and environmental issues. The Plan includes objectives, policies, and implementation measures for air quality, conservation, and other aspects of development which are not explicitly stated below but can be referenced in the Plan (Kern County 2003).

Chapter 4. Conservation Element

- Objective 4.6: Promote the improvement of air quality and the maintenance of State and Federal air quality standards in the Mojave area.
- Policy 4.6.2: Continue to enforce the Kern County grading ordinance through Engineering and Survey Services (ESS), along with dust control and other rules and measures through the Air Pollution Control District to mitigate air quality effects during the construction of new development.
- Policy 4.6.3: Encourage development designs that promote energy conservation and that minimize the direct and indirect emissions of air contaminants.

Chapter 10. Implementation

- Measure N-2b: Air Quality studies will be required for industrial zone changes and conditional use permit projects which may emit affected pollutants, or toxic air contaminants. Prior to the approval of any industrial zone changes and/or conditional use permits, a level of impact determination shall be made, at which time the appropriate air quality analysis will be conducted.
- Measure N-4: Require that construction of new development projects comply with the County Grading Ordinance and all adopted applicable dust control measures of the Kern County Air Pollution Control District.
- Measure N-6a through N-6c: The following measures shall be incorporated into all development projects, as applicable, that implement the plan. Verification of these measures shall occur during site plan review and building inspection:
  - During grading operations, the developer shall be responsible for the application of water to development sites at least twice daily to mitigate the impact of dust and PM_{10} emissions. Spraying should be sufficient to ensure that soils remain damp, with the frequency of spraying dependent on weather conditions. Graded areas that are to be left undeveloped or unpaved for more than six weeks are to be sufficiently dust controlled through use of an applied surface agent, daily watering, or revegetated.
  - During grading operations, all activity should be restricted to periods of low wind, generally considered under 25 miles per hour (mph), to reduce dust emissions.
  - Construction speed limits will be posted at 15 mph. Preparation of roadway surfaces in a phased manner (where segments of the route are graded in succession) will greatly minimize the amount of time the surfaces are left exposed, thereby reducing vehicle-related dust emissions.

Since this Project requires a CUP from the Kern County Planning and Natural Resources Department, EKAPCD is not the lead reviewing agency. As such, the Project must adhere to the Kern County Planning and Natural Resources Department's minimum technical guidance for preparing air quality assessments, as established in the *Guidelines for Preparing an Air Quality Assessment for Use In Environmental Impact Reports* (Kern County 2006). These Guidelines are intended to ensure the assumptions and methodology used in Kern County's environmental documents are uniform from one project to another, thereby facilitating comparison of air quality impacts. To that end, the Guidelines provide a series of specific instructions for what must be included in the assessment and how to conduct the assessment. For example, an air quality assessment must quantify short-term construction emissions and long-term operational emissions, determine maximum 24-hour average concentrations of PM_{10} and $PM_{2.5}$ through air dispersion modeling, conduct a cumulative impact assessment, and prepare an HRA, if applicable. These and all other Kern County Planning and Natural Resources Department requirements are more specifically addressed throughout this report.

3.3.2 Air Toxics

As discussed previously, EKAPCD's CEQA Guidelines indicate that a project will not have significant individual or cumulative air quality impacts if operation of the project will not exceed EKAPCD's health risk public notification thresholds (EKAPCD 1999). This can be demonstrated through preparation of an HRA, consistent with the requirements of the Kern County Planning and Natural Resources Department's Guidelines. EKAPCD's health risk public notification thresholds are specified in EKAPCD Rule 208.2.

3.3.3 Greenhouse Gases

On March 8, 2012, EKAPCD adopted the *Addendum to CEQA Guidelines Addressing GHG Emission Impacts for Stationary Source Projects When Serving as Lead CEQA Agency* (EKAPCD 2012a). This policy establishes EKAPCD's process of evaluating new or modified stationary source GHG impacts and will be used when EKAPCD is the lead reviewing agency. The policy requires project-specific GHG emissions to be quantified for comparison to the significance threshold of 25,000 tons per year (tpy). If a project's emissions are less than 25,000 tpy, EKAPCD will determine the project to have a less-than-significant individual or cumulatively considerable impact on GHG emissions. If a project's emissions are equal to or greater than 25,000 tpy, its significance will be assessed based on its ability to demonstrate compliance with State GHG reduction plans, such as the Climate Change Scoping Plan, or to reduce emissions by at least 20 percent below business-as-usual.

In 2018, the Kern Council of Governments (KCOG) released its Regional Transportation Plan and Sustainable Communities Strategy (RTP/SCS), which is a 24-year blueprint establishing a set of regional transportation goals, policies, and actions intended to guide development of transportation systems in Kern County and includes a sustainable communities strategy component in accordance with SB 375. According to the SCS, per capita CO_2 emissions from cars and light-duty trucks were expected to be 14.1 percent lower than 2005 levels by 2020 and 16.6 percent lower than 2005 levels by 2035, exceeding the 5 and 10 percent targets, respectively, established by CARB in 2010 (KCOG 2018). The 2022 update of the RTP confirms that having outperformed the 2020 state GHG target, the Kern region is on track to achieve the 2035 target (KCOG 2022). The RTP projects that the total employment in Kern County will be 364,700 in 2030 and 402,200 in 2050 (Table 3-1, KCOG 2022). In comparison to the 2015 forecast used in the 2018 RTP, the new plan presents an adjusted, "more modest long term forecast of demographic and economic indicators for Kern County". The adjusted forecast stems from actual economic and demographic indicators from the 2015 to 2019 period, which were lower than the previous forecast levels for those years.[4] A project's significance can also be assessed through its consistency with the SCS.

Since this Project requires a CUP from the Kern County Planning and Natural Resources Department, EKAPCD is not the lead reviewing agency. However, the Kern County Planning and Natural Resources Department's Guidelines do reference air district-level guidance, such that the Project would be expected to demonstrate compliance with EKAPCD's GHG policy and not conflict with KCOG's development goals.

3.3.4 Valley Fever

Valley Fever, as outlined in Section 2.2.4, is known to be present in Kern County. Though it is not explicitly regulated, control and mitigation of exposure to Valley Fever is indirectly implemented through the use of fugitive dust and particulate-related controls and regulations. The controls and fugitive dust mitigation measure requirements for the Project are summarized in Section 4 below.

[4] Determined through interpolation of data presented in Table 3-4; specifically leveraged the 2014 employment forecast of 318,000 and the 2014 – 2035 growth rate of 1.5 percent (KCOG 2018).

3.3.5 Asbestos

In addition to the State's Asbestos ATCM, EKAPCD Rule 423 adopts EPA's NESHAP for asbestos. This NESHAP covers several activities, including demolition and renovation projects. Asbestos-containing material (ACM) is defined as any building material containing greater than 1 percent commercial asbestos by weight, area, or count, and includes both friable and Category I or Category II non-friable ACM. If material known or suspected to contain asbestos is encountered, removal, handling, labeling, transport, and disposal of the material would be conducted in accordance with EPA's procedures. Since no existing buildings are present at the Project site, demolition activities are not expected to occur during Project construction that would encounter ACM; therefore, the requirements of Rule 423 would not apply to this Project.

4. Emissions Reduction Measures

CEQA requires the consideration of regional, State, and federal plans, policies, and regulations when evaluating potential project impacts and developing avoidance and minimization measures. BMPs were identified to address State and regional plans, policies, and requirements and are considered part of the Project (EKAPCD 2012b). Mitigation measures were also identified and are expected to be implemented, where feasible, for consistency with neighboring solar development projects.

4.1 Best Management Practices

The following BMPs will be implemented as part of Project design to help minimize the Project's air emissions, and are consistent with the recommendations of both EKAPCD's Rule 402 and *Suggested Air Pollutant Mitigation Measures for Construction Sites for Eastern Kern APCD* (EKAPCD 2012b):

- Water trucks will be present and in use at the construction site. All portions of the site subject to blowing dust will be watered as necessary to ensure proper control of blowing dust for the duration of the Project, but no less than twice daily.
- Disturbed areas will be minimized as best as possible.
- Stockpiles of soil and other loose materials will be stabilized by watering to prevent wind-blown fugitive dust.
- All earthmoving activities including clearing, grading, bulldozing, and excavation will cease during periods of sustained wind speeds (averaged over one hour) greater than 20 mph if working material is easily windblown or causes dust plumes with 20 percent opacity or greater impacting public roads, occupied structures, or neighboring property.
- Public streets and medians soiled or littered due to Project construction activities will be cleaned and swept as needed during the work week, or as otherwise directed by Kern County's Department of Public Works.
- All trucks hauling soil, sand, and other loose materials will be covered with tarpaulins or other effective covers.
- The construction contractor will be solely responsible for dust control measures and for obtaining all required permits and approvals, if any.
- Unpaved roads will be treated with a soil stabilizer, as applicable, and vehicle speeds will be limited to 15 mph onsite.
- Access to the site will be by means of an apron from adjoining surfaced roadways. The apron will be surfaced or treated with dust palliatives. If soils cling to the wheels of vehicles, a device will be placed on the exiting roadway to remove most of the soil on vehicle wheels.
- When needed and acceptable to the local fire department, weed control will be accomplished by mowing instead of discing.
- All employees and contractors will comply with California idling restrictions for compression engines and use ultra-low sulfur diesel fuel.
- The construction contractor will properly maintain and tune all internal combustion engine powered equipment.

4.2 Mitigation Measures

The Enterprise Solar Storage Project is expected to implement similar mitigation measures deemed necessary for the Sanborn Solar Project and other nearby solar projects approved by the County. These measures are as follows:

MM AQ-1, Implement Diesel Emission-Reduction Measures During Construction and Decommissioning: To control NO_X and PM emissions during construction, the Project proponent/operator and/or its contractor(s) shall implement the following measures during construction of the Project, subject to verification by the County:

a) All on-site off-road equipment and on-road vehicles shall meet the recent California Air Resources Board engine emission standards or alternatively fueled equipment, such as compressed natural gas, liquefied natural gas, or electric, as appropriate.

b) All equipment shall be maintained in accordance with the manufacturer's specifications.

c) Construction-related equipment, including heavy-duty equipment, motor vehicles, and portable equipment, shall be turned off when not in use for more than 5 minutes.

d) Notification shall be provided to trucks and vehicles in loading or unloading queues that their engines shall be turned off when not in use for more than 5 minutes.

e) Electric equipment shall be used to the extent feasible in lieu of diesel or gasoline-powered equipment.

f) All construction vehicles shall be equipped with proper emissions control equipment and kept in good and proper running order to substantially reduce NO_X emissions.

g) On-road and off-road diesel equipment shall use diesel particulate filters (or the equivalent) if permitted under manufacturer's guidelines.

h) Existing electric power sources shall be used to the extent feasible. This measure would minimize the use of higher polluting gas or diesel generators.

i) The hours of operation of heavy-duty equipment and/or the quantity of equipment in use shall be limited to the extent feasible.

MM AQ-2, Implement Fugitive Dust Control Plan During Construction and Decommissioning. To control fugitive PM emissions during construction, prior to the issuance of grading or building permits and any earthwork activities, the project proponent shall prepare a comprehensive Fugitive Dust Control Plan for review by the Kern County Planning and Natural Resources Department. The plan shall include all EKAPCD-recommended measures, including but not limited to, the following:

a) All soil being actively excavated or graded shall be sufficiently water to prevent excessive dust. Watering shall occur as needed with complete coverage of disturbed soils areas. Watering shall take place a minimum of three times daily where soil is being actively disturbed, unless dust is otherwise controlled by rainfall or use of a dust suppressant.

b) All clearing, grading, earth moving, and excavation activities should cease during the following:

    1. Periods of winds greater than 20 mph (averaged over one hour), if disturbed materials is easily windblown,

    2. When dust plumes of 20% or greater opacity impact, or

    3. During periods of high winds (i.e., greater than 30 mph)

c) Vehicle speed for all on site (i.e., within the project boundary) construction vehicles shall not exceed 15 mph on any unpaved surface at the construction site. Signs identifying construction vehicle speed

limits shall be posted along onsite roadways, at the site entrance/exit, and along unpaved site access roads.

d) Vehicle speeds on all offsite unpaved roads (i.e., outside the project boundary) construction vehicles shall not exceed 25 mph. Signs identifying vehicle speed limits shall be posted along unpaved site access roads and at the site entrance/exit.

e) All onsite unpaved roads and offsite unpaved public project-site access road(s) shall be effectively stabilized of dust emissions using water or EKAPCD- approved dust suppressants/palliatives, sufficient to prevent wind-blown dust exceeding 20 percent opacity at nearby residences or public roads. If water is used, watering shall occur a minimum of three times daily, sufficient to keep soil moist along actively used roadways. During the dry season, unpaved road surfaces and vehicle parking/staging areas shall be watered immediately prior to periods of high use (e.g., worker commute periods, truck convoys). Reclaimed (non-potable) water shall be used to the extent available and feasible.

f) The amount of the disturbed area (e.g., grading, excavation) shall be reduced and/or phased where possible.

g) All disturbed areas shall be sufficiently watered or stabilized by EKAPCD-approved methods to prevent excessive dust. On dry days, watering shall occur a minimum of three times daily on actively disturbed areas. Watering frequency shall be increased whenever wind speeds exceed 15 mph or, as necessary, to prevent wind-blown dust exceeding 20 percent opacity at nearby residences or public roads. Reclaimed (non-potable) water shall be used to the extent available and feasible.

h) All clearing, grading, earth moving, and excavation activities shall cease during periods when dust plumes of 20 percent or greater opacity affect public roads or nearby occupied structures.

i) All disturbed areas anticipated to be inactive for periods of 30 days or more shall be treated to minimize wind-blown dust emissions. Treatment may include, but is not limited to, the application of an EKAPCD- approved chemical dust suppressant, gravel, hydro- mulch, revegetation/seeding, or wood chips.

j) All active and inactive disturbed surface areas shall be compacted, where feasible.

k) Equipment and vehicle access to disturbed areas shall be limited to only those vehicles necessary to complete the construction activities.

l) Where applicable, permanent dust control measures shall be implemented as soon as possible following completion of any soil-disturbing activities.

m) Stockpiles of dirt or other fine loose material shall be stabilized by watering or other appropriate methods sufficient to reduce visible dust emissions to a limit of 20 percent opacity. If necessary and where feasible, three-sided barriers shall be constructed around storage piles and/or piles shall be covered by use of tarps, hydro-mulch, woodchips, or other materials sufficient to minimize wind-blown dust.

n) Water shall be applied prior to and during the demolition of onsite structures sufficient to minimize wind-blown dust.

o) Where acceptable to the fire department and feasible, weed control shall be accomplished by mowing instead of disking, thereby leaving the ground undisturbed and with a mulch covering.

p) All trucks hauling dirt, sand, soil, or other loose materials shall be covered or shall maintain at least 2 feet of freeboard (minimum vertical distance between top of the load and top of the trailer) in accordance with California Vehicle Code Section 23114.

q) Gravel pads, grizzly strips, or other material track-out control methods approved for use by EKAPCD shall be installed where vehicles enter or exit unpaved roads onto paved roadways.

r) Haul trucks and off-road equipment leaving the site shall be washed with water or high-pressure air, and/or rocks/grates at the project entry points shall be used, when necessary, to remove soil deposits and minimize the track-out/deposition of soil onto nearby paved roadways.

s) During construction paved road surfaces adjacent to the site access road(s), including adjoining paved aprons, shall be cleaned, as necessary, to remove visible accumulations of track-out material. If dry sweepers are used, the area shall be sprayed with water prior to sweeping to minimize the entrainment of dust. Reclaimed water shall be used to the extent available.

t) Portable equipment, 50 horsepower or greater, used during construction activities (e.g., portable generators, temporary concrete batch plant) shall require California statewide portable equipment registration (issued by CARB) or an EKAPCD permit.

u) The Fugitive Dust Control Plan shall identify a designated person or persons to monitor the fugitive dust emissions and enhance the implementation of the measures, as necessary, to minimize the transport of dust off-site and to ensure compliance with identified fugitive dust control measures. Contact information for a hotline shall be posted on site any should any complaints or concerns be received during working hours and holidays and weekend periods when work may not be in progress. The names and telephone numbers of such persons shall be provided to the EKAPCD Compliance Division prior to the start of any grading or earthwork.

v) Signs shall be posted at the project site entrance and written notifications shall be provided a minimum of 30 days prior to initiation of project construction to residential land uses located within 1,000 feet of the project site. The signs and written notifications shall include the following information: (a) Project Name; (b) Anticipated Construction Schedule(s); and (c) Telephone Number(s) for designated construction activity monitor(s) or, if established, a complaint hotline.

w) The designated construction monitor shall document and immediately notify EKAPCD of any air quality complaints received. If necessary, the project operator and/or contractor will coordinate with EKAPCD to identify any additional feasible measures and/or strategies to be implemented to address public complaints.

MM AQ-3, Minimize Exposure to Potential Valley Fever–Containing Dust: To minimize personnel and public exposure to potential Valley Fever–containing dust on and off site, the following control measures shall be implemented during Project construction:

a) Equipment, vehicles, and other items shall be thoroughly cleaned of dust before they are moved off site to other work locations.

b) Wherever possible, grading and trenching work shall be phased so that earth-moving equipment is working well ahead or downwind of workers on the ground.

c) The area immediately behind grading or trenching equipment shall be sprayed with water before ground workers move into the area.

d) In the event that a water truck runs out of water before dust is sufficiently dampened, ground workers being exposed to dust shall leave the area until a truck can resume water spraying.

e) To the greatest extent feasible, heavy-duty earth-moving vehicles shall be closed- cab and equipped with a HEP-filtered air system.

f) Workers shall receive training in procedures to minimize activities that may result in the release of airborne *Coccidioides immitis* (CI) spores, to recognize the symptoms of Valley Fever, and shall be instructed to promptly report suspected symptoms of work-related Valley Fever to a supervisor. Evidence of training shall be provided to the Kern County Planning and Natural Resources Department.

g) A Valley Fever informational handout shall be provided to all onsite construction personnel. The handout shall, at a minimum, provide information regarding the symptoms, health effects, preventative measures, and treatment. Additional information and handouts can be obtained by contacting the Kern County Public Health Services Department.

h) On-site personnel shall be trained on the proper use of personal protective equipment, including respiratory equipment. National Institute for Occupational Safety and Health–approved respirators shall be provided to on-site personnel, upon request. When exposure to dust is unavoidable, provide appropriate NIOSH-approved respiratory protection to affected workers, if necessary. If respiratory protection is deemed necessary, employers must develop and implement a respiratory protection program in accordance with Cal/OSHA's Respiratory Protection standard (8 CCR 5144).

MM AQ-4: Prior to the issuance of grading permits, a one- time fee shall be paid to the Kern County Public Health Services Department in the amount of $3,200 for Valley Fever public awareness programs.

MM AQ-5: As required by EKAPCD, all permitted stationary sources of air pollution would be equipped with applicable BACT.

5. Environmental Analysis

5.1 Methodology

5.1.1 Emission Estimates

The Project's short-term construction emissions and long-term operation emissions were estimated using the following, as applicable:

- Construction equipment horsepower, load factors, and emission factors from the *California Emissions Estimator Model (CalEEMod) User's Guide* (BREEZE Software 2021), assuming Tier 3 equipment to be conservative for the mitigated emissions scenario.
- Paving and water-usage related emission factors from the *CalEEMod User's Guide* (BREEZE Software 2021).
- Vehicle running exhaust, idling exhaust, tire wear, and brake wear emission factors from *EMFAC2017*[5].
- Fugitive dust emission factors for grading, bulldozing, truck loading/dumping, and paved and unpaved road travel from the *CalEEMod User's Guide* (BREEZE Software 2021), which incorporates portions of *AP-42* (EPA 2006 and 2011).
- Fugitive dust control efficiencies from the South Coast Air Quality Management District's (SCAQMD) *CEQA Air Quality Analysis Handbook* (SCAQMD 2007) or CalEEMod model, where needed, consistent with BMPs and MM AQ-2 for the unmitigated and mitigated emissions scenarios, respectively.
- Emission factors for stationary diesel- and natural gas-fired engines based on *AP-42* (EPA 1996), certified tier emission rates, and Caterpillar and MTU vendor performance data.

Appendix B contains the air quality and GHG construction and operation emission calculations, as well as assumptions used to facilitate the emission estimates. Specifications and emissions for the Project's diesel- and natural gas-fired emergency backup generator engines are included as Appendix B1.

5.1.2 Air Quality Impact Assessment

An air dispersion modeling analysis for 24-hour PM_{10} and 24-hour $PM_{2.5}$ was performed for assessing Project construction-related ambient air quality impacts. Air dispersion modeling was not performed for the operational emissions as they are below the thresholds of significance and would be intermittent sources estimated at approximately 50 hours per year, likely to have negligible impacts. A detailed summary of the models and data used in performing this dispersion modeling assessment is included in Appendix C.

5.1.3 Health Risk Assessment

DPM is the only air toxin to be potentially emitted during Project construction and operation in potentially impactful quantities. Construction emissions of DPM, resulting from construction equipment and heavy-duty vehicle exhaust, would be transient, temporary, and occur in varying locations within the Project site. Operational emissions of DPM are the result of maintenance and testing operations of diesel-fired emergency generators. Other non-diesel combustion sources would be minimal and likely have negligible health-risk impacts and were therefore not included in the HRA. A screening HRA was performed for both construction and operation DPM emissions using the AERMOD dispersion model, along with equations

[5] *EMFAC2017* is the most recent version approved by the EPA and is available for download at https://ww2.arb.ca.gov/our-work/programs/mobile-source-emissions-inventory/msei-modeling-tools-emfac-software-and.

from the *Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments* (OEHHA 2015), to estimate the Project's cancer and non-cancer chronic health risks. The Project's non-cancer acute health risks were not estimated because OEHHA has not established an acute reference exposure level or associated non-cancer risk values for DPM. As described in Appendix C, DPM emissions were best represented by PM_{10} emissions from diesel-fueled onsite equipment exhaust. Particulate emissions associated with gasoline-powered equipment and vehicles, natural gas-fired generators, and offsite vehicle trips were not included in the DPM emissions. In the mitigated emissions scenario and for the HRA, construction equipment was assumed to meet Tier 3 emission standards in the development of the emission estimates to be conservative. A detailed summary of the models and data used in performing this screening HRA is included in Appendix C.

5.2 Significance Criteria

5.2.1 CEQA Checklist

The significance criteria were defined based on the checklist items presented in Appendix G of the CEQA Guidelines (2021). The proposed project would cause a significant impact on air quality if it would:

a) Conflict with or obstruct implementation of the applicable air quality plan,

b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard. Specifically, would implementation of the project (in a specific location) exceed any of the following adopted thresholds:

Eastern Kern Air Pollution Control District:

Operational and Area Sources

25 tons per year for ROG

25 tons per year for NO_X

15 tons per year for PM_{10}

c) Expose sensitive receptors to substantial pollutant concentrations, or

d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

The proposed project would cause a significant impact on GHGs if it would:

a) Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment, or

b) Conflict with any applicable plan, policy, or regulation of an agency adopted for the purpose of reducing the emissions of GHGs.

5.2.2 Criteria Air Pollutants

Quantitative thresholds of significance for projects under EKAPCD's jurisdiction are specified in the *Guidelines for Preparing an Air Quality Impact Assessment for Use in Environmental Impact Reports* (Kern County 2006) and in the *Guidelines for Implementation of the California Environmental Quality Act (CEQA) of 1970, As Amended* (EKAPCD 1999). Specifically, Attachment A of the Kern County Planning and Natural Resources Department's Guidelines indicates that project-related impacts on air quality may be individually or cumulatively significant when onsite emission increases from construction activities or operational activities exceed the screening level of any criteria air pollutant after implementation of all enforceable mitigation measures.

For criteria air pollutants, the annual and daily mass emissions significance thresholds for EKAPCD are shown in Table 7.

Table 7. EKAPCD Criteria Air Pollutant Significance Thresholds

Construction or Operation Emissions	ROG	CO	NO_X	SO_2	PM_{10}	$PM_{2.5}$
EKAPCD Annual Thresholds (tpy)	25	--	25	--	15	--
EKAPCD Daily Thresholds (lb/day)	137	--	137	--	--	--

Sources: Kern County 2006 and EKAPCD 1999

Notes:

-- = No established threshold of significance

lb/day = pound(s) per day

For an ambient air quality analysis, the respective SILs for each pollutant and averaging period reflect the threshold for which a project's emissions would not cause or significantly contribute to a violation of the NAAQS. For this Project, EPA's SILs of 1.2 micrograms per cubic meter ($\mu g/m^3$) for 24-hour $PM_{2.5}$ and 5 $\mu g/m^3$ for 24-hour PM_{10} should be used.

The EKAPCD's CEQA Guidelines point to additional thresholds related to the offset triggers specified in EKAPCD Rule 210.1, *New & Modified Stationary Source Review (NSR)*, which are applicable to new stationary sources or modifications to existing stationary sources. However, emergency equipment operating less than 200 hours per year are exempt from these requirements. As such, these thresholds are not applicable to the Project and have not been included above for comparison to the Project's emissions.

Although the EKAPCD is currently an attainment area for CO, there is a potential for the formation of microscale CO "hotspots" to occur immediately around points of congested traffic. Typically, high CO concentrations are associated with urban roadways or intersections operating at an unacceptable Level of Service (LOS). Therefore, the EKAPCD has established the following criteria for determining the need for a CO Hotspot analysis:

- A traffic study for the project indicates that the LOS on one or more streets or at one or more intersections in the project vicinity will be reduced to LOS E or F; or
- A signalization or channelization is added to an intersection; or
- Sensitive receptors are located near the vicinity of an affected intersection or signalization.

If any of the above criteria can be associated with any intersection affected by the project, the applicant would need to conduct a CO Hotspot analysis to determine the project's significance. However, if none of the above criteria can be associated with any intersection affected by the project, the project will have no potential to create a violation of the CO standard.

5.2.3 Air Toxics

EKAPCD's Rule 208.2, *Criteria for Finding of No Significant Environmental Impact (California Environmental Quality Act)*, provides thresholds for analysis of health risk impacts from project operation, considering both permitted and non-permitted sources. The following are the TAC significance thresholds:

- Carcinogens: Maximally exposed individual risk equals or exceeds 1 in 1 million
- Non-Carcinogens, Acute: Hazard Index equals or exceeds 0.2 for the maximally exposed individual
- Non-Carcinogens, Chronic: Hazard Index equals or exceeds 0.2 for the maximally exposed individual

5.2.4 Greenhouse Gases

With respect to GHGs, EKAPCD has developed a significance threshold of 25,000 tpy in its *Addendum to CEQA Guidelines Addressing GHG Emission Impacts For Stationary Source Projects When Serving as Lead CEQA Agency* (EKAPCD 2012a). In the event that emergency backup generators are required for Project substations or the battery energy storage systems by the AHJ, they would be the only stationary sources of emissions for the Project. However, all construction and operation-related emissions from the Project will be compared to this threshold. The analysis also addresses the Project's consistency with the Climate Change Scoping Plan, which is an applicable plan to reduce GHG emissions.

5.3 Environmental Impacts

The significance criteria described above were used to evaluate air quality and GHG impacts associated with construction and operation of the Project. Emission estimates and modeled results, as well as the potential impacts and their significance, are identified below.

5.3.1 Project-related Emissions

5.3.1.1 Construction

The Project's short-term construction emissions are a result of construction equipment and vehicle exhaust, paving, water usage, and fugitive dust associated with vehicle travel on paved and unpaved roads and earthmoving activities. Construction traffic would consist of worker passenger vehicles and heavy trucks delivering parts, equipment, and materials to the Project site. Up to 50 construction workers per week would be required to support the transmission line realignment. During the remainder of the construction, the construction peak workforce is conservatively assumed to be approximately 800 workers (760 trips), and the average daily workforce of approximately 475 construction, supervisory, support, and construction management personnel (despite actual projections being closer to 250 workers per day). To the extent feasible, the NO_X, PM_{10}, and $PM_{2.5}$ exhaust emissions from construction equipment with a horsepower rating greater than 50 horsepower will be reduced by using newer, lower polluting construction equipment and cleaner fuels, consistent with Mitigation Measure (MM) AQ-1. Fugitive dust emissions during construction will be limited through implementation of the construction BMPs and MM AQ-2 identified in Section 4.

Major sources of emissions during site preparation, grading, and solar panel construction include: (1) exhaust emissions from construction equipment and vehicles, (2) fugitive dust generated by construction vehicles and equipment traveling over exposed surfaces, and (3) soil disturbances from grading, bulldozing, and excavating/backfilling. For emissions purposes, it is assumed that construction activities will overlap, and that construction is projected to commence in 2022 and last 28 months, with the first four months dedicated to realignment of the SCE transmission line. Construction would primarily occur during daylight hours, Monday through Friday. Unmitigated construction emissions are shown in Table 8A and include implementation of BMPs for dust control. Mitigated construction emissions are shown in Table 8B and include implementation of BMPs and MM AQ-2 for dust control and MM AQ-1 for controlling construction equipment exhaust. Detailed emissions calculations are provided in Appendix B. As shown, the Project's construction emissions would exceed the EKAPCD's annual significance threshold for PM_{10}, even with mitigation.

Table 8A. Construction Criteria Pollutant Emissions without Mitigation [a]

Construction Period	VOC	CO	NOx	SO_2	PM_{10}	$PM_{2.5}$
Maximum Daily Emissions (lb/day) [b]	9.39	157	109	0.37	434	50.2
EKAPCD Daily Thresholds (lb/day) [c]	137	--	137	--	--	--
Exceeds Daily Thresholds (Y/N)?	N	NA	N	NA	NA	NA
Annual Average Emissions (tpy) [d]	0.64	10.5	7.47	0.03	38.6	4.34
EKAPCD Annual Thresholds (tpy) [e]	25	--	25	--	15	--
Exceeds Annual Thresholds (Y/N)?	N	NA	N	NA	Y	NA

Notes:

NA or -- = Not applicable (i.e., no significance threshold exists for this pollutant)

[a] The unmitigated emissions scenario accounts for emission reductions achieved through implementation of BMPs for dust control, as described in Section 4.1, because these are required by existing regulations.

[b] Maximum daily emissions reflect the maximum emissions possible on any given day during the 28-month construction duration, based on the schedule of expected overlapping activities, and assuming all construction equipment and vehicles within a phase could operate simultaneously on any given day during the Project.

[c] The EKAPCD Daily Thresholds were taken from the *Guidelines for Implementation of the California Environmental Quality Act (CEQA) of 1970, as Amended* (EKAPCD 1999). Although these thresholds are intended for Project operations only, they were applied to construction emissions for comparison purposes.

[d] To facilitate comparison to the EKAPCD Annual Thresholds, total construction emissions were scaled by a factor of 12 months to 28 months, reflecting an adjustment from the 28-month construction duration.

[e] The EKAPCD Annual Thresholds were taken from Attachment A of the *Guidelines for Preparing an Air Quality Assessment for Use in Environmental Impact Reports* (Kern County 2006). Although EKAPCD Rule 210.1 does provide an offset threshold for SO_2, this threshold only applies to new stationary sources or modifications to existing stationary sources. As a result, it is not appropriate for comparison to the mobile-oriented construction emission sources.

Table 8B. Construction Criteria Pollutant Emissions with Mitigation [a]

Construction Period	VOC	CO	NOx	SO_2	PM_{10}	$PM_{2.5}$
Maximum Daily Emissions (lb/day) [b]	9.39	157	109	0.37	381	44.5
EKAPCD Daily Thresholds (lb/day) [c]	137	--	137	--	--	--
Exceeds Daily Thresholds (Y/N)?	N	NA	N	NA	NA	NA
Annual Average Emissions (tpy) [d]	0.64	10.5	7.47	0.03	33.9	3.83
EKAPCD Annual Thresholds (tpy) [e]	25	--	25	--	15	--
Exceeds Annual Thresholds (Y/N)?	N	NA	N	NA	Y	NA

Notes:

NA or -- = Not applicable (i.e., no significance threshold exists for this pollutant)

[a] The mitigated emissions scenario accounts for emission reductions achieved through implementation of BMPs and MM AQ-2 for dust control and MM AQ-1 for controlling construction equipment exhaust, as described in Sections 4.1 and 4.2.

[b] Maximum daily emissions reflect the maximum emissions possible on any given day during the 28-month construction duration, based on the schedule of expected overlapping activities, and assuming all construction equipment and vehicles within a phase could operate simultaneously on any given day during the Project.

[c] The EKAPCD Daily Thresholds were taken from the *Guidelines for Implementation of the California Environmental Quality Act (CEQA) of 1970, as Amended* (EKAPCD 1999). Although these thresholds are intended for project operations only, they were applied to construction emissions for comparison purposes.

[d] To facilitate comparison to the EKAPCD Annual Thresholds, total construction emissions were scaled by a factor of 12 months to 28 months, reflecting an adjustment from the 28-month construction duration.

[e] The EKAPCD Annual Thresholds were taken from Attachment A of the *Guidelines for Preparing an Air Quality Assessment for Use in Environmental Impact Reports* (Kern County 2006). Although EKAPCD Rule 210.1 does provide an offset threshold for SO_2, this threshold only applies to new stationary sources or modifications to existing stationary sources. As a result, it is not appropriate for comparison to the mobile-oriented construction emission sources.

5.3.1.2 Operation

Long-term air emission impacts are associated with any change in permanent use of the Project site by onsite stationery and on- or offsite mobile sources that substantially increase emissions. As stated previously, if emergency backup generators are required for Project substations or the battery energy storage systems by the AHJ, they would be the only stationary source of emissions for the Project. The Project would also have mobile source emissions resulting from vehicle trips associated with the Project operations and maintenance.

Specifically, long-term operational emissions associated with the Project's mobile sources would be limited to vehicle travel by Project employees to the site and around the site for routine maintenance and monitoring activities, material delivery truck trips to the site, and water consumption. Project operations are anticipated to require six full-time positions to maintain the infrastructure, each traveling to the site daily. Additional staff would also be needed for certain activities such as solar panel washing and solid and nonhazardous waste removal; however, these activities would not occur daily. The solar panel washing is expected to occur one to four times per year, requiring up to 10 workers. The waste removal is assumed to occur on a regular basis but not daily. Up to 10 material delivery truck trips per month are expected throughout the year. Water consumption would include washing of the solar panels and water used for operations, fire suppression, and other maintenance activities. Emergency generator operations assume

approximately 50 hours for maintenance and testing operations per year per generator. Unmitigated operational emissions are shown in Table 8C and include implementation of BMPs for dust control and BACT for emergency backup generators. Because there are minimal additional feasible mitigation measures that can be applied to Project operations, emissions are similar between the two scenarios and mitigated emissions are not presented herein. Detailed emissions calculations are provided in Appendix B. Specifications and emissions for the diesel- and natural gas-fired emergency backup generator engines are included as Appendix B1. As shown, the Project's operational emissions even without mitigation would not exceed the EKAPCD's significance thresholds.

Table 8C. Operation Criteria Pollutant Emissions without Mitigation [a]

Operations	VOC	CO	NO_X	SO_2	PM_{10}	$PM_{2.5}$
Mobile Source Maximum Daily Emissions (lb/day)	0.03	1.31	0.18	0.004	65.4	6.62
Emergency Generator Maximum Daily Emissions (lb/day)	3.37	61.8	12.2	0.12	0.53	0.53
Total Operational Maximum Daily Emissions (lb/day) [b]	3.40	63.1	12.4	0.13	65.9	7.15
EKAPCD Daily Thresholds (lb/day) [c]	137	--	137	--	--	--
Exceeds Daily Thresholds (Y/N)?	N	NA	N	NA	NA	NA
Mobile Source Annual Emissions (tpy)	0.003	0.13	0.01	0.0004	11.9	1.19
Emergency Generator Annual Emissions (tpy)	0.08	1.54	0.30	0.003	0.01	0.01
Total Operational Annual Emissions (tpy)	0.09	1.67	0.31	0.0034	11.9	1.20
EKAPCD Annual Thresholds (tpy) [d]	25	--	25	--	15	--
Exceeds Annual Thresholds (Y/N)?	N	NA	N	NA	N	NA

Notes:

NA or -- = Not applicable (i.e., no significance threshold exists for this pollutant)

[a] The unmitigated emissions scenario accounts for emission reductions achieved through implementation of BMPs for dust control and BACT for emergency backup generators, as described in Section 4.1, because these are required by existing regulations.

[b] Maximum daily generator emissions assume each generator operates one hour within a single day.

[c] The EKAPCD Daily Thresholds were taken from the *Guidelines for Implementation of the California Environmental Quality Act (CEQA) of 1970, as Amended* (EKAPCD 1999).

[d] The EKAPCD Annual Thresholds were taken from Attachment A of the *Guidelines for Preparing an Air Quality Assessment for Use in Environmental Impact Reports* (Kern County 2006). Although EKAPCD Rule 210.1 does provide an offset threshold for SO_2, this threshold only applies to new stationary sources or modifications to existing stationary sources and emergency equipment operating less than 200 hours per year are exempt. As a result, it is not appropriate for comparison to the Project's mobile-oriented operation emission sources or the emergency backup generators.

Table 9 includes a comparison of the 2021 ozone precursor emissions projections for the EKAPCD's jurisdiction and the Project's unmitigated operation emissions. This comparison shows that Project operations would emit less than 0.4 percent of the total ozone precursor emissions in EKAPCD's

jurisdiction without mitigation, and that implementation of any mitigation measures would decrease the Project's already minimal contribution to emissions of ozone precursors within the EKAPCD.

Table 9. Ozone Precursors Emissions Comparison

Source	VOC Emissions (tpd)	NOx Emissions (tpd)
2021 EKAPCD District-Wide On-Road Sources	0.986	3.046
2021 EKAPCD District-Wide Off-Road Sources	3.607	5.679
2021 EKAPCD District-Wide Total Mobile Sources	4.593	8.725
2021 EKAPCD District-Wide Total Stationary Sources	1.027	19.633
2021 EKAPCD District-Wide Total Mobile and Stationary Sources	5.620	28.358
Enterprise Solar Storage Project Operation (Unmitigated)	0.0017	0.0062
Enterprise Solar Storage Project % of EKAPCD District-Wide Mobile Source Emissions [a]	0.037%	0.071%
Enterprise Solar Storage Project % of EKAPCD District-Wide Stationary Source Emissions [a]	0.17%	0.032%

Source: EKAPCD 2017

Note:

[a] The Project's emissions conservatively include both mobile and stationary sources.

tpd = tons per day

Additionally, the Project's unmitigated operation emissions would represent a small portion (less than 0.4 percent) of both the EKAPCD's baseline emissions and transportation conformity budget, as shown in Table 10. Implementation of any mitigation measures would decrease the Project's emissions and already small portion of the EKAPCD's baseline emissions.

Table 10. Transportation Conformity Emissions Comparison

Source	VOC Emissions (summer tpd)	NOx Emissions (summer tpd)
2020 EKAPCD Baseline Emissions	1.05	3.36
EKAPCD Conformity Budget	2	4
Enterprise Solar Storage Project Operation (Unmitigated)	0.0017	0.0062
Enterprise Solar Storage Project % of EKAPCD 2020 Baseline Emissions	0.16%	0.18%
Enterprise Solar Storage Project % of EKAPCD Conformity Budget	0.085%	0.16%

Source: EKAPCD 2017

5.3.2 Air Quality Impact Assessment Results

Following the Kern County Planning and Natural Resources Department's *Guidelines for Preparing an Air Quality Assessment for Use in Environmental Impact Reports* (Kern County 2006) and the methodology outlined in Appendix C, maximum 24-hour average concentrations of primary $PM_{2.5}$ and PM_{10} construction-related mitigated emissions were modeled using AERMOD. Table 11 summarizes the results of the air dispersion analysis; details are provided in Appendix C, including the model output. As shown,

the predicted impacts for 24-hour $PM_{2.5}$ and 24-hour PM_{10} are above EPA's SILs of 1.2 µg/m^3 and 5 µg/m^3, respectively, even with the incorporation of feasible mitigation measures. Modeled impacts of the unmitigated emissions would result in greater modeled impacts and would similarly exceed the respective SILs.

Table 11. 24-hour PM_{10} and $PM_{2.5}$ Construction Impacts

Pollutant	Modeled Impact (µg/m^3)	SIL (µg/m^3)	Above the SIL (Y/N)?
24-hour PM_{10} [a]	120	5	Y
24-hour $PM_{2.5}$ [b]	8.1	1.2	Y

[a] Modeled result represents the high-first-high 24-hour modeled concentration from 2009-2014.

[b] Modeled result represents the high-first-high five-year average 24-hour modeled concentration from 2009--2014.

Operational activities emitting PM would include onsite work trucks and diesel-fueled trucks making infrequent material deliveries to the Project site during operation and maintenance, and potential use of emergency backup generators, which would be run intermittently for maintenance and testing purposes, at the Project's substations or battery energy storage systems. These emissions are assumed to be negligible based upon their limited daily and annual operations and less impactful than the construction-related emissions, as illustrated in Tables 8A/B and 8C. Therefore, an operational air quality impacts analysis was not performed.

5.3.3 Health Risk Assessment Results

Table 12 summarizes the mitigated construction emissions screening HRA results at the point of maximum impact (PMI), maximally exposed individual resident (MEIR), maximally exposed individual worker (MEIW), and maximally exposed individual sensitive receptor. As shown, all cancer risks are below the EKAPCD's significance threshold of 1 in 1 million and all non-cancer chronic hazard indexes are below the EKAPCD's significance threshold of 0.2. Details of the screening HRA for construction DPM are included in Appendix C.

Table 12. Screening HRA for Mitigated Construction Emissions

Risk	Value	EKAPCD Thresholds	Exceeds EKAPCD Thresholds (Y/N)?	Receptor Coordinates (UTM NAD 83 Zone 11)	
				Easting (meters)	Northing (meters)
Cancer PMI Risk (in 1 million)	0.87	1 in 1 million	N	398,957	3,874,880
Cancer MEIR Risk (in 1 million)	0.87	1 in 1 million	N	398,957	3,874,880
Cancer Sensitive Risk (in 1 million)	0.87	1 in 1 million	N	398,957	3,874,880
Cancer MEIW Risk (in 1 million)	0.02	1 in 1 million	N	398,957	3,874,880
Chronic PMI HI	<0.001	0.2	N	398,957	3,874,880

Table 12. Screening HRA for Mitigated Construction Emissions

Risk	Value	EKAPCD Thresholds	Exceeds EKAPCD Thresholds (Y/N)?	Receptor Coordinates (UTM NAD 83 Zone 11)	
				Easting (meters)	Northing (meters)
Chronic MEIR HI	<0.001	0.2	N	398,957	3,874,880
Chronic Sensitive HI	<0.001	0.2	N	398,957	3,874,880
Chronic MEIW HI	<0.001	0.2	N	398,957	3,874,880

Notes:

NAD = North American Datum

UTM = Universal Transverse Mercator

Table 13 summarizes the mitigated operation emissions screening HRA results at the PMI, MEIR, MEIW, and maximally exposed individual sensitive receptor. As shown, residential, sensitive, and worker cancer risks are below the EKAPCD's significance threshold of 1 in 1 million and all non-cancer chronic hazard indexes are below the EKAPCD's significance threshold of 0.2. Although the cancer risk at the PMI exceeds the EKAPCD's significance threshold of 1 in 1 million, this point of maximum impact occurs at the strip of land North of the battery energy storage system parcel and the adjacent solar array. Receptors located along the fenceline of the battery energy storage system and along the roadways between the battery energy storage system land and the neighboring Project solar arrays to the North and South are not likely to be developed or occupied in a method that would allow for a long-term exposure during the operational life of the Project. When these receptors, shown in Figure 4, are removed from the analysis, the PMI cancer risk would be reduced to 0.86 in 1 million, which is below the EKAPCD's significance threshold. Details of the screening HRA for operation DPM are included in Appendix C.

Table 13. Screening HRA for Mitigated Operational Emissions

Risk	Value	EKAPCD Thresholds	Exceeds EKAPCD Thresholds (Y/N)?	Receptor Coordinates (UTM NAD 83 Zone 11)	
				Easting (meters)	Northing (meters)
Cancer PMI Risk (in 1 million)	2.58	1 in 1 million	Y	398,518.89	3,876,684.49
Cancer MEIR Risk (in 1 million)	0.01	1 in 1 million	N	402,000	3,871,000
Cancer Sensitive Risk (in 1 million)	0.01	1 in 1 million	N	402,000	3,871,000
Cancer MEIW Risk (in 1 million)	0.23	1 in 1 million	N	398,518.89	3,876,684.49
Chronic PMI HI	<0.001	0.2	N	398,518.89	3,876,684.49
Chronic MEIR HI	<0.001	0.2	N	402,000	3,871,000
Chronic Sensitive HI	<0.001	0.2	N	402,000	3,871,000
Chronic MEIW HI	<0.001	0.2	N	398,518.89	3,876,684.49

Table 13. Screening HRA for Mitigated Operational Emissions

Risk	Value	EKAPCD Thresholds	Exceeds EKAPCD Thresholds (Y/N)?	Receptor Coordinates (UTM NAD 83 Zone 11)	
				Easting (meters)	Northing (meters)

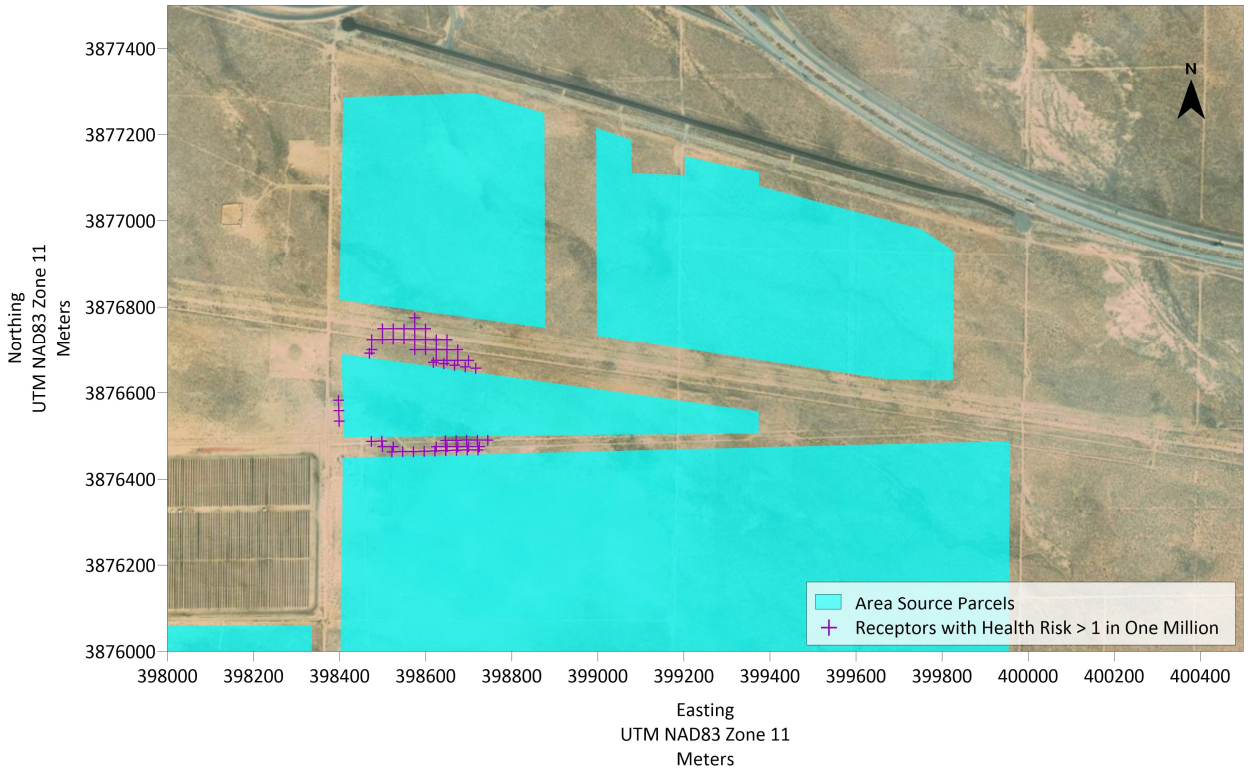


Figure 4. Receptors Not Likely To Have Chronic Exposure To Operation Emissions

5.3.4 Project-related Air Quality Impacts

Impact AQ-1: Conflict with or obstruct implementation of the applicable air quality plan

SIGNIFICANT AND UNAVOIDABLE IMPACT AFTER IMPLEMENTATION OF MITIGATION MEASURES (Temporary Construction)

Section 5.3.2 presents the results of the air quality impacts analysis for the Project. The results of this analysis indicate Project construction may cause or significantly contribute to an exceedance of the NAAQS, with or without mitigation. Therefore, Project construction would result in a significant and unavoidable impact after implementation of mitigation measures to plans such as the *Indian Wells Valley Second PM_{10} Maintenance Plan* (EKAPCD 2020a). The Indian Wells Valley Plan was used as a guideline for this analysis though the Project itself is not subject to or within the jurisdiction of the Indian Wells Valley Plan. The Project will implement all applicable BMPs outlined in the Indian Wells Valley Plan and EKAPCD Rule 402 to minimize its ambient air quality potential impacts during construction. Implementation of these BMPs, along with MM AQ-2, will also minimize any potential visibility impacts at the Project site's perimeter during construction.

The Project's operation as a solar facility is not expected to generate significant dust or particulate emissions, and as described in Section 5.3.1.2, would result in emissions less than the operational significance criteria outlined in Section 5.2.2, even without mitigation. The Indian Wells Valley Plan was used as a guideline for this analysis though the Project itself is not subject to or within the jurisdiction of the Indian Wells Valley Plan. Therefore, Project operational emissions would not conflict with the Indian Wells Valley Plan and operational impacts would be less than significant.

Emergency backup generators for the Project's substations or battery energy storage systems may be required by the AHJ. If required, the generators would use natural gas and diesel fuel and would need to be intermittently run for maintenance and testing purposes. All engines would implement applicable BACT emission controls. Additionally, the Project must comply with CARB's ATCMs for emergency standby diesel-fueled compression ignition engines, which are identified as key stationary source control measures in EKAPCD's *2017 Ozone Attainment Plan for 2008 Federal 75 ppb 8-Hour Ozone Standard* (EKAPCD 2017). Through implementation of the construction BMPs, MM AQ-1, and MM AQ-2, the Project is expected to comply with CARB's ATCMs for diesel-fueled, heavy-duty, off-road equipment, which are identified as key mobile source control measures in EKAPCD's *Reasonably Available Control Technology (RACT) State Implementation Plan (SIP) for the 2015 Ozone National Ambient Air Quality Standards (NAAQS)* (EKAPCD 2020b). Therefore, the construction and operation of the Project would be consistent with the SIP, resulting in a less-than-significant impact.

The Project construction workforce would be temporary, requiring approximately 28 months of employment between 2022 and 2023, and is expected to come from the existing construction labor pool in Kern County. The Project is anticipated to have onsite personnel consisting of plant operators and maintenance technicians starting in 2024. The additional jobs required for the Project would be well within the annual growth projection presented in the KCOG's *2022 Regional Transportation Plan and Sustainable Communities Strategy* in Section 3.3.3. Therefore, Project construction and operation would be consistent with the RTP/SCS, resulting in a less-than-significant impact.

Traffic analysis zones (TAZs) are basic spatial units of analysis facilitating the ability of transportation planners to forecast changes in commuting patterns, trip volumes, and modes of travel, and to develop plans to meet the changing demands for transportation facilities and capacities. The Project area is considered generally rural and agricultural, with the nearest community approximately 1 mile away. Although traffic associated with the Project site may increase during construction, those increases would be temporary. Additionally, since the workforce is expected to come from the existing construction labor pool in Kern County, trips to the Project site would be a redirection of trips elsewhere but still within Kern County. There are no intersections or roadways identified as LOS E or worse associated with the Project. Additionally, there would be no signalization or channelization added to an intersection as part of this Project. Therefore, Project operation and construction would be consistent with TAZs and have a less-than-significant impact.

Impact AQ-2: Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard

SIGNIFICANT AND UNAVOIDABLE IMPACT AFTER IMPLEMENTATION OF MITIGATION MEASURES (Temporary Construction)

As shown in Tables 8A and 8B, construction of the Project would result in emissions of the following nonattainment pollutants: ozone precursors (NO_X and VOC) and PM_{10}. Although, these emissions would be temporary (occurring in a 28-month period beginning in 2022), PM_{10} emissions would exceed EKAPCD's annual significance threshold even after mitigation. Implementation of BMPs for dust control and MM

AQ-1 and MM AQ-2 minimize, to the extent feasible, PM_{10} and $PM_{2.5}$ emissions during construction. However, based on the Project's construction mass emissions and air quality impacts analysis in Section 5.3.2, the Project may result in a cumulatively considerable net increase of PM_{10} concentrations and the cumulative impact to air quality would be significant and unavoidable, even after mitigation. Details of the construction emission estimates are provided in Appendix B. (As discussed below, the analysis of criteria air pollutants is inherently cumulative because the thresholds are set to account for existing significant cumulative impacts in the air basin.)

As shown in Table 8C, emissions associated with Project operations would not exceed applicable EKAPCD significance thresholds even without mitigation. Hence, operational emissions would be less than significant, and no mitigation measures beyond the BMPs and MMs identified and incorporated into the Project's design are required. Details of the operational emission estimates are provided in Appendix B. Specifications and emissions for diesel- or natural gas-fired emergency backup generator engines are included as Appendix B1.

The following tables (Tables 14A, 14B, and14C) show the MDAB emissions of nonattainment pollutants and their precursors, along with a composite showing the contribution from the Project's unmitigated operation emissions. The Kern County and MDAB emissions were downloaded from the CARB website (CARB 2019) and are based on 2025 projections. The most recent year of actual data published by CARB is for 2017, with all later years projected from the 2017 results. Given this, projected annual emissions for the year 2025 were used for comparison to the Project's unmitigated emissions as they are the closest future year projections available.

Table 14A. Emissions Inventory for the MDAB, 2025 Projection – Tons per Day

	VOC	NO_X	PM_{10}
Total Emissions	210.7	107	135.5
Percent Stationary Sources	8%	42%	22%
Percent Area-Wide Sources	7%	2%	54%
Percent Mobile Sources	9%	54%	5%
Percent Natural Sources	76%	2%	19%
Total Stationary Source Emissions	16.4	44.8	30.2
Total Area-Wide Source Emissions	15.1	1.8	73.4
Total Mobile Source Emissions	18.5	58.2	6.8
Total Natural Source Emissions	160.7	2.2	25.2

Source: CARB 2019

Table 14B. Emissions Inventory for the Kern County Portion of the MDAB, 2025 Projection – Tons per Day

	VOC	NO_X	PM_{10}
Total Emissions	116.8	28.4	33.7
Percent Stationary Sources	1%	68%	8%
Percent Area-Wide Sources	2%	1%	22%
Percent Mobile Sources	5%	28%	9%
Percent Natural Sources	92%	4%	61%
Total Stationary Source Emissions	1.7	19.2	2.6
Total Area-Wide Source Emissions	1.8	0.2	7.4
Total Mobile Source Emissions	6.1	8.0	3.2
Total Natural Source Emissions	107.2	1.0	20.4

Source: CARB 2019

Table 14C. 2025 Emissions Projections for Enterprise Solar Storage Project, Kern County, and the MDAB – Tons per Day

	VOC	NO_X	PM_{10}
Enterprise Solar Storage Project (Unmitigated)	0.0017	0.013	0.033
Kern County	116.8	28.4	33.7
MDAB	210.7	107	135.5
Enterprise Solar Storage Project % of Kern County	<0.1%	<0.1%	<0.1%
Enterprise Solar Storage Project % of MDAB	<0.1%	<0.1%	<0.1%
Kern County % of MDAB	55%	27%	25%

The Kern County Planning and Natural Resources Department's Guidelines require that a cumulative impact assessment be conducted to include other projects under construction within a 1-mile and 6-mile radius of the Project boundaries to determine "localized impacts." Appendix D lists all of the currently approved and proposed renewable development projects within Kern County, which may have concurrent construction activities with the Project. While all of the renewable projects are presented, 12 or fewer are within 6 miles of the Project boundary.[6] The Project's construction emissions would only have a potential cumulative impact when they occur concurrently with construction emissions of these other development projects. As such, if other projects do not have concurrent construction schedules, cumulative impacts resulting from this Project's construction emissions would not occur. Rather, construction impacts would be temporary and localized to the Project area.

[6] Non-renewable development projects were not included in this analysis as they are assumed either to not be within a 6-mile radius of the Project boundaries or to not be of magnitude to cumulatively contribute to localized construction impacts.

The Kern County Planning and Natural Resources Department has determined that the previously listed project-level thresholds for criteria air pollutants are defined, for purposes of determining cumulative effects, as the baseline for "considerable." In other words, the thresholds are set at a level that accounts for existing and planned future air basin conditions. Thus, if a project's emissions do not exceed the project--level thresholds, the project would not make a cumulatively considerable contribution to significant cumulative impacts in the air basin. As noted above, Project construction activities would generate emissions and modeled ambient impacts that exceed the EKAPCD's annual significance threshold for PM_{10} and the EPA's SILs for PM_{10} and $PM_{2.5}$, respectively, even with mitigation, and the air basin is in nonattainment with its PM_{10} target. As such, Project construction activities would make a cumulatively considerable contribution to significant cumulative PM impacts regardless of including other cumulative sources in a cumulative impact modeling assessment. Project construction activities would result in a finding of significant and unavoidable cumulative impact on PM even after mitigation.

Project operation would not have cumulatively considerable operational impacts because neither the Project's mitigated nor unmitigated operational emissions would exceed the EKAPCD's significance thresholds.

Although the Project would have a cumulative impact with regards to PM_{10} and $PM_{2.5}$ during construction, both with and without mitigation, the Project would generate electricity using emission-free technology during operation and would likely reduce the need to generate electricity using fossil fuel-based technology, such that its cumulative contribution to air quality impacts is considered beneficial when considering both construction and operation.

Impact AQ-3: Expose sensitive receptors to substantial pollutant concentrations

LESS-THAN-SIGNIFICANT IMPACT WITHOUT MITIGATION

Sensitive receptors are defined as people that have an increased sensitivity to air pollution or environmental contaminants. Sensitive receptor locations include schools, parks and playgrounds, day care centers, nursing homes, hospitals, and residential dwelling unit(s). The community of Mojave is directly north of the Project, with the nearest residences approximately 0.4-mile north of the Western Project area . There is also a single rural residence located approximately 0.3 mile east of the Northern Project area. Other sensitive receptors in the vicinity of the Project include Mojave High School and Mojave East Park, located 1.2-mile and 1-mile north of the Western Project area, respectively. These sensitive receptors, located within the Project vicinity (see Figure 3), could be exposed to criteria air pollutants and TACs emitted during Project construction and operation. Of particular concern is the possibility for localized CO hotspots, reduced visibility, and increased health risks in the Project vicinity, including exposure to Valley Fever.

The Project would have vehicle trip generation associated with construction worker vehicles and vendor trucks. As construction is only expected to last 28 months, it would be considered temporary and would not result in a long-term source of CO emissions. Also, the Project would create minimal emission sources during operation. The Project would not cause the LOS of any studied intersection or roadway to operate at LOS E or worse during construction or operation or require adding signalization or channelization to an intersection. As such, a CO hotspot analysis is not required and the potential Project-generated impacts associated with CO hotspots would be less-than-significant without mitigation.

The Project's operation as a solar facility is not in and of itself expected to generate dust or emissions related to visibility, such that a visibility assessment is not warranted. Additionally, compliance with EKAPCD's Rule 402, including implementation of a dust control plan consistent with MM AQ-2, would sufficiently reduce PM emissions to ensure a less-than-significant visibility impact during construction.

This dust control plan would have the added benefit of controlling the release of *Coccidioides* spores, thus limiting exposure to Valley Fever during construction activities. These less-than-significant impacts would be further reduced through implementation of MM AQ-2 and MM AQ-3, as described in Section 4.2.

DPM would be the primary TAC emitted during construction and operation activities, as a result of construction equipment and heavy-duty diesel vehicles traveling to/from and around the Project site and diesel-fired emergency generators, respectively. TACs emitted from vehicles during Project operation would not be noticeably distinguishable from those emitted from existing regional activities. Section 5.3.3 shows that DPM emitted during mitigated construction and operation of the Enterprise Solar Storage Project would not result in cancer risk or a chronic health index above the EKAPCD's significance thresholds of 1 in 1 million and 0.2, respectively, after removal of receptors that would not constitute a point of chronic exposure as discussed in Section 5.3.3. As a result, the Project's health risk impacts would be less-than-significant with mitigation. These less-than-significant impacts would be further reduced through implementation of MM AQ-1 and MM AQ-5, as described in Section 4.2.

Impact AQ-4: Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people

LESS-THAN-SIGNIFICANT IMPACT WITHOUT MITIGATION

Although emissions from Project construction may result in temporary odors, they would be short term and have the potential to affect few people due to the distance between the Project and any occupied areas, including schools and other sensitive receptors. Potential odor sources during construction activities may include diesel exhaust from heavy-duty equipment. Potential odor sources from Project operations may include diesel exhaust from infrequent material delivery truck trips and intermittent operation of the diesel-fired emergency generators. Therefore, given the Project's relatively remote location and minimal emissions generated during facility operations, the Project would not result in other emissions, such as those leading to odor, that would adversely affect a substantial number of people.

The community of Mojave is directly north of the Project, with the nearest residences approximately 0.4-mile north of the Western Project area . There is also a single rural residence located approximately 0.3 mile east of the Northern Project area. Other sensitive receptors in the vicinity of the Project include Mojave High School and Mojave East Park, located 1.2-mile and 1-mile north of the Western Project area , respectively. Given the minimal activities required for Project operations, temporary duration of construction, and spatially varying nature of construction emissions, a less-than-significant impact is expected and no modeling of potential odorous substances is warranted, for either construction or operation.

The Kern County Planning and Natural Resources Department's Guidelines require that a cumulative impact assessment be conducted to include other projects under construction within a 1-mile and 6-mile radius of the Project boundaries to determine "localized impacts." Appendix D lists all of the currently approved and proposed renewable development projects within Kern County, which may have concurrent construction activities with the Project. While all of the renewable projects are presented, 12 or fewer are within 6 miles of the Project boundary.[7] The Project's construction-related odors would only have a potential cumulative impact when they occur concurrently with construction-related odor emissions of these other development projects. Project-related odors are not anticipated to be cumulatively significant due to their impacts being temporary, localized, and spatially varying within the Project area. As such, any

[77] As stated previously, non-renewable development projects were not included in this analysis as they are assumed either to not be within a 6-mile radius of the Project boundaries or to not be of magnitude to cumulatively contribute to localized construction impacts.

odors resulting from nearby development projects would not considerably overlap with the spatially and temporally varying Project-related odors resulting in less-than-significant cumulative odor impacts.

5.3.5 Project-related Greenhouse Gas Impacts

Impact GHG-1: Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment

LESS-THAN-SIGNIFICANT IMPACT WITHOUT MITIGATION

GHG analysis is inherently cumulative. Project-related activities would contribute to the generation of GHG emissions during construction and operation and indirectly contribute to the reduction of GHG emissions during operation by providing low-GHG electricity to California customers and displacing higher GHG emitting resources. The applicable GHGs that have been quantitatively estimated for this Project include CO_2, CH_4, and N_2O, presented as emissions of CO_2e. Although SF_6 or other insulating gases are used as insulation in electric power transmission and distribution equipment, their emissions would occur at very low rates due to the gas's low usage and minimal leak rate when contained by electric power equipment. As such, SF_6 or other insulating gas emissions have not been estimated for this Project.

Directly emitted GHG emissions during construction, as well as indirect GHG emissions associated with electricity consumption for water use, would result in a less-than-significant, short-term impact to climate change. As summarized in Table 15 and detailed in Appendix B, the GHG emissions from the construction phase of the Project would be well below EKAPCD's significance threshold of 25,000 tpy of CO_2e (22,321 metric tons per year of CO_2e) with or without mitigation.[88] Therefore, GHG emissions from construction of the Project would result in less-than-significant impacts that are not cumulatively considerable.

Table 15. GHG Construction Emissions

Construction Period	CO_2e
Project Emissions (metric tons/year) [a]	2,361
EKAPCD Threshold of Significance (metric tons/year) [b]	22,321
Exceeds EKAPCD Threshold of Significance (Y/N)?	N

Notes:

[a] To facilitate comparison to the annual significance threshold, total construction emissions were scaled by a factor of 12 months to 28 months, reflecting an adjustment from the 28-month construction duration. It was assumed that all construction equipment and vehicles could operate simultaneously on any given day during the Project.

[b] The EKAPCD Threshold of Significance was taken from EKAPCD's *Addressing GHG Emission Impacts For Stationary Source Projects When Serving As Lead CEQA Agency* (EKAPCD 2012a). Although this threshold is intended for project operations only, it was applied to construction emissions for comparison purposes.

While the Project would generate a very small amount of GHG emissions (approximately 350 metric tons CO_2e per year) during operations as a result of vehicle travel, electricity consumption for water use, and potential intermittent use of emergency backup generators, these emissions would be more than offset by the renewable energy generated by the Project, as solar energy is a much cleaner source of energy than traditional sources such as the burning of coal, fuel oil, or natural gas, and will help the State displace these traditional sources to meet its requirement of providing 100 percent carbon-free electricity to

[88] The effect of BMPs and MMs implemented as part of this Project were not quantified with respect to GHG emissions.

ratepayers by 2045. This displacement of GHG emissions[9] would occur every year that the Project is in operation, helping the State achieve its target of supplying only carbon-free electricity by 2045 and bringing new, lean, and reliable energy to the region and State. Therefore, in addition to resulting in less than cumulatively considerable impacts, the Project would be beneficial to reducing GHG emissions.

Impact GHG-2: Conflict with any applicable plan, policy, or regulation of an agency adopted for the purpose of reducing the emissions of GHGs

NO IMPACT WITHOUT MITIGATION

At a local level, the Project is consistent with KCOG's *2022 Regional Transportation Plan and Sustainable Communities Strategy* as the Project is consistent with the Kern County Zoning Ordinance and Kern County General Plan. The Project would also not adversely impact local transportation or land use incompatibilities during operation.

The Project would not conflict with any applicable State plan, policy, or regulation adopted to reduce GHG emissions, and would by design assist in achieving the State's goals of reducing GHG emissions. The minimal, short-term construction GHG emissions would not interfere with the goal of SB 32 to reduce GHG emissions to 40 percent below 1990 levels by 2030.

To achieve the 2030 goal of SB 32, SB 350 sets ambitious 2030 targets for energy efficiency and renewable electricity, among other actions aimed at reducing GHG emissions across the energy and transportation sectors, and SB 100 sets even more ambitious renewable energy targets. The Project involves the construction and operation and maintenance of a solar facility that would produce a new renewable source of energy in Kern County. Therefore, the Project would directly support California's Renewable Portfolio Standard goal under SB 100 of increasing the percentage of electricity procured from renewable sources to 60 percent by 2030 and a target of 100 percent from eligible renewable energy resources and zero-carbon resources by 2045. The Project additionally supports California's goal to increase renewable electricity procurement to 50 percent by 2030 as it provides a new source of renewable electricity for the State.

Furthermore, the Project is expected to be consistent with the various measures established in CARB's Climate Change Scoping Plan. Given that the Project provides renewable energy, which is anticipated to continue to be a key part of the State's Scoping Plan strategy to reduce GHG emissions, it is reasonable to assume the Project also will be consistent with any future updates to the Climate Change Scoping Plan.

Based on the above, the Project would be consistent with and promote SB 32, SB 100, and other statewide renewable energy goals by increasing the supply of renewable energy, which will allow the State to decrease reliance on fossil fuels for power supply and promote the use of renewable energy within the State's electricity sector. Additionally, the Project would help the State meet its carbon-free electricity goals through the construction of the battery storage systems that are able to provide electricity to the grid during periods when other renewable sources experience lower productions. Therefore, there are no conflicts with GHG plans, policies, or regulations, and thus there would be no impact.

[9] Refer to the *Enterprise Solar Storage Project Energy Impact Analysis* for an estimate of GHG emissions displaced by this Project (Jacobs 2022).

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Appendix A
Air Pollutant Summary

Appendix A. Air Pollutant Summary

Consistent with the requirements of the Kern County Planning Department's *Guidelines for Preparing an Air Quality Assessment for Use in Environmental Impact Reports* (Kern County 2006), a description of each air pollutant and its associated health effects is provided below. Unless otherwise indicated, the information provided below is a direct excerpt from the Kern County Planning Department's Guidelines.

Although all air pollutants are described below, as required, only a subset of these pollutants are expected to be emitted during construction or operation of the Enterprise Solar Storage Project (Project). Additionally, where information specific to the Mojave Desert Air Basin (MDAB) was not available, the San Joaquin Valley Air Basin (SJVAB) was considered representative as also containing a portion of Kern County with similar geographical features characteristic of central California.

A.1 Ozone

Ozone occurs in two layers of the atmosphere. The layer surrounding Earth's surface is the troposphere. Here, ground level or "bad" ozone is an air pollutant that damages human health, vegetation, and many common materials. It is a key ingredient of urban smog. The troposphere extends to a level about 10 miles up, where it meets the second layer, the stratosphere. The stratospheric or "good" ozone layer extends upward from about 10 to 30 miles and protects life on earth from the sun's harmful ultraviolet rays (UV-B).

"Bad" ozone is what is known as a photochemical pollutant. It needs reactive organic gases (ROG), oxides of nitrogen (NO_X), and sunlight. ROG and NO_X are emitted from various sources throughout Kern County. In order to reduce ozone concentrations, it is necessary to control the emissions of these ozone precursors.

Significant ozone formation generally requires an adequate amount of precursors in the atmosphere and several hours in a stable atmosphere with strong sunlight.

Ozone is a regional air pollutant. It is generated over a large area and is transported and spread by wind. Ozone, the primary constituent of smog, is the most complex, difficult to control, and pervasive of the criteria pollutants. Unlike other pollutants, ozone is not emitted directly into the air by specific sources. Ozone is created by sunlight acting on other air pollutants (called precursors), specifically NO_X and ROG. Sources of precursor gases to the photochemical reaction that form ozone number in the thousands. Common sources include consumer products, gasoline vapors, chemical solvents, and combustion products of various fuels.

Originating from gas stations, motor vehicles, large industrial facilities, and small businesses such as bakeries and dry cleaners, the ozone-forming chemical reactions often take place in another location, catalyzed by sunlight and heat. High ozone concentrations can form over large regions when emissions from motor vehicles and stationary sources are carried hundreds of miles from their origins. Approximately 50 million people lived in counties with air quality levels above U.S. Environmental Protection Agency's (EPA) health-based national air quality standard in 1994. The highest levels of ozone were recorded in Los Angeles, California. High levels also persist in other heavily populated areas including the Texas Gulf Coast and much of the Northeast.

While the ozone in the upper atmosphere absorbs harmful ultraviolet light, ground-level ozone is damaging to the tissues of plants, animals, and humans, as well as to a wide variety of inanimate materials such as plastics, metals, fabrics, rubber, and paints. Societal costs from ozone damage include increased

medical costs, the loss of human and animal life, accelerated replacement of industrial equipment, and reduced crop yields.

A.1.1 Health Effects

While ozone in the upper atmosphere protects Earth from harmful ultraviolet radiation, high concentrations of ground-level ozone can adversely affect the human respiratory system. Many respiratory ailments, as well as cardiovascular disease, are aggravated by exposure to high ozone levels. Ozone also damages natural ecosystems such as forests and foothill communities, and damages agricultural crops and some man-made materials, such as rubber, paint, and plastics. High levels of ozone may negatively impact immune systems, making people more susceptible to respiratory illnesses including bronchitis and pneumonia. Ozone also accelerates aging and exacerbates pre-existing asthma and bronchitis and, in cases of high concentrations, can lead to the development of asthma in active children. Active people, both children and adults, appear to be more at risk from ozone exposure than those with a low level of activity. Additionally, the elderly and those with respiratory disease are also considered sensitive populations for ozone.

People who work or play outdoors are at a greater risk for harmful health effects from ozone. Children and adolescents are also at greater risk, as they are more likely than adults to spend time engaged in vigorous activities. Research indicates that children under 12 years of age spend nearly twice as much time outdoors daily than adults. Teenagers spend at least twice as much time as adults in active sports and outdoor activities. Also, children inhale more air per pound of body weight than adults, and they breathe more rapidly than adults. Children are less likely than adults to notice their own symptoms and avoid harmful exposures.

Ozone is a powerful oxidant – it can be compared to household bleach, which can kill living cells (such as germs or human skin cells) upon contact. Ozone can damage the respiratory tract, causing inflammation and irritation, and it can induce symptoms such as coughing, chest tightness, shortness of breath, and worsening of asthma symptoms. Ozone in sufficient doses increases the permeability of lung cells, rendering them more susceptible to toxins and microorganisms. Exposure to levels of ozone above the current ambient air quality standard leads to lung inflammation and lung tissue damage, and a reduction in the amount of air inhaled into the lungs. Recent evidence has, for the first time, linked the onset of asthma to exposure to elevated ozone levels in exercising children.

Elevated ozone concentrations also reduce crop and timber yields, damage native plants, and damage materials such as rubber, paints, fabric, and plastics.

A.2 Reactive Organic Gases and Volatile Organic Compounds

Hydrocarbons are organic gases that are formed solely of hydrogen and carbon. There are several subsets of organic gases including Volatile Organic Compounds (VOC) and ROG.

ROG includes all hydrocarbons except those exempted by the California Air Resources Board (CARB). Therefore, ROG is a set of organic gases based on state rules and regulations. VOC is similar to ROG in that it includes all organic gases except those exempted by federal law. The list of compounds exempt from the definition of VOC is presented by the San Joaquin Valley Air Pollution Control District (SJVAPCD) in SJVAPCD Rule 1102. Both VOC and ROG are emitted from incomplete combustion of hydrocarbons or other carbon-based fuels. Combustion engine exhaust, oil refineries, and oil-fueled power plants are the primary sources of hydrocarbons. Another source of hydrocarbons is evaporation from petroleum fuels, solvents, dry cleaning solutions, and paint.

A.2.1 Health Effects

The primary health effects of hydrocarbons result from the formation of ozone and its related health effects (see ozone health effects discussion above). High levels of hydrocarbons in the atmosphere can interfere with oxygen intake by reducing the amount of available oxygen through displacement. There are no separate federal or California ambient air quality standards for ROG. Carcinogenic forms of ROG are considered toxic air contaminants (TACs). An example is benzene, which is a carcinogen. The health effects of individual ROGs are described under the TAC heading below.

A.3 Carbon Monoxide

Carbon monoxide (CO) is emitted by mobile and stationary sources as a result of incomplete combustion of hydrocarbons or other carbon-based fuels. CO is an odorless, colorless, poisonous gas that is highly reactive.

CO is a byproduct of motor vehicle exhaust, which contributes more than two-thirds of all CO emissions nationwide. In cities, automobile exhaust can cause as much as 95 percent of all CO emissions. These emissions can result in high concentrations of CO, particularly in local areas with heavy traffic congestion. Other sources of CO emissions include industrial processes and fuel combustion in sources such as boilers and incinerators. Despite an overall downward trend in concentrations and emissions of CO, some metropolitan areas still experience high levels of CO.

A.3.1 Health Effects

CO enters the bloodstream and binds more readily to hemoglobin than oxygen, reducing the oxygen carrying capacity of blood, thus reducing oxygen delivery to organs and tissues. The health threat from CO is most serious for those who suffer from cardiovascular disease. Healthy individuals are also affected, but only at higher levels of exposure.

CO binds strongly to hemoglobin, the oxygen-carrying protein in blood, and thus reduces the blood's capacity for carrying oxygen to the heart, brain, and other parts of the body. Exposure to CO can cause chest pain in heart patients, headaches, and reduced mental alertness. At high concentrations, CO can cause heart difficulties in people with chronic diseases and can impair mental abilities. Exposure to elevated CO levels is associated with visual impairment, reduced work capacity, reduced manual dexterity, poor learning ability, difficulty performing complex tasks, and in prolonged, enclosed exposure, death.

The adverse health effects associated with exposure to ambient and indoor concentrations of CO are related to concentration of carboxyhemoglobin (COHb) in the blood. Health effects observed may include early onset of cardiovascular disease, behavioral impairment; decreased exercise performance of young healthy men, reduced birth weight, Sudden Infant Death Syndrome (SIDS), and increased daily mortality rate.

Most of the studies evaluating adverse health effects of CO on the central nervous system examine high-level poisoning. Such poisoning results in symptoms ranging from common flu and cold symptoms (shortness of breath on mild exertion, mild headaches, and nausea) to unconsciousness and death. Hexter and Goldsmith report an association between daily death rate and exposure to ambient CO in Los Angeles County, California. They postulate a concentration of 20.2 parts per million (ppm; the highest daily concentration recorded during a 4-year period) contributed 11 out of 159 deaths. Additional studies conducted in Los Angeles, California and Sao Paulo, Brazil also suggest a relationship between daily death rates and CO concentrations.

A.4 Nitrogen Oxides

NO_X is a family of highly reactive gases that are a primary precursor to the formation of ground-level ozone and react in the atmosphere to form acid rain. NO_X is emitted from the use of solvents and combustion processes in which fuel is burned at high temperatures, principally from motor vehicle exhaust and stationary sources such as electric utilities and industrial boilers. A brownish gas, nitrogen dioxide (NO_2) is a strong oxidizing agent that reacts in the air to form corrosive nitric acid, as well as toxic organic nitrates.

A.4.1 Health Effects

NO_X is an ozone precursor that combines with ROG to form ozone. See the ozone section above for a discussion of the health effects of ozone.

Direct inhalation of NO_X can also cause a wide range of health effects. NO_X can irritate the lungs, cause lung damage, and lower resistance to respiratory infections such as influenza. Short-term exposures (e.g., less than 3 hours) to low levels of NO_2 may lead to changes in airway responsiveness and lung function in individuals with preexisting respiratory illnesses. These exposures may also increase respiratory illnesses in children. Long-term exposures to NO_2 may lead to increased susceptibility to respiratory infection and may cause irreversible alterations in lung structure. Other health effects associated with NO_X are an increase in the incidence of chronic bronchitis and lung irritation. Chronic exposure to NO_2 may lead to eye and mucus membrane aggravation, along with pulmonary dysfunction. NO_X can cause fading of textile dyes and additives, deterioration of cotton and nylon, and corrosion of metals due to production of particulate nitrates. Airborne NO_X can also impair visibility. NO_X is a major component of acid deposition in California. NO_X may affect both terrestrial and aquatic ecosystems. NO_X in the air is a potentially significant contributor to a number of environmental effects such as acid rain and eutrophication in coastal waters. Eutrophication occurs when a body of water suffers an increase in nutrients that reduce the amount of oxygen in the water, producing an environment that is destructive to fish and other animal life.

NO_2 is toxic to various animals as well as to humans. Its toxicity relates to its ability to combine with water to form nitric acid in the eye, lung, mucus membranes, and skin. Studies of the health impacts of NO_2 include experimental studies on animals, controlled laboratory studies on humans, and observational studies.

In animals, long-term exposure to NO_X increases susceptibility to respiratory infections, lowering their resistance to such diseases as pneumonia and influenza. Laboratory studies show susceptible humans, such as asthmatics, exposed to high concentrations of NO_2 can suffer lung irritation and potentially lung damage.

Epidemiological studies have also shown associations between NO_2 concentrations and daily mortality from respiratory and cardiovascular causes and with hospital admissions for respiratory conditions.

NO_X contributes to a wide range of environmental effects directly and when combined with other precursors in acid rain and ozone. Increased nitrogen inputs to terrestrial and wetland systems can lead to changes in plant species composition and diversity. Similarly, direct nitrogen inputs to aquatic ecosystems such as those found in estuarine and coastal waters can lead to eutrophication (a condition that promotes excessive algae growth, which can lead to a severe depletion of dissolved oxygen and increased levels of toxins harmful to aquatic life). Nitrogen, alone or in acid rain, also can acidify soils and surface waters. Acidification of soils causes the loss of essential plant nutrients and increased levels of soluble aluminum that are toxic to plants. Acidification of surface waters creates conditions of low pH and levels of aluminum that are toxic to fish and other aquatic organisms. NO_X also contributes to visibility impairment.

A.5 Particulate Matter

Particulate matter pollution consists of very small liquid and solid particles floating in the air. Some particles are large or dark enough to be seen as soot or smoke. Others are so small they can be detected only with an electron microscope. Particulate matter is a mixture of materials that can include smoke, soot, dust, salt, acids, and metals. Particulate matter also forms when gases emitted from motor vehicles and industrial sources undergo chemical reactions in the atmosphere. PM_{10} refers to particles less than or equal to 10 microns in aerodynamic diameter. $PM_{2.5}$ refers to particles less than or equal to 2.5 microns in aerodynamic diameter and are a subset of PM_{10}.

In the western United States, there are sources of PM_{10} in both urban and rural areas. PM_{10} and $PM_{2.5}$ are emitted from stationary and mobile sources, including diesel trucks and other motor vehicles, power plants, industrial processing, wood burning stoves and fireplaces, wildfires, dust from roads, construction, landfills, and agriculture, and fugitive windblown dust. Because particles originate from a variety of sources, their chemical and physical compositions vary widely.

A.5.1 Health Effects

PM_{10} and $PM_{2.5}$ particles are small enough – about $1/7^{th}$ the thickness of a human hair, or smaller – to be inhaled into, and lodge in, the deepest parts of the lung, evading the respiratory system's natural defenses. Health problems begin as the body reacts to these foreign particles.

Acute and chronic health effects associated with high particulate levels include the aggravation of chronic respiratory diseases, heart and lung disease, and coughing, bronchitis, and respiratory illnesses in children. Recent mortality studies have shown a statistically significant direct association between mortality and daily concentrations of particulate matter in the air. Non-health-related effects include reduced visibility and soiling of buildings. PM_{10} can increase the number and severity of asthma attacks, cause or aggravate bronchitis and other lung diseases, and reduce the body's ability to fight infections. PM_{10} and $PM_{2.5}$ can aggravate respiratory disease, and cause lung damage, cancer, and premature death.

Although particulate matter can cause health problems for everyone, certain people are especially vulnerable to adverse health effects of PM_{10}. These "sensitive populations" include children, the elderly, exercising adults, and those suffering from chronic lung disease such as asthma or bronchitis. Of greatest concern are recent studies that link PM_{10} exposure to the premature death of people who already have heart and lung disease, especially the elderly. Acidic PM_{10} can also damage manmade materials and is a major cause of reduced visibility in many parts of the U.S.

Premature deaths linked to particulate matter are now at levels comparable to deaths from traffic accidents and second-hand smoke. One of the most dangerous pollutants, fine particulate matter (e.g., from diesel exhaust and fireplace soot) not only bypasses the body's defense mechanisms and becomes embedded in the deepest recesses of the lung, but also can disrupt cellular processes. Population based studies in hundreds of cities in the U.S. and around the world have demonstrated a strong link between elevated particulate levels and premature deaths, hospital admissions, emergency room visits, and asthma attacks. Long-term studies of children's health conducted in California have demonstrated that particulate pollution may significantly reduce lung function growth in children.

Attaining the California particulate matter standards would annually prevent about 6,500 premature deaths, or 3 percent of all deaths. These premature deaths shorten lives by an average of 14 years. This is roughly equivalent to the same number of deaths (4,200 – 7,400) linked to second-hand smoke in the year 2000. In comparison, motor vehicle crashes cause 3,200 deaths and homicides were responsible for 2,000 deaths. Attaining the California particulate matter and ozone standards would annually prevent

4,000 hospital admissions for respiratory disease, 3,000 hospital admissions for cardiovascular disease, and 2,000 asthma-related emergency room visits. Exposure to diesel particulate matter (DPM) causes about 250 excess cancer cases per year in California.

A recent study provides evidence that exposure to particulate air pollution is associated with lung cancer. This study found that residents who live in an area that is severely impacted by particulate air pollution are at risk of lung cancer at a rate comparable to non-smokers exposed to second-hand smoke. This study also found an approximately 16 percent excess risk of dying from lung cancer due to fine particulate air pollution.

Another study shows that individuals with existing cardiac disease can be in a potentially life-threatening situation when exposed to high levels of ultrafine air pollution. Fine particles can penetrate the lungs and may cause the heart to beat irregularly or can cause inflammation, which could lead to a heart attack.

Currently, 61 percent of California's population live in areas that exceed the federal $PM_{2.5}$ air standard, while 89 percent live in areas that exceed California's $PM_{2.5}$ air standard.

A.6 Sulfur Dioxide

Sulfur dioxide (SO_2) is a colorless, irritating gas with a "rotten egg" smell formed primarily by the combustion of sulfur-containing fossil fuels. Historically, in the late 1970's in the San Joaquin Valley Air Basin (SJVAB) portion of Kern County, SO_2 was a pollutant of concern but with the successful application of regulations, the levels have been reduced significantly. In fact, the latest data from CARB demonstrates that the highest 1-hour concentration for SO_2 was 0.011 ppm. With the California Ambient Air Quality Standard (CAAQS) being 0.25 ppm, SO_2 concentrations in the SJVAB are only about 4 percent of the standard.

A.6.1 Health Effects

High concentrations of SO_2 can result in temporary breathing impairment for asthmatic children and adults who are active outdoors. Short-term exposures of asthmatic individuals to elevated SO_2 levels during moderate activity may result in breathing difficulties that can be accompanied by symptoms such as wheezing, chest tightness, or shortness of breath. Other effects that have been associated with longer-term exposures to high concentrations of SO_2, in conjunction with high levels of particulate matter, include aggravation of existing cardiovascular disease, respiratory illness, and alterations in the lungs' defenses. SO_2 also is a major precursor to $PM_{2.5}$, which is a significant health concern, and a main contributor to poor visibility. (See also the discussion of health effects of particulate matter above.)

SO_2 not only has a bad odor, but it can irritate the respiratory system. Exposure to high concentrations for short periods of time can constrict the bronchi and increase mucous flow, making breathing difficult. SO_2 can also:

- Immediately irritate the lung and throat at concentrations greater than 6 ppm in many people.
- Impair the respiratory system's defenses against foreign particles and bacteria, when exposed to concentrations less than 6 ppm for longer time periods.
- Enhance the harmful effects of ozone. (Combinations of the two gases at concentrations occasionally found in the ambient air appear to increase airway resistance to breathing.)

SO_2 tends to have more toxic effects when acidic pollutants, liquid or solid aerosols, and particulates are also present. (In the 1950's and 1960's, thousands of excess deaths occurred in areas where SO_2 concentrations exceeded 1 ppm for a few days and other pollutants were also high.) Effects are more

pronounced among mouth breathers (e.g., people who are exercising or who have head colds). These effects include:

- Health problems, such as episodes of bronchitis requiring hospitalization associated with lower-level acid concentrations.
- Self-reported respiratory conditions, such as chronic cough and difficulty breathing, associated with acid aerosol concentrations. (Asthmatic individuals are especially susceptible to these effects. The elderly and those with chronic respiratory conditions may also be affected at lower concentrations than the general population.)
- Increased respiratory tract infections, associated with longer term, lower-level exposures to SO_2 and acid aerosols.
- Subjective symptoms, such as headaches and nausea, in the absence of pathological abnormalities, due to long-term exposure.

SO_2 easily injures many plant species and varieties, both native and cultivated. Some of the most sensitive plants include various commercially valuable pines, legumes, red and black oaks, white ash, alfalfa and blackberry. The effects include:

- Visible injury to the most sensitive plants at exposures as low as 0.12 ppm for 8 hours.
- Visible injury to many other plant types of intermediate sensitivity at exposures of 0.30 ppm for 8 hours.
- Positive benefits from low levels, in a very few species growing on sulfur deficient soils.

Increases in SO_2 concentrations accelerate the corrosion of metals, probably through the formation of acids. (SO_2 is a major precursor to acidic deposition.) Sulfur oxides may also damage stone and masonry, paint, various fibers, paper, leather, and electrical components.

Increased SO_2 concentrations also contribute to impaired visibility. Particulate sulfate, much of which is derived from SO_2 emissions, is a major component of the complex total suspended particulate mixture.

A.7 Sulfates

Sulfates are particulate products of combustion of sulfur-containing fossil fuels. When sulfur oxide or SO_2 is exposed to oxygen, it precipitates out into sulfates (SO_3 or SO_4). Data collected in Kern County identify levels of sulfates that are significantly less than the applicable health standards.

Sulfates (SO_4^{-2}) are the fully oxidized ionic form of sulfur. Sulfates occur in combination with metal and/or hydrogen ions.

In California, emissions of sulfur compounds occur primarily from the combustion of petroleum-derived fuels (e.g., gasoline and diesel fuel) that contain sulfur. This sulfur is oxidized to SO_2 during the combustion process and subsequently converted to sulfate compounds in the atmosphere. The conversion of SO_2 to sulfates takes place comparatively rapidly and completely in urban areas of California due to regional meteorological features.

A.7.1 Health Effects

CARB's sulfates standard is designed to prevent aggravation of respiratory symptoms. Effects of sulfate exposure at levels above the standard include a decrease in ventilatory function, aggravation of asthmatic symptoms, and an increased risk of cardio-pulmonary disease. Sulfates are particularly effective in

degrading visibility, and, due to the fact that they are usually acidic, can harm ecosystems and damage materials and property.

A.8 Lead

Lead is a metal that is a natural constituent of air, water, and the biosphere. Lead is neither created nor destroyed in the environment, so it essentially persists forever. Lead was used until recently to increase the octane rating in auto fuel. Since gasoline-powered automobile engines were a major source of airborne lead through the use of leaded fuels and the use of leaded fuel has been mostly phased out, the ambient concentrations of lead have dropped dramatically.

A.8.1 Health Effects

Exposure to lead occurs mainly through inhalation of air and ingestion of lead in food, water, soil, or dust. It accumulates in the blood, bones, and soft tissues and can adversely affect the kidneys, liver, nervous system, and other organs. Excessive exposure to lead may cause neurological impairments such as seizures, mental retardation, and behavioral disorders. Even at low doses, lead exposure is associated with damage to the nervous systems of fetuses and young children, resulting in learning deficits and lowered IQ. Recent studies also show that lead may be a factor in high blood pressure and subsequent heart disease. Lead can also be deposited on the leaves of plants, presenting a hazard to grazing animals and humans through ingestion.

A.9 Hydrogen Sulfide

Hydrogen sulfide (H_2S) is associated with geothermal activity, oil and gas production, refining, sewage treatment plants, and confined animal feeding operations.

A.9.1 Health Effects

Exposure to low concentrations of H_2S may cause irritation to the eyes, nose, or throat. It may also cause difficulty in breathing for some asthmatics. Exposure to higher concentrations (above 100 ppm), can cause olfactory fatigue, respiratory paralysis, and death. Brief exposures to high concentrations of H_2S (greater than 500 ppm) can cause a loss of consciousness. In most cases, the person appears to regain consciousness without any other effects. However, in many individuals, there may be permanent or long term effects such as headaches, poor attention span, poor memory, and poor motor function. No health effects have been found in humans exposed to typical environmental concentrations of H_2S (0.00011 – 0.00033 ppm). Deaths due to breathing in large amounts of H_2S have been reported in a variety of different work settings, including sewers, animal processing plants, waste dumps, sludge plants, oil and gas well drilling sites, and tanks and cesspools.

A.10 Visibility-reducing Particles

This standard is a measure of visibility. CARB does not yet have a measuring method with enough accuracy or precision to designate areas in the State as attainment or nonattainment. As such, the entire State is labeled unclassified.

A.11 Vinyl Chloride

Vinyl chloride monomer is a sweet smelling, colorless gas at ambient temperature. Landfills, publicly owned treatment works, and polyvinyl chloride (PVC) production are the major identified sources of vinyl chloride emissions in California. PVC can be fabricated into several products such as PVC pipes,

pipefittings, and plastics. In humans, epidemiological studies of occupationally exposed workers have linked vinyl chloride exposure to development of a rare cancer, liver angiosarcoma, and have suggested a relationship between exposure and lung and brain cancers. There are currently no adopted ambient air standards for vinyl chloride.

A.11.1 Health Effects

Short-term exposure to vinyl chloride has been linked with the following acute health effects:

- Acute exposure of humans to high levels of vinyl chloride via inhalation in humans has resulted in effects on the central nervous system, such as dizziness, drowsiness, headaches, and giddiness.
- Vinyl chloride is reported to be slightly irritating to the eyes and respiratory tract in humans. Acute exposure to extremely high levels of vinyl chloride has caused loss of consciousness, lung and kidney irritation, and inhibition of blood clotting in humans and cardio arrhythmias in animals.
- Tests involving acute exposure of mice have shown vinyl chloride to have high acute toxicity from inhalation exposure.

Long-term exposure to vinyl chloride concentrations has been linked with the following chronic health effects:

- Liver damage may result in humans from chronic exposure to vinyl chloride, through both inhalation and oral exposure.
- A small percentage of individuals occupationally exposed to high levels of vinyl chloride in air have developed a set of symptoms termed "vinyl chloride disease," which is characterized by Raynaud's phenomenon (fingers blanch and numbness and discomfort are experienced upon exposure to the cold), changes in the bones at the end of the fingers, joint and muscle pain, and scleroderma-like skin changes (thickening of the skin, decreased elasticity, and slight edema).
- Central nervous system effects (including dizziness, drowsiness, fatigue, headache, visual and/or hearing disturbances, memory loss, and sleep disturbances) as well as peripheral nervous system symptoms (peripheral neuropathy, tingling, numbness, weakness, and pain in fingers) have also been reported in workers exposed to vinyl chloride.

Several reproductive/developmental health effects from vinyl chloride exposure have been identified. They include:

- Several case reports suggest that male sexual performance may be affected by vinyl chloride. However, these studies are limited by lack of quantitative exposure information and possible cooccurring exposure to other chemicals.
- Several epidemiological studies have reported an association between vinyl chloride exposure in pregnant women and an increased incidence of birth defects, while other studies have not reported similar findings.
- Epidemiological studies have suggested an association between men occupationally exposed to vinyl chloride and miscarriages in their wives' pregnancies although other studies have not supported these findings.

Long-term exposure to vinyl chloride has also been identified as a cancer risk. Inhaled vinyl chloride has been shown to increase the risk of a rare form of liver cancer (angiosarcoma of the liver) in humans. Animal studies have shown that vinyl chloride, via inhalation, increases the incidence of angiosarcoma of the liver and cancer of the liver.

A.12 Toxic Air Contaminants

Hazardous air pollutants (HAP) is a term used by the federal Clean Air Act that includes a variety of pollutants generated or emitted by industrial production activities. Called TAC under the California Clean Air Act, ten have been identified through ambient air quality data as being the most substantial health risk in California. Direct exposure to these pollutants has been shown to cause cancer, birth defects, damage to brain and nervous system and respiratory disorders.

Since no safe levels of TACs can be determined, there are no air quality standards for TACs, with the exception of lead, sulfates, vinyl chloride, and hydrogen sulfide. Instead, TAC impacts are evaluated by calculating the health risks associated with a given exposure. The requirements of the Air Toxic "Hot Spots" Information and Assessment Act (Assembly Bill [AB] 2588) apply to facilities that use, produce, or emit toxic chemicals. Facilities that are subject to the toxic emission inventory requirements of AB 2588 must prepare and submit toxic emission inventory plans and reports, and periodically update those reports.

A.12.1 Health Risks – Acetaldehyde

Acetaldehyde is both directly emitted into the atmosphere and formed in the atmosphere from photochemical oxidation. Sources include combustion processes such as exhaust from mobile sources and fuel combustion from stationary internal combustion engines, boilers, and process heaters.

Acetaldehyde is classified as a federal HAP and as a California TAC. Acetaldehyde is a carcinogen that also causes chronic non-cancer toxicity in the respiratory system. Symptoms of chronic intoxication of acetaldehyde in humans resemble those of alcoholism.

The primary acute effect of inhalation exposure to acetaldehyde is irritation of the eyes, skin, and respiratory tract in humans. At higher exposure levels, erythema, coughing, pulmonary edema, and necrosis may also occur. Acute inhalation of acetaldehyde resulted in a depressed respiratory rate and elevated blood pressure in experimental animals.

Tests involving acute exposure of rats, rabbits, and hamsters have demonstrated acetaldehyde to have low acute toxicity from inhalation and moderate acute toxicity from oral or dermal exposure.

A.12.2 Health Risks – Benzene

Approximately 84 percent of the benzene emitted in California comes from motor vehicles, including evaporative leakage and unburned fuel exhaust. Currently, the benzene content of gasoline is less than one percent.

Benzene is highly carcinogenic and occurs throughout California. Benzene also has non-cancer health effects. Brief inhalation exposure to high concentrations can cause central nervous system depression. Acute effects include central nervous system symptoms of nausea, tremors, drowsiness, dizziness, headache, intoxication, and unconsciousness.

Neurological symptoms of inhalation exposure to benzene include drowsiness, dizziness, headaches, and unconsciousness in humans. Ingestion of large amounts of benzene may result in vomiting, dizziness, and convulsions in humans. Exposure to liquid and vapor may irritate the skin, eyes, and upper respiratory tract in humans. Redness and blisters may result from dermal exposure to benzene.

Chronic inhalation of certain levels of benzene causes disorders in the blood in humans. Benzene specifically affects bone marrow (the tissues that produce blood cells). Aplastic anemia, excessive

bleeding, and damage to the immune system (by changes in blood levels of antibodies and loss of white blood cells) may develop. Increased incidence of leukemia (cancer of the tissues that form white blood cells) has been observed in humans occupationally exposed to benzene.

A.12.3 Health Risks – 1,3-Butadiene

The majority of 1,3-butadiene emissions come from incomplete combustion of gasoline and diesel fuels. Mobile sources account for 83 percent of total statewide emissions. Area-wide sources, such as agricultural waste burning and open burning, contribute approximately 13 percent of statewide emissions.

1,3-Butadiene has been identified as a carcinogen in California. Butadiene vapors cause neurological effects at very high levels such as blurred vision, fatigue, headache, and vertigo. Dermal exposure of humans to 1,3-butadiene causes a sensation of cold, followed by a burning sensation, which may lead to frostbite.

One epidemiological study reported that chronic (long-term) exposure to 1,3-butadiene via inhalation resulted in an increase in cardiovascular diseases, such as rheumatic and arteriosclerotic heart diseases, while other human studies have reported effects on the blood. A large epidemiological study of synthetic rubber industry workers demonstrated a consistent association between 1,3-butadiene exposure and occurrence of leukemia. Several epidemiological studies of workers in styrene-butadiene rubber factories have shown an increased incidence of respiratory, bladder, stomach, and lymphato-hematopoietic cancers. However, these studies are not sufficient to determine a causal association between 1,3-butadiene exposure and cancer due to possible exposure to other chemicals and other confounding factors.

A.12.4 Health Risks – Carbon Tetrachloride

The primary sources of carbon tetrachloride in California include chemical and allied product manufacturers and petroleum refineries.

In California, carbon tetrachloride has been identified as a carcinogen. Carbon tetrachloride is also a central nervous system depressant and mild eye and respiratory tract irritant. EPA has classified carbon tetrachloride as a Group B2, probable human carcinogen.

Acute inhalation and oral exposures to high levels of carbon tetrachloride have been observed primarily to damage the liver (swollen, tender liver, changes in enzyme levels, and jaundice) and kidneys (nephritis, nephrosis, proteinurea) of humans. Depression of the central nervous system has also been reported. Symptoms of acute exposure in humans include headache, weakness, lethargy, nausea, and vomiting. Delayed pulmonary edema (fluid in lungs) has been observed in humans exposed to high levels of carbon tetrachloride by inhalation and ingestion, but this is believed to be due to injury to the kidney rather than direct action of carbon tetrachloride on the lung. Chronic inhalation or oral exposure to carbon tetrachloride produces liver and kidney damage in humans and animals.

A.12.5 Health Risks – Chromium, Hexavalent

Chromium plating and other metal finishing processes are the primary sources of hexavalent chromium emissions in California. In California, hexavalent chromium has been identified as a carcinogen. There is epidemiological evidence that exposure to inhaled hexavalent chromium may result in lung cancer. The principal acute effects are renal toxicity, gastrointestinal hemorrhage, and intravascular hemolysis.

The respiratory tract is the major target organ for hexavalent chromium following inhalation exposure in humans. Other effects noted from acute inhalation exposure to very high concentrations of hexavalent

chromium include gastrointestinal and neurological effects, while dermal exposure causes skin burns in humans. Chronic inhalation exposure to hexavalent chromium in humans results in effects on the respiratory tract, with perforations and ulcerations of the septum, bronchitis, decreased pulmonary function, pneumonia, asthma, and nasal itching and soreness reported. Chronic human exposure to high levels of hexavalent chromium by inhalation or oral exposure may produce effects on the liver, kidney, gastrointestinal and immune systems, and possibly the blood.

A.12.6 Health Risks – 1,4-Dichlorobenzene

The primary sources of 1,4-dichlorobenzene include consumer products such as non-aerosol insect repellents and solid/gel air fresheners. These sources contribute 99 percent of statewide 1,4-dichlorobenzene emissions.

In California, 1,4-dichlorobenzene has been identified as a carcinogen. Acute exposure to 1,4-dichlorobenzene via inhalation in humans results in irritation to the eyes, skin, and throat. In addition, long-term inhalation exposure may affect the liver, skin, and central nervous system in humans (e.g., cerebellar ataxia, dysarthria, weakness in limbs, and hyporeflexia).

A.12.7 Health Risks – Formaldehyde

Formaldehyde is both directly emitted into the atmosphere and formed in the atmosphere as a result of photochemical oxidation. Formaldehyde is a product of incomplete combustion. One of the primary sources of formaldehyde is vehicular exhaust. Formaldehyde is also used in resins, can be found in many consumer products as an antimicrobial agent, and is used in fumigants and soil disinfectants.

The major toxic effects caused by acute formaldehyde exposure via inhalation are eye, nose, and throat irritation and effects on the nasal cavity. Other effects seen from exposure to high levels of formaldehyde in humans are coughing, wheezing, chest pains, and bronchitis. Chronic exposure to formaldehyde by inhalation in humans has been associated with respiratory symptoms and eye, nose, and throat irritation. Animal studies have reported effects on the nasal respiratory epithelium and lesions in the respiratory system from chronic inhalation exposure to formaldehyde. Occupational studies have noted statistically significant associations between exposure to formaldehyde and increased incidence of lung and nasopharyngeal cancer. This evidence is considered to be "limited," rather than "sufficient," due to possible exposure to other agents that may have contributed to the excess cancers.

EPA considers formaldehyde to be a probable human carcinogen (cancer-causing agent) and has ranked it in EPA's Group B1. In California, formaldehyde has been identified as a carcinogen.

A.12.8 Health Risks – Methylene Chloride

Methylene chloride is used as a solvent, a blowing and cleaning agent in the manufacture of polyurethane foam and plastic manufacture, and as a solvent in paint stripping operations. Paint removers account for the largest use of methylene chloride in California.

Case studies of methylene chloride poisoning during paint stripping operations have demonstrated that inhalation exposure to extremely high levels can be fatal to humans. Acute inhalation exposure to high levels of methylene chloride in humans has resulted in effects on the central nervous system (CNS) including decreased visual, auditory, and psychomotor functions, but these effects are reversible once exposure ceases. Methylene chloride also irritates the nose and throat at high concentrations. The major effects from chronic inhalation exposure to methylene chloride in humans are effects on the central nervous system, such as headaches, dizziness, nausea, and memory loss. In addition, chronic exposure can lead to bone marrow, hepatic, and renal toxicity.

EPA considers methylene chloride to be a probable human carcinogen and has ranked it in EPA's Group B2. California considers methylene chloride to be carcinogenic.

A.12.9 Health Risks – Perchloroethylene

Perchloroethylene is used as a solvent, primarily in dry cleaning operations. Perchloroethylene is also used in degreasing operations, paints and coatings, adhesives, aerosols, specialty chemical production, printing inks, silicones, rug shampoos, and laboratory solvents.

In California, perchloroethylene has been identified as a carcinogen. Perchloroethylene vapors are irritating to the eyes and respiratory tract. Following chronic exposure, workers have shown signs of liver toxicity, as well as kidney dysfunction, and neurological disorders.

A.12.10 Health Risks – Diesel Particulate Matter

DPM is emitted from both mobile and stationary sources. In California, on-road diesel fueled engines contribute approximately 24 percent of the statewide total, with an additional 71 percent attributed to other mobile sources such as construction and mining equipment, agricultural equipment, and transport refrigeration units. Stationary sources contribute about 5 percent of total DPM.

Diesel exhaust and many individual substances contained in it (including arsenic, benzene, formaldehyde, and nickel) have the potential to contribute to mutations in cells that can lead to cancer. Long-term exposure to diesel exhaust particles poses the highest cancer risk of any TAC evaluated by the California Office of Environmental Health Hazard Assessment (OEHHA). CARB estimates that about 70 percent of the cancer risk that the average Californian faces from breathing toxic air pollutants stems from diesel exhaust particles.

In its comprehensive assessment of diesel exhaust, OEHHA analyzed more than 30 studies of people who worked around diesel equipment, including truck drivers, railroad workers, and equipment operators. The studies showed these workers were more likely to develop lung cancer than workers who were not exposed to diesel emissions. These studies provide strong evidence that long-term occupational exposure to diesel exhaust increases the risk of lung cancer. Using information from OEHHA's assessment, CARB estimates that diesel-particle levels measured in California's air in 2000 could cause 540 "excess" cancers (beyond what would occur if there were no diesel particles in the air) in a population of 1 million people over a 70-year lifetime. Other researchers and scientific organizations, including the National Institute for Occupational Safety and Health, have calculated cancer risks from diesel exhaust that are similar to those developed by OEHHA and CARB.

Exposure to diesel exhaust can have immediate health effects. Diesel exhaust can irritate the eyes, nose, throat, and lungs, and it can cause coughs, headaches, lightheadedness and nausea. In studies with human volunteers, diesel exhaust particles made people with allergies more susceptible to the materials to which they are allergic, such as dust and pollen. Exposure to diesel exhaust also causes inflammation in the lungs, which may aggravate chronic respiratory symptoms and increase the frequency or intensity of asthma attacks.

Diesel engines are a major source of fine-particle pollution. The elderly and people with emphysema, asthma, and chronic heart and lung disease are especially sensitive to fine-particle pollution. Numerous studies have linked elevated particle levels in the air to increased hospital admissions, emergency room visits, asthma attacks, and premature deaths among those suffering from respiratory problems. Because children's lungs and respiratory systems are still developing, they are also more susceptible than healthy adults to fine particles. Exposure to fine particles is associated with increased frequency of childhood

illnesses and can also reduce lung function in children. In California, diesel exhaust particles have been identified as a carcinogen.

A.13 Valley Fever

Valley Fever is a disease caused by breathing in the spores of a fungus called Coccidioides. In Kern County, rain during late winter and early spring causes the fungus to germinate and grow in undisturbed soil. When temperatures rise, the Valley Fever fungus has the unique ability to form spores which then can survive the dry, hot summers. When naturally occurring winds or man-made activities disturb the top few inches of soil, spores become airborne. Once airborne, humans and animals can inhale the spores and become infected. (Kern County Public Health Services Department 2021)

A.13.1 Health Effects

Mild symptoms of contracting Valley Fever can include a slight cold, which quickly goes away. The most common Valley Fever symptoms are described as flu-like and include a cough, fever, headache, chills, sweats, chest pain, and fatigue. Other symptoms that could occur with Valley Fever include rashes on lower legs and joint pain similar to arthritis. Chest x-rays of persons with Valley Fever typically show fluid in one or both lungs, enlarged glands behind the lungs, or fluid build-up around the lungs. Residents of Kern County have a 1 to 3 percent chance of acquiring Valley Fever each year, with the west side of Kern County having the highest risk of acquiring Valley Fever, as compared to the Mountain or Desert regions. (Kern County Public Health Services Department 2021)

A.14 Asbestos

Asbestos is the common name for a group of naturally occurring fibrous silicate minerals that can separate into thin but strong and durable fibers. The principal forms of asbestos include chrysotile, crocidolite, amosite, tremolite, actinolite, and anthophyllite. All but chrysotile are classified as amphiboles, which tend to have a thin, needle-like appearance. Chrysotile breaks into curly fibers. Asbestos deposits are located in many parts of California and are commonly associated with serpentine (OEHHA 2000).

A.14.1 Health Effects

Asbestos fibers can cause health problems if inhaled. When asbestos fibers become airborne, they can be inhaled deep into the lung. Many fibers deposited in the lung are retained there for long periods of time, others may be translocated to other parts of the body (e.g., the lining of the lung and abdomen), and others are completely cleared, albeit slowly. The fibers can cause chronic local inflammation and disrupt orderly cell division, both of which can facilitate the development of asbestosis and cancer. Thus, inhalation of asbestos fibers can initiate a chain of events resulting in cancer or other asbestos-related illness, which may not become apparent for years, even long after the exposure has ended (OEHHA 2000).

A.15 Greenhouse Gases

Greenhouse gases (GHGs) include both naturally occurring and anthropogenic gases, such as carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF_6), and nitrogen trifluoride (NF_3). GHGs absorb infrared radiation, trap energy from the sun, and help maintain the temperature of Earth's surface, creating a process known as the "greenhouse effect."

According to California's 2019 GHG emissions inventory, CO_2 accounts for 83 percent of the State's total GHG emissions. Transportation is the single largest source of CO_2 emissions in California, which is primarily

comprised of on-road travel. Electricity production and industrial and residential sources also make important contributions. (CARB 2021)

CH_4 has a global warming potential (GWP) of 25, indicating one gram of CH_4 is equivalent to 25 grams of CO_2 over a 100-year timeframe. CH_4 is the second highest emitting GHG in California, accounting for 9 percent of the State's 2019 GHG emissions. Agriculture accounts for the majority of emissions, primarily from livestock enteric fermentation and manure management. Industrial sources and landfills also make important contributions. (CARB 2021)

N_2O has a GWP of 298 and accounts for 3.1 percent of the State's 2019 GHG emissions. Agriculture again accounts for the majority of N_2O emissions, primarily from fertilizer and manure added to soil. Commercial and residential use of nitrogen fertilizer on turf and transportation are also important contributors. (CARB 2021)

The other high-GWP GHGs (SF_6, NF_3, PFCs, and HFCs) account for 4.8 percent of California's 2019 GHG emissions. HFCs account for 98.7 percent of those high-GWP GHG emissions. PFCs and HFCs are used as substitutes for chlorofluorocarbons, which destroy stratospheric ozone. SF_6 is used in electricity transmission and distribution and in semiconductor manufacturing. Semiconductor manufacturing also emits a small amount of NF_3. (CARB 2021)

A.15.1 Health Effects

The accumulation of GHGs in the atmosphere influences the long-term range of average atmospheric temperatures. Scientific evidence indicates a trend of increasing global temperature over the past century due to an increase in GHG emissions from human activities. The climate change associated with this global warming is predicted to produce economic, physical, and social consequences across the globe.

A.16 References

California Air Resources Board (CARB). 2021. "GHGs Descriptions & Sources in California." Accessed December 2, 2021. Online: https://ww2.arb.ca.gov/ghg-descriptions-sources.

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Appendix B
Air Quality and GHG Emission Calculations

Appendix B, Table 1A
Mitigated Emissions Summary
TGP Enterprise Solar Storage Project

Mitigated Construction Emissions Summary

	Maximum Daily Emissions						
	ROG	CO	NOx	SOx	Total PM_{10}	Total $PM_{2.5}$	CO_2e
Daily Emissions Comparison	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(metric tons/day)
Maximum Daily Construction Emissions [a]	9.39	157	109	0.37	381	44.5	16.9
EKAPCD Significance Threshold [b]	137	N/A	137	N/A	N/A	N/A	N/A
Exceeds EKAPCD Significance Threshold (Y/N)?	N	N/A	N	N/A	N/A	N/A	N/A
	Annual Average Emissions						
	ROG	CO	NOx	SOx	Total PM_{10}	Total $PM_{2.5}$	CO_2e
Annual Emissions Comparison	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(metric tons/year)
Annual Construction Emissions [c]	0.64	10.5	7.47	0.03	33.9	3.83	2,361
EKAPCD Significance Threshold [d, e]	25	N/A	25	N/A	15	N/A	22,321
Exceeds EKAPCD Significance Threshold (Y/N)?	N	N/A	N	N/A	Y	N/A	N

	Maximum Daily Emissions by Phase								
	ROG	CO	NOx	SOx	Exhaust PM_{10}	Fugitive PM_{10}	Exhaust $PM_{2.5}$	Fugitive $PM_{2.5}$	CO_2e
Daily Emissions by Construction Phase	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)		(lb/day)		(metric tons/day)
Transmission Line Realignment	2.82	22.62	31.18	0.05	1.02	42.75	0.98	4.31	2.32
Perimeter Fence Installation	0.11	1.86	1.57	0.00	0.06	16.85	0.05	1.69	0.16
Site Preparation and Clearing/Grading	4.35	25.95	50.00	0.06	0.93	29.25	0.91	4.25	2.61
Underground Work (Trenching)	1.95	23.14	19.54	0.04	0.86	8.46	0.83	0.85	1.64
System Installation	6.81	90.41	79.84	0.15	3.00	67.59	2.82	6.79	6.71
Gen-tie Construction	0.54	2.61	6.67	0.01	0.14	16.85	0.13	1.69	0.39
Energy Storage System	1.24	7.56	15.48	0.02	0.36	0.00	0.35	0.00	0.88
Testing and Commissioning	0.02	0.22	0.02	0.00	0.01	33.71	0.00	3.37	0.03
Site Cleanup and Restoration	0.66	3.95	8.66	0.01	0.20	0.00	0.20	0.00	0.48
General Management	1.34	59.15	13.85	0.19	3.02	290.83	1.28	31.75	9.30

	Total Emissions by Phase								
	ROG	CO	NOx	SOx	Exhaust PM_{10}	Fugitive PM_{10}	Exhaust $PM_{2.5}$	Fugitive $PM_{2.5}$	CO_2e
Total Emissions by Construction Phase	(tons)	(tons)	(tons)	(tons)	(tons)	(tons)	(tons)	(tons)	(metric tons)
Transmission Line Realignment	0.11	0.90	1.25	0.00	0.04	1.71	0.04	0.17	185.81
Perimeter Fence Installation	0.00	0.04	0.03	0.00	0.00	0.34	0.00	0.03	6.28
Site Preparation and Clearing/Grading	0.07	0.39	0.75	0.00	0.01	0.44	0.01	0.06	78.42
Underground Work (Trenching)	0.08	0.93	0.78	0.00	0.03	0.34	0.03	0.03	131.15
System Installation	0.93	12.59	10.84	0.02	0.41	5.23	0.39	0.52	1,763.05
Gen-tie Construction	0.01	0.05	0.13	0.00	0.00	0.34	0.00	0.03	15.55
Energy Storage System	0.05	0.30	0.62	0.00	0.01	0.00	0.01	0.00	70.22
Testing and Commissioning	0.00	0.01	0.00	0.00	0.00	1.35	0.00	0.13	2.49
Site Cleanup and Restoration	0.01	0.04	0.09	0.00	0.00	0.00	0.00	0.00	9.63
General Management	0.24	9.19	2.94	0.03	0.49	68.28	0.21	7.24	3,247.14

Notes:
N/A = Not Applicable (i.e., no significance threshold exists)

[a] The maximum daily emissions reflect the maximum emissions possible on any given day during the 28-month construction duration, based on the schedule of expected overlapping activities. These estimates account for reductions achieved through implementation of best management practices and mitigation measures for dust control and construction equipment diesel exhaust.

[b] The daily EKAPCD significance thresholds were taken from EKAPCD's *Guidelines for Implementation of the California Environmental Quality Act (CEQA) of 1970* (EKAPCD, 1999). Although these thresholds are intended for project operations only, they were applied to construction emissions for comparison purposes.

[c] To facilitate comparison to the annual EKAPCD significance thresholds, total construction emissions were scaled by a factor of 12 months to 28 months, reflecting an adjustment from the 28-month construction duration.

[d] The annual EKAPCD significance thresholds for criteria pollutants were taken from Attachment A of the Kern County Planning Department's *Guidelines for Preparing an Air Quality Assessment for Use in Environmental Impact Reports* (County, 2006). Although EKAPCD Rule 210.1 does provide offset thresholds for CO and SOx, those thresholds only apply to new stationary sources or modifications to existing stationary sources. As a result, they are not appropriate for comparison to the mobile-oriented construction emissions.

[e] The annual EKAPCD significance threshold for GHGs was taken from EKAPCD's *Addressing GHG Emission Impacts For Stationary Source Projects When Serving As Lead CEQA Agency* (EKAPCD, 2012a). Although this threshold is intended for project operations only, it was applied to construction emissions for comparison purposes. The threshold of significance was converted from U.S. tons to metric tons for consistency with calculations.

Mitigated Operations Emissions Summary

	Maximum Daily Emissions						
	ROG	CO	NOx	SOx	Total PM_{10}	Total $PM_{2.5}$	CO_2e
Daily Emissions Comparison	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(metric tons/day)
Maximum Daily Operation Emissions [a]	0.03	1.31	0.18	0.004	65.4	6.62	0.23
EKAPCD Significance Threshold [b]	137	N/A	137	N/A	N/A	N/A	N/A
Exceeds EKAPCD Significance Threshold (Y/N)?	N	N/A	N	N/A	N/A	N/A	N/A
	Annual Emissions						
	ROG	CO	NOx	SOx	Total PM_{10}	Total $PM_{2.5}$	CO_2e
Annual Emissions Comparison	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(metric tons/year)
Annual Operation Emissions [a]	0.003	0.13	0.01	0.0004	11.9	1.19	50.8
EKAPCD Significance Threshold [c, d]	25	N/A	25	N/A	15	N/A	22,321
Exceeds EKAPCD Significance Threshold (Y/N)?	N	N/A	N	N/A	N	N/A	N

Notes:
N/A = Not Applicable (i.e., no significance threshold exists)
[a] Emissions account for reductions achieved through implementation of best management practices and mitigation measures for dust control.
[b] The daily EKAPCD significance thresholds were taken from EKAPCD's *Guidelines for Implementation of the California Environmental Quality Act (CEQA) of 1970* (EKAPCD, 1999).

[c] The annual EKAPCD significance thresholds for criteria pollutants were taken from Attachment A of the Kern County Planning Department's *Guidelines for Preparing an Air Quality Assessment for Use in Environmental Impact Reports* (County, 2006). Although EKAPCD Rule 210.1 does provide offset thresholds for CO and SOx, those thresholds only apply to new stationary sources or modifications to existing stationary sources. As a result, they are not appropriate for comparison to the mobile-oriented operation emissions.
[d] The annual EKAPCD significance threshold for GHGs was taken from EKAPCD's *Addressing GHG Emission Impacts For Stationary Source Projects When Serving As Lead CEQA Agency* (EKAPCD, 2012a).

Appendix B, Table 1B
Unmitigated Emissions Summary
TGP Enterprise Solar Storage Project

Unmitigated Construction Emissions Summary

Daily Emissions Comparison	ROG (lb/day)	CO (lb/day)	NOx (lb/day)	SOx (lb/day)	Total PM_{10} (lb/day)	Total $PM_{2.5}$ (lb/day)	CO_2e (metric tons/day)
	Maximum Daily Emissions						
Maximum Daily Construction Emissions [a]	9.39	157	109	0.37	434	50.2	16.9
EKAPCD Significance Threshold [b]	137	N/A	137	N/A	N/A	N/A	N/A
Exceeds EKAPCD Significance Threshold (Y/N)?	N	N/A	N	N/A	N/A	N/A	N/A

Annual Emissions Comparison	ROG (tpy)	CO (tpy)	NOx (tpy)	SOx (tpy)	Total PM_{10} (tpy)	Total $PM_{2.5}$ (tpy)	CO_2e (metric tons/year)
	Annual Average Emissions						
Annual Construction Emissions [c]	0.64	10.5	7.47	0.03	38.6	4.34	2,361
EKAPCD Significance Threshold [d, e]	25	N/A	25	N/A	15	N/A	22,321
Exceeds EKAPCD Significance Threshold (Y/N)?	N	N/A	N	N/A	Y	N/A	N

Daily Emissions by Construction Phase	ROG (lb/day)	CO (lb/day)	NOx (lb/day)	SOx (lb/day)	Exhaust PM_{10} (lb/day)	Fugitive PM_{10} (lb/day)	Exhaust $PM_{2.5}$ (lb/day)	Fugitive $PM_{2.5}$ (lb/day)	CO_2e (metric tons/day)
	Maximum Daily Emissions by Phase								
Transmission Line Realignment	2.82	22.62	31.18	0.05	1.40	49.29	1.27	4.97	2.32
Perimeter Fence Installation	0.11	1.86	1.57	0.00	0.06	19.45	0.05	1.94	0.16
Site Preparation and Clearing/Grading	4.35	25.95	50.00	0.06	2.10	33.75	1.93	4.91	2.61
Underground Work (Trenching)	1.95	23.14	19.54	0.04	0.99	9.76	0.92	0.98	1.64
System Installation	6.81	90.41	79.84	0.15	3.55	77.96	3.26	7.82	6.71
Gen-tie Construction	0.54	2.61	6.67	0.01	0.25	19.45	0.23	1.94	0.39
Energy Storage System	1.24	7.56	15.48	0.02	0.56	0.00	0.51	0.00	0.88
Testing and Commissioning	0.02	0.22	0.02	0.00	0.01	38.89	0.00	3.89	0.03
Site Cleanup and Restoration	0.66	3.95	8.66	0.01	0.29	0.00	0.26	0.00	0.48
General Management	1.34	59.15	13.85	0.19	3.02	329.73	1.28	35.64	9.30

Total Emissions by Construction Phase	ROG (tons)	CO (tons)	NOx (tons)	SOx (tons)	Exhaust PM_{10} (tons)	Fugitive PM_{10} (tons)	Exhaust $PM_{2.5}$ (tons)	Fugitive $PM_{2.5}$ (tons)	CO_2e (metric tons)
	Total Emissions by Phase								
Transmission Line Realignment	0.11	0.90	1.25	0.00	0.06	1.97	0.05	0.20	185.81
Perimeter Fence Installation	0.00	0.04	0.03	0.00	0.00	0.39	0.00	0.04	6.28
Site Preparation and Clearing/Grading	0.07	0.39	0.75	0.00	0.03	0.51	0.03	0.07	78.42
Underground Work (Trenching)	0.08	0.93	0.78	0.00	0.04	0.39	0.04	0.04	131.15
System Installation	0.93	12.59	10.84	0.02	0.49	6.03	0.45	0.60	1,763.05
Gen-tie Construction	0.01	0.05	0.13	0.00	0.01	0.39	0.00	0.04	15.55
Energy Storage System	0.05	0.30	0.62	0.00	0.02	0.00	0.02	0.00	70.22
Testing and Commissioning	0.00	0.01	0.00	0.00	0.00	1.56	0.00	0.16	2.49
Site Cleanup and Restoration	0.01	0.04	0.09	0.00	0.00	0.00	0.00	0.00	9.63
General Management	0.24	9.19	2.94	0.03	0.49	77.61	0.21	8.17	3,247.14

Notes:
N/A = Not Applicable (i.e., no significance threshold exists)

[a] The maximum daily emissions reflect the maximum emissions possible on any given day during the 28-month construction duration, based on the schedule of expected overlapping activities. These estimates account for reductions achieved through implementation of best management practices for dust control.

[b] The daily EKAPCD significance thresholds were taken from EKAPCD's *Guidelines for Implementation of the California Environmental Quality Act (CEQA) of 1970* (EKAPCD, 1999). Although these thresholds are intended for project operations only, they were applied to construction emissions for comparison purposes.

[c] To facilitate comparison to the annual EKAPCD significance thresholds, total construction emissions were scaled by a factor of 12 months to 28 months, reflecting an adjustment from the 28-month construction duration.

[d] The annual EKAPCD significance thresholds for criteria pollutants were taken from Attachment A of the Kern County Planning Department's *Guidelines for Preparing an Air Quality Assessment for Use in Environmental Impact Reports* (County, 2006). Although EKAPCD Rule 210.1 does provide offset thresholds for CO and SOx, those thresholds only apply to new stationary sources or modifications to existing stationary sources. As a result, they are not appropriate for comparison to the mobile-oriented construction emissions.

[e] The annual EKAPCD significance threshold for GHGs was taken from EKAPCD's *Addressing GHG Emission Impacts For Stationary Source Projects When Serving As Lead CEQA Agency* (EKAPCD, 2012a). Although this threshold is intended for project operations only, it was applied to construction emissions for comparison purposes. The threshold of significance was converted from U.S. tons to metric tons for consistency with calculations.

Unmitigated Operations Emissions Summary

Daily Emissions Comparison	ROG (lb/day)	CO (lb/day)	NOx (lb/day)	SOx (lb/day)	Total PM_{10} (lb/day)	Total $PM_{2.5}$ (lb/day)	CO_2e (metric tons/day)
	Maximum Daily Emissions						
Maximum Daily Operation Emissions [a]	0.03	1.31	0.18	0.004	65.4	6.62	0.23
EKAPCD Significance Threshold [b]	137	N/A	137	N/A	N/A	N/A	N/A
Exceeds EKAPCD Significance Threshold (Y/N)?	N	N/A	N	N/A	N/A	N/A	N/A

Annual Emissions Comparison	ROG (tpy)	CO (tpy)	NOx (tpy)	SOx (tpy)	Total PM_{10} (tpy)	Total $PM_{2.5}$ (tpy)	CO_2e (metric tons/year)
	Annual Emissions						
Annual Operation Emissions [a]	0.003	0.13	0.01	0.0004	11.9	1.19	50.8
EKAPCD Significance Threshold [c, d]	25	N/A	25	N/A	15	N/A	22,321
Exceeds EKAPCD Significance Threshold (Y/N)?	N	N/A	N	N/A	N	N/A	N

Notes:
N/A = Not Applicable (i.e., no significance threshold exists)
[a] Emissions account for reductions achieved through implementation of best management practices for dust control.
[b] The daily EKAPCD significance thresholds were taken from EKAPCD's *Guidelines for Implementation of the California Environmental Quality Act (CEQA) of 1970* (EKAPCD, 1999).

[c] The annual EKAPCD significance thresholds for criteria pollutants were taken from Attachment A of the Kern County Planning Department's *Guidelines for Preparing an Air Quality Assessment for Use in Environmental Impact Reports* (County, 2006). Although EKAPCD Rule 210.1 does provide offset thresholds for CO and SOx, those thresholds only apply to new stationary sources or modifications to existing stationary sources. As a result, they are not appropriate for comparison to the mobile-oriented operation emissions.
[d] The annual EKAPCD significance threshold for GHGs was taken from EKAPCD's *Addressing GHG Emission Impacts For Stationary Source Projects When Serving As Lead CEQA Agency* (EKAPCD, 2012a).

Appendix B, Table 2

Preliminary Construction Schedule [a]

TGP Enterprise Solar Storage Project

Construction Phase	Duration (Months)	Duration (Days) [b]	2022												2023												2024			
			1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
Transmission Line Realignment	4	80	X	X	X	X																								
Perimeter Fence Installation	2	40					X	X																						
Site Preparation and Clearing/Grading	1.5	30						X	X																					
Underground Work (Trenching)	4	80						X	X	X	X																			
System Installation	14	280										X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
Gen-tie Construction	2	40																		X	X									
Energy Storage System	4	80																				X	X	X	X					
Testing and Commissioning	4	80																								X	X	X	X	
Site Cleanup and Restoration	1	20																												X
General Management	24	480					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Notes:

[a] This schedule was based on Table 2 of the Conditional Use Permit Application Package for the Enterprise Solar Storage Project, and depicts approximate duration of each construction phase. Phase overlaps were assumed based on expected activities within each phase. It is conservatively assumed construction would begin in January 2022 with realignment of Southern California Edison's transmission line. Construction of the solar storage project would follow completion of the transmission realignment.

[b] It is assumed that each month will have 20 working days: 5 days per week and 4 weeks per month.

Appendix B, Table 3A

Mitigated Construction Emissions [a]

TGP Enterprise Solar Storage Project

Equipment / Vehicle List	Equipment / Vehicle Type	Horsepower	Load Factor	Quantity	Number of Days Used	Hours per Day [b]	Miles per Day [c]	Emissions (lbs/day) [d]								Emissions (metric tons/day) [d]	Emissions (tons/phase) [d]								Emissions (metric tons/phase)
								ROG	CO	NOx	SOx	Exhaust PM_{10} [e]	Fugitive PM_{10} [e]	Exhaust $PM_{2.5}$ [e]	Fugitive $PM_{2.5}$ [e]	CO_2e	ROG	CO	NOx	SOx	Exhaust PM_{10} [e]	Fugitive PM_{10} [e]	Exhaust $PM_{2.5}$ [e]	Fugitive $PM_{2.5}$ [e]	CO_2e
Transmission Line Realignment [f, g]																									
Scraper/Grader	Construction Equipment	367	0.48	1	80	10	-	1.161	8.756	13.378	0.019	0.342	-	0.342	-	0.840	0.046	0.350	0.535	0.001	0.014	-	0.014	-	67.187
Backhoe	Construction Equipment	97	0.37	1	80	10	-	0.234	2.825	2.370	0.004	0.140	-	0.128	-	0.172	0.009	0.113	0.095	0.000	0.006	-	0.005	-	13.772
Pickup Truck	Light-Duty Truck	-	-	3	80	-	10	0.011	0.163	0.015	0.001	0.004	25.282	0.002	2.528	0.023	0.000	0.007	0.001	0.000	0.000	1.011	0.000	0.101	1.87
Pole Auger	Construction Equipment	221	0.5	1	80	10	-	0.322	2.592	3.778	0.012	0.114	-	0.105	-	0.522	0.013	0.104	0.151	0.000	0.005	-	0.004	-	41.744
80-ton Crane	Construction Equipment	231	0.29	1	80	10	-	0.515	2.479	6.062	0.007	0.130	-	0.130	-	0.320	0.021	0.099	0.242	0.000	0.005	-	0.005	-	25.574
Boom Truck with Bucket	Heavy-Duty Diesel	-	-	1	80	-	10	0.013	0.068	0.307	0.001	0.003	8.427	0.002	0.843	0.035	0.001	0.003	0.012	0.000	0.000	0.337	0.000	0.034	2.76
Hydraulic Tensioner	Construction Equipment	88	0.34	1	80	10	-	0.266	2.467	2.452	0.003	0.127	-	0.127	-	0.142	0.011	0.099	0.098	0.000	0.005	-	0.005	-	11.352
Line Truck with Spool Trailer	Heavy-Duty Diesel	-	-	1	80	-	10	0.013	0.068	0.307	0.001	0.003	8.427	0.002	0.843	0.035	0.001	0.003	0.012	0.000	0.000	0.337	0.000	0.034	2.76
Drum Puller	Construction Equipment	88	0.34	1	80	10	-	0.266	2.467	2.452	0.003	0.127	-	0.127	-	0.142	0.011	0.099	0.098	0.000	0.005	-	0.005	-	11.352
Fugitive Dust [k]	Grading Area (acres)	-	-	20	80	-	-	-	-	-	-	-	0.388	-	0.042	-	-	-	-	-	-	0.016	-	0.002	-
Indirect Emissions from Water Use		-	-	-	80	-	-	-	-	-	-	-	-	-	-	0.004	-	-	-	-	-	-	-	-	0.32
Passenger Vehicles (Worker Commutes)	Light-Duty Auto/Truck	-	-	10	80	-	33.6	0.012	0.732	0.056	0.002	0.034	0.223	0.014	0.056	0.089	0.000	0.029	0.002	0.000	0.001	0.009	0.001	0.002	7.11
Perimeter Fence Installation [f]																									
Skid Steer Loader	Construction Equipment	65	0.37	1	40	10	-	0.094	1.737	1.254	0.003	0.051	-	0.047	-	0.115	0.002	0.035	0.025	0.000	0.001	-	0.001	-	4.582
Pickup Truck	Light-Duty Truck	-	-	1	40	-	10	0.004	0.054	0.005	0.000	0.001	8.427	0.001	0.843	0.008	0.000	0.001	0.000	0.000	0.000	0.169	0.000	0.017	0.312
Flatbed Truck	Heavy-Duty Diesel	-	-	1	40	-	10	0.013	0.068	0.307	0.001	0.003	8.427	0.002	0.843	0.035	0.000	0.001	0.006	0.000	0.000	0.169	0.000	0.017	1.382
Site Preparation and Clearing/Grading [f]																									
Water Truck	Heavy-Duty Diesel	-	-	3	30	-	10	0.039	0.203	0.920	0.002	0.010	25.282	0.006	2.528	0.104	0.001	0.003	0.014	0.000	0.000	0.379	0.000	0.038	3.109
Grader	Construction Equipment	187	0.41	2	30	10	-	1.132	4.418	14.811	0.017	0.297	-	0.297	-	0.734	0.017	0.066	0.222	0.000	0.004	-	0.004	-	22.027
Bulldozer	Construction Equipment	247	0.4	1	30	10	-	1.307	5.047	13.714	0.011	0.192	-	0.192	-	0.473	0.020	0.076	0.206	0.000	0.003	-	0.003	-	14.201
Scraper	Construction Equipment	367	0.48	1	30	10	-	1.161	8.756	13.378	0.019	0.031	-	0.031	-	0.840	0.017	0.131	0.201	0.000	0.000	-	0.000	-	25.195
10-ton Roller	Construction Equipment	80	0.38	1	30	10	-	0.237	2.350	2.405	0.003	0.129	-	0.129	-	0.145	0.004	0.035	0.036	0.000	0.002	-	0.002	-	4.361
Sheepsfoot Roller	Construction Equipment	80	0.38	1	30	10	-	0.237	2.350	2.405	0.003	0.129	-	0.129	-	0.145	0.004	0.035	0.036	0.000	0.002	-	0.002	-	4.361
Tractor with Mower Attachment	Construction Equipment	97	0.37	1	30	10	-	0.234	2.825	2.370	0.004	0.140	-	0.128	-	0.172	0.004	0.042	0.036	0.000	0.002	-	0.002	-	5.165
Fugitive Dust [l]	Bulldozing Activity (hours)	-	-	1	30	10	-	-	-	-	-	-	2.936	-	1.614	-	-	-	-	-	-	0.044	-	0.024	-
Fugitive Dust [k]	Grading Area (acres)	-	-	75	30	-	-	-	-	-	-	-	1.034	-	0.112	-	-	-	-	-	-	0.016	-	0.002	-
Underground Work (Trenching) [f]																									
Excavator	Construction Equipment	158	0.38	2	80	10	-	0.572	8.179	5.383	0.013	0.262	-	0.241	-	0.572	0.023	0.327	0.215	0.001	0.010	-	0.010	-	45.79
Sheepsfoot Roller	Construction Equipment	80	0.38	1	80	10	-	0.237	2.350	2.405	0.003	0.129	-	0.129	-	0.145	0.009	0.094	0.096	0.000	0.005	-	0.005	-	11.63
Water Truck	Heavy-Duty Diesel	-	-	1	80	-	10	0.013	0.068	0.307	0.001	0.003	8.427	0.002	0.843	0.035	0.001	0.003	0.012	0.000	0.000	0.337	0.000	0.034	2.76
Generator	Construction Equipment	84	0.74	1	80	10	-	0.447	4.606	3.958	0.008	0.210	-	0.210	-	0.354	0.018	0.184	0.158	0.000	0.008	-	0.008	-	28.30
Aussie Padder Screening Machine	Construction Equipment	172	0.42	1	80	10	-	0.526	5.069	5.476	0.008	0.178	-	0.178	-	0.342	0.021	0.203	0.219	0.000	0.007	-	0.007	-	27.39
4x4 Forklift	Construction Equipment	100	0.4	1	80	10	-	0.154	2.868	2.015	0.004	0.078	-	0.071	-	0.191	0.006	0.115	0.081	0.000	0.003	-	0.003	-	15.28
Fugitive Dust [m]	Truck Dumping/Loading Volume (yd^3)	-	-	519	1	-	-	-	-	-	-	-	0.030	-	0.005	-	-	-	-	-	-	0.000	-	0.000	-
System Installation [f, n]																									
4x4 Forklift	Construction Equipment	100	0.4	8	280	10	-	1.235	22.941	16.122	0.035	0.628	-	0.571	-	1.528	0.173	3.212	2.257	0.005	0.088	-	0.080	-	427.75
80-ton Crane	Construction Equipment	231	0.29	1	280	10	-	0.515	2.479	6.062	0.007	0.130	-	0.130	-	0.320	0.072	0.347	0.849	0.001	0.018	-	0.018	-	89.51
ATV	Construction Equipment	65	0.37	20	280	10	-	1.888	34.748	25.088	0.053	1.018	-	0.944	-	2.291	0.264	4.865	3.512	0.007	0.143	-	0.132	-	641.43
Pile Driver	Construction Equipment	172	0.42	4	280	10	-	2.102	20.275	21.904	0.032	0.713	-	0.713	-	1.370	0.294	2.839	3.067	0.004	0.100	-	0.100	-	383.52
Pickup Truck	Light-Duty Truck	-	-	4	280	-	10	0.015	0.217	0.020	0.001	0.005	33.709	0.003	3.371	0.031	0.002	0.030	0.003	0.000	0.001	4.719	0.000	0.472	8.73
Offroad Cement Truck	Heavy-Duty Diesel	-	-	20	30	-	2	0.060	0.368	1.316	0.003	0.013	33.709	0.007	3.371	0.146	0.001	0.006	0.020	0.000	0.000	0.506	0.000	0.051	4.38
Onroad Cement Truck	Heavy-Duty Diesel	-	-	20	30	-	13.2	0.032	0.166	1.410	0.007	0.072	0.175	0.035	0.044	0.321	0.000	0.002	0.021	0.000	0.001	0.003	0.001	0.001	9.63
Generator	Construction Equipment	84	0.74	2	280	10	-	0.893	9.212	7.915	0.016	0.419	-	0.419	-	0.708	0.125	1.290	1.108	0.002	0.059	-	0.059	-	198.11
Paving [o]	Paved Area (acres)	-	-	0.06	2	-	-	0.072	-	-	-	-	-	-	-	-	0.000	-	-	-	-	-	-	-	-
Gen-tie Construction [f]																									
Line Truck with Spool Trailer	Heavy-Duty Diesel	-	-	1	40	-	10	0.013	0.068	0.307	0.001	0.003	8.427	0.002	0.843	0.035	0.000	0.001	0.006	0.000	0.000	0.169	0.000	0.017	1.38
Boom Truck with Bucket	Heavy-Duty Diesel	-	-	1	40	-	10	0.013	0.068	0.307	0.001	0.003	8.427	0.002	0.843	0.035	0.000	0.001	0.006	0.000	0.000	0.169	0.000	0.017	1.38
80-ton Crane	Construction Equipment	231	0.29	1	40	10	-	0.515	2.479	6.062	0.007	0.130	-	0.130	-	0.320	0.010	0.050	0.121	0.000	0.003	-	0.003	-	12.79
Energy Storage System																									
80-ton Crane	Construction Equipment	231	0.29	1	80	10	-	0.515	2.479	6.062	0.007	0.130	-	0.130	-	0.320	0.021	0.099	0.242	0.000	0.005	-	0.005	-	25.57
Grader	Construction Equipment	187	0.41	1	80	10	-	0.566	2.209	7.406	0.008	0.149	-	0.149	-	0.367	0.023	0.088	0.296	0.000	0.006	-	0.006	-	29.37
4x4 Forklift	Construction Equipment	100	0.4	1	80	10	-	0.154	2.868	2.015	0.004	0.078	-	0.071	-	0.191	0.006	0.115	0.081	0.000	0.003	-	0.003	-	15.28
Testing and Commissioning																									
Pickup Truck	Light-Duty Truck	-	-	4	80	-	10	0.015	0.217	0.020	0.001	0.005	33.709	0.003	3.371	0.031	0.001	0.009	0.001	0.000	0.000	1.348	0.000	0.135	2.49
Site Cleanup and Restoration																									
Grader	Construction Equipment	187	0.41	1	20	10	-	0.566	2.209	7.406	0.008	0.149	-	0.149	-	0.367	0.006	0.022	0.074	0.000	0.001	-	0.001	-	7.34
Skid Steer Loader	Construction Equipment	65	0.37	1	20	10	-	0.094	1.737	1.254	0.003	0.051	-	0.047	-	0.115	0.001	0.017	0.013	0.000	0.001	-	0.000	-	2.29
General Management [q, r, t]																									
Onsite Crew Truck	Light-Duty Truck	-	-	150	480	-	2	0.113	1.627	0.147	0.005	0.038	252.817	0.020	25.282	0.234	0.027	0.390	0.035	0.001	0.009	60.676	0.005	6.068	112.21
Various Onroad Haul Trucks	Heavy-Duty Diesel	-	-	100	480	-	13.2	0.162	0.828	7.048	0.034	0.362	0.874	0.177	0.219	1.604	0.039	0.199	1.692	0.008	0.087	0.210	0.043	0.052	770.07
Various Offroad Haul Trucks	Heavy-Duty Diesel	-	-	117	480	-	0.5	0.125	1.074	2.413	0.005	0.019	20.225	0.011	2.023	0.257	0.030	0.258	0.579	0.001	0.005	4.854	0.003	0.485	123.37
Indirect Emissions from Water Use		-	-	-	480	-	-	-	-	-	-	-	-	-	-	0.450	-	-	-	-	-	-	-	-	216.19
Passenger Vehicles (Worker Commutes)	Light-Duty Auto/Truck	-	-	475	480	-	33.6	0.939	55.623	4.239	0.149	2.601	16.916	1.075	4.229	6.751	0.141	8.343	0.636	0.022	0.390	2.537	0.161	0.634	2,025.30

Appendix B, Table 3A

Mitigated Construction Emissions [a]

TGP Enterprise Solar Storage Project

Notes:

- = Parameter not required for computing emissions.

[a] Unless otherwise noted, Equipment/Vehicle List and Daily Equipment Use provided by TGP in Table 2 and/or Section 5 of the Conditional Use Permit Application for the Enterprise Solar Storage Project. Soil stockpiling activities are expected to be negligible during construction. Waste and aggregate hauling activities are included conservatively assuming up to 117 onroad material haul truck trips per day during the General Management phase, with minimal offroad travel upon entering the site.

[b] All construction equipment are conservatively estimated to be used 10 hours per day, based on construction activities occurring between 7 am and 6 pm daily with a 1-hour lunch break.

[c] Unless otherwise noted, it is assumed that each onsite light-duty and heavy-duty truck will travel up to 10 miles per day. It is also assumed that each worker commute vehicle will travel up to 33.6 miles per day and that each material delivery truck will travel up to 13.2 miles per day offiste, based on CalEEMod default values for H-W and C-NW rural trip lengths, respectively, for the Mojave Air Basin (taken from Table 4.2 of Appendix D of the *CalEEMod User's Guide* [BREEZE Software, 2021]).

[d] The following conversion factors were used to estimate emissions:

1 lb =	453.6	g
1 metric ton =	1,000,000	g
1 ton =	2,000	lbs
1 yd^3 =	1.2641662	tons
1 yd^3 =	27	ft^3
Blade width of grading equipment =	12	ft
1 acre =	43,560	ft^2
1 mile =	5,280	ft
1 acre-ft =	325,851	gallons

[e] PM_{10} and $PM_{2.5}$ emissions are separated into exhaust and fugitive emissions. Brake and tire wear are conservatively captured with the exhaust emisisons. Exhaust emissions also account for reductions achieved through implementation of mitigation measures for construction equipment diesel exhaust. Fugitive emissions include dust emissions associated with road travel, bulldozing activities, grading activities, and truck dumping/loading activities and account for reductions achieved through implementation of best management practices and mitigation measures for dust control.

[f] Each heavy-duty diesel vehicle is expected to idle no more than 5 minutes per day, or: 0.083 idle-hr/day

[g] As described in Section 5 of the Conditional Use Permit Application, up to 50 construction workers per week (or 10 per day) will be required to support the Transmission Line Realignment phase, before other construction activities begin. Crew will be transported around the realignment area using the offroad pickup trucks. Construction water usage during this phase is conservatively included, as estimated below:

Parameter		Value	Units
Annual Water Use during Transmission Line Realignment		0.5	acre-feet/phase
		0.16	million gal/phase
Water Electricity Intensity (Mojave Desert Air Basin) [h]	Supply	9,727	kWh/million gal
	Treat	111	
	Distribute	1,272	
	Total	11,110	
Electrical Utility Emission Factors (SoCal Edison) [i,j]		391	lb/MWh CO_2
		0.033	lb/MWh CH_4
		0.004	lb/MWh N_2O
		393.0	lb/MWh CO_2e

[h] Water Electricity Intensity values for water supply, treatment, and distribution were taken from Table 9.2 in Appendix D of the *CalEEMod User's Guide* (BREEZE Software, 2021).

[i] Electrical Utility Emission Factors were taken from Table 1.2 in Appendix D of the *CalEEMod User's Guide* (BREEZE Software, 2021).

[j] CO_2e values were calculated using the following global warming potentials (GWP, 100-year GWP) from the *2014 IPCC Fifth Assessment Report* (AR5):

Appendix B, Table 3A

Mitigated Construction Emissions [a]

TGP Enterprise Solar Storage Project

Pollutant	AR5 GWP
Carbon Dioxide (CO_2)	1
Methane (CH_4)	28
Nitrous Oxide (N_2O)	265

[k] The graded area was estimated assuming each Scraper could grade 1 acre per day, each Bulldozer could grade 0.5 acres per day, and each Grader could grade 0.5 acres per day, per Section 4.3 of Appendix A of the *CalEEMod User's Guide* (BREEZE Software, 2021). Grading activities were assumed to occur in the first month of the Transmission Line Realignment phase and throughout the Site Preparation and Clearing/Grading phase.

[l] Fugitive dust emissions associated with bulldozing activity were included based on hours of bulldozer operation per day, consistent with Section 4.3 of Appendix A of the *CalEEMod User's Guide* (BREEZE Software, 2021).

[m] Fugitive dust emissions from Truck Dumping/Loading activities are a result of excavating for installation of electrical and communication wiring and subsequently backfilling with the same volume of soil. These activities were conservatively assumed to occur in a single day. Volumes were estimated using the following assumed trench details:

Trenching Depth (ft)	Trenching Width (ft)	Trenching Length (ft)	Trenching Volume (yd^3)
3.5	2	1,000	259

[n] A cement truck was assumed to be onsite during the system installation to supply the concrete required for footings and pads for transformers and equipment. While onsite, the truck was assumed to travel up to 2 miles per day as concrete pouring activities are expected to occur in only one location near the site entrance. To reach the site, the truck was assumed to travel up to 13.2 miles per day, based on CalEEMod default values for C-NW rural trip lengths for the Mojave Air Basin (taken from Table 4.2 of Appendix D of the *CalEEMod User's Guide* [BREEZE Software, 2021]).

[o] The default emission factor for ROG off-gasssing emissions from paving and the default parking space size were taken from Section 4.8 of Appendix A of *CalEEMod User's Guide* (BREEZE Software, 2021). Paving was assumed to occur over 2 days, and emissions were calculated using the following assumptions:

Parameter	Value	Units
Parking Space Size	400	ft^2
Parking Space Quantity [p]	6	-
ROG Emission Factor	2.62	lb/acre

[p] The number of parking spaces is assumed based upon 6 permanent full-time staff being onsite during operation.

[q] Traffic analyses indicate that up to 150 onsite crew trucks will be onsite throughout construction to facilitate shuttling workers from one location to another within the project boundary. Each onsite crew truck was assumed to travel up to 2 miles per day as daily driving is expected to be fairly localized.

[r] The General Management phase includes passenger vehicle worker commute counts based upon an average daily work force. Construction water usage is also conservatively included, as estimated below and utilizing emission factors presented in Note g above:

Parameter	Value	Units
Annual Water Use during General Management [s]	167.5	acre-feet/year
	54.58	million gal/year

[s] Annual water usage during construction was estimated from the Conditional Use Permit Application, which states that 335 acre-feet of water will be used per the 24-month construction period not associated with Transmission Line Realignment. Water usage was assumed to be evenly distributed over this 24-month period.

[t] The construction peak workforce is 550 workers, and the average daily workforce onsite during construction is expected to include 250 construction, supervisory, support, and construction management personnel. However, offsite construction worker trips are conservatively estimated to be a peak of 760 per day (800 workers) and an annual average of 475 per day. The daily emissions conservatively represent the potential emissions from a peak day of 760 worker trips and the annual emissions conservatively reflect the annual average trips per day of 475.

Appendix B, Table 3B

Unmitigated Construction Emissions [a]

TGP Enterprise Solar Storage Project

Equipment / Vehicle List	Equipment / Vehicle Type	Horsepower	Load Factor	Quantity	Number of Days Used	Hours per Day [b]	Miles per Day [c]	Emissions (lbs/day) [d] ROG	CO	NOx	SOx	Exhaust PM_{10} [e]	Fugitive PM_{10} [e]	Exhaust $PM_{2.5}$ [e]	Fugitive $PM_{2.5}$ [e]	Emissions (metric tons/day) [d] CO_2e	Emissions (tons/phase) [d] ROG	CO	NOx	SOx	Exhaust PM_{10} [e]	Fugitive PM_{10} [e]	Exhaust $PM_{2.5}$ [e]	Fugitive $PM_{2.5}$ [e]	Emissions (metric tons/phase) CO_2e
Transmission Line Realignment [f, g]																									
Scraper/Grader	Construction Equipment	367	0.48	1	80	10	-	1.161	8.756	13.378	0.019	0.520	-	0.478	-	0.840	0.046	0.350	0.535	0.001	0.021	-	0.019	-	67.187
Backhoe	Construction Equipment	97	0.37	1	80	10	-	0.234	2.825	2.370	0.004	0.140	-	0.128	-	0.172	0.009	0.113	0.095	0.000	0.006	-	0.005	-	13.772
Pickup Truck	Light-Duty Truck	-	-	3	80	-	10	0.011	0.163	0.015	0.001	0.004	29.171	0.002	2.917	0.023	0.000	0.007	0.001	0.000	0.000	1.167	0.000	0.117	1.87
Pole Auger	Construction Equipment	221	0.5	1	80	10	-	0.322	2.592	3.778	0.012	0.114	-	0.105	-	0.522	0.013	0.104	0.151	0.000	0.005	-	0.004	-	41.744
80-ton Crane	Construction Equipment	231	0.29	1	80	10	-	0.515	2.479	6.062	0.007	0.247	-	0.226	-	0.320	0.021	0.099	0.242	0.000	0.010	-	0.009	-	25.574
Boom Truck with Bucket	Heavy-Duty Diesel	-	-	1	80	-	10	0.013	0.068	0.307	0.001	0.003	9.724	0.002	0.972	0.035	0.001	0.003	0.012	0.000	0.000	0.389	0.000	0.039	2.76
Hydraulic Tensioner	Construction Equipment	88	0.34	1	80	10	-	0.266	2.467	2.452	0.003	0.169	-	0.155	-	0.142	0.011	0.099	0.098	0.000	0.007	-	0.006	-	11.352
Line Truck with Spool Trailer	Heavy-Duty Diesel	-	-	1	80	-	10	0.013	0.068	0.307	0.001	0.003	9.724	0.002	0.972	0.035	0.001	0.003	0.012	0.000	0.000	0.389	0.000	0.039	2.76
Drum Puller	Construction Equipment	88	0.34	1	80	10	-	0.266	2.467	2.452	0.003	0.169	-	0.155	-	0.142	0.011	0.099	0.098	0.000	0.007	-	0.006	-	11.352
Fugitive Dust [k]	Grading Area (acres)	-	-	20	80	-	-	-	-	-	-	-	0.447	-	0.048		-	-	-	-	-	0.018	-	0.002	
Indirect Emissions from Water Use		-	-	-	80	-	-	-	-	-	-	-	-	-	-	0.004	-	-	-	-	-	-	-	-	0.32
Passenger Vehicles (Worker Commutes)	Light-Duty Auto/Truck	-	-	10	80	-	33.6	0.012	0.732	0.056	0.002	0.034	0.223	0.014	0.056	0.089	0.000	0.029	0.002	0.000	0.001	0.009	0.001	0.002	7.11
Perimeter Fence Installation [f]																									
Skid Steer Loader	Construction Equipment	65	0.37	1	40	10	-	0.094	1.737	1.254	0.003	0.051	-	0.047	-	0.115	0.002	0.035	0.025	0.000	0.001	-	0.001	-	4.582
Pickup Truck	Light-Duty Truck	-	-	1	40	-	10	0.004	0.054	0.005	0.000	0.001	9.724	0.001	0.972	0.008	0.000	0.001	0.000	0.000	0.000	0.194	0.000	0.019	0.312
Flatbed Truck	Heavy-Duty Diesel	-	-	1	40	-	10	0.013	0.068	0.307	0.001	0.003	9.724	0.002	0.972	0.035	0.000	0.001	0.006	0.000	0.000	0.194	0.000	0.019	1.382
Site Preparation and Clearing/Grading [f]																									
Water Truck	Heavy-Duty Diesel	-	-	3	30	-	10	0.039	0.203	0.920	0.002	0.010	29.171	0.006	2.917	0.104	0.001	0.003	0.014	0.000	0.000	0.438	0.000	0.044	3.109
Grader	Construction Equipment	187	0.41	2	30	10	-	1.132	4.418	14.811	0.017	0.470	-	0.433	-	0.734	0.017	0.066	0.222	0.000	0.007	-	0.006	-	22.027
Bulldozer	Construction Equipment	247	0.4	1	30	10	-	1.307	5.047	13.714	0.011	0.667	-	0.612	-	0.473	0.020	0.076	0.206	0.000	0.010	-	0.009	-	14.201
Scraper	Construction Equipment	367	0.48	1	30	10	-	1.161	8.756	13.378	0.019	0.520	-	0.478	-	0.840	0.017	0.131	0.201	0.000	0.008	-	0.007	-	25.195
10-ton Roller	Construction Equipment	80	0.38	1	30	10	-	0.237	2.350	2.405	0.003	0.147	-	0.135	-	0.145	0.004	0.035	0.036	0.000	0.002	-	0.002	-	4.361
Sheepsfoot Roller	Construction Equipment	80	0.38	1	30	10	-	0.237	2.350	2.405	0.003	0.147	-	0.135	-	0.145	0.004	0.035	0.036	0.000	0.002	-	0.002	-	4.361
Tractor with Mower Attachment	Construction Equipment	97	0.37	1	30	10	-	0.234	2.825	2.370	0.004	0.140	-	0.128	-	0.172	0.004	0.042	0.036	0.000	0.002	-	0.002	-	5.165
Fugitive Dust [l]	Bulldozing Activity (hours)	-	-	1	30	10	-	-	-	-	-	-	3.387	-	1.862	-	-	-	-	-	-	0.051	-	0.028	-
Fugitive Dust [k]	Grading Area (acres)	-	-	75	30	-	-	-	-	-	-	-	1.193	-	0.129	-	-	-	-	-	-	0.018	-	0.002	-
Underground Work (Trenching) [f]																									
Excavator	Construction Equipment	158	0.38	2	80	10	-	0.572	8.179	5.383	0.013	0.262	-	0.241	-	0.572	0.023	0.327	0.215	0.001	0.010	-	0.010	-	45.79
Sheepsfoot Roller	Construction Equipment	80	0.38	1	80	10	-	0.237	2.350	2.405	0.003	0.147	-	0.135	-	0.145	0.009	0.094	0.096	0.000	0.006	-	0.005	-	11.63
Water Truck	Heavy-Duty Diesel	-	-	1	80	-	10	0.013	0.068	0.307	0.001	0.003	9.724	0.002	0.972	0.035	0.001	0.003	0.012	0.000	0.000	0.389	0.000	0.039	2.76
Generator	Construction Equipment	84	0.74	1	80	10	-	0.447	4.606	3.958	0.008	0.210	-	0.210	-	0.354	0.018	0.184	0.158	0.000	0.008	-	0.008	-	28.30
Aussie Padder Screening Machine	Construction Equipment	172	0.42	1	80	10	-	0.526	5.069	5.476	0.008	0.287	-	0.263	-	0.342	0.021	0.203	0.219	0.000	0.011	-	0.011	-	27.39
4x4 Forklift	Construction Equipment	100	0.4	1	80	10	-	0.154	2.868	2.015	0.004	0.078	-	0.071	-	0.191	0.006	0.115	0.081	0.000	0.003	-	0.003	-	15.28
Fugitive Dust [m]	Truck Dumping/Loading Volume (yd^3)	-	-	519	1	-	-	-	-	-	-	-	0.034	-	0.005	-	-	-	-	-	-	0.000	-	0.000	-
System Installation [f, n]																									
4x4 Forklift	Construction Equipment	100	0.4	8	280	10	-	1.235	22.941	16.122	0.035	0.628	-	0.571	-	1.528	0.173	3.212	2.257	0.005	0.088	-	0.080	-	427.75
80-ton Crane	Construction Equipment	231	0.29	1	280	10	-	0.515	2.479	6.062	0.007	0.247	-	0.226	-	0.320	0.072	0.347	0.849	0.001	0.035	-	0.032	-	89.51
ATV	Construction Equipment	65	0.37	20	280	10	-	1.888	34.748	25.088	0.053	1.018	-	0.944	-	2.291	0.264	4.865	3.512	0.007	0.143	-	0.132	-	641.43
Pile Driver	Construction Equipment	172	0.42	4	280	10	-	2.102	20.275	21.904	0.032	1.147	-	1.051	-	1.370	0.294	2.839	3.067	0.004	0.161	-	0.147	-	383.52
Pickup Truck	Light-Duty Truck	-	-	4	280	-	10	0.015	0.217	0.020	0.001	0.005	38.895	0.003	3.889	0.031	0.002	0.030	0.003	0.000	0.001	5.445	0.000	0.545	8.73
Offroad Cement Truck	Heavy-Duty Diesel	-	-	20	30	-	2	0.060	0.368	1.316	0.003	0.013	38.895	0.007	3.889	0.146	0.001	0.006	0.020	0.000	0.000	0.583	0.000	0.058	4.38
Onroad Cement Truck	Heavy-Duty Diesel	-	-	20	30	-	13.2	0.032	0.166	1.410	0.007	0.072	0.175	0.035	0.044	0.321	0.000	0.002	0.021	0.000	0.001	0.003	0.001	0.001	9.63
Generator	Construction Equipment	84	0.74	2	280	10	-	0.893	9.212	7.915	0.016	0.419	-	0.419	-	0.708	0.125	1.290	1.108	0.002	0.059	-	0.059	-	198.11
Paving [o]	Paved Area (acres)	-	-	0.06	2	-	-	0.072	-	-	-	-	-	-	-	-	0.000	-	-	-	-	-	-	-	-
Gen-tie Construction [f]																									
Line Truck with Spool Trailer	Heavy-Duty Diesel	-	-	1	40	-	10	0.013	0.068	0.307	0.001	0.003	9.724	0.002	0.972	0.035	0.000	0.001	0.006	0.000	0.000	0.194	0.000	0.019	1.38
Boom Truck with Bucket	Heavy-Duty Diesel	-	-	1	40	-	10	0.013	0.068	0.307	0.001	0.003	9.724	0.002	0.972	0.035	0.000	0.001	0.006	0.000	0.000	0.194	0.000	0.019	1.38
80-ton Crane	Construction Equipment	231	0.29	1	40	10	-	0.515	2.479	6.062	0.007	0.247	-	0.226	-	0.320	0.010	0.050	0.121	0.000	0.005	-	0.005	-	12.79
Energy Storage System																									
80-ton Crane	Construction Equipment	231	0.29	1	80	10	-	0.515	2.479	6.062	0.007	0.247	-	0.226	-	0.320	0.021	0.099	0.242	0.000	0.010	-	0.009	-	25.57
Grader	Construction Equipment	187	0.41	1	80	10	-	0.566	2.209	7.406	0.008	0.235	-	0.216	-	0.367	0.023	0.088	0.296	0.000	0.009	-	0.009	-	29.37
4x4 Forklift	Construction Equipment	100	0.4	1	80	10	-	0.154	2.868	2.015	0.004	0.078	-	0.071	-	0.191	0.006	0.115	0.081	0.000	0.003	-	0.003	-	15.28
Testing and Commissioning																									
Pickup Truck	Light-Duty Truck	-	-	4	80	-	10	0.015	0.217	0.020	0.001	0.005	38.895	0.003	3.889	0.031	0.001	0.009	0.001	0.000	0.000	1.556	0.000	0.156	2.49
Site Cleanup and Restoration																									
Grader	Construction Equipment	187	0.41	1	20	10	-	0.566	2.209	7.406	0.008	0.235	-	0.216	-	0.367	0.006	0.022	0.074	0.000	0.002	-	0.002	-	7.34
Skid Steer Loader	Construction Equipment	65	0.37	1	20	10	-	0.094	1.737	1.254	0.003	0.051	-	0.047	-	0.115	0.001	0.017	0.013	0.000	0.001	-	0.000	-	2.29
General Management [f, q, r, t]																									
Onsite Crew Truck	Light-Duty Truck	-	-	150	480	-	2	0.113	1.627	0.147	0.005	0.038	291.711	0.020	29.171	0.234	0.027	0.390	0.035	0.001	0.009	70.011	0.005	7.001	112.21
Various Onroad Haul Trucks	Heavy-Duty Diesel	-	-	100	480	-	13.2	0.162	0.828	7.048	0.034	0.362	0.874	0.177	0.219	1.604	0.039	0.199	1.692	0.008	0.087	0.210	0.043	0.052	770.07
Various Offroad Haul Trucks	Heavy-Duty Diesel	-	-	117	480	-	0.5	0.125	1.074	2.413	0.005	0.019	20.225	0.011	2.023	0.257	0.030	0.258	0.579	0.001	0.005	4.854	0.003	0.485	123.37
Indirect Emissions from Water Use		-	-	-	480	-	-	-	-	-	-	-	-	-	-	0.450	-	-	-	-	-	-	-	-	216.19
Passenger Vehicles (Worker Commutes)	Light-Duty Auto/Truck	-	-	475	480	-	33.6	0.939	55.623	4.239	0.149	2.601	16.916	1.075	4.229	6.751	0.141	8.343	0.636	0.022	0.390	2.537	0.161	0.634	2,025.30

Appendix B, Table 3B

Unmitigated Construction Emissions [a]

TGP Enterprise Solar Storage Project

Notes:

- = Parameter not required for computing emissions.

[a] Unless otherwise noted, Equipment/Vehicle List and Daily Equipment Use provided by TGP in Table 2 and/or Section 5 of the Conditional Use Permit Application for the Enterprise Solar Storage Project. Soil stockpiling activities are expected to be negligible during construction. Waste and aggregate hauling activities are included conservatively assuming up to 117 onroad material haul truck trips per day during the General Management phase, with minimal offroad travel upon entering the site.

[b] All construction equipment are conservatively estimated to be used 10 hours per day, based on construction activities occurring between 7 am and 6 pm daily with a 1-hour lunch break.

[c] Unless otherwise noted, it is assumed that each onsite light-duty and heavy-duty truck will travel up to 10 miles per day. It is also assumed that each worker commute vehicle will travel up to 33.6 miles per day and that each material delivery truck will travel up to 13.2 miles per day offsite, based on CalEEMod default values for H-W and C-NW rural trip lengths, respectively, for the Mojave Air Basin (taken from Table 4.2 of Appendix D of the *CalEEMod User's Guide* [BREEZE Software, 2021]).

[d] The following conversion factors were used to estimate emissions:

1 lb =	453.6	g
1 metric ton =	1,000,000	g
1 ton =	2,000	lbs
1 yd^3 =	1.2641662	tons
1 yd^3 =	27	ft^3
Blade width of grading equipment =	12	ft
1 acre =	43,560	ft^2
1 mile =	5,280	ft
1 acre-ft =	325,851	gallons

[e] PM_{10} and $PM_{2.5}$ emissions are separated into exhaust and fugitive emissions. Brake and tire wear are conservatively captured with the exhaust emisisons. Fugitive emissions include dust emissions associated with road travel, bulldozing activities, grading activities, and truck dumping/loading activities and account for reductions achieved through implementation of best management practices for dust control.

[f] Each heavy-duty diesel vehicle is expected to idle no more than 5 minutes per day, or: 0.083 idle-hr/day

[g] As described in Section 5 of the Conditional Use Permit Application, up to 50 construction workers per week (or 10 per day) will be required to support the Transmission Line Realignment phase, before other construction activities begin. Crew will be transported around the realignment area using the offroad pickup trucks. Construction water usage during this phase is conservatively included, as estimated below:

Parameter		Value	Units
Annual Water Use during Transmission Line Realignment		0.5	acre-feet/phase
		0.16	million gal/phase
Water Electricity Intensity (Mojave Desert Air Basin) [h]	Supply	9,727	kWh/million gal
	Treat	111	
	Distribute	1,272	
	Total	11,110	
Electrical Utility Emission Factors (SoCal Edison) [i,j]		391	lb/MWh CO_2
		0.033	lb/MWh CH_4
		0.004	lb/MWh N_2O
		393.0	lb/MWh CO_2e

[h] Water Electricity Intensity values for water supply, treatment, and distribution were taken from Table 9.2 in Appendix D of the *CalEEMod User's Guide* (BREEZE Software, 2021).

[i] Electrical Utility Emission Factors were taken from Table 1.2 in Appendix D of the *CalEEMod User's Guide* (BREEZE Software, 2021).

[j] CO_2e values were calculated using the following global warming potentials (GWP, 100-year GWP) from the *2014 IPCC Fifth Assessment Report* (AR5):

Appendix B, Table 3B

Unmitigated Construction Emissions [a]

TGP Enterprise Solar Storage Project

Pollutant	AR5 GWP
Carbon Dioxide (CO_2)	1
Methane (CH_4)	28
Nitrous Oxide (N_2O)	265

[k] The graded area was estimated assuming each Scraper could grade 1 acre per day, each Bulldozer could grade 0.5 acres per day, and each Grader could grade 0.5 acres per day, per Section 4.3 of Appendix A of the *CalEEMod User's Guide* (BREEZE Software, 2021). Grading activities were assumed to occur in the first month of the Transmission Line Realignment phase and throughout the Site Preparation and Clearing/Grading phase.

[l] Fugitive dust emissions associated with bulldozing activity were included based on hours of bulldozer operation per day, consistent with Section 4.3 of Appendix A of the *CalEEMod User's Guide* (BREEZE Software, 2021).

[m] Fugitive dust emissions from Truck Dumping/Loading activities are a result of excavating for installation of electrical and communication wiring and subsequently backfilling with the same volume of soil. These activities were conservatively assumed to occur in a single day. Volumes were estimated using the following assumed trench details:

Trenching Depth (ft)	Trenching Width (ft)	Trenching Length (ft)	Trenching Volume (yd^3)
3.5	2	1,000	259

[n] A cement truck was assumed to be onsite during the system installation to supply the concrete required for footings and pads for transformers and equipment. While onsite, the truck was assumed to travel up to 2 miles per day as concrete pouring activities are expected to occur in only one location near the site entrance. To reach the site, the truck was assumed to travel up to 13.2 miles per day, based on CalEEMod default values for C-NW rural trip lengths for the Mojave Air Basin (taken from Table 4.2 of Appendix D of the *CalEEMod User's Guide* [BREEZE Software, 2021]).

[o] The default emission factor for ROG off-gasssing emissions from paving and the default parking space size were taken from Section 4.8 of Appendix A of *CalEEMod User's Guide* (BREEZE Software, 2021). Paving was assumed to occur over 2 days, and emissions were calculated using the following assumptions:

Parameter	Value	Units
Parking Space Size	400	ft^2
Parking Space Quantity [p]	6	-
ROG Emission Factor	2.62	lb/acre

[p] The number of parking spaces is assumed based upon 6 permanent full-time staff being onsite during operation.

[q] Traffic analyses indicate that up to 150 onsite crew trucks will be onsite throughout construction to facilitate shuttling workers from one location to another within the project boundary. Each onsite crew truck was assumed to travel up to 2 miles per day as daily driving is expected to be fairly localized.

[r] The General Management phase includes passenger vehicle worker commute counts based upon an average daily work force. Construction water usage is also conservatively included, as estimated below:

Parameter	Value	Units
Annual Water Use [s]	167.5	acre-feet/year
	54.58	million gal/year

[s] Annual water usage during construction was estimated from the Conditional Use Permit Application, which states that 335 acre-feet of water will be used per the 24-month construction period not associated with Transmission Line Realignment. Water usage was assumed to be evenly distributed over this 24-month period.

[t] The construction peak workforce is 550 workers, and the average daily workforce onsite during construction is expected to include 250 construction, supervisory, support, and construction management personnel. However, offsite construction worker trips are conservatively estimated to be a peak of 760 per day (800 workers) and an annual average of 475 per day. The daily emissions conservatively represent the potential emissions from a peak day of 760 worker trips and the annual emissions conservatively reflect the annual average trips per day of 475.

Appendix B, Table 4A

Mitigated Operations Emissions [a]

TGP Enterprise Solar Storage Project

Equipment / Vehicle List	Equipment / Vehicle Type	Quantity	Number of Days Used per Year	Hours per Day	Miles per Day [b]	Emissions (lbs/day) [c]								Emissions (metric tons/day) [c,d]	Emissions (tons/year) [c]								Emissions (metric tons/year) [c,d]
						ROG	CO	NOx	SOx	Exhaust PM_{10} [e]	Fugitive PM_{10} [e]	Exhaust $PM_{2.5}$ [e]	Fugitive $PM_{2.5}$ [e]	CO_2e	ROG	CO	NOx	SOx	Exhaust PM_{10} [e]	Fugitive PM_{10} [e]	Exhaust $PM_{2.5}$ [e]	Fugitive $PM_{2.5}$ [e]	CO_2e
Operations [f,g]																							
Passenger Vehicles (Worker Commutes)	Light-Duty Auto/Truck	6	365	-	33.6	0.007	0.439	0.033	0.001	0.021	0.134	0.008	0.033	0.053	0.001	0.080	0.006	0.000	0.004	0.024	0.002	0.006	19.454
Passenger Vehicles (Additional workers for panel washing activities)	Light-Duty Auto/Truck	10	60	-	33.6	0.012	0.732	0.056	0.002	0.034	0.223	0.014	0.056	0.089	0.000	0.022	0.002	0.000	0.001	0.007	0.000	0.002	5.330
Passenger Vehicles (Onsite)	Light-Duty Auto/Truck	6	365	-	5	0.008	0.126	0.010	0.000	0.004	64.825	0.002	6.482	0.021	0.002	0.023	0.002	0.000	0.001	11.831	0.000	1.183	7.713
Material Delivery Truck (Offsite)	Heavy-duty Diesel	1	120	-	13.2	0.002	0.008	0.070	0.000	0.004	0.009	0.002	0.002	0.016	0.000	0.000	0.004	0.000	0.000	0.001	0.000	0.000	1.925
Material Delivery Truck (Onsite)	Heavy-duty Diesel	1	120	-	0.5	0.001	0.003	0.015	0.000	0.000	0.173	0.000	0.017	0.002	0.000	0.000	0.001	0.000	0.000	0.010	0.000	0.001	0.204
Indirect Emissions from Water Use [h]	Use (million gal/year)	8.15	365	-	-	-	-	-	-	-	-	-	-	0.044	-	-	-	-	-	-	-	-	16.133

Notes:

- = Parameter not required for computing emissions.

[a] Unless otherwise noted, Equipment/Vehicle List, Daily Use, and Water Use provided by TGP in Section 5 of the Conditional Use Permit Application for the Enterprise Solar Storage Project. Waste hauling activities are expected to be negligible during operations. Although electricity will be used during operation to provide lighting and comfort heating, associated emissions are expected to be more than offset by the renewable power generated by the project.

[b] It is assumed that each worker commute vehicle will travel up to 33.6 miles per day and that each material delivery truck will travel up to 13.2 miles per day offsite, based on CalEEMod default values for H-W and C-NW rural trip lengths, respectively, for the Mojave Air Basin (taken from Table 4.2 of Appendix D of the *CalEEMod User's Guide* [BREEZE Software, 2021]). Onsite trip lengths for worker vehicles and delivery trucks are based on conservative engineering estimates.

[c] The following conversion factors were used to estimate emissions:

1 lb =	453.6	g
1 metric ton =	1,000,000	g
1 metric ton =	2,204.62	lbs
1 ton =	2,000	lbs
1 acre-ft =	325,851	gallons

[d] CO_2e values were calculated using the following global warming potentials (GWP, 100-year GWP) from the *2014 IPCC Fifth Assessment Report* (AR5):

Pollutant	AR5 GWP
Carbon Dioxide (CO_2)	1
Methane (CH_4)	28
Nitrous Oxide (N_2O)	265

[e] PM_{10} and $PM_{2.5}$ emissions are separated into exhaust and fugitive emissions. Brake and tire wear are conservatively captured with the exhaust emisisons. Fugitive emissions include dust emissions associated with road travel and account for reductions achieved through implementation of best management practices and mitigation measures for dust control.

[f] It is assumed from the Conditional Use Permit Application that the site would receive up to 10 material delivery trips per month.

[g] Each heavy-duty diesel vehicle is expected to idle no more than 5 minutes per day, or: 0.083 idle-hr/day

[h] Indirect emissions resulting from water use for operations, fire suppression, and maintenance activities were estimated using the following:

Parameter		Value	Units
Annual Water Use [c]		25.0	acre-feet/year
		8.15	million gal/year
Water Electricity Intensity (Mojave Desert Air Basin) [i]	Supply	9,727	kWh/million gal
	Treat	111	
	Distribute	1,272	
	Total	11,110	
Electrical Utility Emission Factors (SoCal Edison) [j]		391	lb/MWh CO_2
		0.033	lb/MWh CH_4
		0.004	lb/MWh N_2O

[i] Water Electricity Intensity values for water supply, treatment, and distribution were taken from Table 9.2 in Appendix D of the *CalEEMod User's Guide* (BREEZE Software, 2021).

[j] Electrical Utility Emission Factors were taken from Table 1.2 in Appendix D of the *CalEEMod User's Guide* (BREEZE Software, 2021).

Appendix B, Table 4B

Unmitigated Operations Emissions [a]

TGP Enterprise Solar Storage Project

Equipment / Vehicle List	Equipment / Vehicle Type	Quantity	Number of Days Used per Year	Hours per Day	Miles per Day [b]	Emissions (lbs/day) [c]								Emissions (metric tons/day) [c,d]	Emissions (tons/year) [c]								Emissions (metric tons/year) [c,d]
						ROG	CO	NOx	SOx	Exhaust PM_{10} [e]	Fugitive PM_{10} [e]	Exhaust $PM_{2.5}$ [e]	Fugitive $PM_{2.5}$ [e]	CO_2e	ROG	CO	NOx	SOx	Exhaust PM_{10} [e]	Fugitive PM_{10} [e]	Exhaust $PM_{2.5}$ [e]	Fugitive $PM_{2.5}$ [e]	CO_2e
Operations [f,g]																							
Passenger Vehicles (Worker Commutes)	Light-Duty Auto/Truck	6	365	-	33.6	0.007	0.439	0.033	0.001	0.021	0.134	0.008	0.033	0.053	0.001	0.080	0.006	0.000	0.004	0.024	0.002	0.006	19.454
Passenger Vehicles (Additional workers for panel washing activities)	Light-Duty Auto/Truck	10	60	-	33.6	0.012	0.732	0.056	0.002	0.034	0.223	0.014	0.056	0.089	0.000	0.022	0.002	0.000	0.001	0.007	0.000	0.002	5.330
Passenger Vehicles (Onsite)	Light-Duty Auto/Truck	6	365	-	5	0.008	0.126	0.010	0.000	0.004	64.825	0.002	6.482	0.021	0.002	0.023	0.002	0.000	0.001	11.831	0.000	1.183	7.713
Material Delivery Truck (Offsite)	Heavy-duty Diesel	1	120	-	13.2	0.002	0.008	0.070	0.000	0.004	0.009	0.002	0.002	0.016	0.000	0.000	0.004	0.000	0.000	0.001	0.000	0.000	1.925
Material Delivery Truck (Onsite)	Heavy-duty Diesel	1	120	-	0.5	0.001	0.003	0.015	0.000	0.000	0.173	0.000	0.017	0.002	0.000	0.000	0.001	0.000	0.000	0.010	0.000	0.001	0.204
Indirect Emissions from Water Use [h]	Use (million gal/year)	8.15	365	-	-	-	-	-	-	-	-	-	-	0.044	-	-	-	-	-	-	-	-	16.133

Notes:

- = Parameter not required for computing emissions.

[a] Unless otherwise noted, Equipment/Vehicle List, Daily Use, and Water Use provided by TGP in Section 5 of the Conditional Use Permit Application for the Enterprise Solar Storage Project. Waste hauling activities are expected to be negligible during operations. Although electricity will be used during operation to provide lighting and comfort heating, associated emissions are expected to be more than offset by the renewable power generated by the project.

[b] It is assumed that each worker commute vehicle will travel up to 33.6 miles per day and that each material delivery truck will travel up to 13.2 miles per day offsite, based on CalEEMod default values for H-W and C-NW rural trip lengths, respectively, for the Mojave Air Basin (taken from Table 4.2 of Appendix D of the *CalEEMod User's Guide* [BREEZE Software, 2021]). Onsite trip lengths for worker vehicles and delivery trucks are based on conservative engineering estimates.

[c] The following conversion factors were used to estimate emissions:

1 lb =	453.6	g
1 metric ton =	1,000,000	g
1 metric ton =	2,204.62	lbs
1 ton =	2,000	lbs
1 acre-ft =	325,851	gallons

[d] CO_2e values were calculated using the following global warming potentials (GWP, 100-year GWP) from the *2014 IPCC Fifth Assessment Report* (AR5):

Pollutant	AR5 GWP
Carbon Dioxide (CO_2)	1
Methane (CH_4)	28
Nitrous Oxide (N_2O)	265

[e] PM_{10} and $PM_{2.5}$ emissions are separated into exhaust and fugitive emissions. Brake and tire wear are conservatively captured with the exhaust emisisons. Fugitive emissions include dust emissions associated with road travel and account for reductions achieved through implementation of best management practices for dust control.

[f] It is assumed from the Conditional Use Permit Application that the site would receive up to 10 material delivery trips per month.

[g] Each heavy-duty diesel vehicle is expected to idle no more than 5 minutes per day, or: 0.083 idle-hr/day

[h] Indirect emissions resulting from water use for operations, fire suppression, and maintenance activities were estimated using the following:

Parameter		Value	Units
Annual Water Use [c]		25.0	acre-feet/year
		8.15	million gal/year
Water Electricity Intensity (Mojave Desert Air Basin) [i]	Supply	9,727	kWh/million gal
	Treat	111	
	Distribute	1,272	
	Total	11,110	
Electrical Utility Emission Factors (SoCal Edison) [j]		391	lb/MWh CO_2
		0.033	lb/MWh CH_4
		0.004	lb/MWh N_2O

[i] Water Electricity Intensity values for water supply, treatment, and distribution were taken from Table 9.2 in Appendix D of the *CalEEMod User's Guide* (BREEZE Software, 2021).

[j] Electrical Utility Emission Factors were taken from Table 1.2 in Appendix D of the *CalEEMod User's Guide* (BREEZE Software, 2021).

Appendix B, Table 5A

Mitigated Construction Equipment Emission Factors

TGP Enterprise Solar Storage Project

Equipment	OFFROAD Equipment Category	Horsepower [a]	Load Factor [a]	Emission Factors (g/bhp-hr) [b]						
				ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	CO_2e [c]
10-ton Roller	Rollers	80	0.38	0.353	3.507	3.589	0.005	0.192	0.192	478.185
Generator	Generator Sets	84	0.74	0.326	3.361	2.888	0.006	0.153	0.153	569.111
80-ton Crane	Cranes	231	0.29	0.349	1.678	4.104	0.005	0.088	0.088	477.190
Aussie Padder Screening Machine	Other Construction Equipment	172	0.42	0.330	3.183	3.438	0.005	0.112	0.112	474.020
Bulldozer	Rubber Tired Dozers	247	0.40	0.600	2.317	6.296	0.005	0.088	0.088	479.110
Excavator	Excavators	158	0.38	0.216	3.090	2.034	0.005	0.099	0.091	476.643
Grader	Graders	187	0.41	0.335	1.307	4.381	0.005	0.088	0.088	478.823
Pile Driver	Other Construction Equipment	172	0.42	0.330	3.183	3.438	0.005	0.112	0.112	474.020
Pole Auger	Bore/Drill Rigs	221	0.50	0.132	1.064	1.551	0.005	0.047	0.043	472.220
Hydraulic Tensioner	Other General Industrial Equipment	88	0.34	0.404	3.740	3.718	0.005	0.192	0.192	474.256
Drum Puller	Other General Industrial Equipment	88	0.34	0.404	3.740	3.718	0.005	0.192	0.192	474.256
Sheepsfoot Roller	Rollers	80	0.38	0.353	3.507	3.589	0.005	0.192	0.192	478.185
Skid Steer Loader	Skid Steer Loaders	65	0.37	0.178	3.277	2.366	0.005	0.096	0.089	476.261
4x4 Forklift	Rough Terrain Forklifts	100	0.40	0.175	3.252	2.285	0.005	0.089	0.081	477.394
Scraper	Scrapers	367	0.48	0.299	2.255	3.445	0.005	0.008	0.008	476.748
Scraper/Grader	Scrapers [d]	367	0.48	0.299	2.255	3.445	0.005	0.088	0.088	476.748
ATV	Skid Steer Loaders [e]	65	0.37	0.178	3.277	2.366	0.005	0.096	0.089	476.261
Backhoe	Tractors/Loaders/Backhoes	97	0.37	0.296	3.571	2.995	0.005	0.177	0.162	479.674
Tractor with Mower Attachment	Tractors/Loaders/Backhoes	97	0.37	0.296	3.571	2.995	0.005	0.177	0.162	479.674

Notes:

[a] Unless otherwise noted, Horsepower and Load Factors taken as the default, average values provided in Table 3.3 of Appendix D of the *CalEEMod User's Guide* (Breeze Software, 2021).

[b] Emission Factors in grams per brake-horsepower-hour (g/bhp-hr) taken as the defaults for the year 2021 provided in Table 3.4 of Appendix D of the *CalEEMod User's Guide* (Breeze Software, 2021). Although the project is projected to start in 2022, we are assuming 2021 model year equipment will be utilized during construction activities. Consistent with the mitigation measures for construction equipment diesel exhaust, equipment is assumed to meet Tier 3 standards for PM_{10} and $PM_{2.5}$, as taken from Table 3.5 of Appendix D of the *CalEEMod User's Guide* (Breeze Software, 2021).

[c] CO_2e values were calculated using the following global warming potentials (GWP, 100-year GWP) from the *2014 IPCC Fifth Assessment Report* (AR5):

Pollutant	AR5 GWP
Carbon Dioxide (CO_2)	1
Methane (CH_4)	28
Nitrous Oxide (N_2O)	265

[d] To provide a more conservative estimate of emissions, the Scraper/Grader was selected to be best represented by the horsepower, load factor, and emission factors of a Scraper.

[e] In the absence of ATV-specific data, the ATV was assumed best represented by the diesel-fueled Skid Steer Loader equipment category due to it having a similar horsepower rating to common ATVs. However, the ATVs are assumed to be gasoline-fueled.

Appendix B, Table 5B

Unmitigated Construction Equipment Emission Factors

TGP Enterprise Solar Storage Project

Equipment	OFFROAD Equipment Category	Horsepower [a]	Load Factor [a]	Emission Factors (g/bhp-hr) [b]						
				ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	CO_2e [c]
10-ton Roller	Rollers	80	0.38	0.353	3.507	3.589	0.005	0.219	0.202	478.185
Generator	Generator Sets	84	0.74	0.326	3.361	2.888	0.006	0.153	0.153	569.111
80-ton Crane	Cranes	231	0.29	0.349	1.678	4.104	0.005	0.167	0.153	477.190
Aussie Padder Screening Machine	Other Construction Equipment	172	0.42	0.330	3.183	3.438	0.005	0.180	0.165	474.020
Bulldozer	Rubber Tired Dozers	247	0.40	0.600	2.317	6.296	0.005	0.306	0.281	479.110
Excavator	Excavators	158	0.38	0.216	3.090	2.034	0.005	0.099	0.091	476.643
Grader	Graders	187	0.41	0.335	1.307	4.381	0.005	0.139	0.128	478.823
Pile Driver	Other Construction Equipment	172	0.42	0.330	3.183	3.438	0.005	0.180	0.165	474.020
Pole Auger	Bore/Drill Rigs	221	0.50	0.132	1.064	1.551	0.005	0.047	0.043	472.220
Hydraulic Tensioner	Other General Industrial Equipment	88	0.34	0.404	3.740	3.718	0.005	0.256	0.235	474.256
Drum Puller	Other General Industrial Equipment	88	0.34	0.404	3.740	3.718	0.005	0.256	0.235	474.256
Sheepsfoot Roller	Rollers	80	0.38	0.353	3.507	3.589	0.005	0.219	0.202	478.185
Skid Steer Loader	Skid Steer Loaders	65	0.37	0.178	3.277	2.366	0.005	0.096	0.089	476.261
4x4 Forklift	Rough Terrain Forklifts	100	0.40	0.175	3.252	2.285	0.005	0.089	0.081	477.394
Scraper	Scrapers	367	0.48	0.299	2.255	3.445	0.005	0.134	0.123	476.748
Scraper/Grader	Scrapers [d]	367	0.48	0.299	2.255	3.445	0.005	0.134	0.123	476.748
ATV	Skid Steer Loaders [d]	65	0.37	0.178	3.277	2.366	0.005	0.096	0.089	476.261
Backhoe	Tractors/Loaders/Backhoes	97	0.37	0.296	3.571	2.995	0.005	0.177	0.162	479.674
Tractor with Mower Attachment	Tractors/Loaders/Backhoes	97	0.37	0.296	3.571	2.995	0.005	0.177	0.162	479.674

Notes:

[a] Unless otherwise noted, Horsepower and Load Factors taken as the default, average values provided in Table 3.3 of Appendix D of the *CalEEMod User's Guide* (Breeze Software, 2021).

[b] Emission Factors in grams per brake-horsepower-hour (g/bhp-hr) taken as the defaults for the year 2021 provided in Table 3.4 of Appendix D of the *CalEEMod User's Guide* (Breeze Software, 2021). Although the project is projected to start in 2022, we are assuming 2021 model year equipment will be utilized during construction activities.

[c] CO_2e values were calculated using the following global warming potentials (GWP, 100-year GWP) from the *2014 IPCC Fifth Assessment Report* (AR5):

Pollutant	AR5 GWP
Carbon Dioxide (CO_2)	1
Methane (CH_4)	28
Nitrous Oxide (N_2O)	265

[d] To provide a more conservative estimate of emissions, the Scraper/Grader was selected to be best represented by the horsepower, load factor, and emission factors of a Scraper.

[e] In the absence of ATV-specific data, the ATV was assumed best represented by the Skid Steer Loader equipment category due to it having a similar horsepower rating to common ATVs. However, the ATVs are assumed to be gasoline-fueled.

Appendix B, Table 6A

Mitigated Vehicle Emission Factors

TGP Enterprise Solar Storage Project

Vehicle	Vehicle Class [a]	Onroad or Offroad Vehicle	Exhaust Emission Factors (g/mile) [b]							Construction Fugitive Emission Factors (g/mile) [c]		Operation Fugitive Emission Factors (g/mile) [c]	
			ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	CO_2e [d]	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
Onsite Crew Truck	Light-Duty Truck	Offroad	0.170	2.459	0.223	0.008	0.058	0.030	779.241	382.259	38.226	980.151	98.015
Pickup Truck	Light-Duty Truck	Offroad	0.170	2.459	0.223	0.008	0.058	0.030	779.241	382.259	38.226	980.151	98.015
Boom Truck with Bucket	Heavy-Duty Diesel	Offroad	0.576	2.789	13.657	0.032	0.148	0.083	3,405.364	382.259	38.226	980.151	98.015
Line Truck with Spool Trailer	Heavy-Duty Diesel	Offroad	0.576	2.789	13.657	0.032	0.148	0.083	3,405.364	382.259	38.226	980.151	98.015
Flatbed Truck	Heavy-Duty Diesel	Offroad	0.576	2.789	13.657	0.032	0.148	0.083	3,405.364	382.259	38.226	980.151	98.015
Offroad Cement Truck	Heavy-Duty Diesel	Offroad	0.576	2.789	13.657	0.032	0.148	0.083	3,405.364	382.259	38.226	980.151	98.015
Onroad Cement Truck	Heavy-Duty Diesel	Onroad	0.055	0.285	2.422	0.012	0.124	0.061	1,215.380	0.300	0.075	0.300	0.075
Various Onroad Haul Trucks	Heavy-Duty Diesel	Onroad	0.055	0.285	2.422	0.012	0.124	0.061	1,215.380	0.300	0.075	0.300	0.075
Various Offroad Haul Trucks	Heavy-Duty Diesel	Offroad	0.576	2.789	13.657	0.032	0.148	0.083	3,405.364	156.824	15.682	156.824	15.682
Water Truck	Heavy-Duty Diesel	Offroad	0.576	2.789	13.657	0.032	0.148	0.083	3,405.364	382.259	38.226	980.151	98.015
Material Delivery Truck (Offsite)	Heavy-Duty Diesel	Onroad	0.055	0.285	2.422	0.012	0.124	0.061	1,215.380	0.300	0.075	0.300	0.075
Material Delivery Truck (Onsite)	Heavy-Duty Diesel	Offroad	0.576	2.789	13.657	0.032	0.148	0.083	3,405.364	156.824	15.682	156.824	15.682
Passenger Vehicles (Onsite)	Light-Duty Auto/Truck	Offroad	0.125	1.905	0.152	0.007	0.056	0.028	704.360	382.259	38.226	980.151	98.015
Passenger Vehicles (Additional workers for panel washing activities)	Light-Duty Auto/Truck	Onroad	0.017	0.988	0.075	0.003	0.046	0.019	264.372	0.300	0.075	0.300	0.075
Passenger Vehicles (Worker Commutes)	Light-Duty Auto/Truck	Onroad	0.017	0.988	0.075	0.003	0.046	0.019	264.372	0.300	0.075	0.300	0.075

Vehicle	Vehicle Class [a]	Onroad or Offroad Vehicle	Idling Emission Factors (g/idle-hr) [b]						
			ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	CO_2e [d]
Boom Truck with Bucket	Heavy-Duty Diesel	Offroad	2.381	33.224	30.343	0.057	0.014	0.013	5,929.644
Line Truck with Spool Trailer	Heavy-Duty Diesel	Offroad	2.381	33.224	30.343	0.057	0.014	0.013	5,929.644
Flatbed Truck	Heavy-Duty Diesel	Offroad	2.381	33.224	30.343	0.057	0.014	0.013	5,929.644
Offroad Cement Truck	Heavy-Duty Diesel	Offroad	2.381	33.224	30.343	0.057	0.014	0.013	5,929.644
Various Offroad Haul Trucks	Heavy-Duty Diesel	Offroad	2.381	33.224	30.343	0.057	0.014	0.013	5,929.644
Water Truck	Heavy-Duty Diesel	Offroad	2.381	33.224	30.343	0.057	0.014	0.013	5,929.644
Material Delivery Truck (Onsite)	Heavy-Duty Diesel	Offroad	2.381	33.224	30.343	0.057	0.014	0.013	5,929.644

Notes:

[a] The vehicle classes are represented as follows:

Light-Duty Truck: Assumed to be 50% LDT1 Gas and 50% LDT2 Gas values.

Heavy-Duty Diesel: Assumed to be 100% HHDT DSL values, per Section 4.5 of Appendix A of the *CalEEMod User's Guide* (Breeze Software, 2021).

Light-Duty Auto/Truck: Assumed to be 50% LDA Gas, 25% LDT1 Gas, and 25% LDT2 Gas values, per Section 4.5 of Appendix A of the *CalEEMod User's Guide* (Breeze Software, 2021) and an assumption that workers do not drive diesel vehicles.

[b] Exhaust Emission Factors in grams per mile (g/mile) and Idling Emission Factors in grams per idle-hour (g/idle-hr) from EMFAC2017 for Kern County, calendar year 2021. A speed of 40 miles per hour (mph) was assumed for onroad vehicles, which is consistent with the CalEEMod default. A speed of 5 mph was assumed for offroad vehicles. Idling emissions are only applicable to onsite heavy-duty diesel vehicles.

[c] Paved and unpaved road dust emission factors calculated using CalEEMod methodology, as described below. Consistent with the best management practices and mitigation measures for dust control, it is assumed that watering unpaved roadways three times daily to control fugitive dust emissions will only be implemented during construction and that onsite unpaved roadways used by haul and delivery trucks will be treated with a chemical dust suppressant during both construction and operation.

[d] CO_2e values were calculated using the following global warming potentials (GWP, 100-year GWP) from the *2014 IPCC Fifth Assessment Report* (AR5):

Pollutant	AR5 GWP
Carbon Dioxide (CO_2)	1
Methane (CH_4)	28
Nitrous Oxide (N_2O)	265

Appendix B, Table 6A

Mitigated Vehicle Emission Factors

TGP Enterprise Solar Storage Project

Derivation of Paved Road Emission Factors

Parameter	PM_{10}	$PM_{2.5}$
Average Weight [a]	2.4	2.4
k [b]	1	0.25
sL [a]	0.1	0.1
Emission Factor (g/mile) [c]	**0.300**	**0.075**

Notes:

[a] Average Weight and sL taken as the default value from CalEEMod.

[b] k taken from Table 13.2.1-1 of Section 13.2.1 of *AP-42* (EPA, 2011).

[c] Emission factor calculated using Equation 1 from Section 13.2.1 of *AP-42* (EPA, 2011), which is generally consistent with Section 5.3 of Appendix A of the *CalEEMod User's Guide* (Breeze Software, 2021):

Emission Factor (g/mile) = k (g/mile) x [sL (g/m^2)]$^{0.91}$ x [Average Weight (tons)]$^{1.02}$

Derivation of Unpaved Road Emission Factors

Parameter	PM_{10}	$PM_{2.5}$
Mean Vehicle Weight [a]	16.5	16.5
Silt Content [b]	8.5	8.5
k [c]	1.50	0.15
a [c]	0.9	0.9
b [c]	0.45	0.45
P [d]	32	32
Emission Factor (g/mile) [e]	**980.151**	**98.015**
Reduction for Watering 3x Daily [f]	61%	61%
Watering Controlled Emission Factor (g/mile)	**382.259**	**38.226**
Reduction for Chemical Dust Supressant [f]	84%	84%
Dust Supressant Controlled Emission Factor (g/mile)	**156.824**	**15.682**

Notes:

[a] Mean vehicle weight assumes that heavy- and light-duty trucks weigh an average of 16.5 tons.

[b] Silt content taken from Table 13.2.2-1 of Section 13.2.2 of *AP-42* (EPA, 2006) for a Construction Site, Scraper Route; this value is consistent with the CalEEMod defaults.

[c] k, a, and b taken from Table 13.2.2-2 of Section 13.2.2 of *AP-42* (EPA, 2006) for industrial roads.

[d] P (days of precipitation) taken as the CalEEMod default for the Kern County APCD, as provided in Table 1.1 of Appendix D of the *CalEEMod User's Guide* (Breeze Software, 2021).

[e] Emission factor calculated using Equations 1a and 2 from Section 13.2.2 of *AP-42* (EPA, 2006):

Emission Factor (g/mile) = {k (lbs/mile) x [Silt Content (%) / 12]^{a} x [Mean Vehicle Weight (tons) / 3]^{b}} x [(365-P) / 365] x 453.6 (g/lb)

[f] Percent reduction taken from Table XI-D of the *SCAQMD CEQA Air Quality Analysis Handbook* (SCAQMD, 2007).

Appendix B, Table 6B
Unmitigated Vehicle Emission Factors
TGP Enterprise Solar Storage Project

Vehicle	Vehicle Class [a]	Onroad or Offroad Vehicle	Exhaust Emission Factors (g/mile) [b]							Construction Fugitive Emission Factors (g/mile) [c]		Operation Fugitive Emission Factors (g/mile) [c]	
			ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	CO_2e [d]	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
Onsite Crew Truck	Light-Duty Truck	Offroad	0.170	2.459	0.223	0.008	0.058	0.030	779.241	441.068	44.107	980.151	98.015
Pickup Truck	Light-Duty Truck	Offroad	0.170	2.459	0.223	0.008	0.058	0.030	779.241	441.068	44.107	980.151	98.015
Boom Truck with Bucket	Heavy-Duty Diesel	Offroad	0.576	2.789	13.657	0.032	0.148	0.083	3,405.364	441.068	44.107	980.151	98.015
Line Truck with Spool Trailer	Heavy-Duty Diesel	Offroad	0.576	2.789	13.657	0.032	0.148	0.083	3,405.364	441.068	44.107	980.151	98.015
Flatbed Truck	Heavy-Duty Diesel	Offroad	0.576	2.789	13.657	0.032	0.148	0.083	3,405.364	441.068	44.107	980.151	98.015
Offroad Cement Truck	Heavy-Duty Diesel	Offroad	0.576	2.789	13.657	0.032	0.148	0.083	3,405.364	441.068	44.107	980.151	98.015
Onroad Cement Truck	Heavy-Duty Diesel	Onroad	0.055	0.285	2.422	0.012	0.124	0.061	1,215.380	0.300	0.075	0.300	0.075
Various Onroad Haul Trucks	Heavy-Duty Diesel	Onroad	0.055	0.285	2.422	0.012	0.124	0.061	1,215.380	0.300	0.075	0.300	0.075
Various Offroad Haul Trucks	Heavy-Duty Diesel	Offroad	0.576	2.789	13.657	0.032	0.148	0.083	3,405.364	156.824	15.682	156.824	15.682
Water Truck	Heavy-Duty Diesel	Offroad	0.576	2.789	13.657	0.032	0.148	0.083	3,405.364	441.068	44.107	980.151	98.015
Material Delivery Truck (Offsite)	Heavy-Duty Diesel	Onroad	0.055	0.285	2.422	0.012	0.124	0.061	1,215.380	0.300	0.075	0.300	0.075
Material Delivery Truck (Onsite)	Heavy-Duty Diesel	Offroad	0.576	2.789	13.657	0.032	0.148	0.083	3,405.364	156.824	15.682	156.824	15.682
Passenger Vehicles (Onsite)	Light-Duty Auto/Truck	Offroad	0.125	1.905	0.152	0.007	0.056	0.028	704.360	441.068	44.107	980.151	98.015
Passenger Vehicles (Additional workers for panel washing activities)	Light-Duty Auto/Truck	Onroad	0.017	0.988	0.075	0.003	0.046	0.019	264.372	0.300	0.075	0.300	0.075
Passenger Vehicles (Worker Commutes)	Light-Duty Auto/Truck	Onroad	0.017	0.988	0.075	0.003	0.046	0.019	264.372	0.300	0.075	0.300	0.075

Vehicle	Vehicle Class [a]	Onroad or Offroad Vehicle	Idling Emission Factors (g/idle-hr) [b]						
			ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	CO_2e [d]
Boom Truck with Bucket	Heavy-Duty Diesel	Offroad	2.381	33.224	30.343	0.057	0.014	0.013	5,929.644
Line Truck with Spool Trailer	Heavy-Duty Diesel	Offroad	2.381	33.224	30.343	0.057	0.014	0.013	5,929.644
Flatbed Truck	Heavy-Duty Diesel	Offroad	2.381	33.224	30.343	0.057	0.014	0.013	5,929.644
Offroad Cement Truck	Heavy-Duty Diesel	Offroad	2.381	33.224	30.343	0.057	0.014	0.013	5,929.644
Various Offroad Haul Trucks	Heavy-Duty Diesel	Offroad	2.381	33.224	30.343	0.057	0.014	0.013	5,929.644
Water Truck	Heavy-Duty Diesel	Offroad	2.381	33.224	30.343	0.057	0.014	0.013	5,929.644
Material Delivery Truck (Onsite)	Heavy-Duty Diesel	Offroad	2.381	33.224	30.343	0.057	0.014	0.013	5,929.644

Notes:

[a] The vehicle classes are represented as follows:

Light-Duty Truck: Assumed to be 50% LDT1 Gas and 50% LDT2 Gas values.

Heavy-Duty Diesel: Assumed to be 100% HHDT DSL values, per Section 4.5 of Appendix A of the *CalEEMod User's Guide* (Breeze Software, 2021).

Light-Duty Auto/Truck: Assumed to be 50% LDA Gas, 25% LDT1 Gas, and 25% LDT2 Gas values, per Section 4.5 of Appendix A of the *CalEEMod User's Guide* (Breeze Software, 2021) and an assumption that workers do not drive diesel vehicles.

[b] Exhaust Emission Factors in grams per mile (g/mile) and Idling Emission Factors in grams per idle-hour (g/idle-hr) from EMFAC2017 for Kern County, calendar year 2021. A speed of 40 miles per hour (mph) was assumed for onroad vehicles, which is consistent with the CalEEMod default. A speed of 5 mph was assumed for offroad vehicles. Idling emissions are only applicable to onsite heavy-duty diesel vehicles.

[c] Paved and unpaved road dust emission factors calculated using CalEEMod methodology, as described below. Consistent with the best management practices for dust control, it is assumed that watering unpaved roadways twice daily to control fugitive dust emissions will only be implemented during construction and that onsite unpaved roadways used by haul and delivery trucks will be treated with a chemical dust suppressant during both construction and operation.

[d] CO_2e values were calculated using the following global warming potentials (GWP, 100-year GWP) from the *2014 IPCC Fifth Assessment Report* (AR5):

Appendix B, Table 6B

Unmitigated Vehicle Emission Factors

TGP Enterprise Solar Storage Project

Pollutant	AR5 GWP
Carbon Dioxide (CO_2)	1
Methane (CH_4)	28
Nitrous Oxide (N_2O)	265

Derivation of Paved Road Emission Factors

Parameter	PM_{10}	$PM_{2.5}$
Average Weight [a]	2.4	2.4
k [b]	1	0.25
sL [a]	0.1	0.1
Emission Factor (g/mile) [c]	**0.300**	**0.075**

Notes:

[a] Average Weight and sL taken as the default value from CalEEMod.

[b] k taken from Table 13.2.1-1 of Section 13.2.1 of *AP-42* (EPA, 2011).

[c] Emission factor calculated using Equation 1 from Section 13.2.1 of *AP-42* (EPA, 2011), which is generally consistent with Section 5.3 of Appendix A of the *CalEEMod User's Guide* (Breeze Software, 2021):

Emission Factor (g/mile) = k (g/mile) x [sL (g/m^2)]$^{0.91}$ x [Average Weight (tons)]$^{1.02}$

Derivation of Unpaved Road Emission Factors

Parameter	PM_{10}	$PM_{2.5}$
Mean Vehicle Weight [a]	16.5	16.5
Silt Content [b]	8.5	8.5
k [c]	1.50	0.15
a [c]	0.9	0.9
b [c]	0.45	0.45
P [d]	32	32
Emission Factor (g/mile) [e]	**980.151**	**98.015**
Reduction for Watering 2x Daily [f]	55%	55%
Watering Controlled Emission Factor (g/mile)	**441.068**	**44.107**
Reduction for Chemical Dust Supressant [f]	84%	84%
Dust Supressant Controlled Emission Factor (g/mile)	**156.824**	**15.682**

Notes:

[a] Mean vehicle weight assumes that heavy- and light-duty trucks weigh an average of 16.5 tons.

[b] Silt content taken from Table 13.2.2-1 of Section 13.2.2 of *AP-42* (EPA, 2006) for a Construction Site, Scraper Route; this value is consistent with the CalEEMod defaults.

[c] k, a, and b taken from Table 13.2.2-2 of Section 13.2.2 of *AP-42* (EPA, 2006) for industrial roads.

[d] P (days of precipitation) taken as the CalEEMod default for the Kern County APCD, as provided in Table 1.1 of Appendix D of the *CalEEMod User's Guide* (Breeze Software, 2021).

[e] Emission factor calculated using Equations 1a and 2 from Section 13.2.2 of *AP-42* (EPA, 2006):

Emission Factor (g/mile) = {k (lbs/mile) x [Silt Content (%) / 12]^{a} x [Mean Vehicle Weight (tons) / 3]^{b}} x [(365-P) / 365] x 453.6 (g/lb)

[f] Percent reduction taken from the CalEEMod model (Breeze Software, 2021).

Appendix B, Table 7A

Mitigated Fugitive Dust Emission Factors

TGP Enterprise Solar Storage Project

Fugitive Dust Emission Factors for Truck Dumping/Loading

Truck Dumping on a Pile or Loading to a Truck from a Pile

Parameter	PM_{10}	$PM_{2.5}$
k [a]	0.35	0.053
U [b]	6.0	6.0
M [a]	12	12
Emission Factor (lb/ton) [c]	0.0001	0.00002
Reduction from Watering Disturbed Areas Every Three Hours [d]	61%	61%
Emission Factor (Controlled, lb/ton)	0.00005	0.000007

Notes:

[a] k and M taken from Section 4.3 of Appendix A of the *CalEEMod User's Guide* (Breeze Software, 2021).

[b] U taken as the CalEEMod default for the Kern County - Mojave Desert climate region, as provided in Table 1.1 of Appendix D of the *CalEEMod User's Guide* (Breeze Software, 2021). Value converted from units of m/s to mph.

[c] Emission factor calculated using the following equation from Section 4.3 of Appendix A of the *CalEEMod User's Guide* (Breeze Software, 2021):

Emission Factor (lb/ton) = $k \times 0.0032 \times [U\ (mph) / 5]^{1.3} / [M\ (\%) / 2]^{1.4}$

[d] Percent reduction taken from Table XI-A of the *SCAQMD CEQA Air Quality Analysis Handbook* for Construction Activities (SCAQMD, 2007).

Fugitive Dust Emission Factors for Grading

Grading Equipment Passes

Parameter	PM_{10}	$PM_{2.5}$
S [a]	7.1	7.1
F [a]	0.6	0.031
Emission Factor (lb/VMT) [b]	1.543	0.167
Reduction from Watering Disturbed Areas Every Three Hours [c]	61%	61%
Emission Factor (Controlled, lb/VMT)	0.602	0.065

Notes:

[a] S and F taken from Section 4.3 of Appendix A of the *CalEEMod User's Guide* (Breeze Software, 2021).

[b] Emission factors calculated using the following equations from Section 4.3 of Appendix A of the *CalEEMod User's Guide* (Breeze Software, 2021):

PM_{10} Emission Factor (lb/VMT) = $0.051 \times [S\ (mph)]^{2.0} \times F_{PM10}$

$PM_{2.5}$ Emission Factor (lb/VMT) = $0.04 \times [S\ (mph)]^{2.5} \times F_{PM2.5}$

[c] Percent reduction taken from Table XI-A of the *SCAQMD CEQA Air Quality Analysis Handbook* for Construction Activities (SCAQMD, 2007).

Fugitive Dust Emission Factors for Bulldozing

Bulldozing Equipment Passes

Parameter	PM_{10}	$PM_{2.5}$
s [a]	6.9	6.9
C [a]	1.0	5.7
M [a]	7.9	7.9
F [a]	0.75	0.105
Emission Factor (lb/hr) [b]	0.753	0.414
Reduction from Watering Disturbed Areas Every Three Hours [c]	61%	61%
Emission Factor (Controlled, lb/hr)	0.294	0.161

Notes:

[a] s, C, M, and F taken from Section 4.3 of Appendix A of the *CalEEMod User's Guide* (Breeze Software, 2021).

[b] Emission factors calculated using the following equations from Section 4.3 of Appendix A of the *CalEEMod User's Guide* (Breeze Software, 2021):

PM_{10} Emission Factor (lb/hr) = $[(C \times s\ (\%)^{1.5}) / M\ (\%)^{1.4}] \times F_{PM10}$

$PM_{2.5}$ Emission Factor (lb/hr) = $[(C \times s\ (\%)^{1.2}) / M\ (\%)^{1.3}] \times F_{PM2.5}$

[c] Percent reduction taken from Table XI-A of the *SCAQMD CEQA Air Quality Analysis Handbook* for Construction Activities (SCAQMD, 2007).

Appendix B, Table 7B

Unmitigated Fugitive Dust Emission Factors

TGP Enterprise Solar Storage Project

Fugitive Dust Emission Factors for Truck Dumping/Loading

Truck Dumping on a Pile or Loading to a Truck from a Pile

Parameter	PM_{10}	$PM_{2.5}$
k [a]	0.35	0.053
U [b]	6.0	6.0
M [a]	12	12
Emission Factor (lb/ton) [c]	0.0001	0.00002
Reduction from Watering Disturbed Areas Twice per Day [d]	55%	55%
Emission Factor (Controlled, lb/ton)	0.00005	0.000008

Notes:

[a] k and M taken from Section 4.3 of Appendix A of the *CalEEMod User's Guide* (Breeze Software, 2021).

[b] U taken as the CalEEMod default for the Kern County - Mojave Desert climate region, as provided in Table 1.1 of Appendix D of the *CalEEMod User's Guide* (Breeze Software, 2021). Value converted from units of m/s to mph.

[c] Emission factor calculated using the following equation from Section 4.3 of Appendix A of the *CalEEMod User's Guide* (Breeze Software, 2021):

Emission Factor (lb/ton) = k x 0.0032 x $[U (mph) / 5]^{1.3}$ / $[M (\%) / 2]^{1.4}$

[d] Percent reduction taken from the CalEEMod model (Breeze Software, 2021).

Fugitive Dust Emission Factors for Grading

Grading Equipment Passes

Parameter	PM_{10}	$PM_{2.5}$
S [a]	7.1	7.1
F [a]	0.6	0.031
Emission Factor (lb/VMT) [b]	1.543	0.167
Reduction from Watering Disturbed Areas Twice per Day [c]	55%	55%
Emission Factor (Controlled, lb/VMT)	0.694	0.075

Notes:

[a] S and F taken from Section 4.3 of Appendix A of the *CalEEMod User's Guide* (Breeze Software, 2021).

[b] Emission factors calculated using the following equations from Section 4.3 of Appendix A of the *CalEEMod User's Guide* (Breeze Software, 2021):

PM_{10} Emission Factor (lb/VMT) = 0.051 x $[S (mph)]^{2.0}$ x F_{PM10}

$PM_{2.5}$ Emission Factor (lb/VMT) = 0.04 x $[S (mph)]^{2.5}$ x $F_{PM2.5}$

[d] Percent reduction taken from the CalEEMod model (Breeze Software, 2021).

Fugitive Dust Emission Factors for Bulldozing

Bulldozing Equipment Passes

Parameter	PM_{10}	$PM_{2.5}$
s [a]	6.9	6.9
C [a]	1.0	5.7
M [a]	7.9	7.9
F [a]	0.75	0.105
Emission Factor (lb/hr) [b]	0.753	0.414
Reduction from Watering Disturbed Areas Twice per Day [c]	55%	55%
Emission Factor (Controlled, lb/hr)	0.339	0.186

Notes:

[a] s, C, M, and F taken from Section 4.3 of Appendix A of the *CalEEMod User's Guide* (Breeze Software, 2021).

[b] Emission factors calculated using the following equations from Section 4.3 of Appendix A of the *CalEEMod User's Guide* (Breeze Software, 2021):

PM_{10} Emission Factor (lb/hr) = $[(C \times s (\%)^{1.5}) / M (\%)^{1.4}]$ x F_{PM10}

$PM_{2.5}$ Emission Factor (lb/hr) = $[(C \times s (\%)^{1.2}) / M (\%)^{1.3}]$ x $F_{PM2.5}$

[d] Percent reduction taken from the CalEEMod model (Breeze Software, 2021).

Appendix B, Table 8

Equations Used to Calculate Criteria Pollutant and GHG Emissions

TGP Enterprise Solar Storage Project

Equations Used to Calculate Emissions from Construction and Operation

Emission Source	Pollutants	Equations	Variables
Construction Equipment Exhaust	CO, ROG, NO_X, SO_X, PM_{10}, and $PM_{2.5}$	$E_d = EF \times N \times Hp \times L \times H / 453.6$	E_d = Emissions (lb/day)
			EF = Emission factor (g/bhp-hr) from CalEEMod
			N = Number of pieces of equipment
			Hp = Average horsepower
			L = Average load factor
			H = Hours per day
			453.6 = Conversion from g to lb
		$E_t = E_d \times D / 2,000$	E_d = Emissions (lb/day)
			D = Number of construction days
			E_t = Total Project Emissions (tons)
			2,000 = Conversion from lb to tons
	CO_2e	$E_d = EF \times N \times Hp \times L \times H / 1,000,000$	E_d = Emissions (metric tons/day)
			N = Number of pieces of equipment
			Hp = Average horsepower
			L = Average load factor
			EF = CO_2e emission factor (g/bhp-hr)
			H = Hours per day
			1,000,000 = Conversion from g to metric tons
		$EF = (EF_{CO2} \times GWP_{CO2}) + (EF_{CH4} \times GWP_{CH4}) + (EF_{N2O} \times GWP_{N2O})$	EF_{GHG} = CO_2, CH_4, or N_2O emission factor (g/bhp-hr) from CalEEMod
			EF = CO_2e emission factor (g/bhp-hr)
			GWP = IPCC AR5 Global Warming Potential
		$E_t = E_d \times D$	E_d = Emissions (metric tons/day)
			D = Number of construction days
			E_t = Total Project Emissions (metric tons)
Vehicle Exhaust	CO, ROG, NO_X, SO_X, PM_{10}, and $PM_{2.5}$	$E_d = N \times VMT \times EF / 453.6$	E_d = Emissions (lb/day)
			N = Number of vehicles
			VMT = Vehicle miles traveled per day (miles/day)
			453.6 = Conversion from g to lb
			EF = Exhaust emission factor (g/mile) from EMFAC2017; PM_{10} and $PM_{2.5}$ emission factors conservatively include brake wear and tire wear
		$E_t = E_d \times D / 2,000$	E_t = Total Project Emissions (tons)
			E_d = Emissions (lb/day)
			D = Number of construction or operation days
			2,000 = Conversion from lb to tons
	CO_2e	$E_d = N \times VMT \times EF / 1,000,000$	1,000,000 = Conversion from g to metric tons
			E_d = Emissions (metric tons/day)
			N = Number of vehicles
			VMT = Vehicle miles traveled per day (miles/day)
			EF = CO_2e exhaust emission factor (g/mile)
		$EF = (EF_{CO2} \times GWP_{CO2}) + (EF_{CH4} \times GWP_{CH4}) + (EF_{N2O} \times GWP_{N2O})$	EF_{GHG} = CO_2, CH_4, or N_2O exhaust emission factor (g/mile) from EMFAC2017
			EF = CO_2e exhaust emission factor (g/mile)
			GWP = IPCC AR5 Global Warming Potential
		$E_t = E_d \times D$	E_d = Emissions (metric tons/day)
			D = Number of construction or operation days
			E_t = Total Project Emissions (metric tons)
Vehicle Idling Exhaust	CO, ROG, NO_X, SO_X, PM_{10}, and $PM_{2.5}$	$E_d = N \times I \times EF / 453.6$	E_d = Emissions (lb/day)
			N = Number of vehicles
			I = Idle time per vehicle per day (idle-hr/day)
			EF = Idling emission factor (g/idle-hr) from EMFAC2017
			453.6 = Conversion from g to lb
		$E_t = E_d \times D / 2,000$	E_t = Total Project Emissions (tons)
			E_d = Emissions (lb/day)
			D = Number of construction or operation days
			2,000 = Conversion from lb to tons
	CO_2e	$E_d = N \times I \times EF / 1,000,000$	1,000,000 = Conversion from g to metric tons
			E_d = Emissions (metric tons/day)
			N = Number of vehicles
			I = Idle time per vehicle per day (idle-hr/day)
			EF = CO_2e idling emission factor (g/idle-hr)
		$EF = (EF_{CO2} \times GWP_{CO2}) + (EF_{CH4} \times GWP_{CH4}) + (EF_{N2O} \times GWP_{N2O})$	EF_{GHG} = CO_2, CH_4, or N_2O idling emission factor (g/idle-hr) from EMFAC2017
			EF = CO_2e idling emission factor (g/idle-hr)
			GWP = IPCC AR5 Global Warming Potential
		$E_t = E_d \times D$	E_d = Emissions (metric tons/day)
			D = Number of construction or operation days
			E_t = Total Project Emissions (metric tons)

Equations Used to Calculate Criteria Pollutant and GHG Emissions
TGP Enterprise Solar Storage Project

Equations Used to Calculate Emissions from Construction and Operation

Emission Source	Pollutants	Equations	Variables
Fugitive PM_{10} and $PM_{2.5}$ from Vehicle Travel on Paved and Unpaved Roads	PM_{10} and $PM_{2.5}$	$E_d = N \times VMT \times EF / 453.6$	EF = Unpaved road emission factors (g/mile) calculated per Section 13.2.2 of *AP-42* (EPA, 2006) and paved road emission factors (g/mile) calculated per Section 13.2.1 of AP-42 (EPA, 2011)
			E_d = Emissions (lb/day)
			N = Number of vehicles
			VMT = Vehicle miles traveled per day (miles/day)
			453.6 = Conversion from g to lb
		$E_t = E_d \times D / 2{,}000$	E_t = Total Project Emissions (tons)
			E_d = Emissions (lb/day)
			D = Number of construction or operation days
			2,000 = Conversion from lb to tons
Fugitive PM_{10} and $PM_{2.5}$ from Truck Dumping/Loading	PM_{10} and $PM_{2.5}$	$E_d = V \times 1.2641662 \times EF / D$	E_d = Emissions (lb/day)
			V= Volume of material dumped or loaded (yd^3/project)
			1.2641662 = Conversion from yd^3 to tons
			EF = Fugitive emission factors (lb/ton), calculated per Section 4.3 of Appendix A of the *CalEEMod User's Guide* (BREEZE, 2021)
			D = Number of construction days
		$E_t = E_d \times D / 2{,}000$	E_d = Emissions (lb/day)
			E_t = Total Project Emissions (tons)
			D = Number of construction days
			2,000 = Conversion from lb to tons
Fugitive PM_{10} and $PM_{2.5}$ from Grading	PM_{10} and $PM_{2.5}$	$E_d = EF \times A / W \times 43{,}560 / 5{,}280 / D$	E_d = Emissions (lb/day)
			EF = Fugitive emission factors (lb/mile), calculated per Section 4.3 of Appendix A of the *CalEEMod User's Guide* (BREEZE, 2021)
			A = Graded area (acres/project)
			W = Grading equipment blade width (ft)
			43,560 = Conversion factor from ft^2 to acres
			5,280 = Conversion factor from ft to miles
			D = Number of construction days
		$E_t = E_d \times D / 2{,}000$	E_d = Emissions (lb/day)
			E_t = Total Project Emissions (tons)
			D = Number of construction days
			2,000 = Conversion from lb to tons
Fugitive PM_{10} and $PM_{2.5}$ from Bulldozing	PM_{10} and $PM_{2.5}$	$E_d = EF \times H \times N$	E_d = Emissions (lb/day)
			EF = Fugitive emission factors (lb/hr), calculated per Section 4.3 of Appendix A of the *CalEEMod User's Guide* (BREEZE, 2021)
			N = Number of bulldozing equipment
			H = Hours per day
		$E_t = E_d \times D / 2{,}000$	E_d = Emissions (lb/day)
			E_t = Total Project Emissions (tons)
			D = Number of construction days
			2,000 = Conversion from lb to tons
Paving	ROG	$E_d = A / D \times EF$	EF = Emission factor (lb/acre), calculated per Section 4.8 of Appendix A of the *CalEEMod User's Guide* (BREEZE, 2021)
			A = Paved area (acres)
			E_d = Emissions (lb/day)
			D = Number of construction days
		$E_t = E_d \times D / 2{,}000$	E_t = Total Project Emissions (tons)
			E_d = Emissions (lb/day)
			D = Number of construction days
			2,000 = Conversion from lb to tons
Water Use	CO_2e	$E_d = \Sigma(U \times I \times GWP_{GHG} \times 0.001 \times EF_{GHG}) / 2{,}204.62 / D$	U = Annual water use (million gal/year)
			I = Water electricity intensity (kWh/million gal) from CalEEMod for Mojave Desert Air Basin
			GWP_{GHG} = IPCC AR5 Global Warming Potential
			0.001 = Conversion from kWh to MWh
			EF_{GHG} = CO_2, CH_4, and N_2O electrical utility emission factors (lb/MWh) from CalEEMod for SoCal Edison
			E_d = Emissions (metric tons/day)
			D = Number of operation days
			2,204.62 = Conversion from lb to metric tons
		$E_t = E_d \times D$	E_t = Total Project Emissions (metric tons)
			E_d = Emissions (metric tons/day)
			D = Number of operation days

Appendix B1
Emergency Generator Specifications and Emissions

TGP Enterprise

August 2023

Generator Emissions Summary

Pollutant	NOx	CO	PM_{10}	$PM_{2.5}$	SO_2	VOCs	CO_2e [e]	Total HAPs
Pollutant Category	CAP	CAP	CAP	CAP	CAP	CAP	GHG	HAP
Emergency Generator Equipment								
Annual Emissions (Tons/Year) [a]								
Diesel Generators	2.95E-01	1.54E+00	1.32E-02	1.32E-02	3.03E-03	8.38E-02	2.89E+02	8.63E-03
Natural Gas Generators	8.67E-03	9.13E-04	5.79E-06	5.79E-06	4.41E-05	4.56E-04	7.85E+00	1.68E-02
Total Annual Emissions	**0.30**	**1.54**	**0.01**	**0.01**	**0.003**	**0.08**	**296.68**	**0.03**
Daily Emissions (Pounds/Day) [b]								
Diesel Generators	1.18E+01	6.17E+01	5.29E-01	5.29E-01	1.21E-01	3.35E+00	1.29E+04	3.45E-01
Natural Gas Generators	3.47E-01	3.65E-02	2.31E-04	2.31E-04	1.77E-03	1.83E-02	3.52E+02	6.74E-01
Total Daily Emissions [b]	**12.16**	**61.76**	**0.53**	**0.53**	**0.12**	**3.37**	**13,291.38**	**1.02**
EKAPCD Annual Emissions Significance Thresholds (Tons/Year) [c]	**25**	**N/A**	**15**	**N/A**	**N/A**	**25**	**N/A**	**N/A**
Above Threshold?	**No**	**N/A**	**No**	**N/A**	**N/A**	**No**	**N/A**	**N/A**
EKAPCD Daily Emissions Significance Thresholds [c]	**137**	**N/A**	**N/A**	**N/A**	**N/A**	**137**	**N/A**	**N/A**
Above Threshold?	**No**	**N/A**	**N/A**	**N/A**	**N/A**	**No**	**N/A**	**N/A**
Major Source Threshold Limits [d]	**50**	**100**	**100**	**100**	**100**	**50**	**N/A**	**25**
Above Threshold?	No	No	No	No	No	No	N/A	No

Notes:

[a] CO_2e emissions in units of metric tons per year.

[b] Daily emissions assume each engine could operate up to one hour per day.

[c] EKAPCD significance thresholds obtained from *Guidelines for Implementation of the California Environmental Quality Act (CEQA) of 1970, As Amended* (EKAPCD 1999), and *Guidelines for Preparing and Air Quality Assessment For Use in Environmental Impact Reports* (EKAPCD 2006).

[d] Major source thresholds based upon EKAPCD Rule 201.2.

[e] CO_2e includes the following global warming potentials:

CO_2	1
CH_4	25
N_2O	298

CAP = criteria air pollutant
HAP = hazardous air pollutant
NOx = nitrogen oxide
CO = carbon monoxide
PM_{10} = particulate matter less than 10 micrometers in diameter
$PM_{2.5}$ = particulate matter less than 2.5 micrometers in diameter
SO_2 = sulfur dioxide
VOC = volatile organic compounds
CO_2e = carbon dioxide equivalent
CO_2 = carbon dioxide
CH_4 = methane
N_2O = nitrous oxide
N/A = Not applicable

TGP Enterprise
August 2023
Diesel Emergency Generator Emissions

Generator Data and Assumptions

Parameter	Value	Units
Fuel Type	Diesel	--
No. of Generators	10	--
Engine Electric Kilowatt Rating	800	ekW
Engine Horsepower Rating	1,073	hp
Heat Input	7.9	MMBtu/hr
Fuel Consumption	57.3	gal/hour
Annual Operation	50	hours/year
Stack Exhaust Flow Rate	2.84	m^3/s
Exhaust Temperature	952.5	F
Stack Height	2.22	m
Stack Diameter	0.15	m
Exit Velocity	155.6	m/s
Base Elevation	794	m

Notes:
Caterpillar C27 engine information from CM2021115-fb785-c4f9a (002).pdf

Total Criteria Air Pollutant Emissions (CAPs)

Emission Factors	Value	Unit	Source	Total Hourly Emissions (lb/hr)	Total Annual Emissions (lb/year)	Total Annual Emissions (TPY)
NOx	0.67	g/kW-hr	U.S. EPA Nonroad Compression-Ignition Engines, Tier 4 Emission Standard for Generators	11.82	591	0.30
CO	3.50	g/kW-hr	U.S. EPA Nonroad Compression-Ignition Engines, Tier 4 Emission Standard for Generators	61.73	3,086	1.54
PM_{10}	0.03	g/kW-hr	U.S. EPA Nonroad Compression-Ignition Engines, Tier 4 Emission Standard for Generators	0.53	26	0.013
$PM_{2.5}$	0.03	g/kW-hr	U.S. EPA Nonroad Compression-Ignition Engines, Tier 4 Emission Standard for Generators	0.53	26	0.013
SO_2	0.01	lb/hr	Assumes 15 ppm Ultra-Low Sulfur Diesel	0.12	6	0.003
VOC	0.19	g/kW-hr	U.S. EPA Nonroad Compression-Ignition Engines, Tier 4 Emission Standard for Generators	3.35	168	0.08
CO2	73.96	kg/MMBtu	40 CFR 98.33 Table C-1	12,896	644,777	322
CH4	0.003	kg/MMBtu	40 CFR 98.33 Table C-2	0.52	26	0.01
N2O	0.0006	kg/MMBtu	40 CFR 98.33 Table C-2	0.10	5	0.00

Notes:
These emissions represent the sum of the ten (10) generators.

TGP Enterprise
August 2023
Diesel Emergency Generator Emissions

Total Hazardous Air Pollutant Emissions (HAPs)

Pollutants	Emission Factor (lb/MMBtu)	Total Hourly Emissions (lb/hr)	Total Annual Emissions (lb/year)	Total Annual Emissions (TPY)
Benzene	7.76E-04	6.14E-02	3.07E+00	1.53E-03
Toluene	2.81E-04	2.22E-02	1.11E+00	5.55E-04
Xylenes	1.93E-04	1.53E-02	7.63E-01	3.82E-04
Formaldehyde	7.89E-05	6.24E-03	3.12E-01	1.56E-04
Acetaldehye	2.52E-05	1.99E-03	9.96E-02	4.98E-05
Acrolein	7.88E-06	6.23E-04	3.12E-02	1.56E-05
Naphthalene	1.30E-04	1.03E-02	5.14E-01	2.57E-04
Propylene	2.79E-03	2.21E-01	1.10E+01	5.52E-03
Acenaphthylene	9.23E-06	7.30E-04	3.65E-02	1.82E-05
Acenaphthene	4.68E-06	3.70E-04	1.85E-02	9.25E-06
Fluorene	1.28E-05	1.01E-03	5.06E-02	2.53E-05
Phenanthrene	4.08E-05	3.23E-03	1.61E-01	8.07E-05
Anthracene	1.23E-06	9.73E-05	4.86E-03	2.43E-06
Fluoranthene	4.03E-06	3.19E-04	1.59E-02	7.97E-06
Pyrene	3.71E-06	2.93E-04	1.47E-02	7.33E-06
Benz(a)anthracene	6.22E-07	4.92E-05	2.46E-03	1.23E-06
Chrysene	1.53E-06	1.21E-04	6.05E-03	3.02E-06
Benzo(b)fluoranthene	1.11E-06	8.78E-05	4.39E-03	2.19E-06
Benzo(k)fluoranthene	2.18E-07	1.72E-05	8.62E-04	4.31E-07
Benzo(a)pyrene	2.57E-07	2.03E-05	1.02E-03	5.08E-07
Indeno(1,2,3-cd)pyrene	4.14E-07	3.27E-05	1.64E-03	8.18E-07
Dibenz(a,h)anthracene	3.46E-07	2.74E-05	1.37E-03	6.84E-07
Benzo(g,h,l)perylene	5.56E-07	4.40E-05	2.20E-03	1.10E-06
Total Combined	--	**3.45E-01**	**1.73E+01**	**8.63E-03**

Notes:
- Emission factors from AP-42 Chapter 3 Section 4 Tables 3.4-3 and 3.4-4 for Large Stationary Diesel Engines and conservatively do not account for emission controls.
- All toxic emissions conservatively totaled as HAPs.
- These emissions represent the sum of the ten (10) generators.

Conversions	Value	Notes
Density of Diesel Fuel (lbs/gal)	7.05	AP-42 Appendix A
Heat content of Diesel Fuel (BTU/gal)	138,000	40 CFR 98.33
Heat content of Diesel Fuel (MMBTU/gal)	0.138	AP-42 Appendix A
grams per pound	453.6	--
pounds per kilogram	2.205	--

Notes:
kW = kilowatt
gals/hour = gallons per hour
MMBtu/hour = million British thermal units per hour
m^3/min = meters cubed per minute
ft = feet
g/kW-hr = grams per kilowatt hour
lb/hour = pound(s) per hour
lb/year = pound(s) per year
TPY = tons per year
U.S. EPA = United States Environmental Protection Agency
CAP = criteria air pollutant
HAP = hazardous air pollutant
NOx = nitrogen oxide
CO = carbon monoxide
PM_{10} = particulate matter less than 10 micrometers in diameter
$PM_{2.5}$ = particulate matter less than 2.5 micrometers in diameter
SO_2 = sulfur dioxide
VOC = volatile organic compounds
CO_2 = Carbon dioxide
CH_4 = Methane
N_2O = Nitrous Oxide
CFR = Code of Federal Regulations

TGP Enterprise
August 2023
Natural Gas Generator Emissions

Generator Data and Assumptions

Parameter	Value	Units
Fuel Type	Natural Gas	--
No. of Generators	2	--
Engine Electric Kilowatt Rating	154	kW
Engine Horsepower Rating	207	hp
Heat Input	1.50	MMBtu/hr
Fuel Consumption	1,463	scf/hr
Annual Operation	50	hours/year

Notes:
Engine data from EPC SERVICES EDWARDS MTU LP GS125 GENERATOR SUBMITTAL FILE.pdf

Total Criteria Air Pollutant Emissions (CAPs)

Emission Factors	Value	Unit	Source	Total Hourly Emissions (lb/hr)	Total Annual Emissions (lb/year)	Total Annual Emissions (TPY)
NOx	3.80E-01	g/hp-hr	EPC SERVICES EDWARDS MTU LP GS125 GENERATOR SUBMITTAL FILE.pdf. Assumed as 95% of THC+NOx as Nox.	3.47E-01	1.73E+01	8.67E-03
CO	4.00E-02	g/hp-hr	EPC SERVICES EDWARDS MTU LP GS125 GENERATOR SUBMITTAL FILE.pdf	3.65E-02	1.83E+00	9.13E-04
PM_{10}	7.71E-05	lb/MMBtu	U.S. EPA AP-42 Chapter 3.2 Natural Gas-Fire Recirocating Engines Table 3.2-2, Uncontrolled 4-Stroke Lean Burn	2.31E-04	1.16E-02	5.79E-06
$PM_{2.5}$	7.71E-05	lb/MMBtu	U.S. EPA AP-42 Chapter 3.2 Natural Gas-Fire Recirocating Engines Table 3.2-2, Uncontrolled 4-Stroke Lean Burn	2.31E-04	1.16E-02	5.79E-06
SO_2	5.88E-04	lb/MMBtu	U.S. EPA AP-42 Chapter 3.2 Natural Gas-Fire Recirocating Engines Table 3.2-2, Uncontrolled 4-Stroke Lean Burn	1.77E-03	8.83E-02	4.41E-05
VOC	2.00E-02	g/hp-hr	EPC SERVICES EDWARDS MTU LP GS125 GENERATOR SUBMITTAL FILE.pdf. Assumed as 5% of THC+NOx as VOC.	1.83E-02	9.13E-01	4.56E-04
CO_2	5.31E+01	kg/MMBtu	40 CFR 98.33 Table C-1	3.51E+02	1.76E+04	8.78E+00
CH_4	1.00E-03	kg/MMBtu	40 CFR 98.33 Table C-2	6.62E-03	3.31E-01	1.65E-04
N_2O	1.00E-04	kg/MMBtu	40 CFR 98.33 Table C-2	6.62E-04	3.31E-02	1.65E-05

Notes:
These emissions represent the sum of the two (2) generators.

TGP Enterprise

August 2023

Natural Gas Generator Emissions

Total Hazardous Air Pollutant Emissions (HAPs)

Pollutants	Emission Factor (lb/MMBtu)	Total Hourly Emissions (lb/hr)	Total Annual Emissions (lb/year)	Total Annual Emissions (TPY)
1,1,2,2-Tetrachloroethane	4.00E-05	1.20E-04	6.00E-03	3.00E-06
1,1,2-Trichloroethane	3.18E-05	9.55E-05	4.77E-03	2.39E-06
1,1-Dichloroethane	2.36E-05	7.08E-05	3.54E-03	1.77E-06
1,2,3-Trimethylbenzene	2.30E-05	6.90E-05	3.45E-03	1.73E-06
1,2,4-Trimethylbenzene	1.43E-05	4.29E-05	2.15E-03	1.07E-06
1,2-Dichloroethane	2.36E-05	7.08E-05	3.54E-03	1.77E-06
1,2-Dichloropropane	2.69E-05	8.08E-05	4.04E-03	2.02E-06
1,3,5-Trimethylbenzene	3.38E-05	1.01E-04	5.07E-03	2.54E-06
1,3-Butadiene	2.67E-04	8.02E-04	4.01E-02	2.00E-05
1,3-Dichloropropene	2.64E-05	7.93E-05	3.96E-03	1.98E-06
2-Methylnaphthalene	3.32E-05	9.97E-05	4.98E-03	2.49E-06
2,2,4-Trimethylpentane	2.50E-04	7.51E-04	3.75E-02	1.88E-05
Acenaphthene	1.25E-06	3.75E-06	1.88E-04	9.38E-08
Acenaphthylene	5.53E-06	1.66E-05	8.30E-04	4.15E-07
Acetaldehyde	8.36E-03	2.51E-02	1.25E+00	6.27E-04
Acrolein	5.14E-03	1.54E-02	7.72E-01	3.86E-04
Benzene	4.40E-04	1.32E-03	6.60E-02	3.30E-05
Benzo(b)fluoranthene	1.66E-07	4.98E-07	2.49E-05	1.25E-08
Benzo(e)pyrene	4.15E-07	1.25E-06	6.23E-05	3.11E-08
Benzo(g,h,i)perylene	4.14E-07	1.24E-06	6.21E-05	3.11E-08
Biphenyl	2.12E-04	6.36E-04	3.18E-02	1.59E-05
Butane	5.41E-04	1.62E-03	8.12E-02	4.06E-05
Butyr/Isobutyraldehyde	1.01E-04	3.03E-04	1.52E-02	7.58E-06
Carbon Tetrachloride	3.67E-05	1.10E-04	5.51E-03	2.75E-06
Chlorobenzene	3.04E-05	9.13E-05	4.56E-03	2.28E-06
Chloroethane	1.87E-06	5.61E-06	2.81E-04	1.40E-07
Chloroform	2.85E-05	8.56E-05	4.28E-03	2.14E-06
Chrysene	6.93E-07	2.08E-06	1.04E-04	5.20E-08
Cyclopentane	2.27E-04	6.81E-04	3.41E-02	1.70E-05
Ethane	1.05E-01	3.15E-01	1.58E+01	7.88E-03
Ethylbenzene	3.97E-05	1.19E-04	5.96E-03	2.98E-06
Ethylene Dibromide	4.43E-05	1.33E-04	6.65E-03	3.32E-06
Fluoranthene	1.11E-06	3.33E-06	1.67E-04	8.33E-08
Fluorene	5.67E-06	1.70E-05	8.51E-04	4.26E-07
Formaldehyde	5.28E-02	1.59E-01	7.93E+00	3.96E-03
Methanol	2.50E-03	7.51E-03	3.75E-01	1.88E-04
Methylcyclohexane	1.23E-03	3.69E-03	1.85E-01	9.23E-05
Methylene Chloride	2.00E-05	6.00E-05	3.00E-03	1.50E-06
n-Hexane	1.11E-03	3.33E-03	1.67E-01	8.33E-05
n-Nonane	1.10E-04	3.30E-04	1.65E-02	8.26E-06
n-Octane	3.51E-04	1.05E-03	5.27E-02	2.63E-05
n-Pentane	2.60E-03	7.81E-03	3.90E-01	1.95E-04
Naphthalene	7.44E-05	2.23E-04	1.12E-02	5.58E-06
PAH	2.69E-05	8.08E-05	4.04E-03	2.02E-06
Phenanthrene	1.04E-05	3.12E-05	1.56E-03	7.81E-07
Phenol	2.40E-05	7.20E-05	3.60E-03	1.80E-06
Propane	4.19E-02	1.26E-01	6.29E+00	3.14E-03
Pyrene	1.36E-06	4.08E-06	2.04E-04	1.02E-07
Styrene	2.36E-05	7.08E-05	3.54E-03	1.77E-06
Tetrachloroethane	2.48E-06	7.45E-06	3.72E-04	1.86E-07
Toluene	4.08E-04	1.22E-03	6.12E-02	3.06E-05
Vinyl Chloride	1.49E-05	4.47E-05	2.24E-03	1.12E-06
Xylene	1.84E-04	5.52E-04	2.76E-02	1.38E-05
Total Combined	**--**	**6.74E-01**	**3.37E+01**	**1.68E-02**

Notes:
- Emission factors from AP-42 Chapter 3 Section 2 Table 3.2-2 for Uncontrolled Emission Factors for 4-Stroke Lean-Burn Engines and conservatively do not account for emission controls.
- All toxic emissions conservatively totaled as HAPs.
- These emissions represent the sum of the two (2) generators.

TGP Enterprise

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Natural Gas Generator Emissions

Conversions	Value	Notes
Heat Content of Natural Gas (MMBtu/MMscf)	1,026	40 CFR 98.33 Table C-1
Horsepower (boiler) to Btu (mean)/hr	33,446	AP-42 Appendix A
grams per pound	453.6	--
pounds per kilogram	2.205	--

Notes:
kW = kilowatt
gals/hour = gallons per hour
MMBtu/hour = million British thermal units per hour
m^3/min = meters cubed per minute
ft = feet
g/kW-hr = grams per kilowatt hour
lb/hour = pound(s) per hour
lb/year = pound(s) per year
TPY = tons per year
U.S. EPA = United States Environmental Protection Agency
CAP = criteria air pollutant
HAP = hazardous air pollutant
NOx = nitrogen oxide
CO = carbon monoxide
PM_{10} = particulate matter less than 10 micrometers in diameter
$PM_{2.5}$ = particulate matter less than 2.5 micrometers in diameter
SO_2 = sulfur dioxide
VOC = volatile organic compounds
CO_2 = Carbon dioxide
CH_4 = Methane
N_2O = Nitrous Oxide
CFR = Code of Federal Regulations

Appendix C
Dispersion Modeling and Health Risk Assessment for the Enterprise Solar Storage Project

Appendix C. Dispersion Modeling and Health Risk Assessment for the Enterprise Solar Storage Project

Dispersion modeling and a health risk assessment (HRA) were conducted to evaluate potential impacts from the Terragen Power (TGP) Enterprise Solar Storage Project in support of the California Environmental Quality Act (CEQA) air quality impact analysis. Specifically, this appendix details the methodology and results of the following evaluations:

- Maximum 24-hour concentrations of particulate matter with aerodynamic diameter less than or equal to 2.5 microns ($PM_{2.5}$) and particulate matter with aerodynamic diameter less than or equal to 10 microns (PM_{10}), resulting from mitigated construction emissions associated with onsite combustion and fugitive dust.
- HRA estimating the potential risk attributed from mitigated diesel particulate matter (DPM) emissions from Project construction and operation.

These analyses were conducted as required by the Kern County Planning and Natural Resources Department's *Guidelines for Preparing an Air Quality Assessment For Use in Environmental Impact Reports* (Kern County 2006). All modeling input and output files are included with this appendix on a compact disc.

C.1 Dispersion Modeling Analysis for Construction Emissions of 24-hour PM_{10} and $PM_{2.5}$

Model Selection. Air dispersion modeling was conducted based on guidance presented in the *Guideline on Air Quality Models* (EPA 2017) and the U.S. Environmental Protection Agency (EPA)-approved dispersion model, AERMOD (Version 21112). The AERMOD model is a steady-state, multiple-source dispersion model that incorporates hourly meteorological data inputs and local surface characteristics. The AERMOD model is well suited for this assessment based on the ability of the model to handle the physical characteristics of the Project's emission sources, best represented as area source types. The source locations are specified for a Cartesian (x,y) coordinate system where x and y are distances east and north in meters, respectively. The Cartesian coordinate system used for this analysis is the Universal Transverse Mercator Projection (UTM), 1983 North American Datum (NAD 83), Zone 11.

Model Options. The technical options selected for the AERMOD model include the following:

- Regulatory default control options
- Rural dispersion mode
- Receptor elevations and controlling hill heights obtained from AERMAP (Version 18081) output

Meteorological Data. In the absence of site-specific meteorological data, the EPA requires the use of 5 years of representative National Weather Service (NWS) meteorological data or comparable station, or prognostic meteorological data. According to EPA's *Guideline on Air Quality Models* (EPA 2017), representativeness of meteorological data used in dispersion modeling depends on (1) the proximity of the meteorological monitoring site to the area under consideration, (2) the complexity of the terrain, (3) the exposure of the meteorological monitoring site, and (4) the period of time during which data are collected.

AERMOD-ready meteorological data were acquired from the California Air Resources Board (CARB) for the Mojave Airport, California Station for years 2009 through 2014[10]. The Mojave Airport data were considered representative of the Project, and accordingly recommended for use, based on the following reasons:

- The meteorological data station is located approximately 1.5 miles North from the Project site.
- The meteorological data station and the Project site both have significant mountainous geographic features to the Northwest.
- The land uses surrounding the meteorological data station and the Project site are similar (each is surrounded by mostly undeveloped open space).

Figure C.1 displays the windrose for the Mojave Airport station.

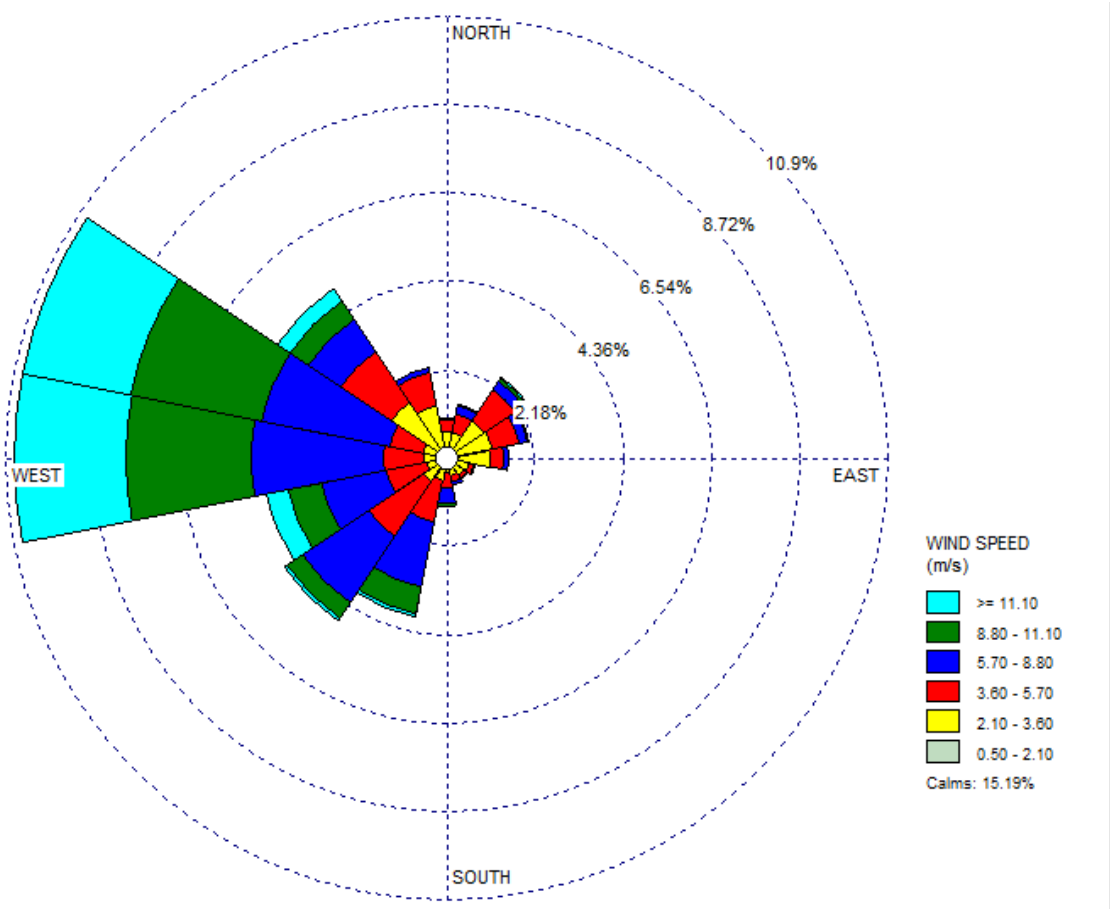

Figure C.1. Mojave Airport, CA Windrose

Receptor Grid Spacing. The receptor grid for the AERMOD modeling consists of receptors that are placed at the ambient air boundary (i.e., the Project's property boundary) and Cartesian-grid receptors that are placed beyond the Project's property boundary at spacing that increases with distance from the origin, as presented in Figure C.2. Property boundary receptors were placed at 25-meter intervals. Beyond the Project's property boundary, receptor spacing was as follows:

- 25-meter spacing from property boundary to 100 meters from the origin
- 50-meter spacing from beyond 100 meters to 250 meters from the origin

[10] Data retrieved from https://ww2.arb.ca.gov/resources/documents/harp-aermod-meteorological-files, as recommended by Eastern Kern Air Pollution Control District (EKAPCD) staff.

- 100-meter spacing from beyond 250 meters to 500 meters from the origin
- 250-meter spacing from beyond 500 meters to 1,000 meters from the origin
- 500-meter spacing from beyond 1,000 meters to 2,000 meters from the origin

All receptors and source locations were expressed in a UTM NAD 83, Zone 11 coordinate system. AERMAP (Version 18081) was used to calculate the receptor elevations and the controlling hill heights. Terrain in the vicinity of the Project was accounted for by assigning base elevations to each receptor. National Elevation Dataset files from the U. S. Geological Survey were obtained in one arc-second resolution for the 4-kilometer (km) grid. The AERMAP domain was large enough to encompass the 10 percent slope factor required for calculating the controlling hill height.

Source Parameters. The Enterprise Solar Storage Project construction emissions result from construction-related equipment and vehicle combustion as well as fugitive dust emissions. Because the particulate emissions result primarily from fugitive emission processes, the sources were modeled as area sources. Each area source was characterized to have a release height of zero meters (fugitive emissions are generated on the ground surface) with an initial vertical dimension of 2.3 meters, calculated as the height of a typical construction equipment of 5 meters divided by 2.15 as per EPA Guidance (EPA 2017). The Project was split up amongst a total of 7 parcels, each representing an area in which daily construction activities would likely occur.

Maximum calculated daily mitigated emissions, excluding offsite contributions, were assigned to each of these individual project parcels, assuming maximum daily activities as it relates to particulate emissions could occur within each single parcel at any given time. Note that emissions assigned to the parcel associated with the Windhub Substation excluded emissions associated with onsite crew trucks and offroad haul trucks (i.e., general management activities), assuming workers would not be shuttled between construction areas and that material imports/exports would be limited in this area. Additionally, each source was modeled using the HROFDAY factor in AERMOD to reflect construction activities occurring for only eleven hours per day from 7 am to 6 pm. The layout of the Project parcels for this modeling analysis are included in Figure C.2.

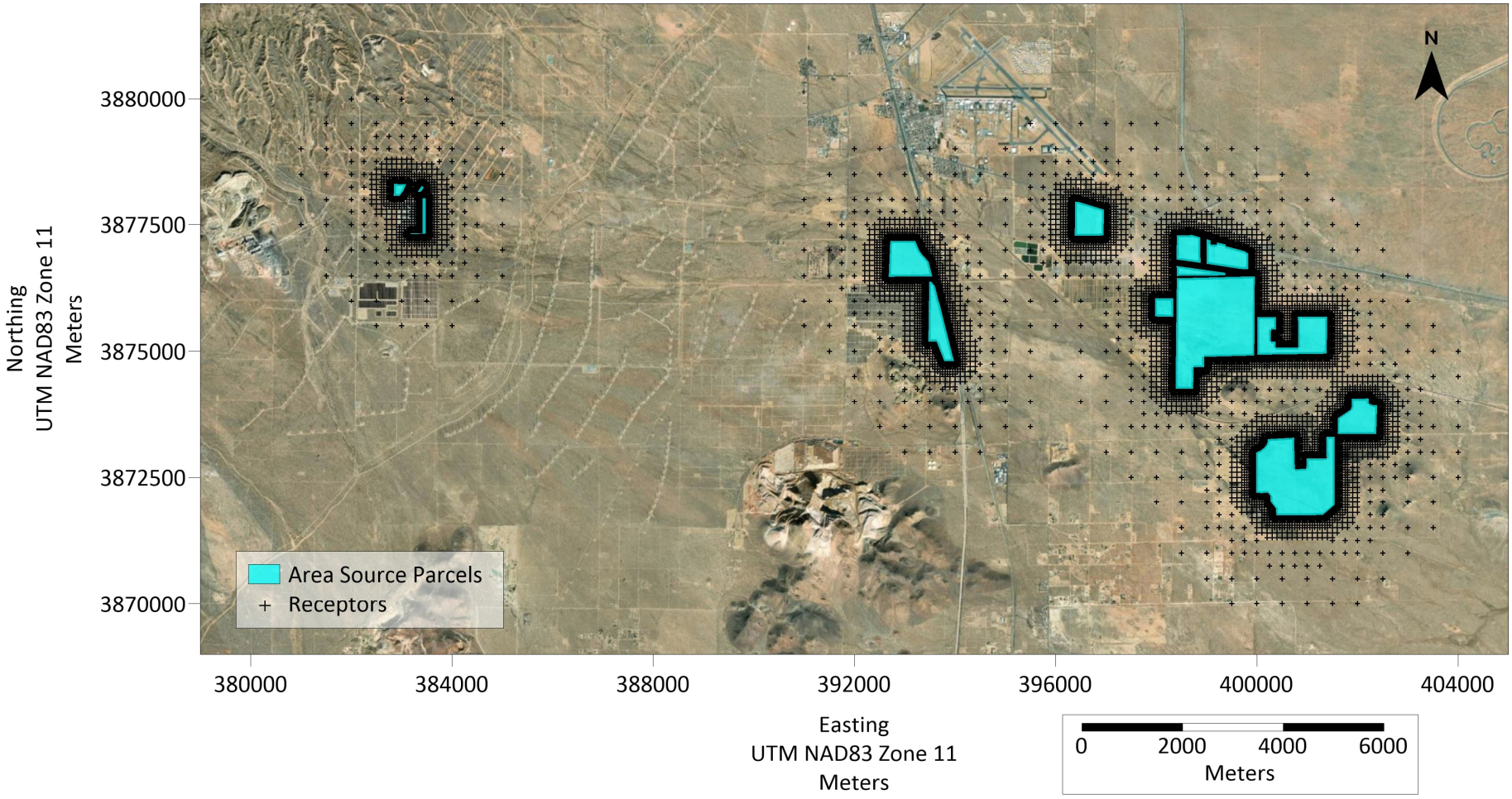

Figure C.2. Project Modeled Parcels

C.2 Screening Health Risk Assessments

Following the same rationale as that listed in Section C.1, a screening HRA was conducted to determine DPM health risks associated with the 28-month construction period and annual operations for the Enterprise Solar Storage Project. The model selection, model options, meteorological data, and grid receptor spacing used were the same as described above in Section C.1. The AERMOD output (maximum ground-level concentrations), along with equations from the *Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments* (OEHHA 2015), were used to estimate the cancer and chronic non-cancer health risks for residential and worker exposure to mitigated DPM emissions. As previously mentioned, there are no acute non-cancer risks associated with DPM. The source parameters used for modeling in AERMOD and the health risk calculations, specific to the screening HRAs, are described below.

Construction Source Parameters. During construction of the Enterprise Solar Storage Project, DPM is expected to be emitted by diesel-fueled construction equipment exhaust and diesel-fueled onsite vehicle exhaust. DPM was assumed to be best represented by PM_{10} emitted as a result of diesel fuel combustion. Therefore, fugitive dust emissions were excluded, as they are not expected to include DPM. Offsite contributions of PM_{10} resulting from on-road vehicle travel were excluded as they are not expected to significantly contribute to localized impacts of DPM. For modeling, these emissions were averaged over the construction period (28 months) and spatially distributed within the construction areas as area sources. Each area source was characterized to have a release height of 2.5 meters (mid-point of typical construction equipment height) with an initial vertical dimension of 1.15 meters, calculated as the delta of the height of a typical construction equipment of 5 meters and the release height (2.5 meters) divided by 2.15 as per EPA Guidance (EPA 2017). Additionally, each source was modeled using the HROFDAY factor in AERMOD to reflect construction activities occurring for only eleven hours per day from 7 am to 6 pm.

Operational Source Parameters. During Project operations, DPM is expected to be emitted by diesel-fueled emergency generators, which may operate approximately 50 hours per year per engine for maintenance and testing purposes. DPM was assumed to be best represented by PM_{10} emitted as a result of diesel fuel combustion. Each generator point source was characterized to have a stack height of 2.22 meters, an exhaust flow of 2.85 cubic meters per second, a stack diameter of 0.15 meters, and annual emissions averaged over 8,760 hours per year. The locations of each engine were estimated and may be subject to change as design progresses. Other smaller natural gas-fueled emergency generators and operational vehicles were not included in this screening HRA as their toxic emissions are assumed to be negligible.

Construction Health Risk Estimates. The construction screening HRA conservatively estimated the 28-month construction duration with the 36-month (three year) rolling cancer risks, during a possible 30-year exposure duration (starting with exposure during the third trimester) for residential exposure and a 25-year exposure duration (from age 16 to 40) for worker exposure at the point of maximum impact (PMI), maximally exposed individual resident (MEIR), maximally exposed individual worker (MEIW), and maximally exposed individual sensitive receptor. To determine the 36-month rolling cancer risks, cancer risk for each year in each age bin was first calculated for the duration of each exposure analysis (30 years for residential exposure and 25 years for worker exposure). The maximum 3-year sum (i.e., 36-month sum) within this exposure duration was used for comparison to the significance thresholds. The sensitive receptor was assumed to be any receptor within the 2 km perimeter gridded cartesian receptors. The excess cancer risks were estimated using the following:

- Equations 5.4.1.1 and 8.2.4A from the *Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments* (OEHHA 2015) for residential exposure

- Equations 5.4.1.2A, 5.4.1.2B, and 8.2.4B from the *Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments* (OEHHA 2015) for worker exposure
- The maximum annual ground-level concentrations used to estimate risk were determined through dispersion modeling with AERMOD

Chronic risks were also estimated for the PMI, MEIR, MEIW, and maximally exposed individual sensitive receptor, based on the same emission rates and ground-level concentrations described above. To calculate chronic risk, as characterized by a hazard index, the maximum annual ground-level concentration, determined through scaling of the unit emission rate dispersion modeling with AERMOD, was divided by the DPM Reference Exposure Level (REL) of 5 micrograms per cubic meter ($\mu g/m^3$) (OEHHA and CARB 2020).

Operation Health Risk Estimates. The operation screening HRA estimated rolling cancer risks during a possible 30-year exposure duration (starting with exposure during the third trimester) for residential exposure and a 25-year exposure duration (from age 16 to 40) for worker exposure at the PMI, MEIR, MEIW, and maximally exposed individual sensitive receptor. To determine the rolling cancer risks, cancer risk for each year in each age bin was first calculated for the duration of each exposure analysis (30 years for residential exposure and 25 years for worker exposure). The maximum 30/25-year sums within this exposure duration was used for comparison to the significance thresholds. The sensitive receptor was assumed to be any receptor within the 2 km perimeter gridded cartesian receptors. The excess cancer risks were estimated using the same methodology presented above for the construction health risk analysis.

Chronic risks were also estimated for the PMI, MEIR, MEIW, and maximally exposed individual sensitive receptor, based on the same emission rates and ground-level concentrations described above. To calculate chronic risk, as characterized by a hazard index, the maximum annual ground-level concentration, determined through scaling of the unit emission rate dispersion modeling with AERMOD, was divided by the DPM REL of 5 $\mu g/m^3$ (OEHHA and CARB 2020).

C.3 References

Kern County Planning and Natural Resources Department (Kern County). 2006. *Guidelines for Preparing an Air Quality Assessment For Use in Environmental Impact Reports*. December.

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Appendix D
Potential Cumulative Source List

Appendix D, Table 1D
Potential Cumulative Source List
TGP Enterprise Solar Storage Project

Project Name	Applicant	CEQA	Case Number	Cons	Acres	MW	Location	Deemed Complete	Approved	Substation	Region	Contact Name	Contact Phone	Distance From Enterprise Project
Alta Solar PV & Storage Project	Alta Solar PV & Storage LLC	EIR (assumed)	Not assigned	Tetra Tech	5,900	1,000	6 miles southwest of the community of Mojave	N/A	N/A	Windhub	desert	Simon Day	(415) 404 0807	Within 6 miles
Galaxy Solar Storage	Galaxy Solar Storage LLC	EIR (assumed)	Not assigned	Tetra Tech	3,500	600	6 miles southeast of the community of Mojave	N/A	N/A	Windhub	desert	Simon Day	(415) 404 0807	Within 6 miles
Redwood Solar	8 Minute Energy Renewables	EIR	CUP, ZCC, GPA, Map 125	ESA		135	South of Highway 58, along north side of Muller Road, between Tower Line Rd and Tejon Highway; APN's 177-220-07, -08.		n/a			Thomas Buttgenbach	(310) 525-0900	Greater Than 6 Miles
Springbok Solar	8 Minute Energy Renewables	Add	ZCC/CUP Maps 133, 134, 152, 153	NA	2,298	150	Sects: 26 & 27 T.30S, R.37E MDB&M; 32 & 33 T.30S, R.38E; 12 T.31S, R.37E		Yes	Barren Ridge	desert	Alexander Sundquist	(424) 234-6947	Greater Than 6 Miles
RE Astoria Solar	Recurrent (RE Astoria LLC)	EIR	CUP 10, Map 233	ICF	1,501	175	Astoria Dr, 180th St, Ave A, and 205th Str, Willow Springs area	01/25/2013	n/a	Whirlwind	desert	Seth Israel	(415) 675-1500	Greater Than 6 Miles
Monte Vista Solar Array	First Solar	EIR	GPA 24, ZCC 45, CUP 29, Map 196	ESA	1,040	126	Southeast of Mojave	08/25/2009	n/a	Windhub	desert	Jack Pigott	(415) 935-2500	Within 6 Miles
Rosamond Solar Array	First Solar	EIR	GPA 14, ZCC 31, CUP 25, Map 232	ESA	1,177	155	West of Rosamond	12/29/2009	n/a	Whirlwind	desert	Jack Pigott	(415) 935-2500	Greater Than 6 Miles
Willow Springs Solar Array	First Solar	EIR	GPA 15, ZCC 32, CUP 26, Map 232	ESA	1,402	160	Northwest of Rosamond	12/29/2009	n/a	Whirlwind	desert	Jack Pigott	(415) 935-2500	Greater Than 6 Miles
Kingbird Solar	First Solar	EIR	SPA 3/ZCC 16 /CUP 9 Map 233	ESA	324	40	NW Corner of 170th Street West and Avenue A	01/25/2012	n/a	Whirlwind	desert	Jack Pigott	(415) 935-2500	Greater Than 6 Miles
Oro Verde Solar	FRV EAFB Solar Holdings LLC	EIR/ EIS	Franchise agreement	ESA			Edwards AFB		n/a	unknown	desert	Christina Wolf	(415) 483-5509	Within 1 Mile
FRV Mojave Solar Project	FRV Mojave Solar, LP	EIR	SPA 24, ZCC 56, CUP 62, Map 213	ICF	174	20	APN 431-010-02 & 431-030-02 SEC of Sierra Highway & Sopp Road	04/12/2011	n/a	Windhub	desert	Mark Higgins	(415) 229-8816	Within 6 Miles
Morelos Del Sol	Gestamp Asetym Solar North America, Inc.	EIR	CUP 6, Map 3	ICF	138	15	APN 043-330-06	06/14/2013	n/a	Twisselman	valley	Francisco Sanchez	(559)-430-4775	Greater Than 6 Miles
Castor Solar Project	Green Light Energy Corp	EIR	CUP 5, Map 139-22	ICF	12	1.5	APN 298-150-23 ;South of Dustin Acres Road and approximately 1 mile due east of State Route 119.		n/a	Elk Hills	valley	Jamie Nagel	(916) 985-9461	Greater Than 6 Miles
Kern Solar Ranch	Kern Solar Ranch, LLC	EIR	GPA 3/CUP 2, Map 50 GPA 3/CUP 7 Map 5 GPA 1/CUP 1, Map 73 GPA 2/CUP 6, Map 74 GPA 3/CUP 2, Map 50; GPA 3/CUP 7, Map 51; GPA 1/CUP 1, Map 73; GPA 2/CUP 6, Map 74	ICF	6,100	1,000	south of SR 46 and west of SR 33		n/a	new off-site PG&E substation	valley	Charles Gallager	(858) 869-5403	Greater Than 6 Miles
RE Columbia and RE Columbia 2	Recurrent	Add	CUP 31/CUP 32, Map 196 MODIFICATION	NA	476	40	Southeast of Purdy Avenue and Holt Street, South of Mojave	03/02/2013	n/a	Windhub	desert	Charity Wagner	(415) 730-6718	Within 1 Mile
RE Garland	Recurrent	EIR	CUP		2,116	200	Sec 25, 26, 35 and 36 of T9N, R16W; Sec 30, 31, and 32 of T9N, R15W.		n/a	unknown	desert	Aimee Epstein	(415) 501-95-31	Greater Than 6 Miles
RE Clearwater & Yakima	Recurrent (RE Clearwater LLC/RE Yakima LLC)	EIR	CUP 55, Map 196, ZCC 52, Map 196; CUP 12, Map 196-17, ZCC 10, Map 196-17.		432	40	Sects-17 and 20, T11N, R12W SBB&M.		n/a	Windhub	desert	Aimee Epstein	(415) 501-95-31	Within 1 Mile
SEPV Mojave West	SEPV	EIR	ZCC 54, GPA 1, CUP 14, Map 197		230	40	Oak Creek Rd		n/a		desert	David Revelt	(818) 992-3127	Within 6 Miles
Rosamond Solar	SGS	Add		NA	230	40	Oak Creek Rd, Sect 13 & 29 of T.11N, R.13W SBB&M	03/15/2013	n/a		desert			Greater Than 6 Miles
Wasco-Charca Solar	Solar Land Partners	EIR	CUP 14, Map 56	ICF	72	8	Hwy 46, less than ¼ mile east of Hwy 43 and on the border of Wasco's city limits	03/12/2012	n/a	Wasco & Charca	valley	Phillip Millenbah	(415) 246-3000	Greater Than 6 Miles
SLP Solar	Sunlight Partners, LLC	EIR	CUP, Map 230-21; ZCC/CUP, Map 231; ZCC/CUP Map 231-14; ZCC/CUP Map 231-17; ZCC/CUP Map 231-19; ZCC/CUP Map 231-20	ESA	139.88	12-12.5	Near Rosamond Blvd. from Sierra Hwy west to 90th Street West	08/28/2012	n/a	Unknown	Desert	Dustin Thompson	(480) 924-5519	Greater Than 6 Miles
Fremont Valley Preservation Water Bank & Solar Project	Aqua Helio Resources, LLC	EIR	ZCC 3/CUP 1 Map 114; ZCC 13/CUP 13, Map 133; CUP 4, Map 134; CUP 12, Map 152; GPA 2 Map 114; GPA 3, map 133; GPA 2, map 134; GPA 3, Map 152	ESA	4,806	1008	north of SR 58 and east of SR 14, in the Cantil/Rancho Seco area of eastern Kern	03/23/2012	n/a	LADWP Barren Ridge, Yeager, Kramer	desert	Darcie Larman	(661) 834-4814	Greater Than 6 Miles
Blackwell Solar Park	Frontier Renewables	EIR	GPA CUP Map 51, CUP Map 51-6	ICF	476	20	SR 33 south of SR 46	11/30/2012	n/a	Blackwell	valley	Tom Fitzgerald	(650) 539-3380	Greater Than 6 Miles
Isis Solar	Isis Solar, LLC	EIR	CUP, Map 33-1		103	17	S/S of Twisselman Rd, betwn Holloway Rd and West Side Hwy		n/a	unknown	valley	Tim Lasocki	(415) 229-8812	Greater Than 6 Miles
Total MW Pending					32,647	4,990.5								

Appendix E
Biological Resource Reports

Appendix E1
Wildlife Report

Draft Wildlife Report

Enterprise Solar Storage Project
Enterprise Solar Storage, LLC

August 22, 2023



Draft Wildlife Report

Client Name:	Enterprise Solar Storage, LLC		
Project Name:	Enterprise Solar Storage Project		
Project No:	D3390800		
Project Manager:	Jessica Otten		
Revision No:	*[Revision number]*	**Prepared By:**	Morgan King
Date:	August 22, 2023	**File Name:**	Enterprise_Wildlife Report_08-22-2023

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Acronyms and abbreviations

°C	degree(s) Celsius
°F	degree(s) Fahrenheit
AFB	Air Force Base
amsl	above mean sea level
APLIC	Avian Power Line Interaction Committee
BCC	Bird of Conservation Concern
BLM	Bureau of Land Management
CDFG	California Department of Fish and Game
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CNDDB	California Natural Diversity Database
CUP	Conditional Use Permit
DRECP	Desert Renewable Energy Conservation Plan
ESA	Endangered Species Act
Jacobs	Jacobs Engineering Group Inc.
MBTA	Migratory Bird Treaty Act
MM	mitigation measure
MV	Medium voltage
MW	Megawatt
kV	kilovolt(s)
PV	photovoltaic
Project	Enterprise Solar Storage Project
SCE	Southern California Edison
SR	State Route
SSC	Species of Special Concern
USFWS	U.S. Fish and Wildlife Service
WL	Watch List

1. Introduction

This Wildlife Report presents the methods and results of a biological survey at the Enterprise Solar Storage Project (Project), which is a proposed photovoltaic (PV) solar and energy storage facility in southeastern Kern County, California (Figure 1-1; figures are located at the end of each section).

The focus of the survey was for Jacobs Engineering Group Inc. (Jacobs) biologists to determine the presence or absence of federally and state-listed desert tortoise (*Gopherus agassizii*) in the Project site (proposed facility). In the process of surveying for desert tortoise, biologists assessed potentially suitable habitat for other special-status wildlife known to occur in the Project vicinity[1], including, but not limited to, American badger (*Taxidea taxus*), burrowing owl (*Athene cunicularia*), desert kit fox (*Vulpes macrotis arsipus*), Mohave ground squirrel (*Xerospermophilus mohavensis*), and Swainson's hawk (*Buteo swainsoni*). In conclusion, desert tortoise may be present at the Project site based on the discovery of a Class 4 burrow. However, no live desert tortoise or definite desert tortoise signs were observed. Seven other special-status species were incidentally observed during the April 2021 and May 2022 survey.

1.1 Project Description

Enterprise Solar Storage, LLC (Enterprise Solar or Applicant) is proposing to construct the Project (Figure 1-2). The proposed Project consists of a PV solar energy generation facility with battery energy storage capacity. The Project includes approximately 600-megawatts (MW) of solar energy and up to 4 gigawatt-hours of battery energy storage capacity. The Project is located on approximately 2,300 acres (931 hectares) adjacent to the County-approved Sanborn Solar Project that is currently under construction.

The Project will interconnect to the Windhub Substation, which is owned and operated by Southern California Edison (SCE). The interconnect will be via a newly constructed gen-tie line that will be co-located within a portion of the Sanborn Solar gen-tie corridor (which was reviewed for California Environmental Quality Act [CEQA] purposes by the Kern County Planning and Natural Resources Department as part of the Sanborn Solar Conditional Use Permit in 2019) to the Windhub Substation. A new 230 kilovolt (kV) to 500 kV substation, up to 15 acres (6 hectares) in size, would be constructed north of the Windhub Substation on private land and would interconnect to SCE's facilitates from the north.

The Project is requesting CEQA coverage for additional substation areas and an alternate gen-tie line route that may extend from the new substation to the southern portion of the Windhub substation along the eastern perimeter. Additionally, SCE would relocate approximately 1 mile (1.6 kilometer) of existing 66 kV Coram-Goldtown transmission line to avoid interrupting the Project solar array. The Project would not physically interconnect into this line.

1.1.1 Project Features

This section defines each of the Project features. For the purposes of this report, the Project site was separated into four areas defined as Eastern, Northern, Southern, and Western segments (Figures 1-1 and 1-2). The medium voltage (MV) collection line connects the Northern, Eastern, and Southern Project segments. The gen-tie line connects the Project to the Windhub substation. The Project would use four temporary laydown yards. Table 1-1 provides Project features acreages or linear distances.

[1] Project vicinity is defined as within a 5-mile (8-kilometer) distance from the Project site or within western Antelope Valley.

Table 1-1. Project Feature Acreages

Project Feature[a]	Acres (Hectares) or Linear Miles (Kilometers)
Project site, Enterprise Solar Storage Project (Project). For the purposes of this report the Project site was separated into four areas defined as Eastern, Northern, Southern, and Western Segments.	Approximately 2,282 acres (924 hectares)[b]
Gen-tie line	Approximately 11 miles (19 kilometers)[c]
MV connection line	Approximately 3 miles (5 kilometers)[c]
Temporary laydown yards (four)	Approximately 23 acres (9 hectares)
Additional 230kV substation area	Approximately 30 acres (12 hectares)

[a] Wildlife surveys on all Project features were conducted in 2021, 2022 and are scheduled for 2023.

[b] A 29-acre (12 hectare) area of the Project site was not surveyed in 2021 or 2022. Surveys scheduled for 2023 include this area.

[c] Does not include Project acreage that overlaps with either the Sanborn Solar or the Enterprise Solar Storage projects.

1.2 Project Location

The Project is located in an unincorporated area in southeastern Kern County, California, at the western edge of the Antelope Valley and south of the community of Mojave, as shown on Figure 1-1. The Project is generally located on undeveloped land, some of which has been used for grazing, and consists entirely of privately owned parcels. The Project lies within the Bissell, Mojave, and Sanborn U.S. Geological Survey 7.5-minute quadrangles:

- Section 6, Township 10 North, Range 11 West
- Sections 20–26, Section 28 and Section 36, Township 11 North, Range 12-13 West
- Section 30 and Section 32, Township 11 North, Range 11 West

The Project is south of State Route (SR)-58 and the Mojave Air and Space Port, and north of Edwards Air Force Base (AFB). A network of unnamed dirt roads surround the Project.

The Project site consists of four areas: Western, Eastern, Northern, and Southern (Figure 1-1). The Western area of the Project is directly west of SR-14 east of 25th Street West, south of Camelot Boulevard, and generally north of Purdy Avenue with one small portion extending south of Purdy Avenue and north of Sunset Avenue. The Northern area is directly south of SR-58, generally west of 10th Street, and north of Purdy Avenue. The Eastern area is east of 10th Street, south of SR-58, and north of Silver Queen Road. The Southern area is south of the Burlington Northern Santa Fe Railway, and a large portion of the area is located south of Silver Queen Road. This Southern area is bordered to the south and west by the County-approved Sanborn Solar project. Medium voltage transmission lines, primarily underground, would connect the Southern area to the Eastern area plus the area west of 10th Street to the area east of 10th Street and would culminate at a 230-kV collector substation located in the Eastern area located near the alignment of Purdy Avenue and 10th Street (Figure 1-1). A battery energy storage facility would be sited adjacent and north of this collector substation in the Eastern area. A second collector substation/high voltage facility area would be located on the Western area north of Purdy Avenue and west of SR-14. A battery energy storage facility may be sited adjacent to this second collector substation as well.

1.3 Regulatory Framework

This section describes the laws, ordinances, regulations, and standards that apply to biological resource protection for the Project site. This section also describes standards that apply to the methods used to evaluate the potential presence of special-status species and the potential adverse impacts on biological resources that could occur with implementation of the proposed Project. This section also lists the agencies responsible for enforcing the regulations.

1.3.1 Federal Laws, Ordinances, Regulations, and Standards

National Environmental Policy Act (NEPA) (Section 102 of Title I) requires federal agencies to assess the environmental effects of their proposed actions prior to making decisions. Using the NEPA process, agencies evaluate the environmental and related social and economic effects of their proposed actions. Agencies also provide opportunities for public review and comment on those evaluations. The U.S. Environmental Protection Agency oversees implementation of the NEPA. NEPA requires that the effects of a project on environmental and related social and economic resources must be analyzed and assessed using criteria determined by the lead Federal agency.

Federal Endangered Species Act (ESA) (16 *United States Code* Section 1531 et seq.) Section 9 prohibits the "take" of species listed as endangered or threatened under ESA. "Take" is defined by regulation as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct." "Harm" is further defined by the U.S. Fish and Wildlife Service (USFWS) to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. "Harass" is defined by USFWS as intentional or negligent actions that create the likelihood of injury to listed species by annoying them to such an extent as to significantly disrupt normal behavioral patterns that include, but are not limited to, breeding, feeding, or sheltering. "Incidental take" is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity.

Although the "take" of a listed species is prohibited under ESA Section 9, incidental take authorization may be obtained pursuant to ESA Section 7 or Section 10. Species that are not listed are not protected by ESA, even if they are candidates for listing; however, USFWS advises that a candidate species (as well as species of concern) could be elevated to listed status at any time; therefore, applicants should regard these species with special consideration.

Migratory Bird Treaty Act (MBTA) (16 *United States Code* Sections 703 through 711) protects all migratory birds, including nests and eggs. The USFWS enforces the MBTA.

Bald and Golden Eagle Protection Act (16 *United States Code* Section 668) specifically protects bald and golden eagles from harm or trade in parts of these species. The USFWS enforces the Bald and Golden Eagle Protection Act.

1.3.1.1 Habitat Conservation Plans

West Mojave Plan is a federal land use plan amendment that (1) presents a comprehensive strategy to conserve and protect the desert tortoise, the Mohave ground squirrel and nearly 100 other sensitive plants and animals and the natural communities of which they are a part, and (2) provides a streamlined program for complying with the requirements of the California Endangered Species Act (CESA) and ESA (BLM 2005). The 9,359,070-acre (3,787,487 hectare) planning area is located to the north of the Los Angeles metropolitan area. The Plan's conservation program applies to both public and private lands within this area. These lands include 3,263,874 acres (1,320,845 hectares) of Bureau of Land Management (BLM)-administered public lands, 3,029,230 acres (1,225,888 hectares) of private lands and 102,168 acres (41,345 hectares) of lands administered by the State of California. The BLM adopted the West Mojave Plan as an amendment to the California Desert Conservation Plan Area in 2006. The habitat conservation plan portion of the West Mojave Plan is not yet complete (BLM 2006). The Project is within the boundaries of the West Mojave Plan.

Desert Renewable Energy Conservation Plan (DRECP) was developed as a Habitat Conservation Plan/Natural Community Conservation Plan and a BLM Land Management Land Use Plan Amendment covering both public and private lands across seven counties, including the Mojave Desert in Kern County (CEC et al. 2014). The Project is within the boundaries of the DRECP.

Although the Project is within the boundaries of both the West Mojave Plan and the DRECP, these plans do not apply to private lands in Kern County. The Project is not within any other local, or state conservation planning areas.

1.3.2 State Laws, Ordinances, Regulations, and Standards

California Endangered Species Act (CESA) (Fish and Game Code Section 2050 et seq.) states that species listed as threatened or endangered in California cannot be "taken" or harmed unless such "take" is authorized pursuant to an incidental take permit. "Take" currently is defined as to doing or attempting to do the following: hunt, pursue, catch, capture, or kill a member of a listed species.

Fish and Game Code Section 3503 states that it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto.

Fish and Game Code Section 3503.5 protects all birds of prey and their eggs and nests.

Fish and Game Code Section 3511 describes bird species, primarily raptors, that are "fully protected." Fully protected birds may not be taken or possessed, except under specific permit requirements.

Fish and Game Code Section 3513 makes it unlawful to take, possess, or destroy any birds of prey or to take, possess, or destroy the nest or eggs of any such bird.

Fish and Game Code Sections 4700, 5050, and 5515 list mammal, amphibian, and reptile species that are fully protected in California.

Fish and Game Code Sections 1601 through 1607 prohibit the alteration of any stream or lake, including intermittent and seasonal channels and many artificial channels, without a Streambed Alteration Agreement from the California Department of Fish and Wildlife (CDFW) (formerly the California Department of Fish and Game [CDFG]). This applies to any channel modifications that would be required to meet the drainage, transportation, or flood control objectives of a project.

Title 14, California Code of Regulations (Sections 670.2 and 670.5) lists animals designated as threatened or endangered in California. California "Species of Concern" is a category conferred by CDFW on those species that are indicators of regional habitat changes or considered potential future protected species. California Species of Special Concern (SSC) do not have any special legal status but CDFW takes these species into special consideration when decisions are made concerning the future of any land parcel.

California Environmental Quality Act (CEQA) (Public Resources Code Section 15380) defines "rare" in a broader sense than the CESA and CDFW definitions of threatened, endangered, or SSC. Under this definition, CDFW can request the additional consideration of species not otherwise protected. CEQA requires that the effects of a project on environmental resources must be analyzed and assessed using criteria determined by the lead agency.

1.3.3 Local and Other Jurisdictions' Laws, Ordinances, Regulations, and Standards

Certain uses of land or types of businesses specified in the Kern Community Zoning Ordinance require a CUP (Kern County 2020b). A CUP application requires a public hearing before the Kern County Planning Commission. Conditions of approval are approved with the permit and must be satisfied before the building permits can be issued or the land use otherwise begins. For some projects, CEQA requires that an environmental study be prepared for which a CUP is needed. The study can take the form of a Negative Declaration, a Mitigative Negative Declaration, or an Environmental Impact Report.

1.4 Environmental Setting

The Project is in the central Mojave Desert physiographic province, an area characterized by alluvial basins between mountain ranges. Mountaintops in the region have eroded, exposing outcrops of bedrock, while the land in between consists of a variety of coarse and fine sediment materials.

The Project site is generally located approximately 5 miles (8 kilometers) southeast of the Tehachapi Mountains and 15 miles (24 kilometers) north of the San Bernardino Mountain Range. Elevations within the Project site range from approximately 2,510 feet (765 meters) above mean sea level (amsl) and 2,760 feet (841 meters). The Project occurs in the Bissell, Mojave, Monolith, and Sanborn U.S. Geological Survey quadrangles (Figure 1-2).

Soils commonly occurring in the region include coarse materials derived from mountainous rock and finer materials located on the valley floors. Soils on the alluvial fans along the bases of mountain ranges (upper bajadas, which are broad alluvial slopes) consist of coarse gravels that change to loamy gravels toward the toe of alluvial fans. Soils on the lower bajadas include sandy loams and finer loamy materials. There are four main soil types within the Project site: Garlock loamy sand, Rosamond clay loam, Cajon-Garlock sand, and Cajon loamy sand (NRCS 2021). The Project site occurs mostly in soils considered suitable habitat for the desert tortoise. Soils within the Project site have been previously disturbed by grazing.

Precipitation levels at the Project site and the surrounding region are highly variable and average approximately 6 inches (15 centimeters) annually. Most of the precipitation falls between November and April, originating from large-scale Pacific storm systems, while the remainder is generated primarily by high-intensity monsoonal thunderstorms during the summer months. The monthly average maximum temperature within the Project site is 98 degrees Fahrenheit (°F) (36 degrees Celsius [°C]) and the minimum mean temperature is 50°F (10°C) (WRCC 2021).

1.4.1 Wildlife Movement Corridors

Wildlife movement corridors, also referred to as dispersal corridors or landscape linkages, are generally defined as linear features along which animals can travel from one habitat or resource area to another. The Project does not lie within a recognized wildlife connectivity area as mapped by the *California Essential Habitat Connectivity Project* (Spencer et al., 2010) or *A Linkage Network for the California Deserts* (Penrod et al. 2012). *A Linkage Network for the California Deserts* is a report used in DRECP analysis that mapped habitat linkages and wildlife movement corridors (Penrod et al. 2012). According to that report, the Project is not within South Coast Missing Linkages Wildlife Corridors or Desert Linkage Networks (Penrod et al. 2012). The closest linkage network is northeast of the Project and connects landscape blocks of Edwards AFB and the southern Sierra Nevada. According to the *California Essential Habitat Connectivity Project* the Project site is not within any Essential Connectivity Areas (Spencer et al., 2010). The closest Essential Connectivity Area is northwest of the Project along the Tehachapi Mountains. Therefore, the Project is located adjacent to, but outside of, identified essential regional wildlife linkages.

The Project vicinity is largely undeveloped with an open landscape; thus, wildlife can move relatively freely throughout the area. In addition, wildlife can utilize dirt roads within the Project to move throughout the area. Constraints to wildlife movement include railroads, SR-14, SR-58, other paved roads such as Oak Creek Road, wind turbines, and scattered rural residences (Figures 1-1 and 1-2). While these features may constrain wildlife movement, the low traffic volume, along with light human presence, does not likely preclude wildlife from moving through the Project site and surrounding areas. Fencing along the boundary of Edwards AFB also provides a constraint south of the Project, although may not be an impassable obstacle for many species of wildlife.

In the larger context, the Project lies on the western edge of the Antelope Valley, on lands that gradually slope downward from the northwest to the southeast. Topography of the area is relatively flat as the Project site is south of the Tehachapi Mountains, with the exception of scattered hills in the surrounding area up to approximately 200 feet (61 meters) in height. Movement of terrestrial animals is likely scattered and spread throughout the entire area. While migratory birds overfly the Antelope Valley, there

are no significant stopover sites in the Project vicinity, as there are no riparian habitats or water bodies with abundant resources to attract concentrations of birds.





Legend

- Enterprise Solar Storage Project
- Generator Tie-Line
- MV Collection Line

Basemap Source: Esri World Street Map

0 1 2 3
Miles

N

Figure 1
Project Vicinity
Enterprise Solar Storage Project
Enterprise Solar Storage, LLC
Kern County, California

Jacobs

\\Dc1vs01\gisproj\T\Terragen\D3390900_Sagebrush\MapFiles\Sanborn\Enterprise\Land_Use\Figure_1_230327.mxd

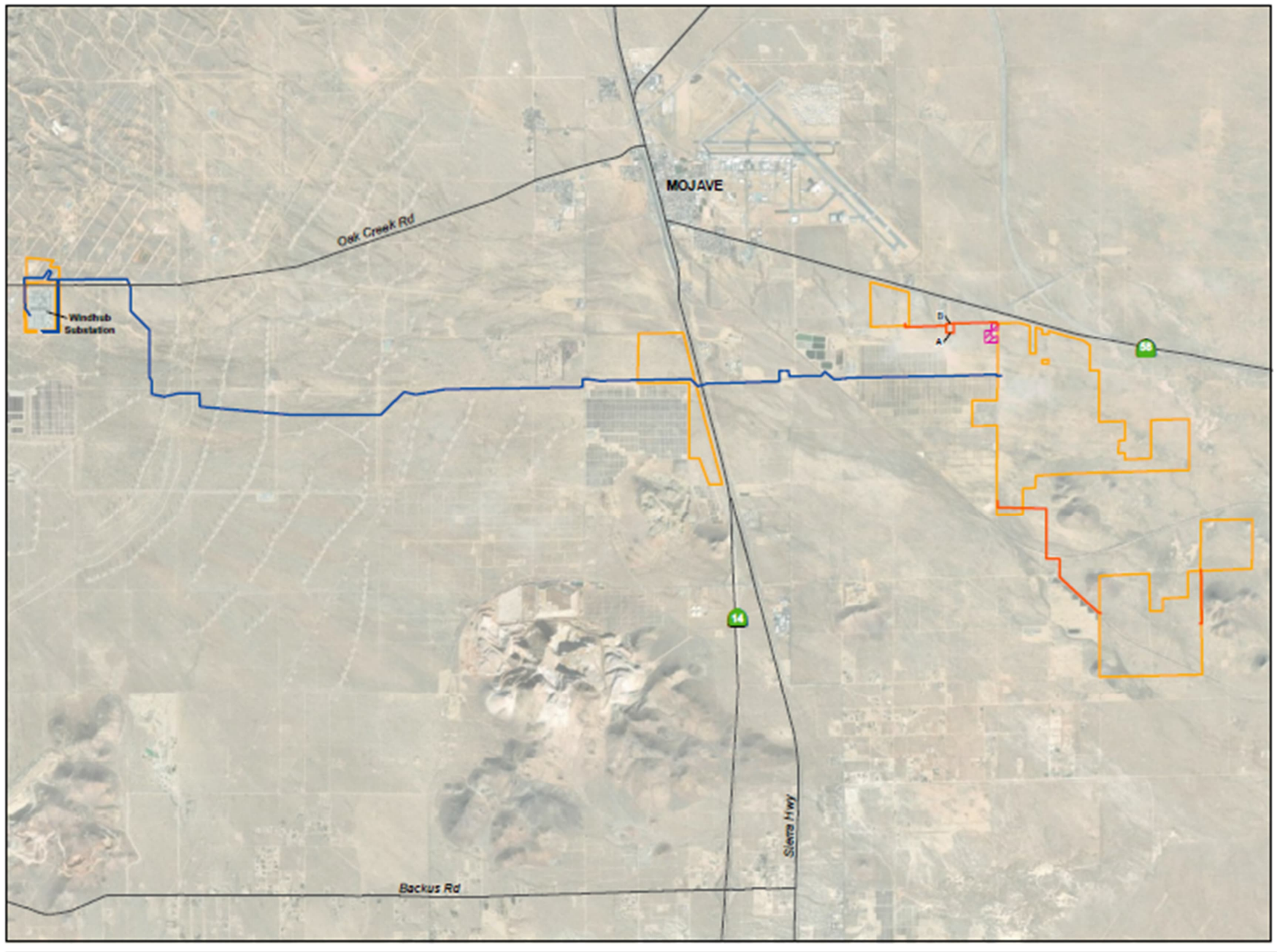


Figure 1
Project Site
Enterprise Solar Storage Project
Enterprise Solar Storage, LLC
Kern County, California

Jacobs

2. Methods

2.1 Introduction

Jacobs biologists conducted biological surveys of the Project features in April 2021 and May 2022 (Figure 1-2). In April 2021, biologists surveyed 2,159 acres (874 hectares) of the Project site. In May 2022, biologists surveyed 104 acres (42 hectares) including temporary laydown yards and areas that were added to the Project site (Figure 1-2). The survey focused on a protocol-level desert tortoise presence or absence survey, determining potentially suitable habitat for special-status wildlife species that could occur within the Project site, and describing the habitat of the Project site.

Prior to finalizing engineering design of the Project, additional biological surveys may be required for areas where Project boundaries may have shifted, or ancillary facilities have been sited since Project surveys were conducted. Additional biological surveys would be conducted, as needed, in 2023 for any Project features that were not previously surveyed (including linear features). Results of any additional investigations would be provided as an addendum to this report.

2.2 Survey Preparation

2.2.1 Pre-field Research and Literature Review

Pre-field reviews were conducted to determine wildlife species that are known to occur in the area and the potential presence of suitable habitat for special-status wildlife species. Existing environmental documents, planning or technical reports, government publications, and other published materials with information relevant to biological resources in the region or the Project site were collected and reviewed, and are summarized herein. For each potentially occurring species, information was compiled on conservation status, distribution, habitat characteristics, known presence in the Project vicinity, and potential to occur in the Project site (Figure 2-1 and Appendix A).

For the purposes of this report, a wildlife species was considered special-status if it met one or more of the following criteria:

- Species listed or proposed for listing as threatened or endangered, or are candidates for possible future listing as threatened or endangered, under the ESA or the CESA.
- Species that meet the definitions of rare or endangered under CEQA Guidelines Section 15380.
- Species covered under an adopted Natural Community Conservation Plan/Habitat Conservation Plan.
- Wildlife designated by the CDFW as “species of special concern” or “special animals.”
- Wildlife “fully protected” in California (Fish and Game Code Sections 3511, 4700, and 5050).
- Wildlife species protected as “fur-bearing mammals” (Fish and Game Code Section 4000 et seq.).
- Avian species protected by the MBTA and California Fish and Game Code (Sections 3500–3516).

During the literature review, the California Natural Diversity Database (CNDDB) was queried for known occurrences of special-status wildlife species within 5 miles (8 kilometers) of the Project site. Based on results of CNDDB query, 38 special-status wildlife species were identified and assessed for their potential to occur in the Project site (Figure 2-1 and Appendix A).

2.2.2 Potentially Present Special-status Species

Appendix A provides a list of the 38 special-status species that were considered for their potential to occur in the Project site and assessed for the likelihood of occurrence. The 38 special-status wildlife species include 2 amphibians and reptiles, 22 birds, and 14 mammals. The biological resource survey focused on

desert tortoise and the habitat assessment of several wildlife species, including, but not limited to, American badger, burrowing owl, desert kit fox, Mohave ground squirrel, and Swainson's hawk. Several of the wildlife species that were assessed for their potential to occur in the Project site are described in Sections 2.2.2.1 through 2.2.2.3.

2.2.2.1 Amphibians and Reptiles

Desert Tortoise

The Mojave population of the desert tortoise was listed as threatened under ESA in 1990 and threatened under CESA in 1989 (USFWS 1990; CDFW 2022). This listing occurred because of continued human-caused habitat destruction through urban expansion, off-road vehicle use, illegal collection for the pet trade, and common raven (*Corvus corax*) predation on juvenile tortoises. On October 19, 2020, California Fish and Game Commission declared this species a candidate for listing as CESA endangered (CFGC 2020).

The desert tortoise is a large, herbivorous reptile that occurs in southeastern California, southern Nevada, southwestern Utah, and northwestern Arizona. Desert tortoises most commonly occur within the desert scrub vegetation type. Optimal habitat for the desert tortoise has been characterized as creosote bush (*Larrea tridentata*) scrub where annual precipitation ranges from 2 to 8 inches (5 to 20 centimeters), where a diversity of perennial plants is relatively high, and production of ephemerals is high (Luckenbach 1982; Turner 1982; Turner and Brown 1982). Soils must be friable enough for digging burrows but firm enough so that burrows do not collapse. Desert tortoises occur from below sea level to an elevation of 7,300 feet (2,225 meters) amsl, but the most favorable habitat occurs at elevations of approximately 1,000 to 3,000 feet (305 to 914 meters) amsl (Luckenbach 1982). Throughout most of the Mojave region, desert tortoises occur most commonly on gently sloping terrain with sandy-gravel soils and scattered shrubs, and where there is abundant inter-shrub space for growth of herbaceous plants. Throughout their range, however, tortoises can be found in steeper, rockier areas (Gardner and Brodie 2000). The desert tortoise is most active in the spring, summer, and autumn when daytime temperatures are below 95°F (35°C).

The Project site is not within USFWS designated desert tortoise critical habitat. The Project site is located at the western edge of the species' range and suitable habitat for desert tortoise is present in the Project site. There are several CNDDB records of this species within a 5-mile (8 kilometer) radius of the Project site (Figure 2-1). Based on CNDDB records, the presence of suitable habitat, and the species' known distribution, desert tortoise may be present within the Project site (Appendix A).

2.2.2.2 Birds

Burrowing Owl

The burrowing owl is a CDFW SSC, USFWS Bird of Conservation Concern (BCC; USFWS 2021; CDFW 2022) and is protected by the MBTA. This ground nesting raptor occupies burrows in open, dry grasslands, agricultural and range lands, and desert habitats. They have been known to inhabit golf courses, airports, cemeteries, vacant lots, and road embankments, wherever there is sufficient friable soil for a nesting burrow. In addition to burrows, the owls also require perching locations and frequently use fence posts or the tops of mounds outside the burrow. Burrowing owls typically use burrows created by other animals. There are several records of this species within a 5-mile (8 kilometer) radius of the Project site (Figure 2-1). The Project site has suitable habitat for burrowing owl (Appendix A).

Cooper's Hawk

The Cooper's hawk (*Accipiter cooperii*) is on the CDFW Watch List (WL) for nesting (CDFW 2022) and included in the MBTA. This species nests in wooded areas in southern California including Sierra Nevada foothills, New York Mountains, and Owens Valley from 0 to 9,000 feet (0 to 2,700 meters) amsl. Typical

nesting sites include dense oak, deciduous riparian, and other forest habitats near water. No suitable nesting sites are present in the Project site. There are no CNDDB occurrences of this species within 5 miles (8 kilometers) of the Project site (Figure 2-1). Cooper's hawk has suitable foraging habitat in the Project site (Appendix A).

Golden Eagle

The golden eagle (*Aquila chrysaetos*) is a fully protected species in California, is on the CDFW WL, and is considered a USFWS BCC (CDFW 2022). The fully protected status is the State of California's initial effort to identify and provide additional protection for animals that are rare or face possible extinction. This species is also protected by the Bald and Golden Eagle Protection Act and the MBTA. The species is an uncommon permanent resident and migrant throughout California and can occur at elevations ranging from sea level up to 11,500 feet (3,505 meters) amsl. Suitable habitat includes rolling foothills, mountain areas, sage-juniper flats, and desert. Golden eagles nest on cliffs and steep escarpments in grassland, chaparral, shrubland, forest, and other vegetated areas (Grinnell and Miller 1944). This species is known to occur in the Project vicinity. There is one CNDDB record of this species within a 5-mile (8 kilometer) radius of the Project site (Figure 2-1). There is no suitable nesting habitat on or adjacent to the Project site, but the habitat within the Project site is suitable for foraging (Appendix A).

Ferruginous Hawk

The ferruginous hawk (*Buteo regalis*) is a CDFW WL and USFWS BCC species for the wintering season (CDFW 2022) and included in the MBTA. This species is an uncommon winter resident and migrant at lower elevations and open grasslands in the eastern deserts of California, the Modoc Plateau, the Central Valley, and the Coast Ranges. This species is not known to nest in California. This species frequents open grasslands, sagebrush flats, desert scrub, low foothills surrounding valleys, and fringes of pinyon-juniper habitats. There are no CNDDB occurrences of this species within 5 miles (8 kilometers) of the Project site (Figure 2-1); however, suitable foraging habitat is present in the Project site (Appendix A).

Le Conte's Thrasher

The Le Conte's thrasher (*Toxostoma lecontei*) is a CDFW SSC and USFWS BCC (CDFW 2022) and is protected by the MBTA. This species inhabits open desert wash, desert scrub, alkali desert scrub, and desert succulent scrub habitat. This species commonly nests in dense, spiny shrub or densely branched cactus in desert wash habitat. Several CNDDB observations documented Le Conte's thrasher within the 5-mile (8 kilometer) radius of the Project site (Figure 2-1). Le Conte's thrasher has suitable nesting and foraging habitat in the Project site (Appendix A)

Loggerhead Shrike

The loggerhead shrike (*Lanius ludovicianus*) is a CDFW SSC, USFWS BCC (CDFW 2022), and is protected by the MBTA. This species is relatively common in lowland California and prefers open habitat with scattered shrubs and trees for nesting (Grinnell and Miller 1944). Several CNDDB occurrences documented loggerhead shrike within 5 miles (8 kilometers) of the Project site (Figure 2-1). Loggerhead shrike has suitable nesting and foraging habitat in the Project site (Appendix A).

Northern Harrier

The northern harrier (*Circus hudsonius*) is a CDFW SSC for nesting (CDFW 2022) and included in the MBTA. This species occurs in various habitats but requires water near meadows, grasslands, open rangeland, desert sinks, and fresh and saltwater emergent wetlands up to 10,000 feet (3,000 meters) amsl. This species nests on the ground in shrubby vegetation usually beside marshes. No suitable nesting habitat is present in the Project site. There are no CNDDB occurrences of this species within 5 miles (8 kilometers) of the Project site (Figure 2-1). Northern harrier has suitable foraging habitat in the Project site (Appendix A).

Prairie Falcon

The prairie falcon (*Falco mexicanus*) is on the CDFW WL for nesting, is a USFWS BCC (CDFW 2022), and is included in the MBTA. This species occurs in various habitats ranging from annual grasslands to alpine meadows, but is primarily associated with perennial grasslands, savannahs, rangeland, some agricultural fields, and desert scrub areas. This species nests in cliffs in canyons, escarpments, and rocky outcrops and forages in open habitats. No suitable nesting habitat is present in the Project site. Two CNDDB occurrences of prairie falcon were recorded within 5 miles (8 kilometers) of the Project site, including at the Soledad Mountain area southwest of Project site (Figure 2-1). Suitable nesting is present in the Soledad Mountain area, but disturbance from active gold and silver mining operations limit the likelihood of this species nesting there. Prairie falcons have suitable foraging habitat in the Project site (Appendix A).

Swainson's Hawk

The Swainson's hawk is listed as threatened under CESA (CDFW 2022) and is protected by the MBTA. Swainson's hawk inhabits grasslands with scattered trees, juniper-sage flats, riparian areas, savannahs, and agricultural or ranch lands with groves or lines of trees. In the Antelope Valley, this species is known to use Joshua tree woodlands for nesting (CEC and CDFG 2010). This species requires foraging areas such as grasslands, alfalfa, or grain fields supporting rodent populations. There is suitable foraging and nesting habitat in the Project site (Appendix A). Bloom Biological Inc. conducted Swainson's Hawk protocol surveys in 2023 and their survey results are reported separately.

2.2.2.3 Mammals

American Badger

The American badger is a CDFW SSC (CDFW 2022) and California Fish and Game Code Section 4000 et seq. and CDFW regulations fur-bearing mammal. In California, this species is most abundant in drier open stages of most shrub, forest, and herbaceous habitats with friable soils. American badgers dig burrows for cover and frequently reuse old burrows, although some are known to dig a new burrow each night during the summer. They typically give birth in March and April, and the typical pup-rearing season is from March 15 through July 31. Young are typically born in burrows dug in relatively dry, often sandy soils with sparse overstory vegetation (Zeiner et al. 1990). The Project site has suitable habitat for American badger (Appendix A).

Desert Kit Fox

Desert kit fox is not state or federally listed; however, it is protected under the California Code of Regulations, Section 460, prohibiting the take of desert kit fox at any time, and the California Fish and Game Code Section 4000 et seq. and CDFW regulations as a fur-bearing mammal. Desert kit fox is considered vulnerable to habitat displacement because of the continued expansion of development into its preferred habitat. Desert kit fox generally prefers open desert, shrubby, or shrub-grass habitat. In the Mojave Desert, the species typically occurs in creosote bush vegetation communities. This nocturnal species forages at night and typically resides in a den or burrow during the day (NatureServe 2021). The pup-rearing season for desert kit fox is February 1 through August 1. The Project site has suitable habitat for desert kit fox (Appendix A).

Mohave Ground Squirrel

The Mohave ground squirrel is listed as threatened by the CESA and is restricted to the Mojave Desert in San Bernardino, Los Angeles, Kern, and Inyo Counties, California (Inman et al. 2013). This species favors open desert scrub, alkali desert scrub, and Joshua tree (*Yucca brevifolia*) habitats at elevations ranging from 1,800 feet (549 meters) to 5,000 feet (1,524 meters) amsl. It is also known to feed in annual grasslands. The primary food sources for Mohave ground squirrel are spiny hopsage (*Grayia spinosa*), winterfat (*KraschenInnikovia lanata*), and saltbushes (*Atriplex* spp.) (Leitner and Leitner 2017).

The Project site is within the westernmost range of Mohave ground squirrel, and there are CNDDB records of this species within the 5-mile (8 kilometer) radius of the Project site (Figure 2-1). Jacobs did not perform camera or live trapping of this species. No individuals were encountered during live trapping on the adjacent Sanborn Solar Project and the species is presumed absent or occurs in low numbers in the Project vicinity (Kern County 2020a).

Pallid Bat

The pallid bat (*Antrozous pallidus*) is a CDFW SSC (CDFW 2022). This species occupies a variety of open dry habitats in low elevations. This species roosts in rocky areas such as caves, crevices, and mines. Foraging habitats for pallid bats are varied and include grasslands, oak savannahs and woodlands, riparian woodland, open pine forests, talus slopes, desert scrub, and agricultural areas. There are no CNDDB occurrences of pallid bats within 5 miles (8 kilometers) of the Project site (Figure 2-1). However, pallid bats have been detected in the Soledad Mountain area (Kern County 2020a). There is no suitable roosting habitat in the Project site; however, there is suitable foraging habitat (Appendix A).

Southern Grasshopper Mouse

The southern grasshopper mouse (*Onychomys torridus ramona*) is a CDFW SSC (CDFW 2022). This nocturnal species occurs in arid habitats in the Mojave Desert and Central Valley with friable soils. This species prefers low to moderate shrub cover in alkali desert scrub and desert scrub habitats, but can also occur in coastal scrub, mixed chaparral, sagebrush, and bitterbrush habitats. There are no CNDDB occurrences of this species within 5 miles (8 kilometers) of the Project site (Figure 2-1). Southern grasshopper mouse has suitable habitat in the Project site (Appendix A).

Townsend's Big-eared Bat

Townsend's big-eared bat (*Corynorhinus townsendii*) is a CDFW SSC (CDFW 2022). This species occurs in wide variety of mesic habitats excluding alpine and sub-alpine habitats. This species roosts in caves, mines, tunnels, buildings, and other human-made structures. Both CNDDB and surveys conducted for other projects recorded occurrences of Townsend's big-eared bat in the Soledad Mountain area (Figure 2-1; Kern County 2020a). There is no suitable roosting habitat in the Project site; however, there is suitable foraging habitat (Appendix A).

2.3 Survey Methodology

This section includes a description of the biological survey methods implemented for the Project.

2.3.1 Desert Tortoise

The protocol-level desert tortoise presence-absence survey followed the *2019 Mojave Desert Tortoise Pre-project Survey Protocol* (USFWS 2019). The survey was conducted by walking transects at 33-foot (10-meter) spacing throughout all accessible, appropriate habitat on the Project site. Temperatures during survey were between 46°F and 86°F (8°C and 30°C). Desert tortoises are most active when temperatures are below 95°F (35°C). Air temperatures were taken at the start and end of each day, at 2 inches (5 centimeters) above the soil surface in the shade of the observer (USFWS 2019).

Desert tortoise "sign" is defined as a desert tortoise burrow, carcass, scat, tracks, or egg. The most common signs are burrows (or a shallow burrow called a pallet), carcasses (or carcass fragment), and scat. Each of these signs has its own classification system (USFWS 1992, 2009). Table 2-1 provides the definitions of Classes 1 through 5 for burrow, scat, and carcass.

Table 2-1. Desert Tortoise Sign Classification

Class	Definition
Burrow [a,b]	
1	Active – Definitely Tortoise. Currently active, with desert tortoise or recent desert tortoise sign (tracks, freshly disturbed soil on mound/runway).
2	Good – Definitely Tortoise. No structural degradation; no evidence of recent use but used this season; cleared annuals; no freshly disturbed soil.
3	Poor – Definitely Tortoise. Deteriorated condition; substantial structural degradation; much effort needed to use the burrow; substantial remodeling to use burrow; includes collapsed burrows.
4	Good – Possibly Tortoise. Good condition. Not sure what species uses burrow.
5	Poor – Possibly Tortoise. Deteriorated condition; includes collapsed burrows. Not sure what species uses burrow.
Scat [a]	
1	Wet (not from rain or dew) or freshly dried; obvious odor
2	Dried with glaze; some odor; dark brown
3	Dried; no glaze or odor; signs of bleaching (light brown)
4	Dried; light brown to pale yellow, loose material; scaly appearance
5	Bleached, or consisting only of plant fiber
Carcass [a]	
1	Fresh or putrid
2	Normal color; scutes adhere to bone
3	Scutes peeling off bone
4	Shell bone is falling apart; growth rings on scutes are peeling
5	Disarticulated and scattered

[a] USFWS (1992).

[b] USFWS (2009).

The biologists regularly inspected behind themselves and under shrubs to record live desert tortoise and desert tortoise sign while walking transects. Any tortoise or large mammal burrows encountered that could be used by tortoises were visually inspected with a mirror, flashlight, or reflective surface (like a cell phone). Very small burrows, which usually are rodent burrows that could be used by juvenile tortoises, were also visually checked when encountered. Only definitive tortoise sign was recorded.

Data were recorded digitally and on hard copy. Digital data were collected on Android or iOS devices with the Collector application on the ArcGIS Online platform. Submeter accuracy was attained by using a Trimble R1 receiver that was connected to devices via a Bluetooth connection. Survey transects and a data dictionary were generated prior to conducting the fieldwork and uploaded to ArcGIS Online. Hard copy data were collected on USFWS 2019 survey data sheets (Appendix B). Each desert tortoise and desert tortoise sign encountered was photographed (Appendix D).

During the survey, biologists kept an observed species list, including incidental observations of wildlife (Appendix C).

2.3.2 Habitat Assessment

During the protocol-level desert tortoise survey (USFWS 2019), biologists also assessed potentially suitable habitat for other special-status species, such as, but not limited to, American badger, burrowing owl, desert kit fox, Mohave ground squirrel, and Swainson's hawk. Vegetation, soil, and slope characteristics were analyzed. In the vegetation component, biologists looked for suitable nesting sites,

forage species, and vegetation as potential shelter. Soil suitability was based on the potential for burrow construction. Although desert tortoise was the focus of the protocol-level transect survey, biologists noted incidental observations of all special-status species and took representative photographs of suitable habitat and species were applicable (Appendix D).

2.3.2.1 Burrowing Owl

Jacobs' evaluation of burrowing owl was based on the habitat assessment methodology provided by CDFW's *Staff Report on Burrowing Owl Mitigation* (CDFG 2012). Biologists incidentally recorded observations of live burrowing owl, including signs of pellets, whitewash, and burrow activity during the field survey.

2.3.2.2 Mohave Ground Squirrel

Jacobs biologists did not perform camera or protocol-level live trapping of Mohave ground squirrel at the Project site (CDFG 2010b). Habitat assessment for this species was based on suitable habitat, forage species, and the results of surveys of adjacent projects in the Project vicinity (Kern County 2020a).

2.3.2.3 Swainson's Hawk

Jacobs biologists did not conduct a protocol-level Swainson's hawk survey (CDFG 2010a). The habitat assessment was focused on identifying potentially suitable foraging and nesting habitat.

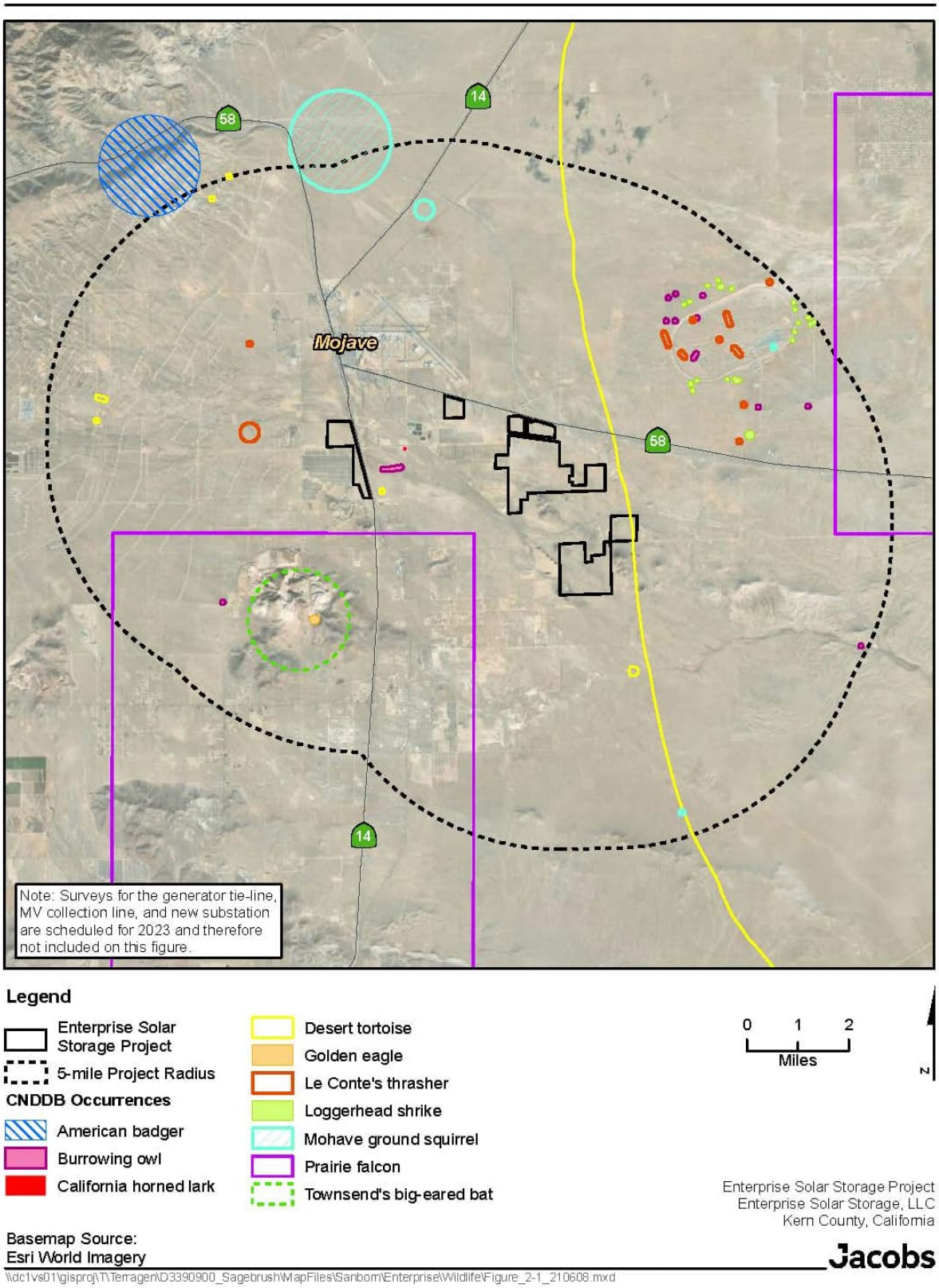
2.3.2.4 Other Special-status Wildlife

There are no survey protocols for American badger, desert kit fox, Le Conte's thrasher, or loggerhead shrike. However, incidental observations of these species, including signs such as scat and burrow activity, were noted during the field survey. Biologists made incidental observations of other special-status wildlife, but these species were not specifically targeted during the field survey.

2.3.2.5 Vegetation

Jacobs biologists provided reconnaissance-level classification of vegetation communities in accordance with *A Manual of California Vegetation* (Sawyer et al. 2009). Biologists noted dominant and associated plants observed. Vegetation communities are an indication of suitable habitat for special-status wildlife species.

Figure 2-1. California Natural Diversity Database - Occurrences within 5 Miles



3. Results

This section provides the results of a protocol-level desert tortoise presence or absence survey and habitat assessment for special-status wildlife species that could occur within the Project site. Jacobs biologists conducted biological surveys of the Project features[2] in April 2021 and May 2022 (Figure 1-2). In April 2021, biologists surveyed 2,159 acres (874 hectares) of the Project site. In May 2022, biologists surveyed 104 acres (42 hectares) including temporary laydown yards and areas that were added to the Project site (Figure 1-2). Thirty-eight (38) special-status wildlife species were identified as having the potential to occur in the Project site (Appendix A). No live desert tortoise and one potential tortoise burrow were observed in the Project site. Suitable habitat for desert tortoise is present in the Project site and desert tortoise may be present. Of the 38 special-status wildlife species, 8 species or their signs were incidentally observed during field surveys and are known to occur in the Project site:

1. Burrowing owl
2. Desert tortoise[3]
3. Desert kit fox
4. Le Conte's thrasher
5. Loggerhead shrike
6. Northern harrier
7. Southern grasshopper mouse
8. White-faced ibis (*Plegadis chihi*)[4]

Eight other special-status species have moderate potential to use the Project site (Appendix A):

1. American badger
2. Cooper's hawk
3. Ferruginous hawk
4. Golden eagle
5. Pallid bat
6. Prairie falcon
7. Swainson's hawk
8. Townsend's big-eared bat

3.1 Staff and Timing

The April 2021 survey was conducted on April 12 through 16, 20 through 22, 24, and 26 through 29, 2021 (Appendix B) by eight (8) Jacobs biologists: Morgan King, Brian Boyd, Daniel Smith, Jen Jelincic, Kay Nicholson, Rebecca John, Samantha Vaughan, and Shane Tom. The May 2022 survey was conducted on May 1 and 2, 2022 (Appendix B) by two (2) Jacobs biologists: Morgan King and Hannah Worthington.

On June 22, 2022, Terra-Gen LLC biologist, Amanda Wilhelm conducted an investigation of the potential desert tortoise burrow observed by Jacobs biologists at the Project site (Appendix E).

[2] Additional biological surveys would be conducted, as needed, in 2023 for any Project features that were not previously surveyed (including linear features).

[3] One potential desert tortoise burrow (Class 4) was observed in the Project site and desert tortoise may be present. No live desert tortoise or definite desert tortoise sign were observed. In April 2021, a second Class 4 desert tortoise burrow was recorded on datasheets (Appendix B), but the area the burrow was recorded has since been removed from the Project.

[4] Although white-faced ibis were incidentally observed during field survey, this species has no suitable foraging or nesting habitat in the Project site. It is most likely that this species was observed during migration given that the Project is adjacent to sewage treatment ponds (Figure 1-2).

3.2 Desert Tortoise

Biologists observed one Class 4 burrow during the 100 percent protocol-level survey of the Project site (Appendix B; Figure 3-1). Class 4 burrows are defined as potentially desert tortoise but uncertain which species uses the burrow. The end of the burrow was visible (depth less than 1.5 feet [0.5 meter]). No live desert tortoise or definite tortoise signs were observed.

During the June 2022 burrow investigation, the biologist visited the Class 4 burrow (DTB01; Figure 3-1). During this visit, the end of the burrow was visible, and no desert tortoise were present (Appendix E).

Suitable desert tortoise habitat is present in the Project site, notably west of SR-14. Most of the Project site has been heavily grazed by domestic sheep (*Ovis* sp.) which reduces the quality of suitable habitat. Based on the presence of suitable habitat and the species' known distribution and range, desert tortoise may be present in the Project site (Appendix A). Representative photographs of the Class 4 burrow are provided in Appendix D and Appendix E.

3.3 Habitat Assessment

3.3.1 Burrowing Owl

Burrowing owl are known to occur in the Project site. Three live burrowing owls and 10 burrowing owl signs (burrows, whitewash, and pellets) were incidentally observed during the survey (Figure 3-1). Burrowing owls have the potential to nest in suitable mammal burrows and forage throughout the Project site. Representative photographs of burrowing owl signs are provided in Appendix D.

3.3.2 Mohave Ground Squirrel

The Project site has suitable habitat for Mohave ground squirrel, in the form of friable soils for burrows and forage species (allscale saltbush [*Atriplex polycarpa*]) and winterfat. According to the results of the Mohave ground squirrel live trapping conducted for the Sanborn Solar Project, this species is presumed absent or occurs in low numbers in the Project vicinity (Kern County 2020a).

3.3.3 Swainson's Hawk

Independently of Jacobs' biological survey, Enterprise Solar contracted Bloom Biological Inc.[5] to conduct Swainson's hawk protocol surveys for the Project in 2023 and their survey results are reported separately.

The Project has suitable Swainson's hawk nesting habitat in large Joshua trees. Jacobs biologists incidentally observed large stick nests that were suitable for Swainson's hawk (Appendix D). These nests were either occupied by common raven or inactive. The Project site has been heavily grazed, which opens the vegetation canopy and provides moderately suitable small mammal foraging habitat. Jacobs biologists did not incidentally observe Swainson's hawk during the field survey (Appendix C).

3.3.4 Other Special-status Wildlife

A variety of reptiles, birds, and mammals occur within the Project site. Excluding burrowing owl, six other special-status species were incidentally observed during the biological survey: desert kit fox, Le Conte's thrasher, loggerhead shrike, northern harrier, southern grasshopper mouse, and white-faced ibis (Appendix A). No live desert kit foxes were observed, but positive signs (scat and tracks) were observed in the Project site. Biologists found a dead southern grasshopper mouse in the eastern part of the Project site and this species is presumed present. No suitable habitat exists in the Project site for white-faced ibis and it is presumed this species was migrating through and may have used the adjacent sewage treatment

[5] Bloom Biological Inc. is a reputable firm who regularly conducts Swainson's hawk surveys in Antelope Valley.

ponds. Eight other special-status species have a moderate potential to use the Project site: American badger, Cooper's hawk, ferruginous hawk, golden eagle, pallid bat, prairie falcon, Swainson's hawk, and Townsend's big-eared bat (Appendix A). American badger has suitable habitat in the Project, but no sign of this species was observed during the survey. Ferruginous hawk, golden eagle, and prairie falcon have moderately potential foraging habitat in the Project site but are not expected to nest. Two special-status bat species, pallid bat and Townsend's big-eared bat were observed during surveys for the Sanborn Solar project on Soledad Mountain (Kern County 2020a) and have a moderate potential to forage in the Project site. Many birds protected by the MBTA have the potential to forage and nest in the Project site. Bird species common to the region include common raven, horned lark (*Eremophila alpestris*), western meadowlark (*Sturnella neglecta*), house finch (*Haemorhous mexicanus*), and red-tailed hawk (*Buteo jamaicensis*). A total of 46 wildlife species were recorded during the survey conducted for the Project (Appendix C).

No ferruginous hawks were observed during survey of the Project site.

Biologists incidentally observed horned lark during the survey, which is a species that is closely related to California horned lark (*Eremophila alpestris actia*), a CDFW WL species. Although California horned lark are recorded in the Project vicinity (Figure 2-1), it is more likely that biologists observed the common horned lark variety. No other special-status wildlife or signs were observed during the field survey.

3.3.5 Vegetation

This section provides general descriptions of the vegetation communities that occur on the Project site as it pertains to potentially suitable wildlife habitat. In general, three natural vegetation communities occur in the Project site: allscale saltbush scrub alliance, creosote bush scrub alliance, and Joshua tree woodland alliance.

Much of the Project site is highly disturbed from domestic sheep grazing. Non-native species, such as cheatgrass (*Bromus tectorum*), Mediterranean grass (*Schismus* sp.), red brome (*Bromus madritensis*), and red-stem filaree (*Erodium cicutarium*), were ubiquitous throughout the Project site.

3.3.5.1 Allscale Saltbush Scrub Alliance

The most common vegetation type in the Project site is allscale saltbush scrub alliance, which corresponds to the allscale scrub series (Sawyer et al. 2009). This widespread alliance occurs in arid washes and alluvial fans in carbonite-rich, alkaline, sandy, or sandy loam soils throughout the Central Valley, and the Mojave, Sonoran, and Colorado deserts. The vegetation is characterized by an open monotypic shrub layer of allscale saltbush. Associated annuals observed in this community include bristly fiddleneck (*Amsinckia tessellata*), turkey mullein (*Croton setiger*), and non-native annuals. Representative photographs of allscale saltbush scrub alliance are provided in Appendix D.

3.3.5.2 Creosote Bush Scrub Alliance

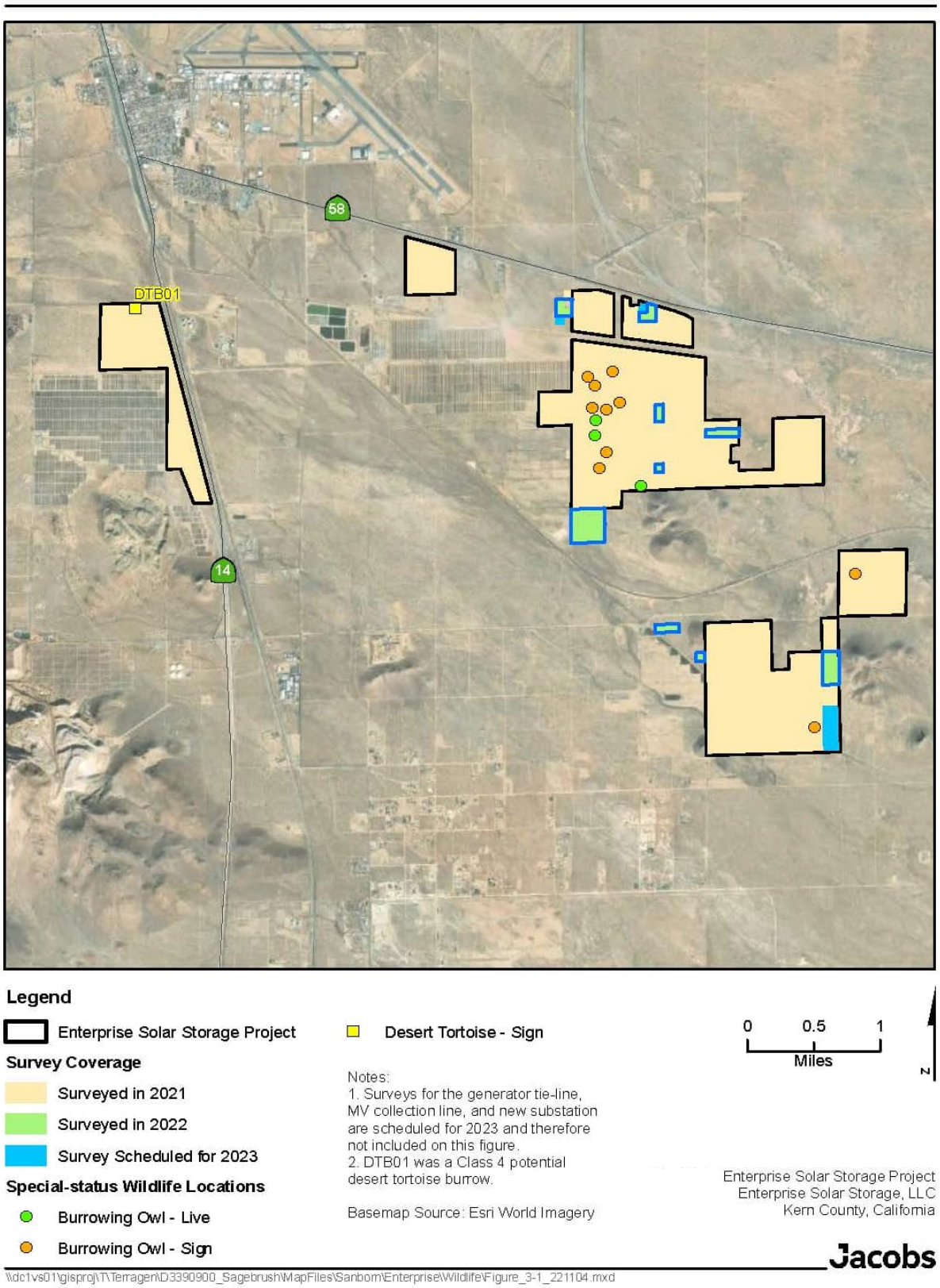
The creosote bush scrub alliance habitat within the Project site most closely corresponds to the creosote bush shrubland series (Sawyer et al. 2009). This widespread alliance occurs in the Mojave, Sonoran, and Colorado deserts and extends north into the transition zone with the Great Basin. The vegetation is characterized by an open shrub layer dominated by creosote bush. Associated shrubs and annuals observed in this community include allscale saltbush, bristly fiddleneck, cheesebush (*Ambrosia salsola*), white bursage (*Ambrosia dumosa*), winterfat, and non-native annuals. A representative photograph of creosote bush scrub alliance is provided in Appendix D.

3.3.5.3 Joshua Tree Woodland Alliance

The Joshua tree woodland alliance habitat within the Project site closely corresponds to the Joshua tree series (Sawyer et al. 2009; SWCA 2022). Joshua tree woodland habitat is characterized by open woodlands of Joshua trees, with intermittently spaced shrubs. Associated plant species observed in the Joshua tree

woodland include creosote bush, cheesebush, white bursage, and winterfat. A photograph of the Joshua tree woodland vegetation community is provided in Appendix D.

Figure 3-1. Special-status Wildlife Locations



4. Conclusions and Recommendations

This section identifies potential impacts on biological resources due to implementation of the Project and presents recommended mitigation measures (MMs) for impacts to these resources.

4.1 Conclusions

Desert tortoise may be present at the Project site (Appendix A). Biologists observed a Class 4 burrow, which is defined as potentially desert tortoise but uncertain which species uses burrow and there is suitable desert tortoise habitat in the Project site. No live desert tortoise or definite desert tortoise signs were observed. Based on trapping results from the adjacent Sanborn Solar project, Mohave ground squirrel are either absent or occur in low densities in the Project vicinity (Kern County 2020a). No federally or state-listed species were observed during the field survey.

Burrowing owl were incidentally observed during the April 2021 field survey (Figure 3-1). Six other special-status species were incidentally observed during the April 2021 and May 2022 survey: desert kit fox, Le Conte's thrasher, loggerhead shrike, northern harrier, southern grasshopper mouse, and white-faced ibis (Appendix A). Eight other special-status species have a moderate potential to use the Project site: American badger, Cooper's hawk, ferruginous hawk, golden eagle, pallid bat, prairie falcon, Swainson's hawk, and Townsend's big-eared bat (Appendix A). Many birds protected by the MBTA have the potential to nest and forage in the Project site. Bird species common to the region include common raven, horned lark, western meadowlark, house finch, and red-tailed hawk. Swainson's hawk have a moderate potential to nest and forage at the Project site (Appendix A). As previously stated, Bloom Biological Inc. conducted Swainson's Hawk protocol surveys and their survey results are reported separately.

4.2 Potential Impacts

Potential impacts to wildlife species and their habitats that may result from Project construction, operation and maintenance, and decommissioning are discussed in this section.

Prior to finalizing engineering design of the Project, additional biological surveys may be required for areas where Project boundaries may have shifted or ancillary facilities have been sited since Project surveys were conducted. Additional biological surveys would be conducted, as needed, in 2023. Results of any additional investigations would be provided as an addendum to this report.

4.2.1 Construction Impacts

The Project has the potential to impact special-status wildlife through the loss of habitat as well as direct and indirect impacts on species, such as mortality of individuals or interference with reproductive success.

- Desert Tortoise: The potential for desert tortoise to occur on the site is low. If the species is present, direct impacts could include death of or injury to individuals, displacement of tortoises and loss of territory, disruption of breeding activities, crushing of burrows and viable eggs, loss of suitable habitat, and increased risk of predation. Indirect impacts could also occur during construction if desert tortoises are present within 500 feet (152 meters) of the Project site, including the potential for construction-related noise and ground vibration to deter individuals from inhabiting or foraging in areas near the Project site, impacts resulting from construction-related dust, sedimentation, and erosion, and the spread of non-native noxious weeds by construction activities. These impacts would be mitigated to less-than-significant levels with implementation of MMs MM-BIO-1 through MM-BIO-6, MM-BIO-15, and MM-BIO-18. Together, these MMs require construction monitoring by a qualified biologist; implementation of a worker environmental awareness training and education program; general avoidance and protective measures designed to avoid impacts on special-status wildlife

during construction, operation and maintenance, and decommissioning activities; preconstruction surveys for special-status species, including desert tortoise, and establishment of a suitable buffer by a qualified biologist; desert tortoise clearance surveys and the development of a desert tortoise translocation plan; development of a raven management plan; implementation of a fugitive dust control plan; and measures to reduce short-term noise levels.

Because of the absence of live tortoise occurrence on the Project site and the Project's position at the periphery of the species' current range, and the quality of immediately surrounding habitats as well as the abundance of suitable habitat to the east of the Project site where the largest primary population in the Mojave Desert is located, the loss of approximately 2,200 acres (890 hectares) of poor but suitable habitat would result in less-than-significant impacts on desert tortoise.

- American Badger: The species has a moderate potential to occur on the site. Direct impacts on American badger from Project construction activities may include permanent and temporary loss of habitat. Additional suitable habitat would remain surrounding the Project site, and impacts related to the loss of habitat for the species would be less than significant. Indirect effects because of displacement of this species could also occur as a result of construction activities associated with the Project. These potential impacts would be mitigated to less-than-significant levels through implementation of MMs MM-BIO-1 through MM-BIO-4, MM-BIO-10, MM-BIO-15, and MM-BIO-16. These MMs require construction monitoring by a qualified biologist; implementation of a worker environmental awareness training and education program; general avoidance and protective measures designed to avoid impacts on special-status wildlife during construction, operation and maintenance, and decommissioning activities; preconstruction surveys for special-status species, including American badger, and establishment of a suitable buffer by a qualified biologist; the development of an avoidance or passive relocation program for American badger; compliance with Kern County's Dark Skies Ordinance to minimize nighttime lighting; and the implementation of measures to reduce short-term noise levels.
- Burrowing Owl: Burrowing owls are present on the Project site. Direct impacts on occupied burrowing owl burrows and burrowing owl habitat could occur as a result of Project construction through the loss of available habitat and potential breeding burrows because of construction activities and increased human presence. Indirect impacts could also occur during construction if burrowing owls are nesting in adjacent offsite areas within 500 feet (152 meters) of the Project site, and noise from construction activities harasses an owl to the point of its abandoning an active nest site. These potential impacts would be mitigated to less-than-significant levels with implementation of MMs MM-BIO-1 through MM-BIO-4, MM-BIO-7, MM-BIO-14, and MM-BIO-15. These MMs require construction monitoring by a qualified biologist; implementation of a worker environmental awareness training and education program; general avoidance and protective measures designed to avoid impacts on special-status wildlife during construction, operation and maintenance, and decommissioning activities; preconstruction surveys for special-status species, including burrowing owl, and establishment of a suitable buffer by a qualified biologist; preconstruction burrowing owl surveys to identify any active or potential burrows that may require avoidance; implementation of compensatory mitigation for impacts if passive relocation of the species is required; the use of herbicides that are not toxic to birds; and the implementation of measures to reduce short-term noise levels.
- Desert Kit Fox: Desert kit fox sign was observed on the Project site. Direct impacts on the species and its habitat could include being hit by vehicles on access roads or the loss of available habitat and potential burrows attributable to construction activities and increased human presence. Indirect impacts include noise, vibrations, and nighttime lighting. These potential impacts would be mitigated to less-than-significant levels with implementation of MMs MM-BIO-1 through MM-BIO-4, MM-BIO-10, MM-BIO-15, and MM-BIO-16. These measures require construction monitoring by a qualified biologist; implementation of a worker environmental awareness training and education program; general avoidance and protective measures designed to avoid impacts on special-status wildlife during construction, operation and maintenance, and decommissioning activities; preconstruction surveys for special-status species, including desert kit fox, and establishment of a suitable buffer by a qualified biologist; the development of an avoidance or passive relocation program for desert kit fox;

compliance with Kern County's Dark Skies Ordinance to minimize nighttime lighting; and the implementation of measures to reduce short-term noise levels.

Loss of suitable habitat for the species is not considered a significant impact. In addition, the abundance of suitable habitat for the species surrounding the Project site ensures that habitat-related impacts would not be significant.

- Golden Eagle: The Project site contains suitable foraging habitat for the species. Golden eagles typically fly at altitudes much higher than the Project planned infrastructure while foraging or traveling, and collision with Project structures during construction or operation is considered extremely unlikely and would result in less-than-significant impacts. While the availability of potential foraging habitat would be reduced or lost as a result of the Project, this reduction would not be considered a significant impact because there is an abundance of foraging habitat surrounding the Project site. Potentially significant indirect impacts could occur because of collisions with and/or electrocution from power lines. This potential impact would be reduced to less-than-significant levels through implementation of MMs MM-BIO-1 through MM-BIO-4, MM-BIO-9, MM-BIO-11, MM BIO-14, and MM-BIO-15. These MMs require construction monitoring by a qualified biologist; implementation of a worker environmental awareness training and education program; general avoidance and protective measures designed to avoid impacts on special-status wildlife during construction, operation and maintenance, and decommissioning activities; avian nesting surveys that would detect any nesting golden eagles within the Project vicinity; power lines to be installed per Avian Power Line Interaction Committee (APLIC) standards; the use of herbicides that are not toxic to birds; and the implementation of measures to reduce short-term noise levels.
- MBTA Protected Species, including Loggerhead Shrike and Le Conte's Thrasher: Loggerhead shrike and Le Conte's thrasher have been observed on the Project site, and other nesting birds have the potential to forage and nest on the site. Direct impacts could include death or injury to chicks or nest destruction, displacement of birds and loss of territory, and disruption of breeding activities. Adults of both species are mobile and not susceptible to direct impacts from construction activities. Additional loss of habitat is not expected to be significant because of the abundance of suitable habitat surrounding the Project site. Indirect impacts from construction, operations and maintenance, and decommissioning activities could include disturbance to nesting individuals related to increased dust, noise, vibrations, and increased human presence. Implementation of MMs MM-BIO-1 through MM-BIO-4, MM-BIO-9, and MM-BIO-14 would mitigate these potential impacts to less-than-significant levels. These MMs require construction monitoring by a qualified biologist; implementation of a worker environmental awareness training and education program; general avoidance and protective measures designed to avoid impacts on special-status wildlife during construction, operation and maintenance, and decommissioning activities; avian nesting surveys that would detect any nesting loggerhead shrike and Le Conte's thrasher within the Project vicinity; and the use of herbicides that are not toxic to birds.
- Mohave Ground Squirrel: This species has a low potential to occur on the Project site. There is suitable habitat for Mohave ground squirrel; however, numerous trapping surveys in Project vicinity have resulted in no captures. This indicates that this species is either absent or occurs in low numbers in the Project vicinity. Direct impacts on Mohave ground squirrel and its habitat could include being hit by vehicles on access roads, loss of habitat and burrows because of construction activities, potential to be entrapped or entombed in burrows, and increased human presence. Indirect impacts could include fugitive dust, noise, vibrations, and release of chemical pollutants. If this low-mobility, burrowing mammal is present during construction, it would be particularly susceptible to injury and mortality. Potential direct and indirect impacts to Mohave ground squirrel would be mitigated to less-than-significant levels with implementation of MMs MM-BIO-1 through MM-BIO-4, MM-BIO-13, MM-BIO-15, and MM-BIO-18. These measures require construction monitoring by a qualified biologist;

implementation of a worker environmental awareness training and education program; general avoidance and protective measures designed to avoid impacts on special-status wildlife during construction, operation and maintenance, and decommissioning activities; preconstruction surveys for small mammals; and, if any are detected, preparation of a small mammal avoidance and monitoring plan, and minimization of noise and dust.

- Bat Species: Pallid bat and Townsend's big-eared bat have a moderate potential to occur on the Project site, but it is likely that both species forage in the area at low levels because of the low insect production in the desert communities at most times of the year. Additional suitable foraging habitat would remain surrounding the Project site. The Project site does not contain suitable roosting habitat to support the two bat species; therefore, no specific avoidance and minimization measures are proposed for these species. However, MM BIO-16 requires compliance with Kern County's Dark Skies Ordinance. Although no MMs are required to reduce impacts to bat species, this MM would minimize indirect nighttime lighting impacts to bats during construction. Potential direct and indirect impacts on pallid bat and Townsend's big-eared bat would not be considered significant.
- Raptor Species: A northern harrier was observed on the Project site and Cooper's hawk, ferruginous hawk and prairie falcon have a moderate potential to occur on the site. None of these species are expected to nest on the site. While the availability of potential foraging habitat for the species would be reduced or lost during Project construction, this reduction would not be a significant impact because there is an abundance of suitable raptor foraging habitat surrounding the Project site. If present during construction activities, the Project would have a low potential to directly impact these raptor species through mortality or injury because the species is highly mobile and could easily avoid construction, hence, potential direct impacts such as vehicular collisions would be considered less than significant.

  The Project could lead to potentially significant indirect impacts to raptor species resulting from collisions with and/or electrocution from power lines. This potential indirect impact is a substantial source of mortality for these species and would be considered significant without mitigation. This potential impact would be reduced to less-than-significant levels with implementation of MMs MM-BIO-11 and MM-BIO-14, which require power lines to be installed per APLIC standards and the use of herbicides that are not toxic to birds.
- Southern Grasshopper Mouse: The species is known to occur on the Project site. Direct impacts on southern grasshopper mouse and its habitat could include being hit by vehicles on access roads, loss of habitat and burrows because of construction activities, potential to be entrapped or entombed in burrows, release of chemical pollutants, and increased human presence. Indirect impacts could include dust, noise, vibrations, and nighttime lighting. If this low-mobility, burrowing mammal is present during construction, it would be particularly susceptible to injury and mortality. Potential direct and indirect impacts to southern grasshopper mouse would be mitigated to less-than-significant levels with implementation of MMs MM-BIO-1 through MM BIO-4, MM-BIO-13 through MM-BIO-16, and MM-BIO-18. These measures require construction monitoring by a qualified biologist; implementation of a worker environmental awareness training and education program; general avoidance and protective measures designed to avoid impacts on special-status wildlife during construction, operation and maintenance, and decommissioning activities; preconstruction surveys for small mammals, and, if any are detected, preparation of a small mammal avoidance and monitoring plan; minimization of noise and dust; use of non-toxic herbicides; and compliance with Kern County's Dark Skies Ordinance to minimize nighttime lighting.
- Swainson's Hawk: The Project has suitable Swainson's hawk nesting habitat in large Joshua trees. Project construction is estimated to occur over two Swainson's hawk breeding seasons. Construction of the Project would require the use of heavy machinery and other noise-generating equipment. In general, construction equipment, worker vehicles, and increased human presence during construction

activities near an active nest can cause stress, resulting in nest abandonment or behavior modification that can indirectly lead to nesting failure or mortality of Swainson's hawk young. Removal of trees that are potentially suitable for nesting could also impact this species. These impacts would be mitigated to less-than-significant levels with implementation of MMs MM-BIO-1 through MM-BIO-4, MM-BIO-8, and MM-BIO-15. Potential effects on Swainson's hawk breeding due to Project construction would be temporary, and it is anticipated that effects, if any, would be limited to two nesting seasons.

The Project has moderately suitable foraging habitat for Swainson's hawk because of heavy grazing that historically occurred on the site, which opens the vegetation canopy. The Project site contains desert scrub habitat but lacks agricultural lands, which Swainson's hawk prefer for foraging. Direct impacts on Swainson's hawk foraging habitat could include reduction or loss of foraging habitat as a result of vegetation removal prior to grading and construction activities. While the availability of potential foraging habitat would be reduced or lost during construction, this reduction would not be considered a significant impact because the area is generally not considered high quality foraging habitat, and there is an abundance of foraging habitat surrounding the Project site. However, if Swainson's hawks are determined to be nesting in the Project vicinity (through protocol surveys), then the loss of the foraging habitat would be considered potentially significant. This potential impact would be mitigated to less-than-significant levels with implementation of MM-BIO-8 Swainson's Hawk Surveys, Avoidance/Minimization, and Compensatory Mitigation.

The Project could lead to potentially significant indirect impacts to Swainson's hawk resulting from collisions with and/or electrocution from power lines as this is a known source of mortality for this species and would be considered significant without mitigation. This potential impact would be reduced to less-than-significant levels with implementation of MMs MM-BIO-11 and MM-BIO-14, which require power lines to be installed per APLIC standards and the use of herbicides that are not toxic to birds.

- Wildlife Movement Corridors: The closest linkage network is northeast of the Project and connects landscape blocks of Edwards AFB and the southern Sierra Nevada. Therefore, the Project is located adjacent to, but outside of, an identified essential regional wildlife linkage. Construction could have direct and indirect impacts on wildlife movement within the Project site, such as deterring wildlife from the construction area due to increased human presence, loud noises, and physical disruptions of habitat, but these impacts would be temporary and less than significant due to the abundance of available habitat adjacent to the Project site through which wildlife could move. While the Project would introduce structures to the Project site that could physically impede wildlife movement in certain areas and directions, potential long-term direct and indirect impacts to wildlife movement corridors are not likely to be significant because abundant adjacent lands would remain available for wildlife movement after Project development, including desert tortoise. Fencing would allow wildlife, such as desert kit fox, to move through the site. As a result, development of the Project would not restrict local or regional wildlife movement. Therefore, the Project is not expected to adversely impact wildlife movement and potential impacts would be less than significant.

4.2.2 Operations and Maintenance Impacts

Direct impacts to special-status wildlife species are unlikely to result from Project operation and maintenance activities. While the Project would remove some habitat for special-status species from the Project site, wildlife movement through or around the Project site (i.e., perimeter or desert tortoise fencing) would still be possible. There is also sufficient habitat around the Project site to avoid significant habitat loss. Additionally, Mitigation Measures MM BIO-2 and MM BIO-3 require methods designed to reduce wildlife mortality and impacts, promote long-term Project site suitability, and educate onsite personnel. Project operation could result in indirect impacts to wildlife in proximity of the Project if nighttime lighting is used. However, the potential indirect impact from nighttime lighting during operation and maintenance would be minimized through compliance with all development standards, the Kern County Zoning Ordinance, and the goals, policies, and implementation measures of the Kern County General Plan. The Project would be required to implement Mitigation Measure MM BIO-16, which requires

compliance with Kern County's Dark Skies Ordinance to minimize nighttime lighting in unincorporated areas of Kern County. Indirect impacts would also include collisions and/or electrocution from power lines which is a known source of mortality for raptor species and would be considered significant without mitigation. Species-specific discussion of potential direct and indirect impacts from Project operations and maintenance are provided below:

Terrestrial Burrowing Species: Direct impacts to terrestrial burrowing species, American badger, desert kit fox, desert tortoise, Mohave ground squirrel, and southern grasshopper mouse, are unlikely to result from Project operation and maintenance activities. While construction of the Project would remove some habitat from the Project site, wildlife movement through the site would still be possible, and fencing would include escape hatches for desert kit foxes. There is also sufficient habitat around the Project site to avoid significant habitat loss. Additionally, Mitigation Measures MM BIO-2 and MM BIO-3 require methods designed to reduce wildlife mortality and impacts, promote long-term Project site suitability, and educate onsite personnel. Indirect impacts to nocturnal species, desert kit fox and southern grasshopper mouse, during operations and maintenance would be minimized through compliance with Kern County's Dark Skies Ordinance MM BIO-16.

Bat Species: Potential direct loss of bat foraging habitat is not considered significant because there is sufficient habitat around the Project site. Potential indirect impacts to nocturnal bat species during operations and maintenance would be minimized through compliance with Kern County's Dark Skies Ordinance MM BIO-16.

Raptor Species: Potential indirect impacts on raptor species, including burrowing owl, Cooper's hawk, ferruginous hawk, golden eagle, northern harrier, prairie falcon, and Swainson's hawk, from the operation and maintenance phase of the Project may occur through collisions with and electrocution by power lines, or both. Raptors may use the utility structures surrounding the facilities as perch sites for hunting, increasing the likelihood for collisions and/or electrocution. This potentially significant impact would be reduced to less-than-significant levels through implementation of MMs MM-BIO-11 and MM-BIO-12. MM-BIO-11 requires power lines to be installed per APLIC standards, reducing the likelihood of collision and/or electrocution from power lines. MM-BIO-12 requires implementation of an avian mortality monitoring program that would provide quarterly reporting and recommendations to reduce the level of avian mortality, if it occurs, to less-than-significant levels.

Migratory Birds. Potential direct and indirect impacts on avian species, including Le Conte's thrasher and loggerhead shrike, may occur during Project operation and maintenance through individual collisions with Project facilities and equipment, including transmission wires, fencing, array structures, and heavy equipment. This potentially significant impact would be reduced to less-than-significant levels with implementation of MMs MM-BIO-12 and MM-BIO-17. Solar panels have the potential to create a lake effect, potentially resulting in avian impacts from collisions, stranding, or other forms of distress. MM-BIO-17 would require all solar panels and hardware to be designed to minimize glare and spectral highlighting. MM-BIO-12 requires implementation of an avian mortality monitoring program that would provide quarterly reporting and recommendations to reduce the level of avian mortality, if it occurs, to less-than-significant levels.

4.2.3 Decommissioning Impacts

If special-status species are present on the site during Project operation, they could be affected by Project decommissioning activities. This potentially significant impact would be reduced to less-than-significant levels through implementation of MMs MM-BIO-2, MM-BIO-3, MM-BIO-7, MM-BIO-9, MM BIO-10, and MM-BIO-15. These measures require the use of methods designed to reduce wildlife mortality and impacts, promote long-term Project site suitability, educate onsite personnel, and implement measures to reduce short-term noise levels.

4.2.4 Other Impacts

Although the DRECP does not apply to the Project because it is not on BLM land, it is noteworthy that the Project is within the boundaries of the DRECP Development Focus Area (CEC et al. 2014). During DRECP analysis, the Development Focus Areas were identified as having fewer expected special-status species impacts and therefore more appropriate for renewable development.

No impact to conservation areas would occur as the Project would not conflict with the provisions of an adopted habitat conservation plan (e.g., West Mojave Plan or DRECP) or within any other local, or state conservation planning areas.

4.3 Mitigation Measures

This section provides a list of recommended MMs to avoid or reduce potential effects on special-status wildlife species during construction, operation and maintenance, and decommissioning activities. With implementation of MM-BIO-1 through MM-BIO-18, potential impacts on special-status wildlife would be less than significant.

MM-BIO-1 Biological Monitoring and Compliance

Prior to the issuance of grading or building permits from the County, the Project proponent/operator shall retain a qualified biologist(s) who meets the qualifications of an authorized biologist as defined by USFWS to oversee compliance with protection measures for all listed and other special-status species that may be affected by the construction of the Project. The following measures pertain to qualified biologist(s) onsite:

1. A qualified biologist(s) (approved by the appropriate agency) shall be on the Project site and monitor all initial ground disturbance activities, fencing installation conducted pursuant to MM BIO-5, and until vegetation removal necessary for Project construction is completed.

2. A qualified biologist(s) shall conduct site and fence inspections monthly throughout construction to ensure Project compliance with MMs and remain on-call throughout construction in the event a special status wildlife species wanders into the Project site.

3. A qualified biologist(s) shall have the right to halt all activities that are in violation of the special-status species MMs, as well as any regulatory permits from the CDFW and/or USFWS. Work shall proceed only after hazards to special-status species are removed.

4. The qualified biologist(s) shall have in her/his possession a copy of all the compliance measures while work is being conducted on the Project site.

5. Prior to issuance of grading or building permits, contact information for the qualified biologist(s) shall be submitted to the Kern County Planning and Natural Resources Department.

6. Any individuals who undertake biological monitoring and mitigation tasks shall be supervised by the qualified biologist(s) and shall have the appropriate education and experience to accomplish biological monitoring and mitigation tasks. Biological monitors shall comply with the above measures.

MM-BIO-2 Worker Environmental Awareness Training and Education Program

Prior to initiation of ground-disturbing activities, and for the duration of construction activities, all construction workers and on-site personnel shall attend a worker environmental awareness training and education program developed by a qualified biologist. Any personnel associated with construction that did not attend the initial training shall be trained by the authorized biologist or designee approved by the authorized biologist prior to working on the Project site.

Any employee responsible for operation and maintenance or decommissioning of Project facilities shall also attend the worker environmental awareness training and education program prior to starting work on the Project and on an annual basis.

The program would be developed and administered by the Project qualified biologist(s) or designee approved by the qualified biologist(s) during construction. The program shall include the components described as follows:

1. Information on the life history of the desert tortoise, American badger, burrowing owl, desert kit fox, golden eagle, loggerhead shrike, Le Conte's thrasher, Mohave ground squirrel, southern grasshopper mouse, Swainson's hawk, nesting birds, as well as other wildlife, and the CDFW-regulated drainages that may be affected during construction activities. The program shall also discuss the legal protection status of each species, the definition of "take" under the ESA and CESA, measures the Project proponent/operator shall implement to protect the species, reporting requirements, specific measures for workers to avoid take of special-status wildlife species, and penalties for violation of the requirements outlined in the CEQA MMs and agency permit requirements.

2. An acknowledgment form signed by each worker indicating that the worker environmental awareness training and education program has been completed shall be kept on file at the construction site.

3. A copy of the training transcript and/or training video, as well as a list of the names of all personnel who attended the worker environmental awareness training and education program and signed acknowledgment forms shall be submitted to the Kern County Planning and Natural Resources Department.

4. A copy of the training transcript, training video, or informational binder for specific procedures shall be kept available for all personnel to review and be familiar with as necessary.

5. A sticker shall be placed on hard hats indicating that the worker has completed the worker environmental awareness training and education program. Construction workers shall not be permitted to operate equipment within the construction areas unless they have attended the worker environmental awareness training and education program and are wearing hard hats with the required sticker.

6. The construction crews and contractor(s) shall be responsible for preventing unauthorized impacts from construction activities to sensitive biological resources that are outside the areas defined as subject to impacts by Project permits. Unauthorized impacts may result in Project stoppage, and/or fines depending on the impact and consultation with the CDFW and/or USFWS.

MM-BIO-3 General Avoidance and Minimization Measures

During construction, operation and maintenance, and decommissioning, the Project proponent/operator and/or contractor(s) shall implement the general avoidance and protective measures described below.

1. Prior to conducting vegetation clearing or grading activities associated with construction or decommissioning, a qualified biologist or biological monitor that has been approved by the qualified biologist shall perform preconstruction visual surveys of the area immediately prior to conducting these activities to ensure that no special-status animals are present. The qualified biologist or biological monitor shall monitor all initial construction and decommissioning ground-disturbance activities. A report of those activities shall be submitted to the Kern County Planning and Natural Resources Department within 30 days of completion of activities.

2. All proposed impact areas, including solar fields, generation-tie lines, staging areas, access routes, and disposal or temporary placement of spoils, shall be delineated with stakes and/or flagging prior to construction to avoid sensitive biological resources (that is, special-status species, jurisdictional drainages, nesting birds, etc.) where possible. Construction-related activities outside of the impact zone shall be avoided.

3. Access roads that are planned for use during construction shall not extend beyond the planned impact area. All vehicle traffic shall be contained within the planned impact area or in previously disturbed areas. Where new access routes are required, the route would be clearly marked (that is, flagged and/or staked) prior to construction.

4. The Project proponent/operator shall minimize the areas of new disturbance to the extent feasible. Parking areas, new roads and staging areas, and spoil disposal site locations shall be confined to the smallest areas possible. These areas shall be demarcated and disturbance activities, vehicles, and equipment shall be confined to these areas.

5. Spoils shall be stockpiled in disturbed areas that lack native vegetation. Best Management Practices shall be employed to prevent erosion in accordance with the Project's approved Stormwater Pollution Prevention Plan. Detected erosion shall be remedied as described in the Erosion Control Plan of the Stormwater Pollution Prevention Plan. Spoils that have been stockpiled and inactive for greater than 10 days shall be inspected by a qualified biologist for signs of special-status wildlife before moving or disturbing the spoils.

6. To prevent inadvertent entrapment of special-status wildlife species or other animals during construction, all excavated, steep-walled holes or trenches more than 2 feet (0.6 meter) deep shall be covered with plywood or similar materials at the close of each working day, or provided with one or more escape ramps constructed of earth fill or wooden planks that are no less than 12 inches (30 centimeters) wide and secured at the top, and placed a minimum of every 100 feet (30 meters) within the open trench. Before such holes or trenches are filled, they shall be thoroughly inspected for trapped animals by a qualified biologist, their biological monitor, or by construction personnel trained by a qualified biologist. If trapped animals are observed, escape ramps or structures shall be installed immediately to allow for their escape. If a listed species is trapped, the USFWS or CDFW or both, as appropriate for the species, and Kern County Planning and Natural Resources Department shall be contacted immediately to determine appropriate action.

7. Desert tortoises, burrowing owls, mammals, and nesting birds may use construction pipes, culverts, or similar structures for refuge or nesting. Therefore, all construction pipes, culverts, or similar structures with a diameter of 4 inches (10 centimeters) or more that are stored at the construction site for one or more overnight periods and without endcaps shall be thoroughly inspected by a qualified biologist for special-status wildlife or nesting birds before the pipe is subsequently buried, capped, or otherwise used or moved. If an animal is discovered inside a pipe, that section of pipe shall not be moved until the animal has moved on its own or a qualified biologist has been consulted and the animal has been captured and relocated by a qualified biologist holding the appropriate handling permits from the USFWS or CDFW or both, as appropriate for the species.

8. No vehicle or equipment parked on the Project site shall be moved prior to inspecting the ground beneath the vehicle or equipment for the presence of wildlife. If present, the animal shall be left to move on its own. If a listed species is discovered under equipment or vehicles and does not move on its own, the Project shall contact CDFW and/or USFWS to determine the appropriate action.

9. Vehicular traffic to and from the Project site shall use existing routes of travel. Cross country vehicle and equipment use outside designated work areas shall be prohibited.

10. A speed limit of 15 miles per hour (24 kilometers per hour) shall be enforced within the limits of the Project site. If night work occurs on the Project, the speed limit would be 10 miles per hour (16 kilometers per hour).

11. Fueling of equipment shall take place within existing roads. No refueling within or adjacent to drainages (within 150 feet [46 meters]) shall be permitted. Contractor equipment shall be checked for leaks prior to operation and repaired as necessary.

12. The Project proponent/operator shall submit a maintenance, trash abatement, and pest management program to the Kern County Planning and Natural Resources Department for review and approval. The program shall include, but not be limited to the following:
    a. The Project proponent/operator shall clear debris from the Project site at least twice per year once the Project is operational; this can be done in conjunction with regular panel washing and site maintenance activities.
        i. Trash and food items shall be contained in closed containers to be locked at the end of the day and removed at least once per week to reduce the attractiveness to opportunistic predators such as common ravens, coyotes (Canis latrans), and feral dogs (*Canis lupus familiaris*).
        ii. The Project proponent/operator shall erect signs with contact information for the Project proponent/operator's maintenance staff at regular intervals along the site boundary, as required by the Kern County Planning and Natural Resources Department. Maintenance staff shall respond within 2 weeks to resident requests for additional cleanup of debris. Correspondence with such requests and responses shall be submitted to the Kern County Planning and Natural Resources Department.
        iii. The Project proponent/operator shall implement a regular trash removal and recycling program once per month on an ongoing basis during construction, including a recycling program. Barriers/locking systems to prevent pest/rodent access to food waste receptacles shall be implemented. Locations of trash receptacles during operation of the Project shall be shown on final plans.
    b. Workers shall be prohibited from bringing pets and firearms to the Project site and from feeding wildlife.
    c. Intentional killing or collection of any plant or wildlife species shall be prohibited.
    d. No rodenticides shall be used on the Project site.
    e. Perimeter fencing during operation and maintenance shall be made wildlife friendly, but can be built to exclude desert tortoise.

MM-BIO-4 Preconstruction Surveys for Special-status Wildlife Species

To protect special-status wildlife species from disturbance during construction, the actions described below shall occur.

Within a maximum of 14 days of the start of ground-disturbing activities, such as geotechnical drilling, vegetation clearing, and/or grading, the qualified biologist(s) shall conduct preconstruction surveys for special-status species within the Project site, as well as within a minimum of 500 feet (152 meters) from the Project site to account for any inadvertent impacts on adjacent areas. Methodology for preconstruction surveys shall be conducted as appropriate for desert tortoise, burrowing owl, desert kit fox, Swainson's hawk, loggerhead shrike, Le Conte's thrasher, and migratory birds, and shall follow USFWS and/or the CDFW survey protocol guidelines, where appropriate. Surveys need not be conducted for all areas of suitable habitat at one time; they may be phased so that surveys occur within 14 days of the portion of the Project site that would be disturbed. If evidence of occupation by a special-status species is observed, a suitable buffer shall be established by a qualified biologist that results in sufficient avoidance.

MM-BIO-5 Preconstruction Desert Tortoise Surveys and Fencing

Prior to construction, the Project proponent/operator shall conduct preconstruction desert tortoise surveys in accordance with the latest USFWS protocol (USFWS 2019). If no occupied burrows, fresh sign, or desert tortoise are discovered during preconstruction surveys conducted pursuant to Mitigation Measure MM BIO-4, no further mitigation under this mitigation measure is necessary. A survey report shall be submitted outlining the survey results.

If occupied burrows, fresh sign, or desert tortoise are discovered during preconstruction surveys conducted pursuant to MM BIO-4, a permanent tortoise proof exclusion fence shall be installed around portions of the Project cleared of occupied burrows, fresh sign, or desert tortoise. If an occupied burrow, fresh sign, or desert tortoise are observed during preconstruction surveys or incidentally prior to or during construction activities, within the construction area, the Project proponent/operator shall redesign the Project layout so that the location of the occupied burrow, fresh sign, or desert tortoise would be avoided. For occupied burrows, an additional 300-foot (91-meter) buffer from the burrow would be avoided. The permanent tortoise proof exclusion fence would be installed so that any occupied burrow (and its 300-foot [91-meter] buffer), fresh sign, or desert tortoise is outside of the exclusion fence to prevent tortoise from entering the site.

The permanent tortoise proof exclusion fence shall be installed around all construction and operation areas prior to the initiation of earth disturbing activities in areas where preconstruction surveys discovered occupied burrows, fresh sign, or desert tortoise, in coordination with a qualified biologist. The fence shall be designed in such a manner to allow other wildlife to access through the permanent security fence and be constructed of 1-inch (2.5-centimeter) horizontal by 2-inch (5-centimeter) vertical mesh hardware cloth and extend 22 to 24 inches (56 to 61 centimeters) above ground and 12 inches (30 centimeters) below ground. Ultimate fence design must allow for desert kit fox pups to move in and out of the site, and species as large as coyotes access, but still protect the site from possible desert tortoise incursions (for example, cinder block steps to a raised gap or opening in the fence). Where burial of the fence is not possible, the lower 12 inches (30 centimeters) shall be folded outward against the ground and fastened to the ground so as to prevent desert tortoise entry. The fence shall be supported sufficiently to maintain its integrity, be checked at least monthly during construction and operation, and maintained when necessary by the Project operator to ensure its integrity. Provisions shall be made for minimizing the potential for tortoise entry by placement of tortoise guards at the site entry. Common raven perching deterrents shall be installed as part of the fence construction.

A qualified biologist shall conduct a preconstruction survey for desert tortoise within the construction site, as well as before and after installation of desert tortoise exclusionary fencing (if required to be installed) and of Project security fencing. Two surveys without finding any desert tortoises or new desert tortoise sign shall occur prior to declaring the site clear of desert tortoises.

MM-BIO-6 Raven Management Plan and Compensatory Mitigation

Prior to the issuance of grading or building permits, a raven management plan shall be developed for the Project site in consultation with the USFWS and CDFW. This plan shall include but is not limited to:

1. Identification of all raven nests observed within the Project site during construction.

2. Weekly inspection under all nests in the Project site for evidence of raven predation on local wildlife (bones, carcasses, and the like), and, if evidence of predation is noted, submit a report to CDFW, USFWS, and the Kern County Planning and Natural Resources Department within 5 calendar days.

3. Provisions for the management of trash and water that could attract common ravens during the construction and operation phases of the Project.

4. The Project proponent/operator shall be required to participate in the regional comprehensive raven management plan to address biological resources; the Project proponent/operator shall be subject to compensation through the payment of a one-time fee not to exceed $150 and no less than $105 per disturbed acre, as established by the Desert Managers Group. Payment shall be made prior to starting construction activities. Evidence of the USFWS and/or CDFW determination and payment of any required fees shall be submitted to the Kern County Planning and Natural Resources Department.

MM-BIO-7 Burrowing Owl Surveys, Avoidance/Relocation, and Compensatory Mitigation

The Project proponent/operator shall implement the following measures, based on the CDFG 2012 Staff Report Burrowing Owl Mitigation, to ensure potential impacts on burrowing owls resulting from Project

construction, operation and maintenance, and decommissioning activities would be avoided and minimized to a less-than-significant level:

1. A qualified wildlife biologist shall be onsite during all initial grading and construction, preconstruction ground-disturbing activities, and decommissioning activities.

2. A qualified wildlife biologist (that is, a wildlife biologist with the ability to identify the species and possessing previous burrowing owl survey and avoidance and minimization protection experience) shall conduct preconstruction surveys of all areas that would be permanently or temporary impacted, plus a 656-foot (200meter) buffer, to identify presence of active breeding or wintering burrowing owl burrows. The survey shall occur no more than 14 days prior to ground-disturbing activities (that is, vegetation clearance, grading). The survey methodology shall be consistent with the methods outlined in the 2012 CDFW Staff Report on Burrowing Owl Mitigation and shall consist of walking parallel transects 23 to 66 feet (7 to 20 meters) apart, adjusting for vegetation height and density as needed, and noting and mapping any potential burrows with burrowing owl signs or presence of burrowing owls.

3. As each burrow is investigated, Project biologists shall also look for signs of American badger and desert kit fox. Surveys may also be conducted concurrently with desert tortoise preconstruction surveys (BIO-5). A biologist shall prepare a preconstruction survey report that shall be submitted to CDFW and the Kern County Planning and Natural Resources Department.

4. A qualified biologist shall conduct an additional preconstruction survey of all impact areas plus an approximately 656 foot (200 meter) buffer no more than 24 hours prior to start or restart (as the case may be) of ground-disturbing activities associated with construction or decommissioning activities to identify any burrowing owls or burrows necessitating avoidance, minimization, or MMs.

5. If burrowing owls are detected onsite, no ground-disturbing activities shall be permitted within 656 feet (200 meters) of an occupied burrow during the breeding season (February 1–August 31), unless authorized by CDFW. During the non-breeding season (September 1–January 31), no ground disturbing activities shall be permitted within 165 feet (50 meters) of an occupied burrow. Depending on the level of disturbance, a smaller buffer may be established in consultation with CDFW.

6. If burrow avoidance is infeasible during the non-breeding season or during the breeding season where resident owls have not yet begun egg laying or incubation, or where the juveniles are foraging independently and capable of independent survival, a qualified biologist shall implement a passive relocation program in accordance with Appendix E *Example Components for Burrowing Owl Artificial Burrow and Exclusion Plans* (CDFG 2012),

7. If passive relocation is required, the qualified biologist shall prepare a Burrowing Owl Exclusion and Mitigation Plan and Mitigation Land Management Plan in accordance with Staff Report on Burrowing Owl Mitigation (CDFG 2012). The Mitigation Land Management Plan shall include a requirement for the permanent conservation of offsite Burrowing Owl Passive Relocation Compensatory Mitigation Land.

8. If passive relocation is required, the Project proponent shall implement the Mitigation Land Management Plan and permanently conserve in a conservation easement offsite habitat suitable for burrowing owl at ratio of 15 acres (6 hectares) per passively relocated burrowing owl pair, not to exceed the size of the final Project footprint. Land identified to mitigate for passive relocation of burrowing owl may be combined with other offsite mitigation requirements of the Project if the compensatory habitat is deemed suitable to support the species. The Passive Relocation Compensatory Mitigation habitat shall be approved by CDFW. If the Project is located within the service area of a CDFW-approved burrowing owl conservation bank, the Project proponent may purchase available burrowing owl conservation bank credits in lieu of placing offsite habitat into a conservation easement, if acceptable to CDFW.

MM-BIO-8 Swainson's Hawk Surveys, Avoidance/Minimization, and Compensatory Mitigation

The Project proponent/operator shall implement the following measures to ensure potential impacts on Swainson's Hawk resulting from Project construction, operation and maintenance, and decommissioning activities would be avoided and minimized to a less-than-significant level:

1. Prior to Project construction, a qualified biologist shall conduct protocol Swainson's hawk nesting surveys within the survey season immediately prior to Project construction. Surveys shall be conducted in areas that would be impacted by construction, with the appropriate buffer as identified in the *Swainson's Hawk Survey Protocols, Impact Avoidance, and Minimization Measures for Renewable Energy Projects in the Antelope Valley of Los Angeles and Kern Counties, California* (CEC and CDFG 2010). If no Swainson's hawk nests are identified in the survey area, then no further avoidance, minimization, or mitigation measures are required.

2. If an active Swainson's hawk nest(s) is detected, no Project-related activities that may cause nest failure or abandonment shall be conducted within a 0.5 mile (0.8 kilometer) radius of the nest site, provided however, that a smaller no-activity buffer may be established if a qualified biologist determines the proposed buffer would protect the nesting hawks from Project-related disturbance with the potential to cause nest failure or abandonment. The no-activity buffer(s) would be maintained until a qualified biologist has determined that young have fledged and are no longer reliant upon the nest or parental care for survival, or the nest is otherwise inactive (i.e., the nest failed or was abandoned).

3. The Project proponent/operator shall not remove a Swainson's hawk nest tree (defined as a tree that has had a nest in it within the past 5 years) unless avoidance measures are determined to be infeasible. Removal of such trees, if necessary, shall occur only between October 1 and February 28.

4. If an active Swainson's hawk nest(s) is detected within an area that would be permanently impacted by Project-related activities, the Project proponent/operator shall prepare a Swainson's Hawk Habitat Mitigation Plan to compensate for the loss of suitable foraging habitat. At minimum, the Swainson's Hawk Habitat Mitigation Plan would compensate for the loss of suitable foraging habitat on the Project site within 5 miles of the nest site at a 0.5:1 ratio. Compensation may be provided through purchase of mitigation credits from a CDFW-approved conservation bank, or through the establishment of habitat management (HM) lands. The Swainson's Hawk Habitat Mitigation Plan would be submitted to Kern County for review and approval. The Plan shall address the following regarding HM land acquisition and management:

    - HM Land Selection Criteria. Identify the region within which lands would be acquired, and the type/quality of habitat to be acquired. Foraging habitat should be moderate to good with a capacity to improve in quality and value to Swainson's hawks. Foraging habitat with suitable nest trees is preferred. Lands provided as mitigation for impacts to other species may be used if appropriate.
    - Review and Approval of HM Lands Prior to Acquisition. Provide an acquisition proposal to Kern County for approval at least 3 months before acquiring the property. The proposal should discuss the suitability of the property by comparing it to the selection criteria.
    - Land Acquisition Schedule and Financial Assurances. Complete acquisition of proposed HM lands before initiating ground-disturbing Project activities. If an irrevocable letter of credit or other form of security is provided, complete land acquisition within 12 months prior to beginning ground-disturbing Project activities. Provide financial assurances for dedicating adequate funding for impact avoidance, minimization and compensation measures required for Project approval.
    - HM Lands Acquisition. Be prepared to provide a preliminary title report, initial hazardous materials survey report, and biological analysis to Kern County. Fee title, deed restriction, or conservation easement would likely be transferred to a non-profit third party. Be prepared to support enhancement and endowment funds for protection and enhancement of acquired lands, if required. Kern County would approve establishment and management of the funds, ensuring that

qualified non-profit organizations would manage the funds in an appropriate manner. Contributed funds and any related interest generated from the initial capital endowment would support long-term operation, management, and protection of the approved HM lands, including reasonable administrative overhead, biological monitoring, improvements to carrying capacity, law enforcement measures, and any other action designed to protect or improve the habitat values of the HM lands.

MM-BIO-9 Nesting Bird Preconstruction Surveys and Avoidance Plan

To mitigate for potential impacts on nesting birds, special-status birds, and birds protected under the MBTA and California Fish and Game Code during construction and decommissioning activities, the following measures shall be implemented:

1. During the avian nesting season (February 1–August 31), a qualified biologist shall conduct a preconstruction avian nesting survey no more than 14 days prior to initial vegetation clearing. Surveys need not be conducted for the entire Project site at one time; they may be phased so that surveys occur within 14 days prior to clearing or disturbance in specific areas of the site. The surveying biologist must be qualified to determine the species, status, and nesting stage without causing intrusive disturbance. At no time shall the qualified biologist be allowed to handle the nest or its eggs. The survey shall cover all reasonably potential nesting locations on and within 500 feet (152 meters) of the Project site, including ground nesting species, such as horned lark, nests in shrubs that could support nests, and suitable raptor nest sites such as nearby trees, windrows, and power poles. Access shall be granted on private offsite properties prior to conducting surveys on private land. If access is not obtainable, the biologist shall survey these areas from the nearest vantage point with use of spotting scopes or binoculars.

2. If construction is scheduled to occur during the non-nesting season (September 1– February 1), no preconstruction surveys or additional measures are required for non-listed avian species.

3. If active nests are found, a 100-foot (30-meter) no-disturbance buffer shall be created around non-listed avian species' nests unless adjusted by the qualified biologist based on the needs and sensitivities of individual species, and a 300-foot (91-meter) no-disturbance buffer shall be created around non-listed raptor species' nests (or a suitable distance otherwise determined in consultation with CDFW). Any nest of a federally or state listed bird species shall require consultation with the appropriate agency (USFWS or the CDFW) to determine the appropriate buffer distance surrounding the nest to provide adequate nest protection. These buffers shall remain in effect until a qualified biologist has determined that the birds have fledged or the Project component(s) have been redesigned to avoid the area. All no-disturbance buffers shall be delineated in the field with visible flagging or fencing material.

MM-BIO-10 American Badger and Desert Kit Fox Avoidance and Minimization Measures

The Project proponent/operator shall implement the following measures to ensure potential impacts on American badger and desert kit foxes resulting from Project construction, operation and maintenance, and decommissioning activities would be avoided and minimized to a less-than-significant level:

1. A qualified biologist shall be onsite during all initial grading and construction, preconstruction ground-disturbing activities, and decommissioning activities.

2. A qualified biologist (that is, a biologist with the ability to identify the species and possessing previous mammal survey and avoidance and minimization protection experience) shall conduct preconstruction surveys of all areas that would be permanently or temporary impacted, plus a 500-foot (152-meter) buffer, to locate unoccupied and occupied dens.

3. Unoccupied potential dens for desert kit fox or American badger shall have a minimum 30-foot (9-meter) avoidance buffer established.

4. An occupied den outside of the pup-rearing season shall be flagged and ground-disturbing activities avoided within 100 feet (30 meters) of the occupied den. An occupied den during the pup-rearing season, also known as a maternity den, should not be disturbed and a minimum 500-foot (152-meter) avoidance buffer established.

5. Desert kit fox pup-rearing season: February 1–August 1.

6. American badger pup-rearing season: March 15–July 31.

7. If outside the pup-rearing season an occupied den cannot be avoided, a passive relocation program can occur. The program shall consist of determining status of the den (confirming it is a nonmaternity den through remote camera monitoring), excluding American badger or desert kit fox from the occupied nonmaternity den by installation of one-way doors at burrow entrances, monitoring of the den for 7 days to confirm usage has been discontinued, and excavation and collapse of the den. Passive relocation occurs by slowly excavating the burrow (either by hand or by mechanized equipment) under the direct supervision of a qualified biologist and removing no more than 4 inches (10 centimeters) of soil at a time. Passive relocation cannot occur during the pup-rearing season unless remote camera monitoring has documented the den as a non-maternity den. A written report documenting the passive relocation shall be provided to the Kern County Planning and Natural Resources Department within 30 days of relocation.

8. Dens or burrows that are determined to be inactive as determined by a qualified biologist within the Project site, shall be collapsed by a qualified biologist to prevent occupation of the den between the time of the preconstruction survey and construction activities.

MM-BIO-11 Avian Power Line Interaction Committee Guidelines

The Project proponent/operator shall install power lines in conformance with APLIC standards for electrocution-reducing techniques as outlined in *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (APLIC 2006), and the collision-reducing techniques outlined in *Reducing Avian Collisions with Power Lines: The State of the Art in 2012* (APLIC 2012), or any superseding document issued by APLIC.

MM-BIO-12 Avian Mortality and Monitoring Program

During the operation and maintenance phase of the Project, an avian mortality monitoring program shall be developed and implemented to systematically and periodically determine the extent of mortality occurring because of collisions with solar arrays. The measures listed below apply to the program:

1. The avian mortality monitoring program shall be developed following the Mortality Monitoring Design for Utility-Scale Solar Power Facilities and include methods to achieve Objective 1 (monitoring to estimate total bird and bat mortality). Methods include using a trained and skilled team of authorized biologists to systematically sample the Project site by walking transects through the solar arrays scanning for deceased birds.

2. Data shall be collected on any encountered deceased bird (or any other wildlife) species including species, condition of the carcass, approximate age, presence of feathers, and the like.

3. Additionally, maintenance personnel working on the Project site that encounter injured or deceased birds (or any other wildlife) should be trained to collect data and photograph the encountered species.

4. Mortality monitoring shall be conducted for a minimum 1-year period following the commencement of the operation and maintenance phase of the Project.

MM-BIO-13 Small Mammal Preconstruction Surveys and Avoidance and Monitoring Plan

Preconstruction surveys for small mammals including Mohave ground squirrel and southern grasshopper mouse shall be conducted within all suitable habitat 14 days prior to initial ground-disturbing activities. If

a Mohave ground squirrel is found on the construction site, work shall be halted and redirected to areas not supporting this species, and consultation with Kern County and CDFW shall occur. A written report shall be sent to CDFW within 5 calendar days of the sighting. The report shall include the date, time of the finding or incident (if known), and location of the animal. If a dead Mohave ground squirrel is encountered, the remains shall be collected, frozen as soon as possible, and CDFW shall be contacted to determine where the remains would be sent.

If Mohave ground squirrels are detected during any Project surveys, the applicant shall prepare a Mohave Ground Squirrel Avoidance and Monitoring Plan. If it is determined from surveys that Mohave ground squirrels are not present, no further action is required.

The Mohave Ground Squirrel Avoidance and Monitoring Plan shall include, at a minimum:

- Specifications for designation of qualified Project biologists for conducting surveys and monitoring
- Methods for excluding Mohave ground squirrels from the work area, such as fencing
- Measures and procedures related to monitoring of construction for presence of Mohave ground squirrels
- A requirement to cease work if a Mohave ground squirrel is encountered in a work area
- Requirements for the worker environmental awareness training and education program training as it pertains to Mohave ground squirrels
- Reporting requirements

MM-BIO-14 Herbicide Use

The Project proponent/operator shall continuously comply with the following:

1. Use of herbicides that are approved by the CDFW and USFWS for use in California which are appropriate for application adjacent to natural vegetation areas (that is, non-agricultural use). Personnel applying herbicides shall have all appropriate state and local herbicide applicator licenses and comply with all state and local regulations regarding herbicide use.

2. Herbicides shall be mixed and applied in conformance with the manufacturer's directions.

3. The herbicide applicator shall be equipped with splash protection clothing and gear, chemical resistant gloves, chemical spill/splash wash supplies, and safety data sheets for all hazardous materials to be used. To minimize harm to wildlife, vegetation, and water bodies, herbicides shall not be applied directly to wildlife.

4. Products identified as non-toxic to birds and small mammals shall be used if nests or dens are observed; and herbicides shall not be applied if it is raining at the site, rain is imminent, or the target area has puddles or standing water.

5. Herbicides shall not be applied when wind velocity exceeds 10 miles per hour (16 kilometers per hour). If spray is observed to be drifting to a non-target location, spraying shall be discontinued until conditions causing the drift have abated.

6. A written record of all herbicide applications on the site, including dates and amounts, shall be furnished annually to the Kern County Planning and Natural Resources Department.

MM-BIO-15 Short-term Noise Reduction

The following measures are to be implemented to further reduce short-term noise levels associated with Project construction and decommissioning:

1. Equipment staging shall be located in areas that would create the greatest distance between construction-related noise sources and noise-sensitive species nearest the Project site during

construction to the extent practical. The Project contractor shall place all stationary construction equipment so that emitted noise is directed away from noise-sensitive species nearest the Project site, where feasible.

2. Construction equipment shall be fitted with noise-reduction features such as mufflers and engine shrouds that are no less effective than those originally installed by the manufacturer.

3. Construction and decommissioning activities at the Project site shall comply with the hourly restrictions for noise-generating construction activities, as specified in the County's Code of Ordinances, Chapter 8.36. Accordingly, construction activities shall be prohibited between the hours of 9:00 p.m. to 6:00 a.m. on weekdays, and between 9:00 p.m. to 8:00 a.m. on weekends. These hourly limitations shall not apply to activities where hourly limitations would result in increased safety risk to workers or the public, such as commissioning and maintenance activities that must occur after dark to ensure photovoltaic arrays are not energized, unanticipated emergencies requiring immediate attention, or security patrols.

4. Haul trucks shall not be allowed to idle for periods greater than 5 minutes, except as needed to perform a specified function (for example, concrete mixing).

5. Onsite vehicle speeds shall be limited to 15 miles per hour (24 kilometers per hour), or less (except in cases of emergency).

6. Back-up beepers for all construction equipment and vehicles shall be broadband sound alarms or adjusted to the lowest noise levels possible, provided that the Occupational Safety and Health Administration and California Division of Occupational Safety and Health's safety requirements are not violated. On vehicles where back-up beepers are not available, alternative safety measures such as escorts and spotters shall be employed.

MM-BIO-16 Kern County Dark Skies Ordinance:

Prior to Project operations, the Project proponent shall demonstrate to Kern County Planning and Natural Resources Staff that the Project site complies with the applicable provisions of the Dark Skies Ordinance (Chapter 19.81 of the Kern County Zoning Ordinance), and shall be designed to provide the minimum illumination needed to achieve safety and security objectives. All lighting shall be directed downward and shielded to focus illumination on the desired areas only and avoid light trespass into adjacent areas. Lenses and bulbs shall not be exposed or extend below the shields.

MM-BIO-17 Minimize Glare

Prior to the issuance of building permits, the Project proponent shall demonstrate the solar panels and hardware are designed to minimize glare and spectral highlighting. Emerging technologies shall be used, such as diffusion coatings and nanotechnological innovations, to effectively reduce the refractive index of the solar cells and protective glass. These technological advancements are intended to make the solar panels more efficient with respect to converting incident sunlight into electrical power while also reducing the amount of glare generated by the panels. Specifications of such designs shall be submitted to the Kern County Planning and Natural Resources Department.

MM-BIO-18 Fugitive Dust Control Plan

Prior to issuance of a grading or building permit, the Project proponent shall prepare and submit a Fugitive Dust Control Plan to the Kern County Planning and Natural Resources Department. The plan shall include all Eastern Kern Air Pollution Control District recommended measures.

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Appendix A
Potential Special-status Wildlife Species with the Potential to Occur in the Project Site

Appendix A Table 1
Special-Status Wildlife with the Potential to Occur in the Project site
Wildlife Report, Enterprise Solar Storage Project, Kern County, California

Common Name	Scientific Name	CESA/FESA	CDFW Status[a]	Other Status[b]	Habitat Requirements	Occurrence Potential
Amphibians and Reptiles						
Mojave Desert tortoise	*Gopherus agassizii*	Threatened[c]/Threatened	None	None	Most commonly inhabits desert scrub, desert wash and Joshua tree habitats. The desert tortoise requires friable soil for burrow and nest construction and prefers creosote bush habitat and areas with wildflower blooms.	May be Present. Biologists observed one potentially desert tortoise burrow (Class 4) during the presence absence surveys. No live desert tortoise or definitely tortoise sign were observed. Potentially suitable desert tortoise habitat is present in Project site, especially west of SR-14. Most of the Project site has been heavily grazed by domestic sheep which reduces the quality of suitable habitat. Based on presence of suitable habitat and the species' known distribution and range, desert tortoise may be present at the Project site.
Northern California legless lizard	*Anniella pulchra*	None	SSC	None	Inhabits chaparral, coastal dunes, and coastal scrub habitats. They prefer sandy or loose loamy soils under sparse vegetation.	Low. Suitable habitat is not found within Project site.
Birds						
Bendire's thrasher	*Toxostoma bendirei*	None	SSC	USFWS - BCC	Migratory; local spring/summer resident in flat areas of desert succulent shrub/Joshua tree habitats in Mojave Desert. Nests in cholla, yucca, palo verde, thorny shrub, or small tree.	Low. Outside of known range of this species.
Burrowing owl	*Athene cunicularia*	None	SSC	USFWS - BCC	Inhabits open, dry annual or perennial grasslands, desert and scrublands characterized by low growing vegetation.	High/Known to occur. Suitable habitat, sign, and live owls were found within the Project site during 2021 visit.
California Condor	*Gymnogyps californianus*	Endangered/Endangered	FP	None	Inhabits chaparral valley and foothill grassland habitats. Deep canyons containing clefts in the rocky walls provide nesting sites. Forages up to 100 miles from roost/nest.	Low. Potentially suitable habitat is absent from the Project site. This species requires mountainous areas for roosting and large sources of carrion. This species is known from Tehachapi, San Gabriel and Liebre Mountains, but there are no records within the Antelope Valley. It is possible that an individual could fly over the Project site. The nearest USFWS designated critical habitat for California Condor is approximately 20 miles (32 kilomeers) to west of Project.
California Horned Lark	*Eremophila alpestris actia*	None	WL	None	Inhabits coastal regions, chiefly from Sonoma County to San Diego County. Also found in main part of San Joaquin Valley and east to foothills.	Low. Although CNDDB records indicate this species known from 5 mile (8 kilometer) radius of Project site, no potentially suitable habitat present. Biologists observed closely related and more common desert variety, horned lark (*Eremophila alpestris*), during the 2021 site visit.
Cooper's hawk	*Accipiter cooperii*	None	WL	None	Nest sites mainly in woodland, riparian growths of deciduous trees.	Moderate. Incidentially observed in field in 2021 during Sanborn Solar Expansion Project surveys. No suitable nesting habitat on Project site. Suitable foraging habitat present.
Ferruginous hawk	*Buteo regalis*	None	WL	USFWS - BCC	Open grasslands, sagebrush flats, desert scrub, low foothills and fringes of pinyon and juniper habitats.	Moderate. Suitable foraging habitat present.
Golden Eagle	*Aquila chrysaetos*	None	FP; WL	USFWS - BCC, Bald and Golden Eagle Protection Act	Inhabits rolling foothills, mountain areas, sage-juniper flats and desert habitats. The golden eagle also prefers large trees in open areas. Cliff-walled canyons provide nesting habitat in most parts of its range.	Moderate. No suitable nesting habitat occurs within the Project site, but foraging habitat is present. One historic CNDDB observation was within 5-mile (8 kilometer) radius of the Project site, but the area is now heavily mined.
Lawrence's Goldfinch	*Spinus lawrencei*	None	None	USFWS - BCC	Inhabits broadleaved upland forest, chaparral, pinyon and juniper woodlands, and riparian woodlands. Nests in open oak or other arid woodland and chaparral, near water. Nearby herbaceous habitats used for feeding.	Low. Low quality foraging habitat and no potentially suitable nesting habitat in Project site.
Le Conte's thrasher	*Toxostoma lecontei*	None	SSC	USFWS - BCC	Inhabits open desert wash, desert scrub, alkali desert scrub and desert succulent scrub habitat. This species commonly nests in dense, spiny shrub or densely branched cactus in desert wash habitat.	High/Known to occur. Suitable foraging habitat present in Project site. CNDDB observations fall within 5-mile (8 kilometer) radius of Project site and species was observed during 2021 field visit.
Least Bell's vireo	*Vireo bellii pusillus*	Endangered/Endangered	None	None	Inhabits low, dense riparian growth along water or along dry parts of intermittent streams. Typically associated with willow, cottonwood, baccharis, wildlife blackberry, or mesquite in desert localities.	Low. No potentially suitable habitat in Project site.
Loggerhead shrike	*Lanius ludovicianus*	None	SSC	USFWS - BCC	Broken woodlands, savannah, pinyon-juniper, Joshua tree, and riparian woodlands, desert oases, scrub, and washes.	High/Known to occur. This species was observed within the Project site during 2021 field visit.

Appendix A Table 1
Special-Status Wildlife with the Potential to Occur in the Project site
Wildlife Report, Enterprise Solar Storage Project, Kern County, California

Common Name	Scientific Name	CESA/FESA	CDFW Status[a]	Other Status[b]	Habitat Requirements	Occurrence Potential
Long-billed Curlew	*Numenius americanus*	None	None	USFWS - BCC	Inhabits Great Basin grassland, meadow and seeps. Favors gravelly soils and gently rolling terrain. Breeds in upland shortgrass prairies and wet meadows in northeastern California.	Low. No potentially suitable habitat in Project site.
Merlin	*Falco columbarius*	None	WL	USFWS - BCC	Seacoast, tidal estuaries, open woodlands, savannahs, edges of grasslands and deserts, farms, and ranches. Clumps of trees or windbreaks are required for roosting in open country.	Low. Suitable foraging habitat is present within the Project site.
Mountain plover	*Charadrius montanus*	None	SSC	USFWS - BCC	Inhabits Great Basin grassland and scrub, Mojavean desert scrub, and Sonoran desert scrub. Breeding sites located on cliffs. Forages far afield, even to marshlands and ocean shores.	Low. No potentially suitable nesting habitat but species could forage over Project site.
Northern harrier	*Circus hudsonius*	None	SSC	None	Nests and forages in tree-less habitats such as marshes, grasslands, pastures, agricultural fields, sagebrush flats, and desert sinks. Nests on ground.	High/Known to occur. Incidentally observed during field survey. No suitable nesting habitat is present; however this species could forage over Project site.
Prairie falcon	*Falco mexicanus*	None	WL	USFWS - BCC	Inhabits dry, open terrain within level or hilly areas. Breeding sites for this species include cliffs. Forages far afield, even to marshfields and ocean shores.	Moderate. Potentially suitable foraging habitat but no potentially suitable nesting habitat present in Project site. No CNDDB occurrences within 5-miles (8 kilometers) of Project site.
Southwestern willow flycatcher	*Empidonax traillii extimus*	Endangered/Endangered	None	None	Inhabits riparian woodlands in southern California.	Low. No potentially suitable habitat in Project site.
Swainson's hawk	*Buteo swainsoni*	Threatened/None	None	None	Inhabits grasslands with scattered trees, juniper-sage flats, riparian areas, savannahs, and agricultural or ranch lands with groves or lines of trees. Requires foraging areas such as grasslands, alfalfa, or grain fields supporting rodent populations.	Moderate. Suitable Joshua trees for nesting and open canopy for foraging in Project site. No CNDDB occurrences within 5-miles (8 kilometers) of Project site.
Western Snowy Plover	*Charadrius alexandrinus nivosus*	None/Threatened	SSC	USFWS - BCC	Inhabits Great Basin standing waters, sandy shore, and wetland habitats. Needs sandy, gravelly, or friable soils for nesting.	Low. No potentially suitable habitat in Project site. The Project is adjacent to sewage treatment ponds (Figure 1-2).
Whimbrel	*Numenius hudsonicus*	None	None	USFWS - BCC	Occupies open habitats, mudflats, beaches, and salt marshes. During nesting season inhabits the tundra.	Low. No potentially suitable habitat in Project site.
White-faced Ibis	*Plegadis chihi*	None	WL	None	Fresh emergent wetland, wet meadows, and flooded/irrigated pastures and croplands.	Low. Incidentally observed during 2021 field visit. No potentially suitable foraging or nesting present and it is most likely that this species was observed during migration. The Project is adjacent to sewage treatment ponds (Figure 1-2).
Willow flycatcher	*Empidonax traillii*	Endangered/None	None	USFWS - BCC	Inhabits extensive thickets of low, dense willows on edge of wet meadows, ponds, or backwaters; 2,000-8,000 foot elevation.	Low. No potentially suitable habitat in Project site.
Mammals						
American badger	*Taxidea taxus*	None	SSC	Fur bearing mammal	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils.	Moderate: Potentially suitable habitat in Project site, but no sign of this species was observed during field surveys.
Desert kit fox	*Vulpes macrotis arsipus*	None	None	Fur bearing mammal	Inhabits open desert, shrubby, or shrub-grass habitat. In the Mojave Desert, the species typically occurs in creosote bush vegetation community. This nocturnal species forages at night and typically resides in a den or burrow	High/Known to occur. Suitable friable soils and foraging habitat within the Project site. Desert kit fox sign observed within Project vicinity during 2021 field visit.
Fisher	*Pekania pennanti*	Threatened/Endangered	SSC	None	Inhabits north coast coniferous forest, Oldgrowth, and riparian forests. Uses cavities, snags, logs and rocky areas for cover and denning. Needs large areas of mature, dense forest.	Low. No potentially suitable habitat in Project site.
Fringed myotis	*Myotis thysanodes*	None	None	WBWG - H	Inhabits a wide variety of habitat, but prefers pinyon juniper, valley foothill hardwood and hardwood conifer habitats. Uses caves, mines, buildings, or crevices for maternity colonies and roosts.	Low. No potentially suitable roosting or foraging habitat in Project site.
Long-eared myotis	*Myotis evotis*	None	None	WBWG - M	Inhabits brush, woodland and forest habitats. This species prefers coniferous woodlands and forests. Nursey colonies in buildings, crevices, space under bark, and snags. Caves used primarily as night roosts.	Low. No potentially suitable roosting or foraging habitat in Project site.
Long-legged myotis	*Myotis volans*	None	None	WBWG - H	Inhabits woodland and forest habitats. This species roosts in trees during the day and caves and mines during the night. Nursery colonies under bark or in hollow trees, but occasionally in crevices or buildings.	Low. No potentially suitable roosting or foraging habitat in Project site.

Appendix A Table 1
Special-Status Wildlife with the Potential to Occur in the Project site
Wildlife Report, Enterprise Solar Storage Project, Kern County, California

Common Name	Scientific Name	CESA/FESA	CDFW Status[a]	Other Status[b]	Habitat Requirements	Occurrence Potential
Mohave ground squirrel	*Xerospermophilus mohavensis*	Threatened/None	None	None	Inhabits Open desert scrub, alkali scrub and Joshua tree woodland. Also feeds in annual grasslands. Restricted to Mojave Desert. Prefers sandy to gravelly soils, avoids rocky areas. Uses burrows at base of shrubs for cover. Nests are in burrows.	Low. Project site is within westernmost range of Mohave ground squirrel. Potentially suitable habitat and forage species are present, but Jacobs did not perform camera or live-trapping for this species. No individiuals were encountered during live-trapping on adjacent Sanborn Solar Project and species is presumed absent or occurs in low numbers in vicinity (Kern County 2020a).
Pallid bat	*Antrozous pallidus*	None	SSC	WBWG - H	Inhabits rocky canyons, open farmland, scattered desert scrub, grassland, shrubland, woodland, and mixed conifer forest.	Moderate. No potentially suitable roosting habitat but species could forage over Project site. Previous documentation of this species on Soledad Mountain (Kern County 2020a).
Southern Grasshopper mouse	*Onychomys torridus ramona*	None	SSC	None	Desert areas, especially scrub habitats with friable soils for digging. Prefers low to moderate shrub cover. Feeds almost exclusively on arthropods, especially scorpions and orthopteran insects.	High/Known to occur. Biologists incidentally observed a dead individual of this species. Suitable desert scrub habitat occurs within the Project site. No CNDDB occurences within 5-miles (8 kilometers).
Spotted bat	*Euderma maculatum*	None	SSC	WBWG - H	Occupies a wide variety of habitats from arid deserts and grasslands through mixed conifer forests. Feeds over water and along washes. Feeds almost entirely on moths. Needs rock crevices in cliffs or caves for roosting.	Low. No potentially suitable roosting habitat but species could forage over Project.
Tehachapi pocket mouse	*Perognathus alticola inexpectatus*	None	SSC	None	Arid annual grassland and desert shrub communities, but also taken in fallow grain fields and in Russian thistle. Burrows for cover and nesting. Aestivates and hibernates during extreme weather. Forages on open ground and under shrubs.	Low. Suitable desert scrub habitat project site soils occur within the project site, although the project site is just below the typical elevation range for this species.
Townsend's big-eared bat	*Corynorhinus townsendii*	None	SSC	WBWG - H	Inhabits a wide variety of habitats throughout California, most commonly occurring in mesic sites in the open, hanging from walls and ceilings. This species has limited roosting sites and is extremely sensitive to human disturbance.	Moderate. No potentially suitable roosting habitat but species could forage over Project site. Both CNDDB and other surveys recorded occurrences of Townsend's big-eared bat in Soledad Mountains (Kern County 2020a) within 5-miles (8 kilometers) of Project site.
Tulare grasshopper mouse	*Onychomys torridus tularensis*	None	None	None	Hot, arid valleys and scrub deserts in the southern San Joaquin Valley. Diet almost exclusively composed of arthropods, therefore needs abundant supply of insects.	Low. Suitable desert scrub habitat occurs within the Project site.
Western mastiff bat	*Eumops perotis californicus*	None	SSC	WBWG - H	Many open, semi-arid to arid habitats, including conifer and deciduous woodlands, coastal scrub, grasslands, chaparral, etc. Roosts in crevices in cliff faces, high buildings, trees, and tunnels.	Low. No potentially suitable roosting habitat but species could forage over Project site.

Notes:
[a] CDFW Status
[b] Other Status
[c] Desert tortoise are listed as CESA threatened. As of October 19, 2020, California Fish and Game Commission listed this species as candidate species for consideration as CESA endangered (2020).
CESA = California Endangered Species Act
CDFW = California Department of Fish and Wildlife
FESA = Federal Endangered Species Act
FP = Fully Protected
SSC = Species of Special Concern
USFWS-BCC = U.S. Fish and Wildlife Service - Bird of Conservation Concern
WL = Watch List
WBWG = Western Bat Working Group
H = High Priority
M = Moderate Priority
L = Low Priority

Kern County. 2020a. Draft Environmental Impact Report. Sanborn Solar Project (SCH# 2019060259). Planning and Natural Resources Department. Bakersfield, California. February.

Appendix B
USFWS 2019 Survey Data Sheets

(916) 335-9141 *See below for more biologists

Date of survey: 12 / 04 /2021 (day, month, year) Survey biologist(s): Morgan King: morgan.king10@jacobs.com (name, email, and phone number)

Site description: TGP Sanborn Expansion : ~5,000 acres: Near Mojave, Kern County, CA (project name and size, general location)

County: Kern Quad: Mojave, Soledad Mtn, Sanborn, Bissell Location: Near Mojave (UTM coordinates, lat-long, and/or TRS, map datum)

Circle one: 100% coverage or Sampling Area size to be surveyed: ~5,000 ac Transect #: NA Transect length: NA

GPS Start-point: 11 N 398393 3877441 (easting, northing, elevation in meters) Start time: 0818 am/pm

GPS End-point: 11 N 398814 3877322 (easting, northing, elevation in meters) End time: 1617 am/pm

Start Temp: 20.1 °C End Temp: 28 °C

Live Tortoises

Detection number	GPS location Easting	Northing	Time	Tortoise location (*in burrow*: all of tortoise beneath plane of burrow opening, or *not in burrow*)	Approx MCL ≥180 mm? (*Yes, No or Unknown*)	Existing tag # and color, if present
1	None / No DETD found					
2						
3						
4						
5						
6						
7						
8						

Tortoise Sign (burrows, scats, carcasses, etc)

Detection number	GPS location Easting	Northing	Type of sign (*burrows, scats, carcass, etc*)	Description and comments
1	None / No Sign found			
2				
3				
4				
5				
6				
7				
8				

*Additional biologists: Brian Boyd
Kay Nicholson
Samantha Vaughan
Daniel Smith
Shane Tom
Rebecca John

(916) 335-9141 *See below for more biologists

Date of survey: 13 / 04 /2021 (day, month, year) Survey biologist(s): Morgan King: morgan.king10@jacobs.com (name, email, and phone number)

Site description: TGP Sanborn Expansion : ~5,000 acres: Near Mojave, Kern County, CA (project name and size; general location)

County: Kern Quad: Mojave, Soledad Mtn, (Sanborn) Bissell Location: Near Mojave (UTM coordinates, lat-long, and/or TRS; map datum)

Circle one: 100% coverage or Sampling Area size to be surveyed: ~5,000 ac Transect #: NA Transect length: NA

GPS Start-point: UN 398920 3877308 (easting, northing, elevation in meters) Start time: 0625 (am)/pm

GPS End-point: UN 399263 3877210 (easting, northing, elevation in meters) End time: 1425 am(pm)

Start Temp: 15.6 °C End Temp: 27.3 °C

Live Tortoises

Detection number	GPS location Easting	Northing	Time	Tortoise location (*in burrow*: all of tortoise beneath plane of burrow opening, or *not in burrow*)	Approx MCL ≥180 mm? (*Yes, No or Unknown*)	Existing tag # and color, if present
1	None / No DETO found					
2						
3						
4						
5						
6						
7						
8						

Tortoise Sign (burrows, scats, carcasses, etc)

Detection number	GPS location Easting	Northing	Type of sign (*burrows, scats, carcass, etc*)	Description and comments
1	None / No Sign found			
2				
3				
4				
5				
6				
7				
8				

*Additional biologists: Brian Boyd
Jen Jelincic
Kay Nicholson
Samantha Vaughan
Daniel Smith
Shane Tom
Rebecca John

(916) 335-9141 *See below for more biologists

Date of survey: 14 / 04 /2021 (day, month, year) Survey biologist(s): Morgan King: morgan.king10@jacobs.com (name, email, and phone number)

Site description: TGP Sanborn Expansion : ~5,000 acres: Near Mojave, Kern County, CA (project name and size, general location)

County: Kern Quad: Mojave, Soledad Mtn, Sanborn, Bissell Location: Near Mojave (UTM coordinates, lat-long, and/or TRS; map datum)

Circle one: 100% coverage or Sampling Area size to be surveyed: ~5,000 ac Transect #: NA Transect length: NA

GPS Start-point: 11N 399440 3877191 (easting, northing, elevation in meters) Start time: 0630 am/pm

GPS End-point: 11N 399742 3877077 (easting, northing, elevation in meters) End time: 1454 am/pm

Start Temp: 15.4 °C End Temp: 21.5 °C

Live Tortoises

Detection number	GPS location Easting	Northing	Time	Tortoise location (*in burrow*: all of tortoise beneath plane of burrow opening, or *not in burrow*)	Approx MCL ≥180 mm? (*Yes, No or Unknown*)	Existing tag # and color, if present
1	None / No DETD found					
2						
3						
4						
5						
6						
7						
8						

Tortoise Sign (burrows, scats, carcasses, etc)

Detection number	GPS location Easting	Northing	Type of sign (*burrows, scats, carcass, etc*)	Description and comments
1	None / No Sign found			
2				
3				
4				
5				
6				
7				
8				

*Additional biologists: Brian Boyd
Jen Jelinoic
Kay Nicholson
Samantha Vaughan
Daniel Smith
Rebecca John

(916) 335-9141 *See below for more biologists

Date of survey: 15 / 04 /2021 (day, month, year) Survey biologist(s): Morgan King: morgan.king10@jacobs.com (name, email, and phone number)

Site description: TGP Sanborn Expansion : ~5,000 acres: Near Mojave, Kern County, CA (project name and size; general location)

County: Kern Quad: Mojave, Soledad Mtn, Sanborn, Bissell Location: Near Mojave (UTM coordinates, lat-long, and/or TRS; map datum)

Circle one: 100% coverage or Sampling Area size to be surveyed: ~5,000 ac Transect #: NA Transect length: NA

GPS Start-point: 319804 3875053 (easting, northing, elevation in meters) Start time: 0630 am/pm

GPS End-point: 401023 3874922 (easting, northing, elevation in meters) End time: 1400 am/pm

Start Temp: 9.4 °C End Temp: 25 °C

Live Tortoises

Detection number	GPS location Easting	Northing	Time	Tortoise location (*in burrow*: all of tortoise beneath plane of burrow opening, or *not in burrow*)	Approx MCL ≥180 mm? (*Yes, No or Unknown*)	Existing tag # and color, if present
1	None / No DETD found					
2						
3						
4						
5						
6						
7						
8						

Tortoise Sign (burrows, scats, carcasses, etc)

Detection number	GPS location Easting	Northing	Type of sign (*burrows, scats, carcass, etc*)	Description and comments
1	None / No Sign found			
2				
3				
4				
5				
6				
7				
8				

*Additional biologists: Brian Boyd
Jen Jelincic
Kay Nicholson
Samantha Vaughan
Daniel Smith
Rebecca John
Shane Tom

Date of survey: 16/04/2021 (day, month, year) Survey biologist(s): Morgan King: morgan.king10@jacobs.com (916) 335-9141 (name, email, and phone number) * See below for more biologists

Site description: TGP Sanborn Expansion: ~5,000 acres: Near Mojave, Kern County, CA (project name and size; general location)

County: Kern Quad: Mojave, Soledad Mtn, (Sanborn) Bissell Location: Near Mojave (UTM coordinates, lat-long, and/or TRS, map datum)

Circle one: 100% coverage or Sampling Area size to be surveyed: ~5000 acres Transect #: NA Transect length: NA

GPS Start-point: 401337 3874930 (easting, northing, elevation in meters) Start time: 0640 am/pm

GPS End-point: 398386 3877404 (easting, northing, elevation in meters) End time: 1130 am/pm

Start Temp: 1.8 °C End Temp: 26 °C

Live Tortoises

Detection number	GPS location Easting	Northing	Time	Tortoise location (*in burrow*: all of tortoise beneath plane of burrow opening, or *not in burrow*)	Approx MCL ≥180 mm? (*Yes, No or Unknown*)	Existing tag # and color, if present
1	None					
2						
3						
4						
5						
6						
7						
8						

Tortoise Sign (burrows, scats, carcasses, etc)

Detection number	GPS location Easting	Northing	Type of sign (*burrows, scats, carcass, etc*)	Description and comments
1	None			
2				
3				
4				
5				
6				
7				
8				

* Additional Biologists: Brian Boyd, Kay Nicholson, Samantha Vaughan, Daniel Smith, Shane Tom, Rebecca John, Jen Jelincic

(916) 335-9141 *See below for more biologists

Date of survey: 20 / 04 /2021 (day, month, year) Survey biologist(s): Morgan King: morgan.king10@jacobs.com (name, email, and phone number)

Site description: TGP Sanborn Expansion : ~5,000 acres: Near Mojave, Kern County, CA (project name and size; general location)

County: Kern Quad: (Mojave) Soledad Mtn, Sanborn, Bissell Location: Near Mojave (UTM coordinates, lat-long, and/or TRS, map datum)

Circle one: (100% coverage) or Sampling Area size to be surveyed: ~5,000 ac Transect #: NA Transect length: NA

GPS Start-point: 393467 3876381 (easting, northing, elevation in meters) Start time: 1200 am/pm

GPS End-point: 392412 3875376 (easting, northing, elevation in meters) End time: 1427 am/pm

Start Temp: 30.1 °C End Temp: 31 °C

Live Tortoises

Detection number	GPS location Easting	Northing	Time	Tortoise location (*in burrow*: all of tortoise beneath plane of burrow opening, or *not in burrow*)	Approx MCL ≥180 mm? (*Yes, No or Unknown*)	Existing tag # and color, if present
1	None					
2						
3						
4						
5						
6						
7						
8						

Tortoise Sign (burrows, scats, carcasses, etc)

Detection number	GPS location Easting	Northing	Type of sign (*burrows, scats, carcass, etc*)	Description and comments
1	None			
2				
3				
4				
5				
6				
7				
8				

*Additional biologists: Jen Jelincic
Shane Tom
Daniel Smith
Brian Boyd
Kay Nicholson
Sam Vaughan
Rebecca John

(916) 335-9141 *See below for more biologists

Date of survey: 21 / 04 /2021 (day, month, year) Survey biologist(s): Morgan King: morgan.king10@jacobs.com (name, email, and phone number)

Site description: TGP Sanborn Expansion : ~5,000 acres: Near Mojave, Kern County, CA (project name and size, general location)

County: Kern Quad: (Mojave) Soledad Mtn, Sanborn, Bissell Location: Near Mojave (UTM coordinates, lat-long, and/or TRS, map datum)

Circle one: 100% coverage or Sampling Area size to be surveyed: ~5,000 ac Transect #: NA Transect length: NA

GPS Start-point: 393494 3876397 (easting, northing, elevation in meters) Start time: 0620 am/pm

GPS End-point: 392681 3877197 (easting, northing, elevation in meters) End time: 1410 am/pm

Start Temp: 9 °C End Temp: 21.6 °C

Live Tortoises

Detection number	GPS location Easting	GPS location Northing	Time	Tortoise location (*in burrow*: all of tortoise beneath plane of burrow opening, or *not in burrow*)	Approx MCL ≥180 mm? (*Yes, No or Unknown*)	Existing tag # and color, if present
1	None					
2						
3						
4						
5						
6						
7						
8						

Tortoise Sign (burrows, scats, carcasses, etc)

Detection number	GPS location Easting	GPS location Northing	Type of sign (*burrows, scats, carcass, etc*)	Description and comments
1	None			
2				
3				
4				
5				
6				
7				
8				

*Additional biologists: Jen Jelincic
Shane Tom
Daniel Smith
Kay Nicholson
Rebecca John
Samantha Vaughan
Brian Boyd

(916) 335-9141 *See below for more biologists

Date of survey: 22 / 04 /2021 (day, month, year) Survey biologist(s): Morgan King: morgan.king10@jacobs.com (name, email, and phone number)

Site description: TGP Sanborn Expansion : ~5,000 acres: Near Mojave, Kern County, CA (project name and size, general location)

County: Kern Quad: (Mojave,) Soledad Mtn, Sanborn, Bissell Location: Near Mojave (UTM coordinates, lat-long, and/or TRS, map datum)

Circle one: 100% coverage or Sampling Area size to be surveyed: ~5,000 ac Transect #: NA Transect length: NA

GPS Start-point: 392630 3877200 (easting, northing, elevation in meters) Start time: 0627 am/pm

GPS End-point: 391857 3877196 (easting, northing, elevation in meters) End time: 1030 am/pm

Start Temp: 13 °C End Temp: 22 °C

Live Tortoises

Detection number	GPS location Easting	Northing	Time	Tortoise location (*in burrow*: all of tortoise beneath plane of burrow opening, or *not in burrow*)	Approx MCL ≥180 mm? (*Yes, No or Unknown*)	Existing tag # and color, if present
1	None					
2						
3						
4						
5						
6						
7						
8						

Tortoise Sign (burrows, scats, carcasses, etc)

Detection number	GPS location Easting	Northing	Type of sign (*burrows, scats, carcass, etc*)	Description and comments
1	393079	3877136	DTB1 : Burrow, class 4	No live DT associated, no sign Depth between 0.0 - 0.5 m width 0.9 cm Morgan King Transect
2	~~392374~~	3876937	DTB2 : Burrow, class 4	~~No live DT associated, no sign~~ Depth between 0.0 - 0.5m width 12 cm ~~Shane Tom Transect~~
3				
4				
5				
6				
7				
8				

The project area was revised after 2021 surveys were completed. DTB2 is no longer within the project boundaries.

*Additional biologists: Samantha Vaughan
Shane Tom
Brian Boyd
Kay Nicholson
Rebecca John
Daniel Smith
Jen Jelincic

(916) 335-9141 *See below for more biologists

Date of survey: 24 / 04 /2021 (day, month, year) Survey biologist(s): Morgan King: morgan.king10@jacobs.com (name, email, and phone number)

Site description: TGP Sanborn Expansion : ~5,000 acres: Near Mojave, Kern County, CA (project name and size, general location)

County: Kern Quad: Mojave, Soledad Mtn, Sanborn, Bissell Location: Near Mojave (UTM coordinates, lat-long, and/or TRS; map datum)

Circle one: 100% coverage or Sampling Area size to be surveyed: ~5,000 ac Transect #: NA Transect length: NA

GPS Start-point: 401565 3873332 (easting, northing, elevation in meters) Start time: 1021 am/pm

GPS End-point: 401899 3873321 (easting, northing, elevation in meters) End time: 1227 am/pm

Start Temp: 21 °C End Temp: 25 °C

Live Tortoises

Detection number	GPS location Easting	GPS location Northing	Time	Tortoise location (*in burrow*: all of tortoise beneath plane of burrow opening, or *not in burrow*)	Approx MCL ≥180 mm? (*Yes, No or Unknown*)	Existing tag # and color, if present
1	None					
2						
3						
4						
5						
6						
7						
8						

Tortoise Sign (burrows, scats, carcasses, etc)

Detection number	GPS location Easting	GPS location Northing	Type of sign (*burrows, scats, carcass, etc*)	Description and comments
1	None			
2				
3				
4				
5				
6				
7				
8				

*Additional biologists: Kay Nicholson
Daniel Smith
Brian Boyd
Samantha Vaughan
Shane Tom
Jen Jelincic
Rebecca John

(916) 335-9141 *See below for more biologists

Date of survey: 26 / 04 /2021 (day, month, year) Survey biologist(s): Morgan King: morgan.king10@jacobs.com (name, email, and phone number)

Site description: TGP Sanborn Expansion : ~5,000 acres: Near Mojave, Kern County, CA (project name and size; general location)

County: Kern Quad: Mojave, Soledad Mtn, Sanborn, Bissell Location: Near Mojave (UTM coordinates, lat-long, and/or TRS, map datum)

Circle one: 100% coverage or Sampling Area size to be surveyed: ~5,000 ac Transect #: NA Transect length: NA

GPS Start-point: 402182 3873329 (easting, northing, elevation in meters) Start time: 0632 am/pm

GPS End-point: 401309 3871674 (easting, northing, elevation in meters) End time: 1417 am/pm

Start Temp: 7 °C End Temp: 18 °C

Live Tortoises

Detection number	GPS location Easting	GPS location Northing	Time	Tortoise location (*in burrow*: all of tortoise beneath plane of burrow opening, or *not in burrow*)	Approx MCL ≥180 mm? (*Yes, No or Unknown*)	Existing tag # and color, if present
1	None					
2						
3						
4						
5						
6						
7						
8						

Tortoise Sign (burrows, scats, carcasses, etc)

Detection number	GPS location Easting	GPS location Northing	Type of sign (*burrows, scats, carcass, etc*)	Description and comments
1	None			
2				
3				
4				
5				
6				
7				
8				

*Additional biologists: Jen Jelincic
Samantha Vaughan
Shane Tom
Rebecca John

Version: October 8, 2019

(916) 335-9141 *See below for more biologists

Date of survey: 27 / 04 /2021 (day, month, year) Survey biologist(s): Morgan King: morgan.king10@jacobs.com (name, email, and phone number)

Site description: TGP Sanborn Expansion : ~5,000 acres: Near Mojave, Kern County, CA (project name and size; general location)

County: Kern Quad: Mojave, Soledad Mtn, Sanborn, Bissell Location: Near Mojave (UTM coordinates, lat-long, and/or TRS; map datum)

Circle one: 100% coverage or Sampling Area size to be surveyed: ~5,000 ac Transect #: NA Transect length: NA

GPS Start-point: 401275 3872890 (easting, northing, elevation in meters) Start time: 0638 am/pm

GPS End-point: 400727 3873291 (easting, northing, elevation in meters) End time: 1351 am/pm

Start Temp: 8 °C End Temp: 19 °C

Live Tortoises

Detection number	GPS location Easting	GPS location Northing	Time	Tortoise location (*in burrow*: all of tortoise beneath plane of burrow opening, or *not in burrow*)	Approx MCL ≥180 mm? (*Yes, No or Unknown*)	Existing tag # and color, if present
1	None					
2						
3						
4						
5						
6						
7						
8						

Tortoise Sign (burrows, scats, carcasses, etc)

Detection number	GPS location Easting	GPS location Northing	Type of sign (*burrows, scats, carcass, etc*)	Description and comments
1	None			
2				
3				
4				
5				
6				
7				
8				

*Additional biologists: Samantha Vaughan, Shane Tom, Rebecca John, Jen Jelincic

ring for any action that may occur within the range of the Mojave desert tortoise (*Gopherus agassizii*)

(916) 335-9141 *See below for more biologists

Date of survey: 28 / 04 /2021 (day month year) Survey biologist(s): Morgan King: morgan.king10@jacobs.com (name email, and phone number)

Site description: TGP Sanborn Expansion : ~5,000 acres: Near Mojave, Kern County, CA (project name and size, general location)

County: Kern Quad: Mojave, Soledad Mtn, Sanborn, Bissell Location: Near Mojave (UTM coordinates, lat-long, and/or TRS, map datum)

Circle one: 100% coverage or Sampling Area size to be surveyed: ~5,000 ac Transect #: NA Transect length: NA

GPS Start-point: 400679 3873291 (easting, northing, elevation in meters) Start time: 0647 am/pm

GPS End-point: 400231 3873281 (easting, northing, elevation in meters) End time: 1336 am/pm

Start Temp: 9 °C End Temp: 25 °C

Live Tortoises

Detection number	GPS location Easting	GPS location Northing	Time	Tortoise location (*in burrow* all of tortoise beneath plane of burrow opening, or *not in burrow*)	Approx MCL ≥180 mm? (*Yes, No or Unknown*)	Existing tag # and color, if present
1	None					
2						
3						
4						
5						
6						
7						
8						

Tortoise Sign (burrows, scats, carcasses, etc)

Detection number	GPS location Easting	GPS location Northing	Type of sign (*burrows, scats, carcass, etc*)	Description and comments
1	None			
2				
3				
4				
5				
6				
7				
8				

*Additional biologists: Shane Tom
Rebecca John
Jen Jelincic
Samantha Vaughan

(916) 335-9141 *See below for more biologists

Date of survey: 29 / 04 /2021 (day, month, year) Survey biologist(s): Morgan King: morgan.king10@jacobs.com (name, email, and phone number)

Site description: TGP Sanborn Expansion : ~5,000 acres: Near Mojave, Kern County, CA (project name and size; general location)

County: Kern Quad: Mojave, Soledad Mtn, Sanborn, Bissell Location: Near Mojave (UTM coordinates, lat-long, and/or TRS; map datum)

Circle one: 100% coverage or Sampling Area size to be surveyed: ~5,000 ac Transect #: NA Transect length: NA

GPS Start-point: 400179 3873126 (easting, northing, elevation in meters) Start time: 0644 am/pm

GPS End-point: 399973 3872898 (easting, northing, elevation in meters) End time: 0942 am/pm

Start Temp: 11 °C End Temp: 24 °C

Live Tortoises

Detection number	GPS location Easting	GPS location Northing	Time	Tortoise location (*in burrow*: all of tortoise beneath plane of burrow opening, or *not in burrow*)	Approx MCL ≥180 mm? (*Yes, No or Unknown*)	Existing tag # and color, if present
1	None					
2						
3						
4						
5						
6						
7						
8						

Tortoise Sign (burrows, scats, carcasses, etc)

Detection number	GPS location Easting	GPS location Northing	Type of sign (*burrows, scats, carcass, etc*)	Description and comments
1	None			
2				
3				
4				
5				
6				
7				
8				

*Additional biologists: Rebecca John
Jen Jelincic
Samantha Vaughan
Shane Tom

(916) 335-9141 *See below for more biologists

Date of survey: 05 / 02 /2021 (day, month, year) Survey biologist(s): Morgan King: morgan.king10@jacobs.com (name, email, and phone number)

Site description: TGP Sanborn Expansion : ~5,000 acres: Near Mojave, Kern County, CA (project name and size; general location)

County: Kern Quad: Mojave, Soledad Mtn, Sanborn, Bissell Location: Near Mojave (UTM coordinates, lat-long, and/or TRS; map datum)

Circle one: 100% coverage or Sampling Area size to be surveyed: ~5,000 ac Transect #: NA Transect length: NA

GPS Start-point: 3999989 3875510 (easting, northing, elevation in meters) Start time: 0630 am/pm

GPS End-point: 398379 3877169 (easting, northing, elevation in meters) End time: 1000 am/pm

Start Temp: 13 ºC End Temp: 23 ºC

Live Tortoises

Detection number	GPS location Easting	GPS location Northing	Time	Tortoise location (*in burrow*: all of tortoise beneath plane of burrow opening, or *not in burrow*)	Approx MCL ≥180 mm? (*Yes, No or Unknown*)	Existing tag # and color, if present
1	None/ No DETO found.					
2						
3						
4						
5						
6						
7						
8						

Tortoise Sign (burrows, scats, carcasses, etc)

Detection number	GPS location Easting	GPS location Northing	Type of sign (*burrows, scats, carcass, etc*)	Description and comments
1	None/ No DETO found.			
2				
3				
4				
5				
6				
7				
8				

*Additional biologists: Hannah Worthington

(916) 335-9141 *See below for more biologists

Date of survey: 05 / 01 /2021 (day, month, year) Survey biologist(s): Morgan King: morgan.king10@jacobs.com (name, email, and phone number)

Site description: TGP Sanborn Expansion : ~5,000 acres: Near Mojave, Kern County, CA (project name and size; general location)

County: Kern Quad: ~~Mojave~~, Soledad Mtn, Sanborn, Bissell Location: Near Mojave (UTM coordinates, lat-long, and/or TRS; map datum)

Circle one: 100% coverage or Sampling Area size to be surveyed: ~5,000 ac Transect #: NA Transect length: NA

GPS Start-point: 401575 3872490 (easting, northing, elevation in meters) Start time: 0655 am/pm

GPS End-point: 398351 3874638 (easting, northing, elevation in meters) End time: 1400 am/pm

Start Temp: 8.5 ºC End Temp: 28 ºC

Live Tortoises

Detection number	GPS location Easting	GPS location Northing	Time	Tortoise location (*in burrow*: all of tortoise beneath plane of burrow opening, or *not in burrow*)	Approx MCL ≥180 mm? (*Yes, No or Unknown*)	Existing tag # and color, if present
1	None/ No DETO found.					
2						
3						
4						
5						
6						
7						
8						

Tortoise Sign (burrows, scats, carcasses, etc)

Detection number	GPS location Easting	GPS location Northing	Type of sign (*burrows, scats, carcass, etc*)	Description and comments
1	None/ No DETO found.			
2				
3				
4				
5				
6				
7				
8				

*Additional biologists: Hannah Worthington

Appendix C
Observed Wildlife Species

Appendix C Table C-1

Observed Wildlife Species

Wildlife Report, Enterprise Solar Storage Project, Kern County, California

Common Name	Scientific Name	Status
Reptiles		
Coachwhip	*Masticophis flagellum piceus*	
Gopher snake	*Pituophis catenifer*	
Leopard lizard	*Gambelia wislizenii*	
Night lizard	*Xantusia vigilis*	
Side blotched lizard	*Uta stansburiana*	
Northern Mohave rattlesnake	*Crotalus scutulatus*	
Southern cesert horned lizard	*Phrynosoma platyrhinos calidiarum*	
Western whiptail	*Cnemidophorus tigris*	
Birds		
American crow	Corvus brachyrhynchos	
Ash-throated flycatcher	Myiarchus cinerascens	
Bewicks wren	Thryomanes bewickii	
Black-chinned sparrow	Spizella atrogularis	
Burrowing owl	Athene cunicularia	CDFW SSC, USFWS BCC
Cactus wren	Campylorhynchus brunneicapillus	
California quail	Callipepla californica	
Common raven	Corvus corax	
Eurasian collared dove	Streptopelia decaocto	
European starling	Sturnus vulgaris	
Hooded oriole	Icterus cucullatus	
Horned lark	Eremophilia alpestris	
House sparrow	Passer domesticus	
Le Conte's thrasher	Toxostoma lecontei	CDFW SSC, USFWS BCC
Lesser nighthawk	Chordeiles acutipennis	
Lincoln's sparrow	Melospiza incolnii	
Loggerhead Shrike	Lanius ludovicianus	CDFW SSC, USFWS BCC
Mourning dove	Zenaida macroura	
Northern harrier	Circus hudsonius	CDFW SSC
Northern mockingbird	Mimus polyglottos	
Sagebrush sparrow	Artemisiospiza nevadensis	
Violet green swallow	Tachycineta thalassina	
Western meadowlark	Sturnella neglecta	
White-throated swift	Aeronautes saxatalis	
White-faced ibis	Plegadis chihi	CDFW WL
Yellow rumped warbler	Setophaga coronata	
Mammals		
Blacktail jackrabbit	*Lepus californicus*	
California ground squirrel	*Otospermophilus beecheyi*	
Coyote	*Canis latrans*	
Desert cottontail	*Sylvilagus audubonii*	
Desert kitfox[a]	*Vulpes macrotis arsipus*	Fur bearing mammal
Domestic dog	*Canis lupus familiaris*	
Domestic sheep	*Ovis sp.*	
Kangaroo rat[a]	*Dipodomys* sp.	
Pack rat[a]	*Neotoma sp.*	
San Joaquin pocket mouse[a]	*Perognathus inornatus*	
Southern grasshopper mouse[a]	*Onychomys torridus ramona*	CDFW SSC

Appendix C Table C-1

Observed Wildlife Species

Wildlife Report, Enterprise Solar Storage Project, Kern County, California

Common Name	Scientific Name	Status
Whitetail antelope squirrel	*Ammospermophilus leucurus*	

Notes:

[a]Biologists incidently obsered sign or carcasses but no live individuals of these species.

CESA = California Endangered Species Act

FESA = Federal Endangered Species Act

CDFW SSC = California Department of Fish and Wildlife Species of Special Concern

CDFW WL = California Department of Fish and Wildife Watch List

USFWS BCC - U.S. Fish and Wildlife Service Bird of Conservation Concern

Appendix D
Representative Photographs

Photo Log Title	**Representative Project Photographs**
Project Title	Wildlife Report for Enterprise Solar Storage Project
Location	Mojave, Kern County, California
Date	June 2022



Photograph 1: Potential desert tortoise burrow (DTB01), Class 4, underneath creosote bush

Taken by: *Morgan King* *Date taken:* *April 22, 2021*



Photograph 2: Burrowing owl sign, burrow complex, white-wash, and pellets with disturbed allscale saltbush scrub alliance in background

Taken by: *Brian Boyd* *Date taken:* *April 12, 2021*



Photograph 3: Burrowing owl sign, burrow, white-wash, and pellets

Taken by: *Morgan King* *Date taken:* *April 24, 2021*



Photograph 4: Large common raven stick nest in a Joshua tree

Taken by: *Morgan King* *Date taken:* *April 21, 2021*



Photograph 5: Allscale saltbush scrub alliance

Taken by: *Morgan King* *Date taken:* *April 29, 2021*



Photograph 6: Highly disturbed (grazed) allscale saltbush scrub alliance

Taken by: *Morgan King* *Date taken:* *April 13, 2021*



Photograph 7: Creosote bush scrub alliance

Taken by: *Morgan King* *Date taken:* *April 28, 2021*



Photograph 8: Joshua tree woodland alliance with understory of creosote bush west of SR-14

Taken by: Morgan King *Date taken: April 13, 2021*

Appendix E
Enterprise Solar Storage Project, Investigation of Possible Desert Tortoise Burrow

Terra-Gen Operating Company, LLC
7021 Oak Creek Rd, Mojave CA 93501

Amanda Wilhelm
(858) 442-2015

Memorandum

To	Kevin Martin, Terra-Gen, LLC
CCs	Karin Fashingbauer, Jacobs
Subject	Enterprise Solar Storage Project, Investigation of Possible Desert Tortoise Burrow
From	Amanda Wilhelm, Terra-Gen LLC
Date	22 June 2022

Purpose of Survey

A burrow exhibiting potential signs of Desert Tortoise was found on April 22, 2021 by Jacobs biologist Morgan King at UTM E393079, N3877136. On June 21, 2022, Terra-Gen biologist Amanda Wilhelm revisited the site to look for signs of tortoise activity and take photographs.

Field Notes and Results

Upon arrival, burrow was located and contained cobwebs at the entrance, as well as in surrounding brush leading up to the entrance. No sign of use by any wildlife was apparent. No desert tortoise were present.

A flashlight was used to inspect burrow entrance. The end of the burrow was visible.

Terra-Gen Operating Company, LLC
7021 Oak Creek Rd, Mojave CA 93501

Amanda Wilhelm
(858) 442-2015



Fig 1. External View of burrow from above.



Fig 2. View of burrow from above.



Fig 3. View looking directly into burrow entrance.

Appendix E1A
Supplemental Wildlife Memorandum for the Enterprise Solar Storage Project

Supplemental Wildlife Memorandum for the Enterprise Solar Storage Project

Date: May 4, 2023
Attention: Kevin Martin and Amy Fuller
Project: Enterprise Solar Storage Project
Company: Enterprise Solar Storage, LLC
Prepared By: Samantha Padilla and Morgan King
Copies to: Jessica Otten and Jerry Salamy

Introduction

This memorandum provides a summary of the methods and results for supplemental biological surveys performed for the Enterprise Solar Storage Project (Project), which is a proposed photovoltaic (PV) solar and energy storage facility in southeastern Kern County, California (Figure 1). The Project is located on approximately 2,300 acres (931 hectares). The 61.8-acre (25.0 hectare) Supplemental Survey Area was added after initial surveys were conducted and the corresponding Wildlife Report was prepared (Jacobs, 2023). The focus of this survey was for Jacobs Engineering Group Inc. (Jacobs) biologists to determine the presence or absence of federally and state-listed Mojave desert tortoise (*Gopherus agassizii*) in the Project site.

Methods

Jacobs biologists, Morgan King and Samantha Padilla, conducted protocol-level presence-absence surveys for the desert tortoise in the 61.8-acre (25.0 hectares) Survey Area on April 6 through 7, 2023 (Figure 1). In the process of surveying for desert tortoise, biologists assessed potentially suitable habitat for other special-status wildlife known to occur in the Survey Area vicinity, including, but not limited to, American badger (*Taxidea taxus*), burrowing owl (*Athene cunicularia*), desert kit fox (*Vulpes macrotis arsipus*), Mohave ground squirrel (*Xerospermophilus mohavensis*), and Swainson's hawk (*Buteo swainsoni*).

The protocol-level desert tortoise presence-absence survey followed the *2019 Mojave Desert Tortoise Pre-project Survey Protocol* (USFWS 2019). The survey was conducted by walking transects at 33-foot (10-meter) spacing over 100% of the Survey Area. Temperatures during surveys were between 47.1 °Fahrenheit (F) and 65.8 °F (8.4 °Celsius [C] and 18.8 °C). Air temperatures were taken at the start and end of each day, at 2 inches (5 centimeters) above the soil surface in the shade of the observer (USFWS 2019) (Attachment 1). Desert tortoise "sign" is defined as a desert tortoise burrow, carcass, scat, tracks, or egg. The most common signs are burrows (or a shallow burrow called a pallet), carcasses (or carcass fragment), and scat. Each of these signs has its own classification system (USFWS 1992, 2009). Biologists regularly inspected behind themselves and under shrubs to record live desert tortoise and desert tortoise sign while walking transects. Any tortoise or mammal burrows encountered that could be used by tortoises were visually inspected with a mirror or flashlight. Only definitive tortoise sign was recorded.

During the protocol-level desert tortoise survey, biologists also assessed potentially suitable habitat for other special-status wildlife species. Vegetation, soil, and slope characteristics were analyzed. In the vegetation component, biologists looked for suitable nesting sites, forage species, and vegetation as potential shelter. Soil suitability was based on the potential for burrow construction.

Data were recorded digitally and on hard copy. Digital data were collected on iOS devices with the Field Maps application on the ArcGIS Online platform. Submeter accuracy was attained by using a Trimble R1 receiver that was connected to devices via a Bluetooth connection. Survey transects and a data dictionary were generated prior to conducting the fieldwork and uploaded to ArcGIS Online. Hard copy data were collected on USFWS 2019 survey data sheets (Attachment 1).

Results

Suitable desert tortoise habitat is present in the Survey Area; however, no live desert tortoise or definite desert tortoise sign were observed in the Survey Area (Attachment 1). Most of the Survey Area has been previously disturbed or grazed by domestic sheep (*Ovis* sp.) which reduces the quality of suitable habitat.

Vegetation

Two general vegetation communities were observed in the Survey Area, allscale saltbush (*Atriplex polycarpa*) scrub and creosote bush (*Larrea tridentata*) scrub. Allscale saltbush scrub occurs in arid washes and alluvial fans in carbonite-rich, alkaline, sandy, or sandy loam soils. Associated annuals observed in this community include bristly fiddleneck (*Amsinckia tessellata*) and non-native annuals. Creosote bush scrub is characterized by an open shrub layer dominated by creosote bush. Associated shrubs and annuals observed in this community include allscale saltbush, cheesebush (*Ambrosia salsola*), white bursage (*Ambrosia dumosa*), and non-native annuals. Representative photographs of the Survey Area are provided in Attachment 2.

Habitat Assessment

No special-status wildlife species were observed in the Survey Area. The Survey Area has potentially suitable habitat for American badger, burrowing owl, desert kit fox, and Mohave ground squirrel. Many burrows were observed in the Survey Area and provide suitable cover for American badger, burrowing owl, and desert kit fox. The Survey Area has suitable habitat for Mohave ground squirrel, in the form of friable soils for burrows and forage species, such as saltbush (*Atriplex* sp.). According to the results of the Mohave ground squirrel live trapping conducted for the Sanborn Solar Project, this species is presumed absent or occurs in low numbers in the vicinity (Kern County 2020). The Survey Area has suitable Swainson's hawk foraging habitat but no large western Joshua trees (*Yucca brevifolia*) suitable for nesting were observed in the Survey Area.

Other Special-status Wildlife

A variety of reptiles, birds, and mammals occur within the Survey Area. Many bird species protected by the Migratory Bird Treaty Act have the potential to forage and nest in the Survey Area. Bird species common to the region include common raven (*Corvus corax*), horned lark (*Eremophila alpestris*), and western meadowlark (*Sturnella neglecta*).

References

Jacobs Engineering Group Inc. 2023. Wildlife Report. Enterprise Solar Storage Project. March 26.

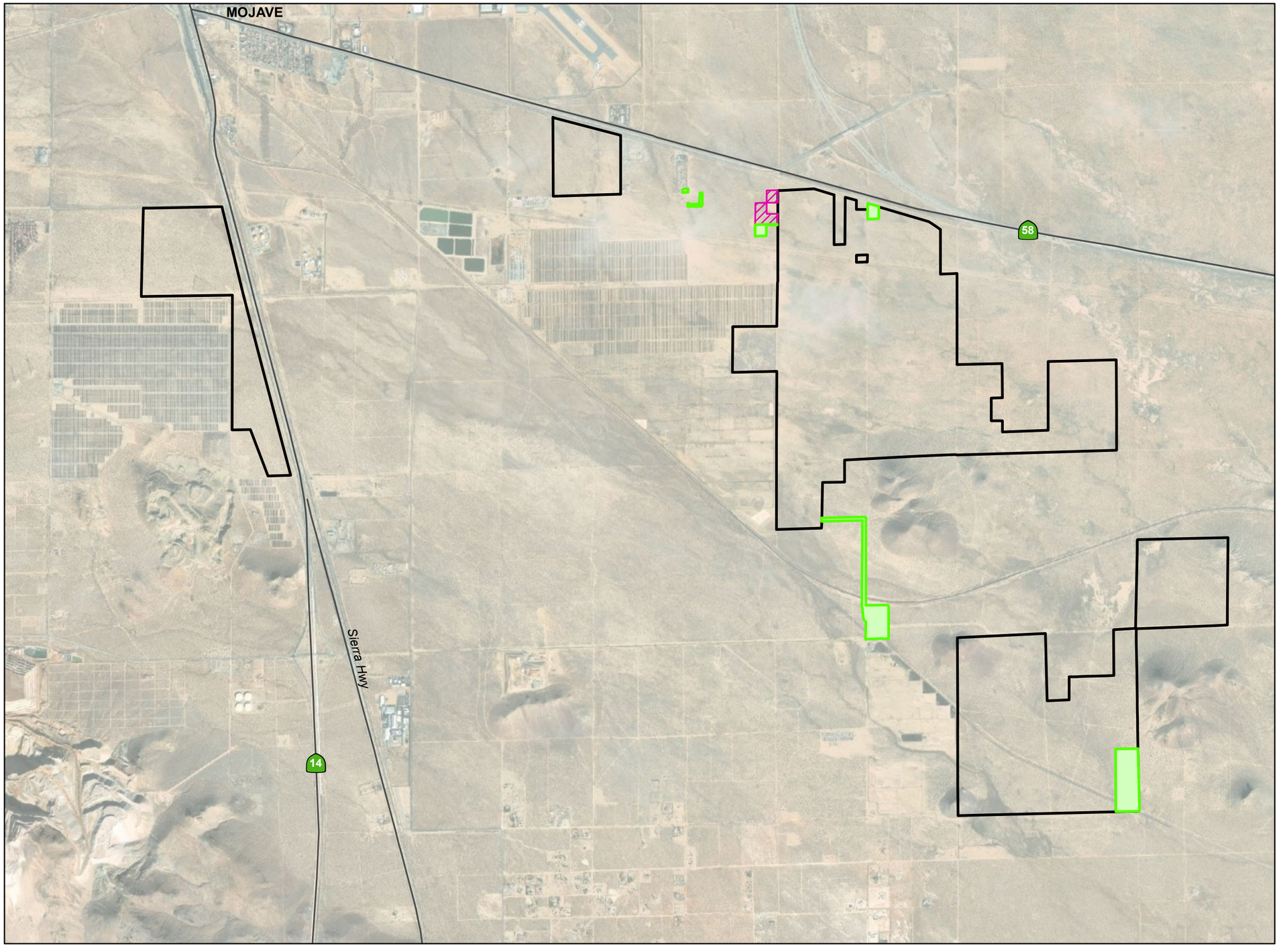
Kern County. 2020. Draft Environmental Impact Report. Sanborn Solar Project (SCH# 2019060259). Planning and Natural Resources Department. Bakersfield, California. February.

U.S. Fish and Wildlife Service (USFWS). 1992. Field Survey Protocol for any Federal Action that May Occur Within Range of the Desert Tortoise

U.S. Fish and Wildlife Service (USFWS). 2009. Desert Tortoise (Mojave Population) Field Manual (*Gopherus agassizii*). Region 8, Sacramento, CA.

U.S. Fish and Wildlife Service (USFWS). 2019. 2019 Mojave Desert Tortoise Pre-project Survey Protocol; Preparing for Any Action that May Occur Within the Range of the Mojave Desert Tortoise (*Gopherus agassizii*).

Figure



Legend

- Survey Area (61.8 acres)
- Enterprise Solar Storage Project
- Temporary Laydown Yard

Basemap Source: Esri World Imagery

N

0 0.25 0.5 1
Miles

Figure 1
Supplemental Wildlife Survey Areas
Enterprise Solar Storage Project
Enterprise Solar Storage, LLC
Kern County, California

Jacobs

\\dc1vs01\gisproj\T\Terragen\D3390900_Sagebrush\MapFiles\Sanborn\Enterprise\Wildlife\230412_Additional_Survey_Areas\Figure_1_230412.mxd

Attachment 1
U.S. Fish and Wildlife Service Data Sheets

916-335-9141 *other

Date of survey: 4,4,2023 (day, month, year) Survey biologist(s): Morgan King, morgan.king10@jacobs.com (name, email, and phone number)

Site description: TGE / Enterprise (project name and size; general location)

County: KERN Quad: SANBORN Location: N/A (UTM coordinates, lat-long, and/or TRS; map datum)

Circle one: 100% coverage or Sampling Area size to be surveyed: ~62 ac Transect #: N/A Transect length: N/A

GPS Start-point: 399120, 3873644, 785 m (easting, northing, elevation in meters) Start time: 0828 (am)/pm

GPS End-point: 397575, 3877178, 803 m (easting, northing, elevation in meters) End time: 1428 am/(pm)

Start Temp: 8.4 °C End Temp: 18.4 °C

Live Tortoises

Detection number	GPS location Easting	GPS location Northing	Time	Tortoise location (*in burrow*: all of tortoise beneath plane of burrow opening, or *not in burrow*)	Approx MCL ≥180 mm? (*Yes, No or Unknown*)	Existing tag # and color, if present
1						
2						
3						
4			NONE			
5						
6						
7						
8						

Tortoise Sign (burrows, scats, carcasses, etc)

Detection number	GPS location Easting	GPS location Northing	Type of sign (*burrows, scats, carcass, etc*)	Description and comments
1				
2				
3				
4			NONE	
5				
6				
7				
8				

* Samantha Padilla

916-335-9141 * other

Date of survey: 7,4,2023 (day, month, year) Survey biologist(s): Morgan King, morgan.king10@jacobs.com (name, email, and phone number)

Site description: TGE / Enterprise (project name and size; general location)

County: KERN Quad: BISSELL Location: N/A (UTM coordinates, lat-long, and/or TRS; map datum)

Circle one: 100% coverage or Sampling Area size to be surveyed: ~62 ac Transect #: N/A Transect length: N/A

GPS Start-point: 401372, 3872239, 775 m (easting, northing, elevation in meters) Start time: 0814 am/pm

GPS End-point: 401570, 3872241, 781 m (easting, northing, elevation in meters) End time: 1001 am/pm

Start Temp: 12.2 °C End Temp: 18.8 °C

Live Tortoises

Detection number	GPS location Easting	GPS location Northing	Time	Tortoise location (*in burrow*: all of tortoise beneath plane of burrow opening, or *not in burrow*)	Approx MCL ≥180 mm? (*Yes, No or Unknown*)	Existing tag # and color, if present
1						
2						
3						
4			NONE			
5						
6						
7						
8						

Tortoise Sign (burrows, scats, carcasses, etc)

Detection number	GPS location Easting	GPS location Northing	Type of sign (*burrows, scats, carcass, etc*)	Description and comments
1				
2				
3				
4			NONE	
5				
6				
7				
8				

* Samantha Padilla

Attachment 2
Representative Photographs



Photograph 1: Allscale saltbush scrub



Photograph 2: Creosote bush scrub

Appendix E1B
Wildlife Resource Memorandum for High Voltage Work near Windhub Substation

Wildlife Resource Memorandum for High Voltage Work near Windhub Substation

Date:	April 17, 2023
Attention:	Kevin Martin and Amy Fuller
Company:	Terra-Gen
Prepared By:	Samantha Padilla and Morgan King
Copies to:	Jessica Otten and Jerry Salamy

Introduction

This memorandum presents the methods and results of a supplemental wildlife resource survey conducted by Jacobs Engineering Group (Jacobs) for areas surrounding the Windhub Substation where proposed improvements are needed for project interconnection to the existing Windhub Substation.

Methods

Jacobs biologists, Morgan King and Samantha Padilla, conducted protocol-level presence-absence surveys for the Mojave desert tortoise (*Gopherus agassizii*) in the 140.5 acres (57 hectares) Survey Area on April 3 through 5, 2023 (Figure 1). In the process of surveying for desert tortoise, biologists assessed potentially suitable habitat for other special-status wildlife known to occur in the Survey Area vicinity, including, but not limited to, American badger (*Taxidea taxus*), burrowing owl (*Athene cunicularia*), desert kit fox (Vulpes macrotis arsipus), Mohave ground squirrel (*Xerospermophilus mohavensis*), and Swainson's hawk (*Buteo swainsoni*).

The protocol-level desert tortoise presence-absence survey followed the *2019 Mojave Desert Tortoise Pre-project Survey Protocol* (USFWS 2019). The survey was conducted by walking transects at 33-foot (10-meter) spacing over 100 % of the Survey Area. Temperatures during surveys were between 31 °Fahrenheit (F) and 52 °F (-0.4 ° Celsius [C] and 11.6 °C). Air temperatures were taken at the start and end of each day, at 2 inches (5 centimeters) above the soil surface in the shade of the observer (USFWS 2019) (Attachment 1). Desert tortoise "sign" is defined as a desert tortoise burrow, carcass, scat, tracks, or egg. The most common signs are burrows (or a shallow burrow called a pallet), carcasses (or carcass fragment), and scat. Each of these signs has its own classification system (USFWS 1992, 2009). Biologists regularly inspected behind themselves and under shrubs to record live desert tortoise and desert tortoise sign while walking transects. Any tortoise or mammal burrows encountered that could be used by tortoises were visually inspected with a mirror or flashlight. Only definitive tortoise sign was recorded.

During the protocol-level desert tortoise survey, biologists also assessed potentially suitable habitat for other special-status wildlife species. Vegetation, soil, and slope characteristics were analyzed. In the vegetation component, biologists looked for suitable nesting sites, forage species, and vegetation as potential shelter. Soil suitability was based on the potential for burrow construction.

Data were recorded digitally and on hard copy. Digital data were collected on iOS devices with the Field Maps application on the ArcGIS Online platform. Submeter accuracy was attained by using a Trimble R1 receiver that was connected to devices via a Bluetooth connection. Survey transects and a data dictionary were generated prior to conducting the fieldwork and uploaded to ArcGIS Online. Hard copy data were collected on USFWS 2019 survey data sheets (Attachment 1).

Results

Suitable desert tortoise habitat is present in the Survey Area; however, no live desert tortoise or definite desert tortoise sign were observed in the Survey Area (Attachment 1). Most of the Survey Area has been previously disturbed or grazed by domestic sheep (*Ovis* sp.) which reduces the quality of suitable habitat.

Vegetation

Three general vegetation communities were observed in the Survey Area: Joshua tree (*Yucca brevifolia*) woodland, nonnative annual grassland, and fourwing saltbush scrub (*Atriplex canescens*). Joshua tree woodland community is defined as having over 1% absolute cover of western Joshua trees with a diverse understory of shrubs and herbaceous plant species. The nonnative annual grassland community is dominated by nonnative grasses and has likely experienced previous disturbance associated with existing infrastructure. The fourwing saltbush scrub community was likely planted due to presence of straw wattles and tilled earth. Representative photographs of the Survey Area are provided in Attachment 2.

Habitat Assessment

No special-status wildlife species were observed in the Survey Area. The Survey Area has potentially suitable habitat for American badger, burrowing owl, desert kit fox, Mohave ground squirrel, and Swainson's hawk. Many burrows were observed in the Survey Area and provide suitable cover for American badger, burrowing owl, and desert kit fox. The Survey Area has suitable habitat for Mohave ground squirrel, in the form of friable soils for burrows and forage species, such as saltbush (*Atriplex* sp.). According to the results of the Mohave ground squirrel live trapping conducted for the Sanborn Solar Project, this species is presumed absent or occurs in low numbers in the vicinity (Kern County 2020). Large Joshua trees in the Survey Area may provide suitable Swainson's hawk nesting habitat.

Other Special-status Wildlife

A variety of reptiles, birds, and mammals occur within the Survey Area. Bird species protected by the Migratory Bird Treaty Act have the potential to forage and nest in the Survey Area. Bird species common to the region include common raven (*Corvus corax*), horned lark (*Eremophila alpestris*), and western meadowlark (*Sturnella neglecta*).

References

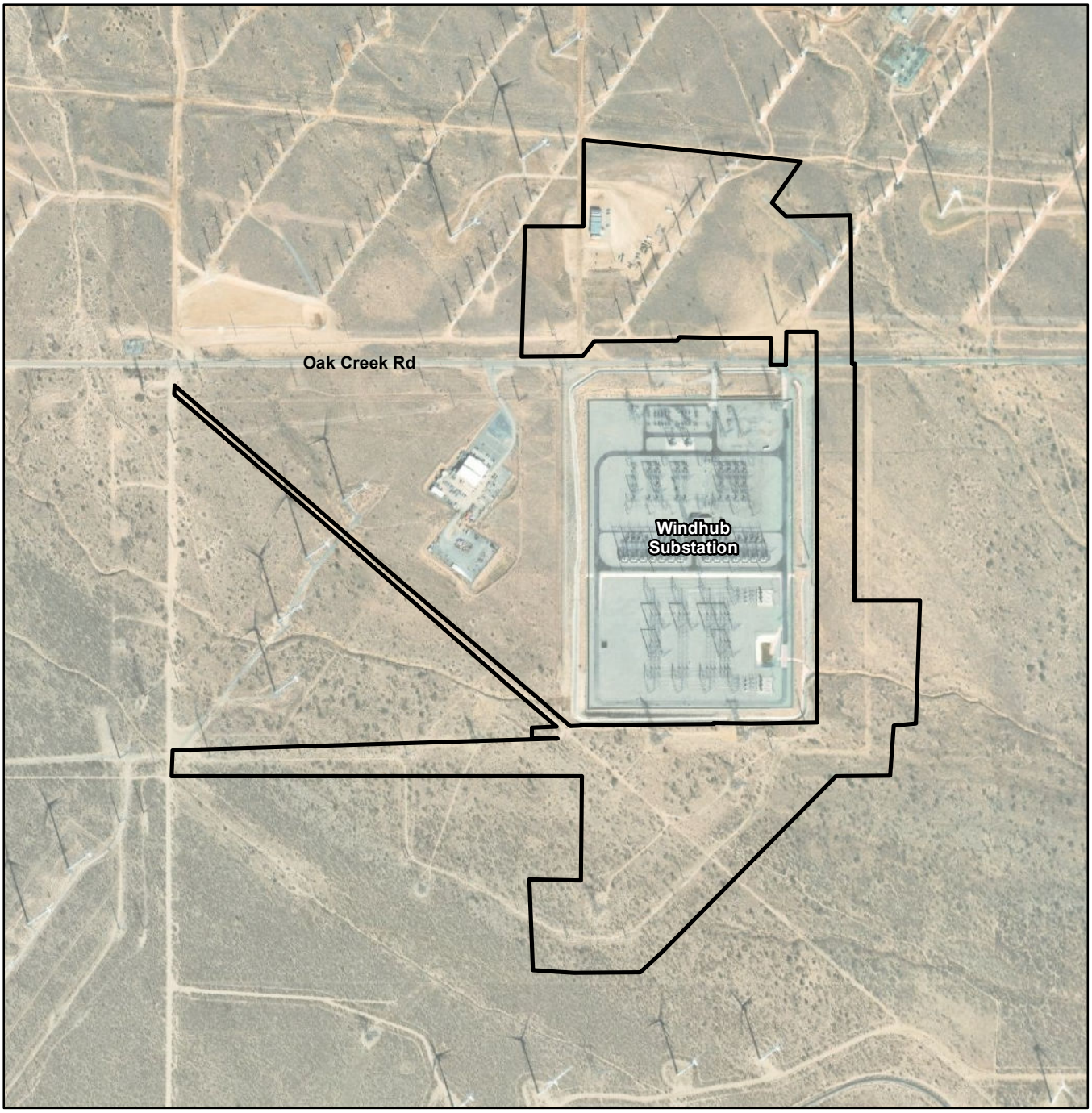
Kern County. 2020. Draft Environmental Impact Report. Sanborn Solar Project (SCH# 2019060259). Planning and Natural Resources Department. Bakersfield, California. February.

U.S. Fish and Wildlife Service (USFWS). 1992. Field Survey Protocol for any Federal Action that May Occur Within Range of the Desert Tortoise.

U.S. Fish and Wildlife Service (USFWS). 2009. Desert Tortoise (Mojave Population) Field Manual (*Gopherus agassizii*). Region 8, Sacramento, CA.

U.S. Fish and Wildlife Service (USFWS). 2019. 2019 Mojave Desert Tortoise Pre-project Survey Protocol; Preparing for Any Action that May Occur Within the Range of the Mojave Desert Tortoise (*Gopherus agassizii*).

Figure



Legend

Survey Area (140.0 acres)

Basemap Source:
Esri World Imagery

0 500 1,000
Feet

N

Figure 1
Survey Area
Kern County, California

Jacobs

\\dc1vs01\gisproj\T\Terragen\D3390900_Sagebrush\MapFiles\Sanborn\Enterprise\Wildlife\Windhub\Figure_1_230412.mxd

Attachment 1
U.S. Fish and Wildlife Service Data Sheets

916-335-9141
Version: October 8, 2019
Morgan King/Morgan.King10@jacobs.com

Date of survey: 3, 4, 2023 (day, month, year) Survey biologist(s): ~~Samantha Padilla/Samantha.Padilla@jacobs.com~~ (name, email, and phone number)

Site description: IGE Enterprise / Sanborn 2.0 (project name and size; general location)

County: Kern Quad: MONOLITH Location: N/A (UTM coordinates, lat-long, and/or TRS; map datum)

Circle one: 100% coverage or Sampling Area size to be surveyed: ~140ac Transect #: NA Transect length: NA

GPS Start-point: 382843, 3878084; 1069 m (easting, northing, elevation in meters) Start time: 0908 am/pm

GPS End-point: 383502, 3878325; 1049 m (easting, northing, elevation in meters) End time: 1455 am/pm

Start Temp: 0.8 °C End Temp: 4.2 °C

Live Tortoises

Detection number	GPS location Easting	GPS location Northing	Time	Tortoise location (*in burrow*: all of tortoise beneath plane of burrow opening, or *not in burrow*)	Approx MCL ≥180 mm? (*Yes, No or Unknown*)	Existing tag # and color, if present
1						
2						
3						
4			NONE			
5						
6						
7						
8						

Tortoise Sign (burrows, scats, carcasses, etc)

Detection number	GPS location Easting	GPS location Northing	Type of sign (*burrows, scats, carcass, etc*)	Description and comments
1				
2				
3				
4			NONE	
5				
6				
7				
8				

Date of survey: 04/04/2023 (day, month, year) Survey biologist(s): MORGAN KING morgan.king10@jacobs.com (916) 335-9141 (name, email, and phone number) * other surveyor

Site description: TGE Enterprise/ Sanborn 2.0. (project name and size, general location)

County: KERN Quad: MONOLITH Location: NA (UTM coordinates, lat-long, and/or TRS, map datum)

Circle one: 100% coverage or Sampling Area size to be surveyed: ~140ac Transect #: NA Transect length: NA

GPS Start-point: 382152, 3878016; 1046m (easting, northing, elevation in meters) Start time: 0739 (am)/pm

GPS End-point: 383183, 3877338; 1036m (easting, northing, elevation in meters) End time: 1502 am/(pm)

Start Temp: -0.4 °C End Temp: 7.2 °C

Live Tortoises

Detection number	GPS location Easting	GPS location Northing	Time	Tortoise location (*in burrow* all of tortoise beneath plane of burrow opening, or *not in burrow*)	Approx MCL ≥180 mm? (*Yes, No or Unknown*)	Existing tag # and color, if present
1						
2						
3						
4			NONE			
5						
6						
7						
8						

Tortoise Sign (burrows, scats, carcasses, etc)

Detection number	GPS location Easting	GPS location Northing	Type of sign (*burrows, scats, carcass, etc*)	Description and comments
1				
2				
3				
4			NONE	
5				
6				
7				
8				

* SAMANTHA PADILLA

916-335-9141

Date of survey: 5/4/2023 (day, month, year) Survey biologist(s): Morgan King / morgan.king10@jacobs.com (name, email, and phone number)

Site description: TGE Enterprise / Sanborn 2.0 (project name and size, general location)

County: ~~Kern~~ KERN Quad: MONOLITH Location: N/A (UTM coordinates, lat-long, and/or TRS, map datum)

Circle one: 100% coverage of Sampling Area size to be surveyed: ~140 ac Transect #: NA Transect length: NA

GPS Start-point: 383193, 3877337; 1033 m (easting, northing, elevation in meters) Start time: 0702 am/pm

GPS End-point: 382141, 3877271; 1058 m (easting, northing, elevation in meters) End time: 1200 am/pm

Start Temp: 1.5 °C End Temp: 11.6 °C

Live Tortoises

Detection number	GPS location Easting	GPS location Northing	Time	Tortoise location (*in burrow*: all of tortoise beneath plane of burrow opening, or *not in burrow*)	Approx MCL ≥180 mm? (*Yes, No or Unknown*)	Existing tag # and color, if present
1						
2						
3						
4			NONE			
5						
6						
7						
8						

Tortoise Sign (burrows, scats, carcasses, etc)

Detection number	GPS location Easting	GPS location Northing	Type of sign (*burrows, scats, carcass, etc*)	Description and comments
1				
2				
3				
4			NONE	
5				
6				
7				
8				

Attachment 2
Representative Photographs



Photograph 1: Previously disturbed nonnative annual grassland east of Windhub Substation.



Photograph 2: Joshua tree woodland south of Windhub Substation.

Appendix E1C
Swainson's Hawk (Buteo swainsoni) Guideline Survey & Nesting Raptor Survey Report

California Department of Fish & Wildlife Swainson's Hawk (*Buteo swainsoni*) Guideline Survey & Nesting Raptor Survey Report

Enterprise Solar Storage Project

Kern County, California

Prepared by:

Bloom Biological, Inc.
13611 Hewes Avenue
Santa Ana, California 92705

Contact: Rainey Barton

Prepared for:

Enterprise Solar Storage, LLC
11455 El Camino Real, Suite 160
San Diego, CA 92130

August 16, 2023

BBI
BLOOM BIOLOGICAL INC.
research | consulting | conservation

CONTRIBUTORS

Field Surveys: Rainey G. Barton, Kerry G. Ross, Peter H. Bloom

Report Authors: Rainey G. Barton

ABOUT BLOOM BIOLOGICAL, INC,

For more than 45 years, Bloom Biological, Inc. (BBI) has provided biological consulting services for large and small clients. Our resume of services includes raptor and endangered species research, biological monitoring, impact assessment, permitting, conservation planning, and geospatial analysis. Our innovative approach has provided solutions to complex problems for clients and projects throughout a range of industries including alternative energy, residential development, and the public sector. Collectively, the management and staff of BBI hold permits or memoranda of understanding for participating in the conservation and recovery of more than a dozen endangered or threatened species, as well as several other special-status species, in California and the western United States. Over the years, BBI has established an impeccable relationship with the resource agencies, project proponents, and environmental organizations by skillfully balancing the needs and objectives of land planning, resource conservation, and the public interest. In addition to our work in California and the western United States, BBI biologists have worked in Alaska, Central and South America, Europe, Southern Asia, and the western Pacific. BBI is a certified Small Business Enterprise and Woman-owned Business Enterprise.

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1.0 INTRODUCTION

Bloom Biological, Inc. (BBI) was retained by Enterprise Solar Storage, LLC (Enterprise) to conduct California Department of Fish and Wildlife (CDFW) and California Energy Commission (CEC) pre-construction protocol level surveys for nesting Swainson's Hawk (*Buteo swainsoni*) in the vicinity of the proposed Enterprise Solar Storage Project (Project) in southern Kern County, California (CEC & CDFW 2010). This report details the methodology and results of the surveys conducted during the period of April 2 through July 14, 2023.

2.0 STUDY AREA DESCRIPTION

The Project is located on the Antelope Valley floor in the western Mojave Desert. It is approximately 2 miles south and southeast of Mojave and 9 miles north and northeast of Rosamond. The Project consists of five non-contiguous sites, including four solar facility sites plus a step-up substation site, as well as a generation tie (gen-tie) line, which together make up the Project Boundary. The proposed 230 kV gen-tie line will carry power generated by the Project to the Project's proposed step-up substation, located north of Southern California Edison's Windhub Substation. At the step-up substation, the voltage will be increased from 230 kV to 500 kV, and a new 500 kV gen-tie line will be constructed from the step-up substation to the Windhub Substation for interconnection to the Windhub Substation, and ultimately the grid. The 230 kV gen-tie line would be co-located within the gen-tie line corridor approved as part of the Sanborn Solar project in 2020 and constructed in 2021.

The Study Area (Figure 1) consists of the Project Boundary and surrounding 5-mile radius survey buffer (CDFW 2010) in southern Kern County.

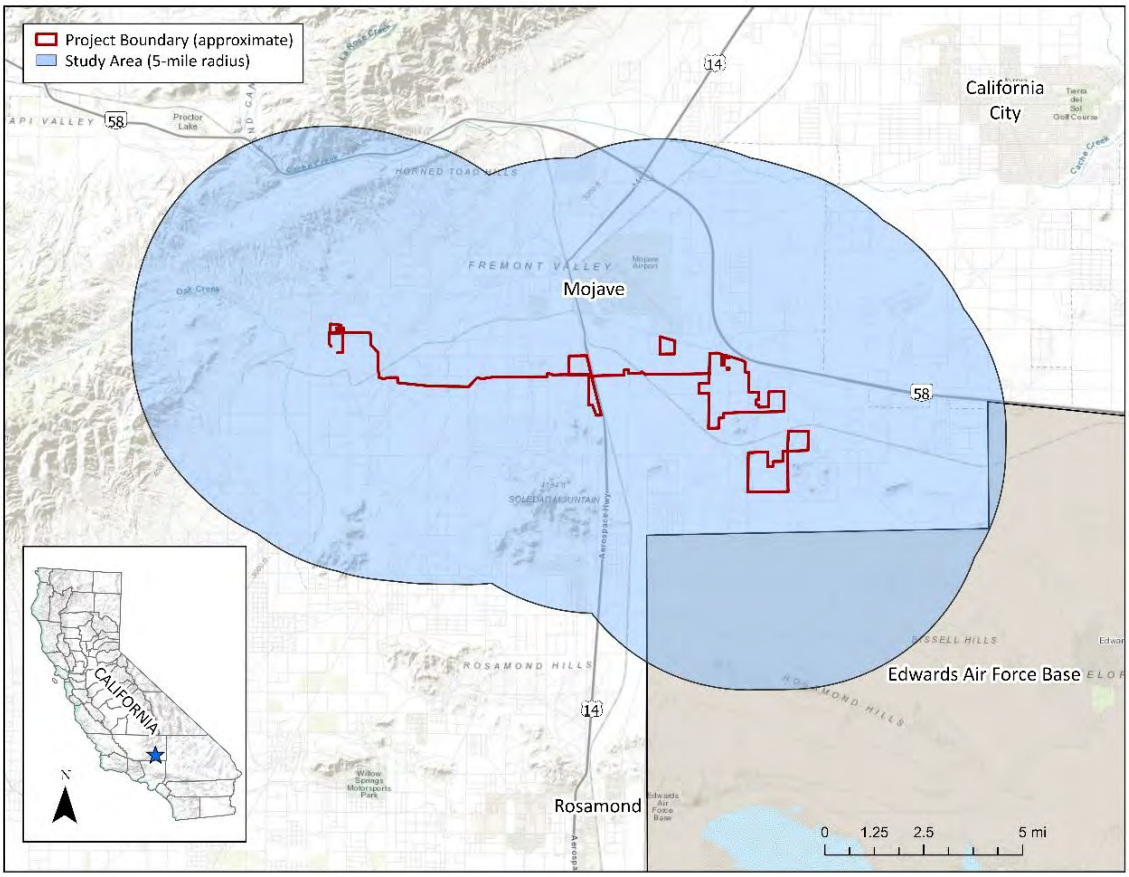


Figure 1. Study Area and Project Boundary locations.

The Study Area encompasses existing renewable energy development, in the form of large wind and solar fields primarily to the west of Mojave and within Edwards Air Force Base (Edwards AFB), and residential development surrounding Mojave and Rosamond. Vegetation within the Study Area consists primarily of Mojave Desert scrub, non-native grassland, and Joshua tree (*Yucca brevifolia*). Vegetation within the Project Boundary consists primarily of Mojave Desert scrub (allscale scrub, creosote bush-white bursage scrub) and non-native grassland, with some Joshua tree woodland and disturbed Joshua tree woodland. The native desert within the Study Area has experienced varying degrees of disturbance. Within the Project Boundary, disturbance in the form of development (wind energy generation and associate infrastructure, paved and unpaved roadways, and other structures and cleared pads), encampments, off-road vehicle recreation, refuse dumping, vegetation clearing, sheep grazing, and colonization by invasive plants is present.

Of the 151,000 acres within the Study Area, approximately 19,000 acres fall within Edwards AFB. While multiple attempts were made to gain access to conduct surveys within Edwards AFB, permission was not granted. Suitable raptor nesting habitat within Edwards AFB was surveyed from outside of the base security fence as well as from within the existing Edwards Solar project located in the northwest corner of Edwards AFB with the use of high-power spotting scopes.

3.0 METHODS

3.1 Survey Schedule and Methodology

BBI conducted Swainson's Hawk protocol surveys in accordance with the 2010 CDFW and CEC *Swainson's Hawk Survey Protocols, Impact Avoidance, and Minimization Measures for Renewable Energy Projects in the Antelope Valley of Los Angeles and Kern Counties, California* ([CEC & CDFW Guidance] CEC & CDFW 2010). Surveys were conducted by BBI biologists Rainey Barton, Kerry Ross, and Peter Bloom from April 2 through July 7, 2023, for a total of 27 person/days of surveys (Table 1). As specified by the CEC & CDFW Guidance, surveys were conducted during the minimum three survey periods between April 1 and July 15, with three complete surveys per period each consisting of 3 person/days. Surveys were completed by driving slowly on roads through suitable habitat in the Study Area, while searching for Swainson's Hawks and their nests, using the vehicle as a "blind" to minimize disturbance to any hawks detected and pausing frequently to observe.

Swainson's Hawk surveys were conducted in accessible suitable habitat inside the Study Area, defined as the area within the Project Boundary and all areas within 5 miles of the Project Boundary. Suitable nesting habitat for Swainson's Hawks in the Study Area is defined generally as low-growing agricultural areas, fallow agricultural fields, and native desert bordered by or containing suitable nesting trees including, but not limited to, Joshua tree. Surveys for all other nesting raptors were conducted simultaneously, expanding the potential nesting habitat to include all suitable nest trees and structures (i.e., utility poles and towers, buildings, rocks, and cliffs). All nesting raptors observed within 5 miles of the Project were documented.

Table 1. Swainson's Hawk & Raptor Nest Survey Schedule

Survey Period II *April 1 – April 30*	*Survey Period III* *May 1 – May 31*	*Survey Period IV* *June 1 – July 15*
4/2/2023 – 4/4/2023	5/7/2023 – 5/9/2023	6/14/2023 – 6/16/2023
4/10/2023 – 4/12/2023	5/22/2023 – 5/24/2023	6/27/2023 – 6/29/2023
4/26/2023 – 4/28/2023	5/30/2023 – 6/1/2023	7/5/2023 – 7/7/2023

3.2 Species Identification

Biologists determined the species that built or occupied all large stick nests discovered during surveys by observing adults present and exhibiting nesting behavior, the size of the nest, stick size, eggs and chicks, volume and height of excrement, and anthropogenic material if present. These distinctions were based on the experience of principal investigator (Dr. Bloom), which includes the entry and inspection of thousands of California raptor nests.

In southern California deserts, Common Raven (*Corvus corax)* and Red-tailed Hawk (*Buteo jamaicensis*) construct the most common large stick nests. Common Raven nests are most notably distinguished from Swainson's Hawk nests by the abundance of anthropogenic materials incorporated into the nest. Red-tailed Hawk nests are commonly significantly larger in size than Swainson's Hawk nests ranging from 2 to 3 ft in diameter and 1 to 3 feet tall. Great Horned Owls (*Bubo virginianus*) commonly usurp Common Raven, Red-tailed Hawk, and Swainson's Hawk nests and are best distinguished by the presence of pellets beneath the nest, the straight-down trajectory of fecal excrement, in addition to adults being present on the nest during daylight hours. Prairie Falcon (*Falco mexicanus*) nest primarily in cavities, crevices, and ledges of cliffs and rocky outcrops, not building their own nests but frequently utilizing stick nests built by Common Ravens, Red-tailed Hawks, and Golden Eagles (*Aquila chrysaetos*) or simply in a small depression scraped clear of debris. Prairie Falcon have become much less common in California's desert landscape over the course of the last several decades.

3.3 Nest Status

A nest was considered active if any of the following three conditions was met: (1) fresh nesting material such as sticks, grasses, or twigs had been added during the current nesting season, (2) the nest was found to contain eggs or young (dead or alive), or (3) an adult was observed on the nest in an incubating (or brooding) posture. Nests without any of these signs were considered inactive. A failed nest was an active nest that was determined not to have successfully fledged young. A successful nest is one that fledged at least one young (typically assumed if young were greater than 5.5 weeks old during an observation).

4.0 RESULTS

The survey effort identified 146 nests within the Study Area of five raptor and raven species: Prairie Falcon, Burrowing Owl (*Athene cunicularia*), Red-tailed Hawk, Great Horned Owl, and Common Raven. No Swainson's Hawk nests or individuals were observed within the 5-mile Study Area. The survey results are discussed in detail in the following sections. Nests are summarized in tabular format in each of the species' sections below with the exception of Common Raven nests, as nests belonging to this species are abundant in the Antelope Valley and were recorded supplementally. Maps displaying the nest locations relative to the Project and Study Area are provided in Appendix A. As raptor nests are sensitive resources, they are displayed in the results maps as 200-acre hexagonal grids to obscure precise locations.

4.1 Swainson's Hawk

No Swainson's Hawk nests or individuals were observed within the 5-mile Study Area. Suitable nesting habitat is present within the Study Area, particularly within Edwards AFB and in remnant stands of Joshua trees to the west of Mojave. With the exception of developed areas, the Study Area largely consists of potential Swainson's Hawk foraging habitat, with large swaths of native desert within Edwards AFB and to the north of Edwards. Should this nesting population continue to expand, it is reasonable to assume that they could again occupy nest territories within this region of the Antelope Valley. Swainson's Hawk nests nearest to the Project which were active within the last 5 years (2019-2023) are 7.6 miles (SWH-KE-012) and 8.0 miles (SWH-KE-014) southwest of the gen-tie line in the Willow Springs Valley. Mapped locations of the nearest Swainson's Hawk nest territories are provided in Appendix A, Map 1.

4.2 Prairie Falcon

One active Prairie Falcon nest was observed on a butte southeast of De Stazo Hill, near the intersection of Dalton Avenue and Mojave Boulevard, 0.6 miles east of the Project Boundary. This nesting location appears to be known by CDFW as there is signage posted stating that the butte is private property protected under Sec. 3503.5 of Fish & Wildlife Code. An adult Prairie Falcon (presumed female) was observed on April 4th in an incubating posture on the nest with a second adult (presumed male) perched nearby and foraging. Three nestlings were present in the nest on May 23rd and the adults were observed feeding the young. During the final observation of this nest territory, recently fledged young were perched nearby indicating that this nesting attempt was successful. While Prairie Falcon is not protected under the Endangered Species Act (ESA) or the California Endangered Species Act (CESA), they have been placed on CDFW's Watch List. Prairie Falcon summary nest data are provided in Table 2 and the mapped nest location is provided in Appendix A, Map 2. Appendix B contains photographs of the nest site.

Table 2. Prairie Falcon Nest within the Study Area

Nest Number	*2023 Nest Status*	*Activity at Final Observation*	*Distance from Project Boundary (miles)*
PRF-001	Active	Fledged young	0.6

4.3 Burrowing Owl

One active Burrowing Owl nest was observed to the south of E Silver Queen Rd along S 10th St, 1.0 mile west of the Project Boundary. This nest was incidentally detected as it is immediately roadside. When driving by, an adult male flushed from near the burrow entrance and landed in fiddleneck (*Amsinckia)* approximately 10 meters to the east. The adult female remained perched on a dirt mound adjacent to the burrow entrance. Whitewash was present at the burrow entrance. This territory was confirmed as occupied but was not revisited after the initial detection on May 24th as it was in a location sensitive to disturbance when viewed. Burrowing Owl is listed as a CDFW Species of Special Concern and a USFWS Bird of Conservation Concern. Burrowing Owl summary nest data are provided in Table 3 and the mapped nest location is provided in Appendix A, Map 3. Appendix B contains photographs of the nest site.

Table 3. Burrowing Owl Nest within the Study Area

Nest Number	*2023 Nest Status*	*Activity at Final Observation*	*Distance from Project Boundary (miles)*
BUO-001	Active	Occupied by adults	1.0

4.4 Red-tailed Hawk

Six Red-tailed Hawk nest territories were documented within the Study Area, of which five were confirmed active in 2023. The most northern territory (RTH-001) is located 4 miles to the north of the Project Boundary in a utility tower and was not confirmed active this season. The most western territory (RTH-002) contains a nest in a utility tower with an adult observed incubating in mid-April. Just south of RTH-002 is RTH-003, which contains a nest in a utility tower. An adult was present at this nest in early June. The nest at RTH-004 is on a cliff to the south of Soledad Mountain, 4 miles southwest of the Project Boundary, and successfully fledged young in 2023. An occupied territory (RTH-005) was observed 2.8 miles to the south of the project boundary, as indicated by two adults perched on rock strata and exhibiting courtship behavior. However, a nest location was not confirmed for this pair. The Red-tailed Hawk nest nearest to the Project Boundary (RTH-006) is located in a Joshua tree 1 mile to the south. This nest successfully fledged two young as confirmed by fledglings perched nearby during the final observation on July 5th. Red-tailed Hawk summary nest data are provided in Table 4 and mapped nest locations are provided in Appendix A, Map 4.

Table 4. Red-tailed Hawk Nests within the Study Area

Nest Number	*2023 Nest Status*	*Activity at Final Observation*	*Distance from Project Boundary (miles)*
RTH-001	Inactive	No activity confirmed	4.0
RTH-002	Active	Incubating	2.2
RTH-003	Active	Adult at nest	2.6
RTH-004	Active	Fledged young	4.1
RTH-005	Active	Occupied territory	2.8
RTH-006	Active	Fledged young	1.0

4.5 Great Horned Owl

Two active Great Horned Owl nest territories were documented within the Study Area. The more northern territory (GHO-001) contained an adult with nestlings in a cottonwood tree on April 12th. The territory in the middle of the Study Area (GHO-002) was located on June 14th, when two recently fledged young were found perched in a tamarisk grove west of Mojave, confirming a successful nesting attempt. This nest (GHO-002) is located in an abandoned golf course 0.1 mile north of the Project's gen-tie line. Great Horned Owl summary nest data are provided in Table 5 and the mapped nest locations are provided in Appendix A, Map 5.

Table 5. Great Horned Owl Nests within the Study Area

Nest Number	*2023 Nest Status*	*Activity at Final Observation*	*Distance from Project Boundary (miles)*
GHO-001	Active	Nestlings present	3.7
GHO-002	Active	Fledglings present	0.1

4.6 Common Raven

One hundred thirty-three Common Raven nests were documented within the Study Area, 94 of which were active in 2023. Five raven nests are present within the Project Boundary. No attempt was made to document nesting success for ravens within the Study Area and nests were often only observed once to verify species occupancy. As it is not pertinent to the project and raven nests were recorded supplementally, tabular nesting data is not provided for ravens. Common Raven nest locations are provided in Appendix A, Map 6.

5.0 RECOMMENDATIONS

In accordance with CDFW recommendations for Swainson's Hawks in the Antelope Valley (CEC & CDFW 2010), the following should be implemented for the Project:

- Protocol surveys should be conducted within the survey season immediately prior to project construction and the implementation of a minimum no disturbance buffer of 0.5-mile be delineated around active nests until the breeding season has ended or until a qualified biologist has determined that the birds have fledged and are no longer reliant upon the nest or parental care for survival.
- Protocol surveys should be repeated within the 5-mile radius if a survey season ensues or elapses before the onset of project related activities.
- If construction begins mid-survey season the year after the initial surveys, then the surveys should continue for that part of the season before construction.

- A survey for all other nesting raptors should be conducted immediately prior to project construction and a CDFW recommended no-disturbance buffer should be implemented until the birds have fledged and are no longer reliant upon the nest or parental care for survival.
- Mitigation should occur for loss of foraging habitat within 5 miles of Swainson's Hawk nests.
- For projects within 5 miles of an active nest tree, a minimum of 2 acres of Habitat Mitigation (HM) land for each acre of development should be provided.

6.0 REFERENCES

CDFW (California Department of Fish and Wildlife). 2023. California Natural Diversity Database (CNDDB) – RareFind – Commercial version dated April 30, 2023. Retrieved May 30, 2023.

CEC (California Energy Commission) and CDFW. 2010. Swainson's Hawk Survey Protocols, Impact Avoidance, and Minimization Measures for Renewable Energy Projects in the Antelope Valley of Los Angeles and Kern Counties, California.

APPENDICES

Appendix A. Survey Results Maps

Map 1. Swainson's Hawk Nests Nearest to the Project

Map 2. Prairie Falcon Nest

Map 3. Burrowing Owl Nest

Map 4. Red-tailed Hawk Nests

Map 5. Great Horned Owl Nests

Map 6. Common Raven Nests



Nests per 200-acre Hexagonal Grid:

1 3

2 4

Project Boundary

5-mile Swainson's Hawk Nest Buffer

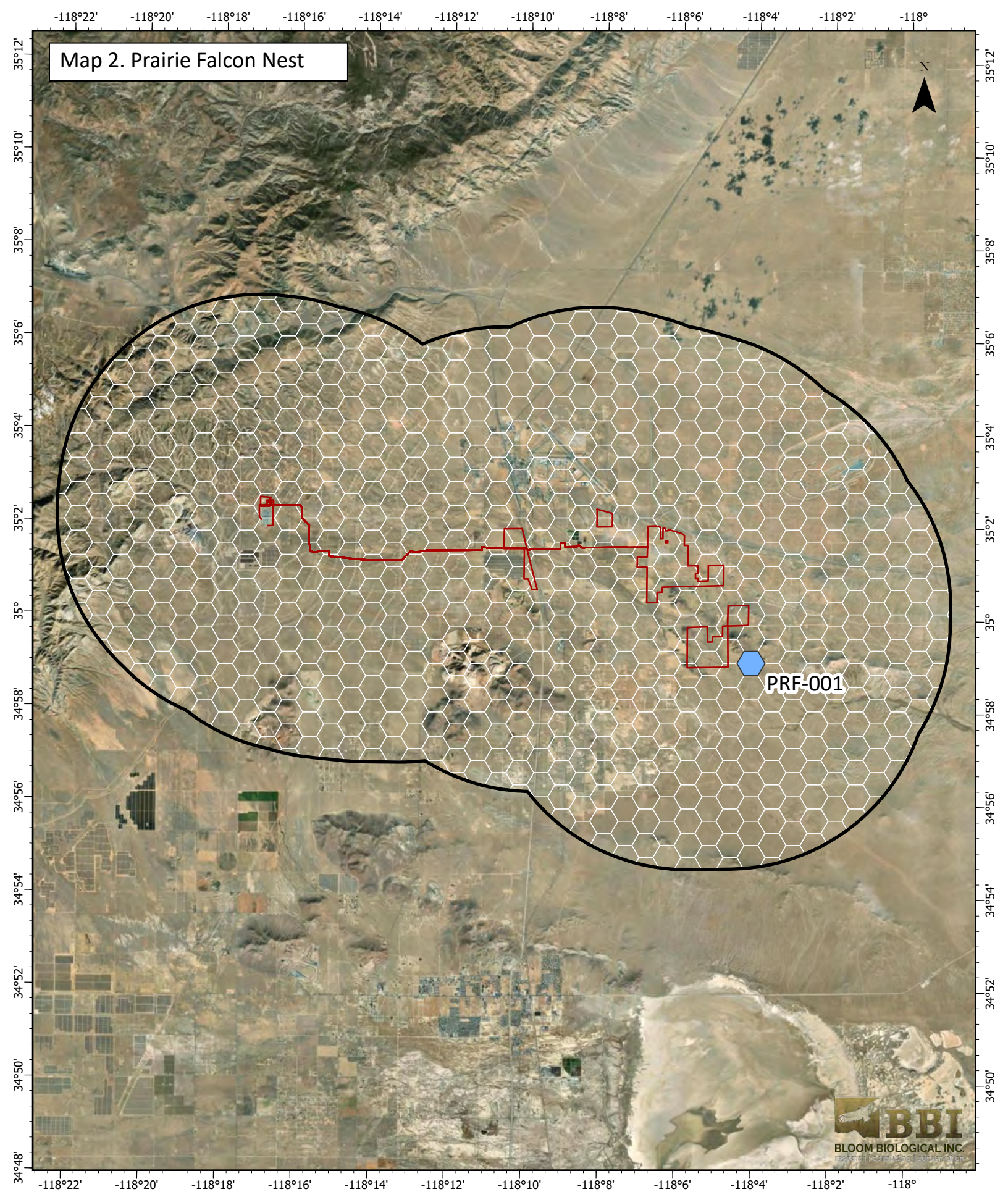
0 1.25 2.5 5 mi

UTM NAD83 Zone 11N Coordinate Grid

Date: 08/16/2023

Author: Bloom Biological, Inc.

Credits: ESRI Imagery



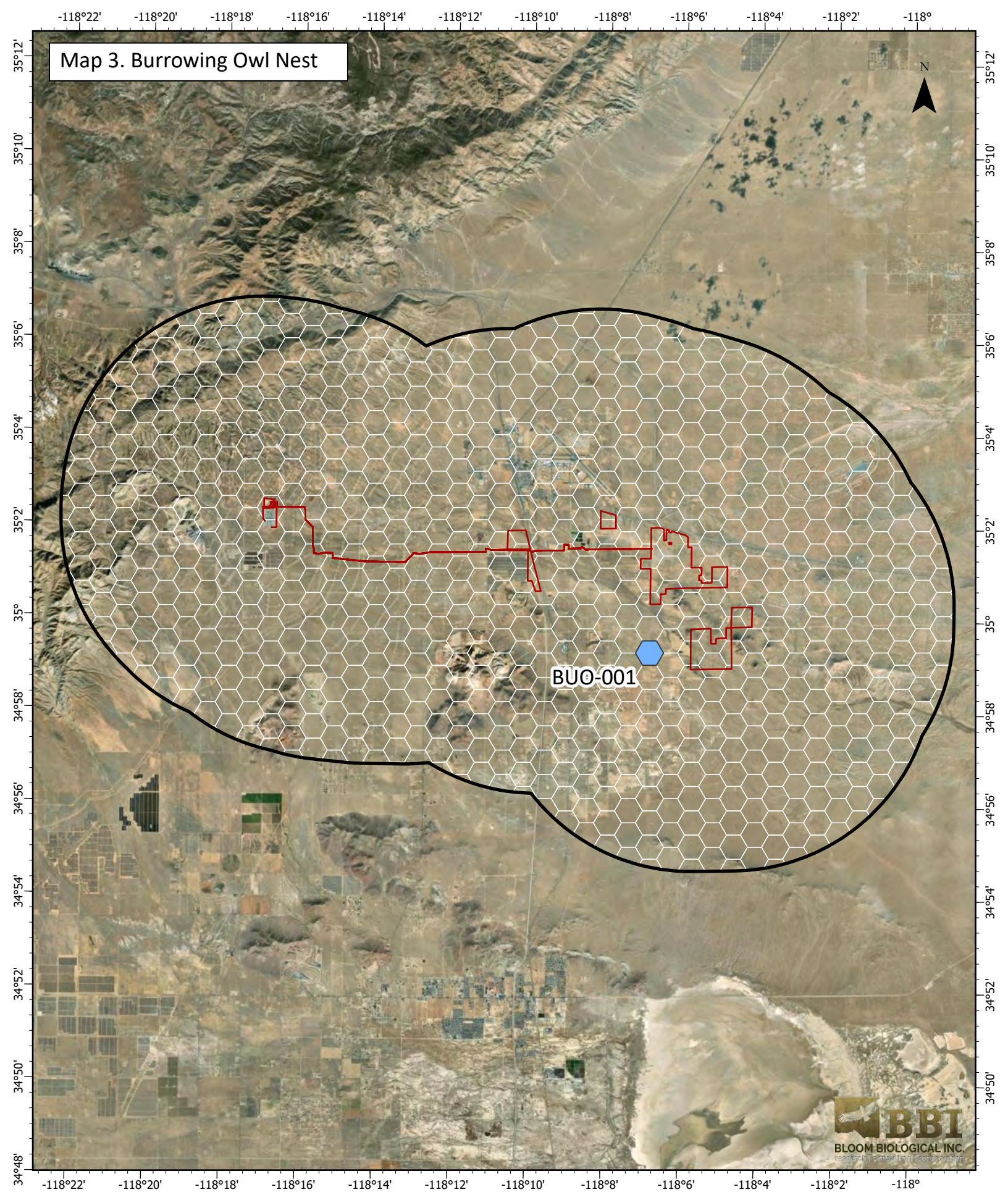
Nests per 200-acre Hexagonal Grid:

1 3
2 4

Project Boundary
Study Area (5-mile radius)

0 1.25 2.5 5 mi

UTM NAD83 Zone 11N Coordinate Grid
Date: 07/25/2023
Author: Bloom Biological, Inc.
Credits: ESRI Imagery



Nests per 200-acre Hexagonal Grid:

1 3

2 4

Project Boundary

Study Area (5-mile radius)

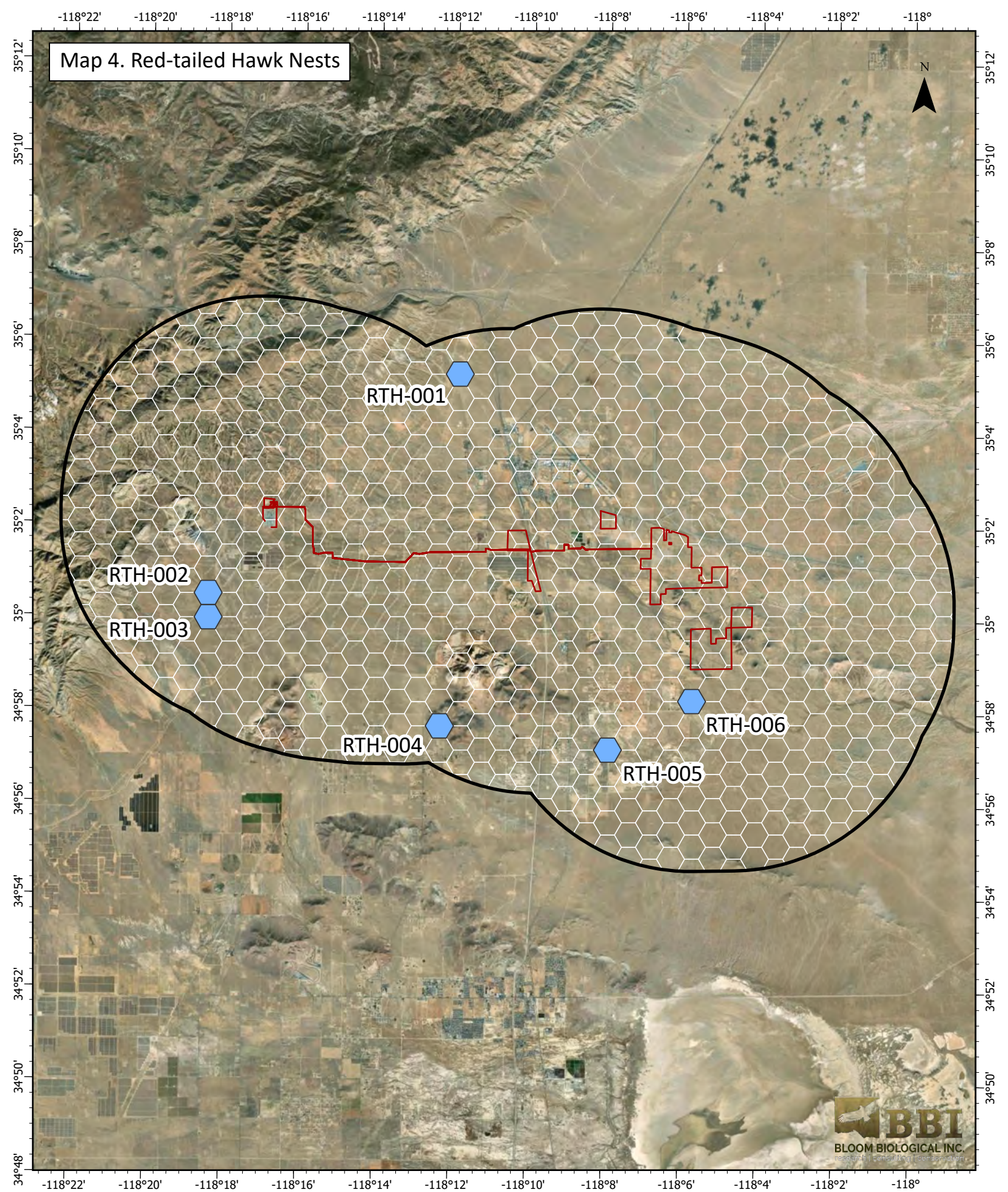
0 1.25 2.5 5 mi

UTM NAD83 Zone 11N Coordinate Grid

Date: 07/25/2023

Author: Bloom Biological, Inc.

Credits: ESRI Imagery



Nests per 200-acre Hexagonal Grid:

1 3

2 4

Project Boundary

Study Area (5-mile radius)

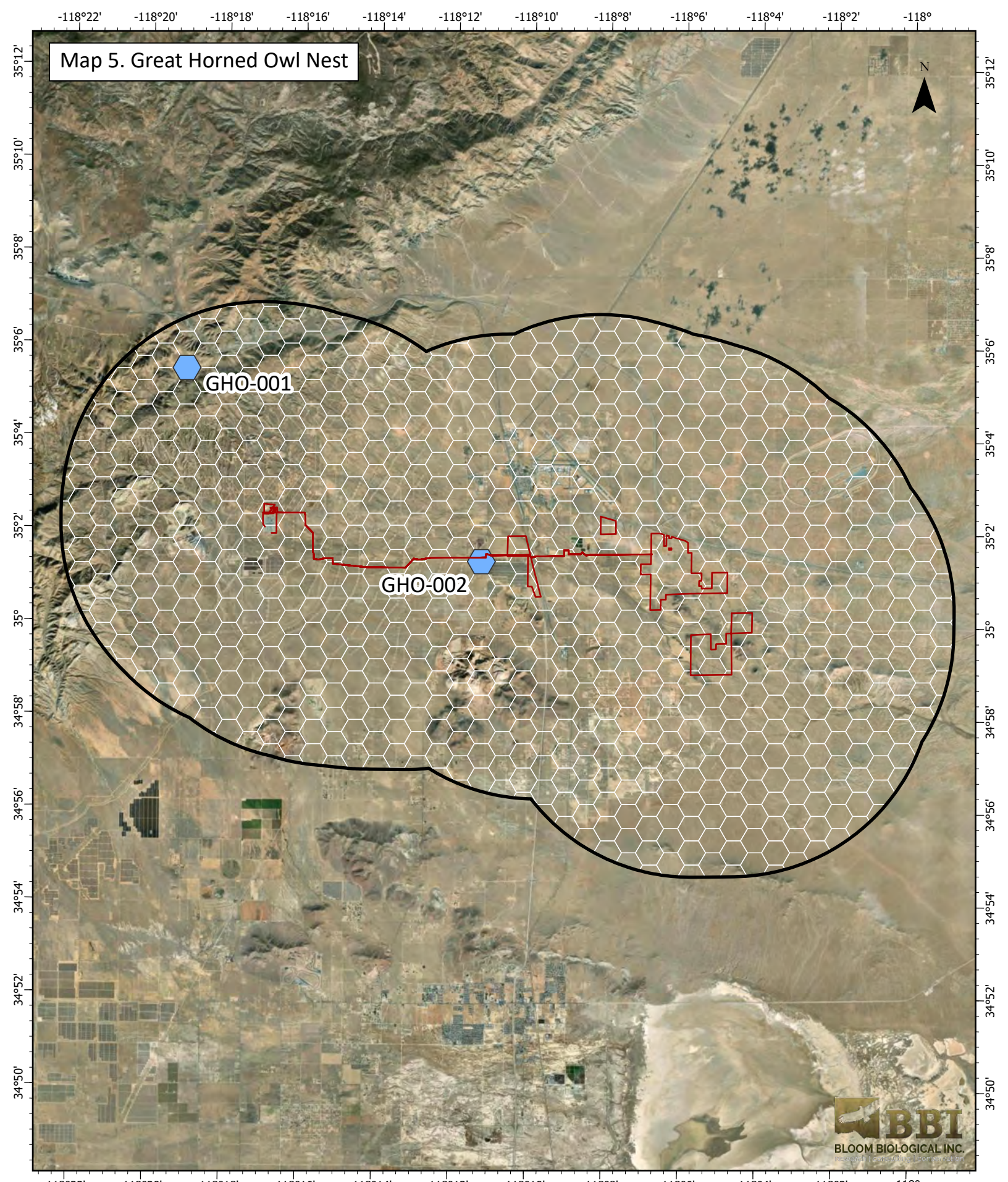
0 1.25 2.5 5 mi

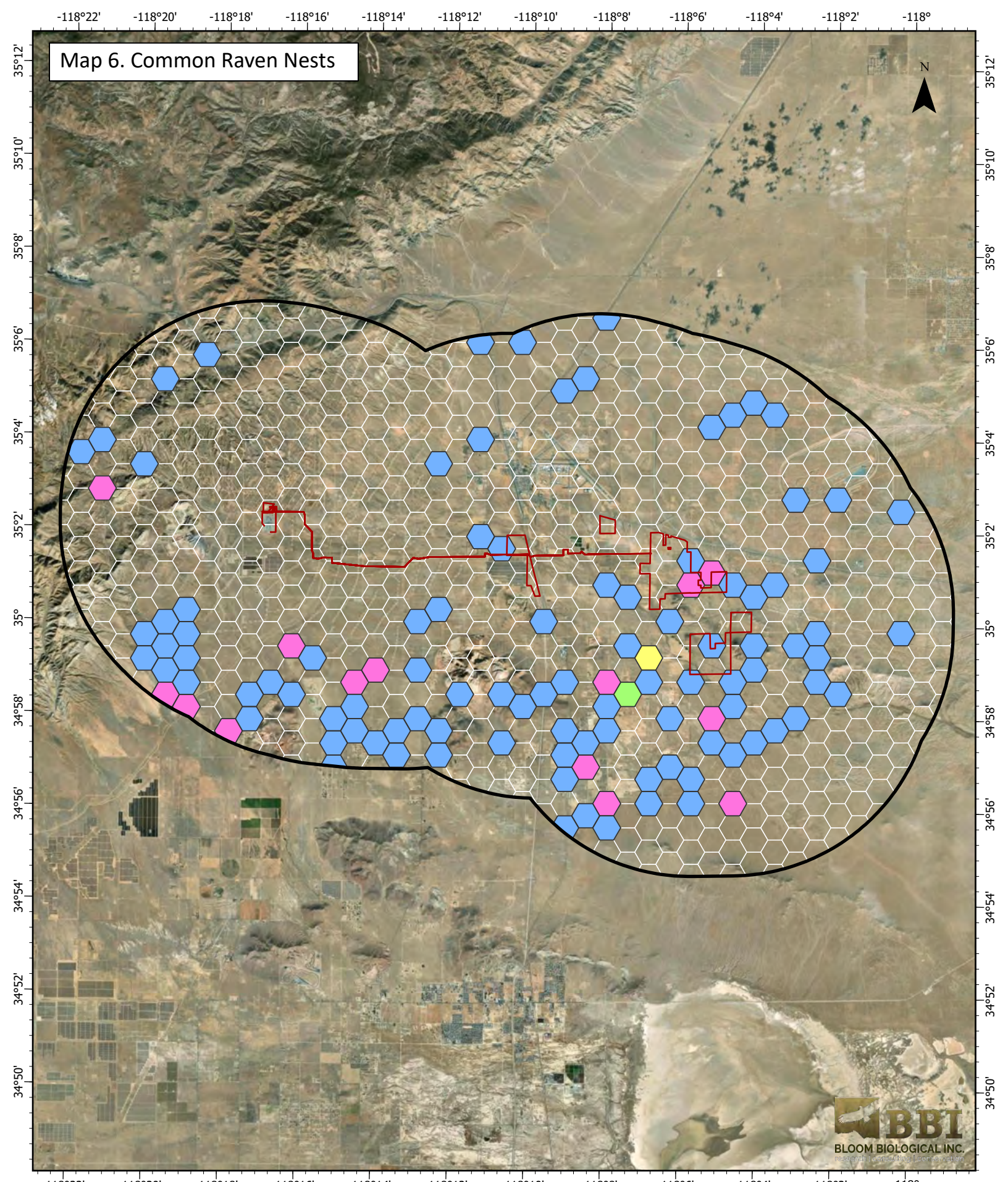
UTM NAD83 Zone 11N Coordinate Grid

Date: 07/25/2023

Author: Bloom Biological, Inc.

Credits: ESRI Imagery


Map 5. Great Horned Owl Nest
N
GHO-001
GHO-002
-118°22'
-118°20'
-118°18'
-118°16'
-118°14'
-118°12'
-118°10'
-118°8'
-118°6'
-118°4'
-118°2'
-118°
35°12'
35°10'
35°8'
35°6'
35°4'
35°2'
35°
34°58'
34°56'
34°54'
34°52'
34°50'
BBI
BLOOM BIOLOGICAL INC.
Nests per 200-acre Hexagonal Grid:
1
2
3
4
Project Boundary
Study Area (5-mile radius)
0
1.25
2.5
5 mi
UTM NAD83 Zone 11N Coordinate Grid
Date: 07/25/2023
Author: Bloom Biological, Inc.
Credits: ESRI Imagery



Nests per 200-acre Hexagonal Grid:

1 3
2 4

Project Boundary

Study Area (5-mile radius)

0 1.25 2.5 5 mi

UTM NAD83 Zone 11N Coordinate Grid

Date: 07/25/2023

Author: Bloom Biological, Inc.

Credits: ESRI Imagery

Appendix B. Nest Photographs



Photo 1. Adult Swainson's Hawk pair perched near nest tree. (SWH-KE-014, 4/27/2023)



Photo 2. Adult Swainson's Hawk perched near nest tree. (SWH-KE-012, 4/27/2023)

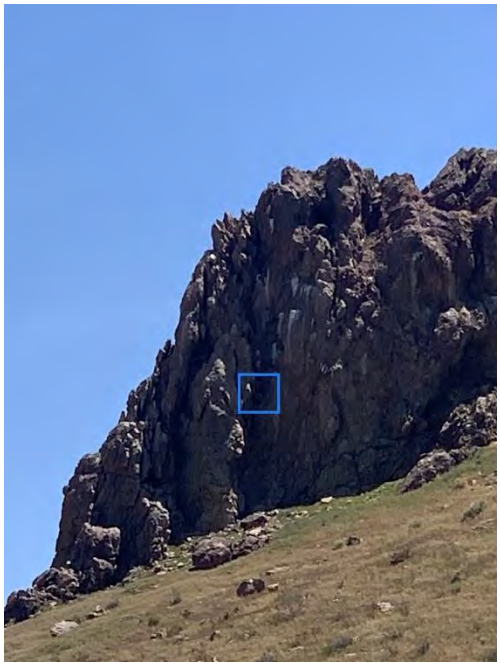


Photo 3. Adult Prairie Falcon in incubating posture on nest located in center of blue polygon. (PRF-001, 4/4/2023)



Photo 4. Signage signifying butte is private property protected under Fish & Wildlife code. Nest butte is present in the background. (PRF-001, 4/4/2023)

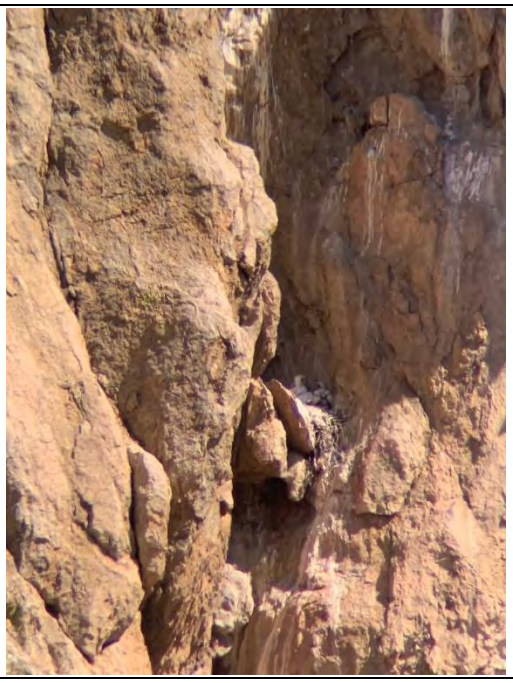


Photo 5. Prairie Falcon nest with three nestlings present in center. (PRF-001, 5/23/2023)	Photo 6. Recently fledged Prairie Falcon perched on a utility pole to the south of the nest butte. (PRF-001, 6/14/2023)
	
Photo 7. Burrowing Owl nesting location shown in blue polygon and adult female owl beneath the red arrow. (BUO-001, 5/24/2023)	Photo 8. Adult female Burrowing Owl on dirt mound near entrance to burrow. (BUO-001, 5/24/2023)

	
Photo 9. Adult male Burrowing Owl in fiddleneck 10 meters from burrow entrance. (BUO-001, 5/24/2023)	Photo 10. Two nestling Red-tailed Hawks in Joshua tree nest near the intersection of 20th St W and E Trotter Avenue. (RTH-006, 6/15/2023).