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Description:	Apx G is the 2D Hydraulic Report and appendices, Apx H is the Air Quality Technical Report and calculations, Apx I is Management Plans: Dust Control Plan, Fire Management and Prevention Plan, Hazardous Materials Management and Oil Spill Response Plan, Health Safety and Noise Plan, Security and Emergency Preparedness Plan, and Operation and Maintenance Plan
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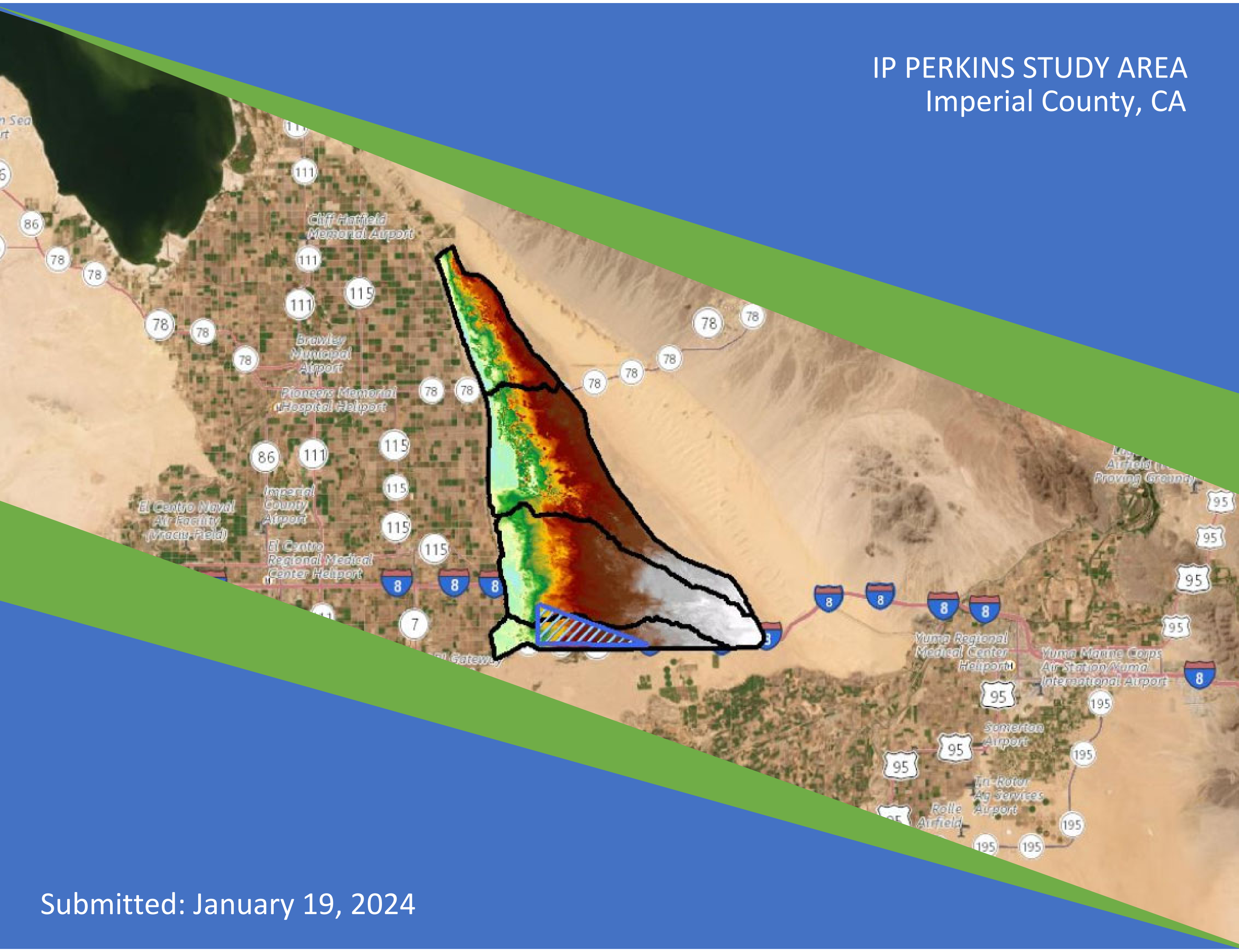
Appendix G 2-D Hydraulic Study

Intersect Power

2-D HYDRAULIC STUDY
SUMMARY ANALYSIS OF FINDINGS

IP PERKINS STUDY AREA
Imperial County, CA



Submitted: January 19, 2024

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Section 1 IP Perkins Hydrology

1.1 Watershed Delineation

The Watershed for the study area was determined by analyzing existing watershed boundaries provided by the National Hydrologic Dataset (NHD). The NHD is a dataset created by the USGS to delineate and identify the Nation's stream networks so that federal and state agencies can quickly indentify streams using unique identifiers based on a network of rivers and streams within a defined hierarchy of watersheds. Based on the location of the IP Perkins study area, which is located within the Salton Sea Basin, the watershed was identified as "Deer Peak", with a HUC10 ID of 1810020404 (See **Figure 1-1**).

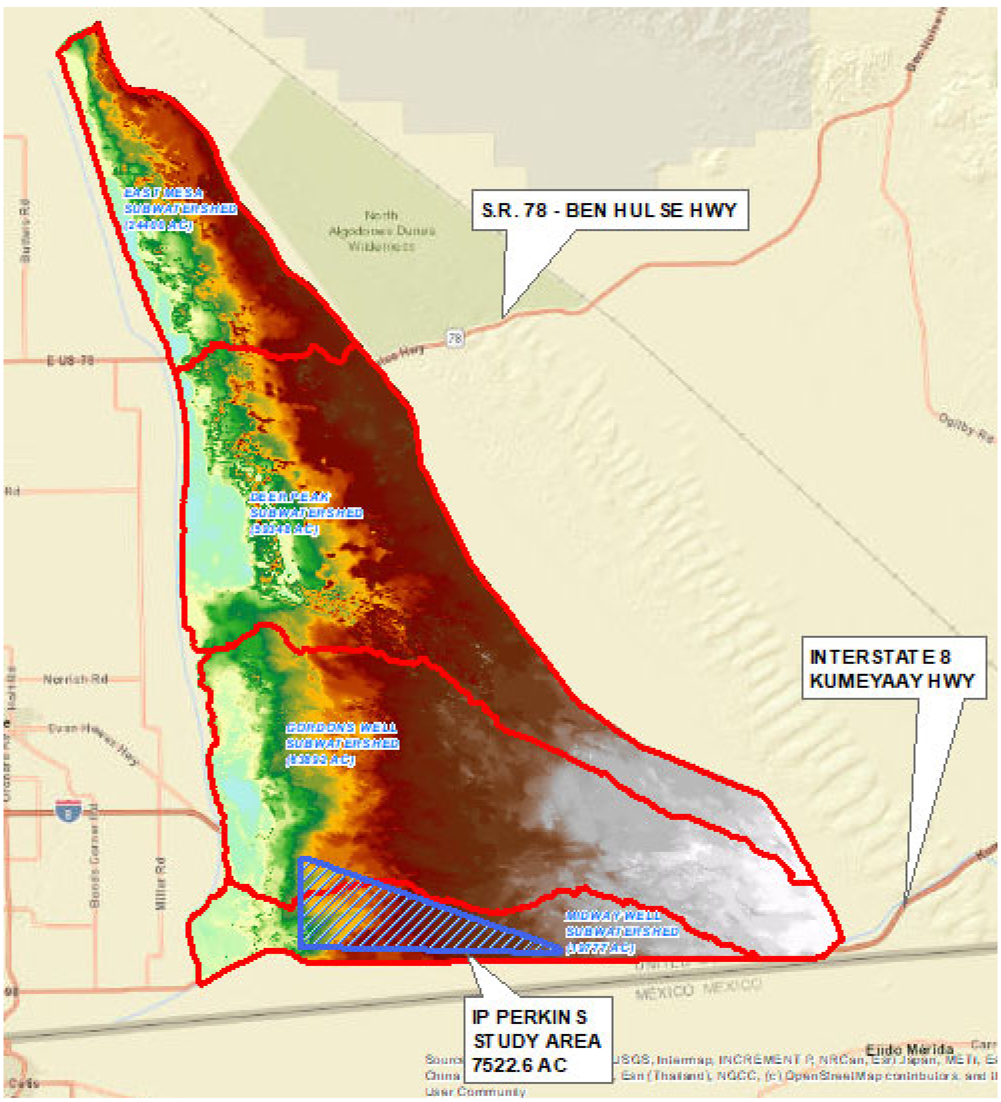

Figure 1-1 IP Perkins Study Area within Midway Well Subwatershed & Relevant Features

1.2 Subwatersheds of Interest

Based on the NHD dataset, the IP Perkins Study Area, is located in Imperial County, California, near the U.S. border with Mexico, and is located within the Deer Peak watershed which consists of four sub-watersheds including East Mesa, Deer Peak, Gordons Well, and Midway Well (See **Tables 1-1 to 1-4**). All four subwatersheds are closed basins.

Table 1-1 East Mesa Subwatershed

NHD Identification Data – East Mesa Sub-Watershed	
HUC ID No.	181002040404
Region (HUC 2):	California Region
Sub-Region (HUC 4):	Southern Mojave-Salton Sea
Basin (HUC 6):	Salton Sea
Sub-Basin (HUC 8):	Salton Sea
Watershed (HUC 10):	Deer Peak
Sub-Watershed (HUC 12):	East Mesa

East Mesa subwatershed is a closed basin totaling 24,400 Acres.

Table 1-2 Deer Peak Subwatershed

NHD Identification Data – Deer Peak Sub-Watershed	
HUC ID No.	181002040403
Region (HUC 2):	California Region
Sub-Region (HUC 4):	Southern Mojave-Salton Sea
Basin (HUC 6):	Salton Sea
Sub-Basin (HUC 8):	Salton Sea
Watershed (HUC 10):	Deer Peak
Sub-Watershed (HUC 12):	Deer Peak

Deer Peak subwatershed is a closed basin and is 59,348 Acres, located to the South of the East Mesa subwatershed.

Table 1-3 Gordons Well Subwatershed

NHD Identification Data – Gordons Well Sub-Watershed	
HUC ID No.	181002040402
Region (HUC 2):	California Region
Sub-Region (HUC 4):	Southern Mojave-Salton Sea
Basin (HUC 6):	Salton Sea
Sub-Basin (HUC 8):	Salton Sea
Watershed (HUC 10):	Deer Peak
Sub-Watershed (HUC 12):	Gordons Well

Gordons Well subwatershed is a closed basin and is 63,892 Acres. The northern most edge of the IP Perkins Study Area is located within the drainage area of Gordons Well.

Table 1-4 Midway Well Subwatershed

NHD Identification Data – Midway Well Sub-Watershed	
HUC ID No.	181002040401
Region (HUC 2):	California Region
Sub-Region (HUC 4):	Southern Mojave-Salton Sea
Basin (HUC 6):	Salton Sea
Sub-Basin (HUC 8):	Salton Sea
Watershed (HUC 10):	Deer Peak
Sub-Watershed (HUC 12):	Midway Well

Midway Well subwatershed is a closed basin and is 19,777 Acres, located on the south end of the Deer Peak watershed. The large majority of the IP Perkins study area is located within the Midway Well subwatershed.

1.3 Hydrologic Model

Hydrologic analysis was performed using the US Army Corps of Engineers HEC-RAS 6.0 modeling software direct precipitation (Rain-on-Grid) routine. Given that all four subwatersheds of interest are closed (bowl shaped) basins and the lack of defined hydrologic features in this desert/shrub location, direct precipitation was selected as the rainfall-runoff hydrology method. HEC-RAS 6.0 provides for user input of various data sources to model the effect of infiltration of the watershed area. Data sources obtained for this analysis (See **Table 1-5**) included land cover, impervious area, soil permeability or hydrologic soil type and catchment areas. Rainfall data for the 100-year, 24-hour storm was obtained from NOAA Atlas 14, which provides the best available rainfall data statistics for the United States.

Table 1-5 Hydrologic Model Data Inputs

Physical Hydrologic Model Input	
Land Cover	USGS National Land Cover Database 2011 Land Cover Classifications
Elevation (Topography)	NextMap 5m and 10m USGS Topographic Raster in NAVD88 and NAD83
% Impervious Area	USGS National Land Cover Database 2011 Impervious Area
Hydrologic Soil Groups	NRCS gSSURGO 30 m 2018 and 10m Rasters for Dominant Conditions
Catchment Areas	Subwatersheds areas delineated by ArcHydro tools within ArcGIS and compared with NHD Plus V2.1 data layers
Curve Numbers	SCS Curve Numbers were selected based on (Moglen 2016) and the literature.

1.4 Rainfall

Using the NOAA Atlas 14 point rainfall for the 100-YR /24-HR storm, the NRCS Type II distribution (See **Figure 1-2**) was applied to determine the rainfall hyetograph over the 24 hour duration of the storm. This data was input into the HEC-RAS 6.0 precipitation (direct rainfall) model. The boundary of the 2D mesh was selected as the Deer Peak Watershed boundary. Consequently, the model applies the rainfall event based on the NRCS Type II distribution, uniformly over the entirety of the watershed area. The 24-hour rainfall was indicated to be 3.84 inches for the 100-YR event which has a 1% annual exceedance probability (See **Table 1-6**). NOAA Atlas 14 Rainfall Data are provided in **Appendix A**.

Table 1-6 Hydrologic Model Rainfall and Loss Characteristics

Rainfall Model Input	
Rainfall	NOAA Atlas 14 provides the most up to date and accurate point rainfall estimates. For the IP Perkins study area, the rainfall depth for the 100 year - 24 Hour storm is 3.84 inches.
Rainfall Distribution	NRCS Type II
Infiltration Method	Soil Conservation Services (SCS) Curve Number
Baseflow Method	Not Applicable

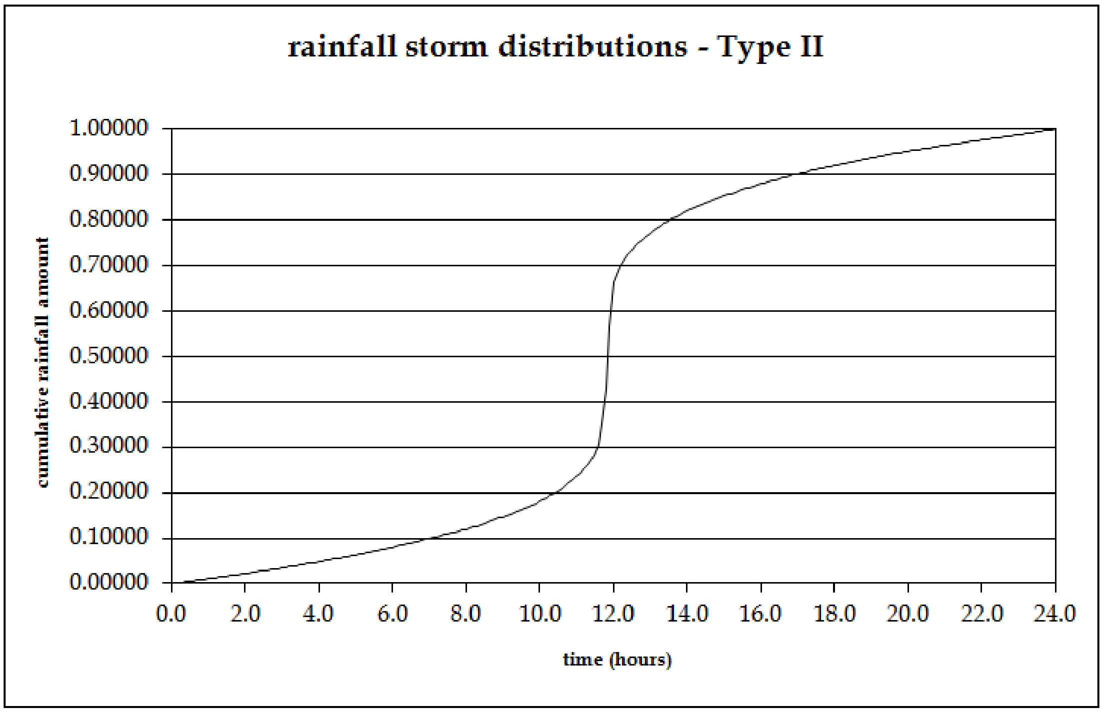

Figure 1-2 NRCS Type II Dimensionless Rainfall Distribution

Table 1-7 NOAA Atlas 14 Rainfall Data for IP Perkins Study Area

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.080 (0.068-0.096)	0.123 (0.104-0.147)	0.185 (0.156-0.222)	0.240 (0.201-0.290)	0.324 (0.261-0.406)	0.396 (0.312-0.507)	0.476 (0.366-0.626)	0.567 (0.423-0.768)	0.707 (0.504-1.00)	0.829 (0.571-1.22)
10-min	0.115 (0.098-0.137)	0.176 (0.149-0.211)	0.265 (0.224-0.318)	0.345 (0.288-0.416)	0.465 (0.375-0.582)	0.567 (0.448-0.726)	0.682 (0.524-0.897)	0.813 (0.607-1.10)	1.01 (0.723-1.43)	1.19 (0.818-1.75)
15-min	0.139 (0.118-0.166)	0.213 (0.181-0.255)	0.321 (0.271-0.384)	0.417 (0.348-0.503)	0.562 (0.453-0.703)	0.686 (0.541-0.879)	0.825 (0.634-1.09)	0.984 (0.734-1.33)	1.23 (0.874-1.73)	1.44 (0.989-2.11)
30-min	0.191 (0.162-0.228)	0.293 (0.248-0.350)	0.441 (0.372-0.528)	0.573 (0.479-0.692)	0.773 (0.623-0.967)	0.944 (0.744-1.21)	1.14 (0.872-1.49)	1.35 (1.01-1.83)	1.69 (1.20-2.38)	1.98 (1.36-2.90)
60-min	0.267 (0.226-0.318)	0.409 (0.346-0.489)	0.615 (0.519-0.737)	0.799 (0.668-0.966)	1.08 (0.869-1.35)	1.32 (1.04-1.69)	1.58 (1.22-2.08)	1.89 (1.41-2.56)	2.35 (1.68-3.33)	2.76 (1.90-4.05)
2-hr	0.371 (0.314-0.442)	0.551 (0.466-0.658)	0.809 (0.682-0.969)	1.04 (0.867-1.25)	1.38 (1.11-1.73)	1.67 (1.32-2.14)	1.99 (1.53-2.62)	2.35 (1.76-3.19)	2.91 (2.07-4.11)	3.39 (2.33-4.97)
3-hr	0.422 (0.358-0.503)	0.621 (0.525-0.741)	0.903 (0.762-1.08)	1.15 (0.963-1.39)	1.52 (1.23-1.91)	1.84 (1.45-2.35)	2.18 (1.68-2.87)	2.57 (1.92-3.49)	3.17 (2.26-4.48)	3.68 (2.53-5.40)
6-hr	0.513 (0.434-0.611)	0.747 (0.632-0.891)	1.08 (0.910-1.29)	1.37 (1.15-1.65)	1.80 (1.45-2.25)	2.16 (1.71-2.77)	2.56 (1.97-3.37)	3.01 (2.24-4.07)	3.68 (2.62-5.21)	4.25 (2.93-6.25)
12-hr	0.589 (0.499-0.702)	0.863 (0.730-1.03)	1.25 (1.06-1.50)	1.60 (1.33-1.93)	2.10 (1.70-2.63)	2.53 (1.99-3.24)	3.00 (2.30-3.94)	3.52 (2.62-4.76)	4.29 (3.06-6.07)	4.95 (3.41-7.27)
24-hr	0.732 (0.646-0.845)	1.08 (0.955-1.25)	1.58 (1.39-1.83)	2.02 (1.77-2.36)	2.68 (2.27-3.23)	3.23 (2.69-3.97)	3.84 (3.12-4.82)	4.52 (3.58-5.82)	5.53 (4.22-7.39)	6.39 (4.72-8.82)

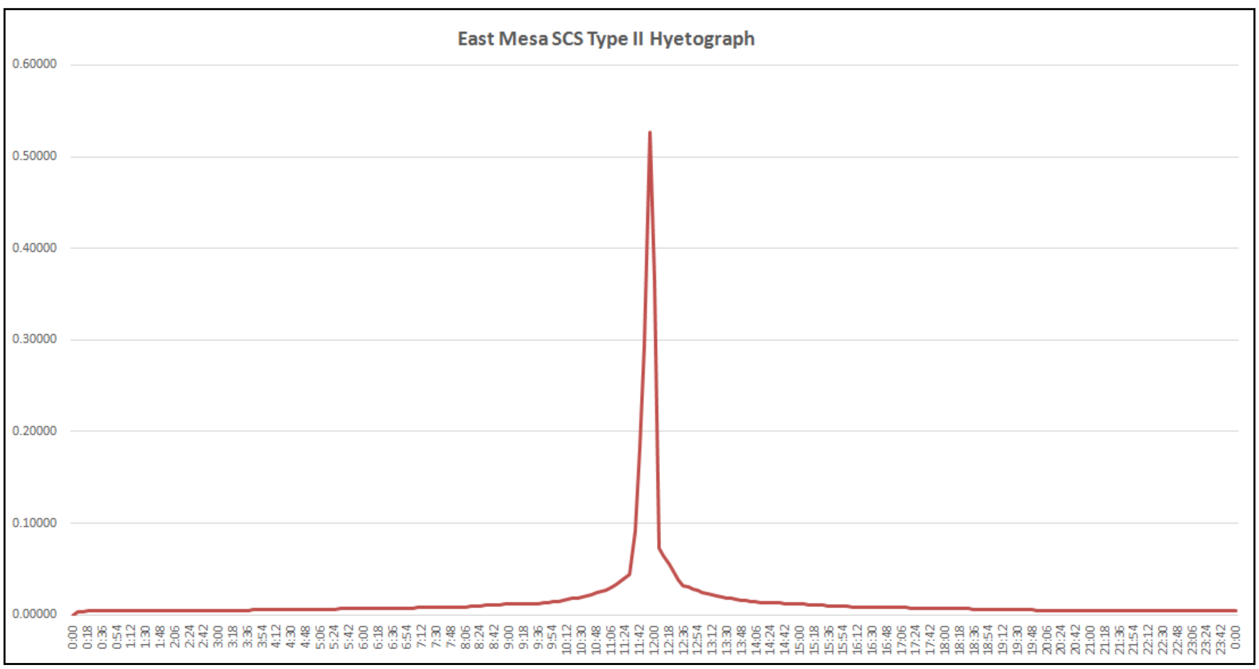

Figure 1-3 IP Perkins Study Area Rainfall Hyetograph

Rainfall data from NOAA Atlas 14 was compared with other data sources from the literature, including TP-40, which likewise indicates a 24-hour rainfall of around 3 to 4 inches for the 100-YR event (See **Figure 1-4**).

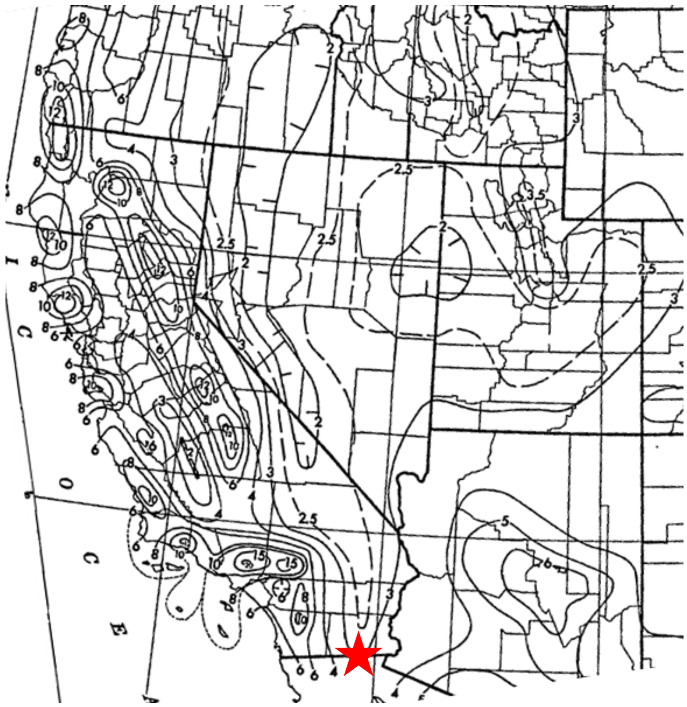

Figure 1-4 Southern California Rainfall Isolines Based on TP-40

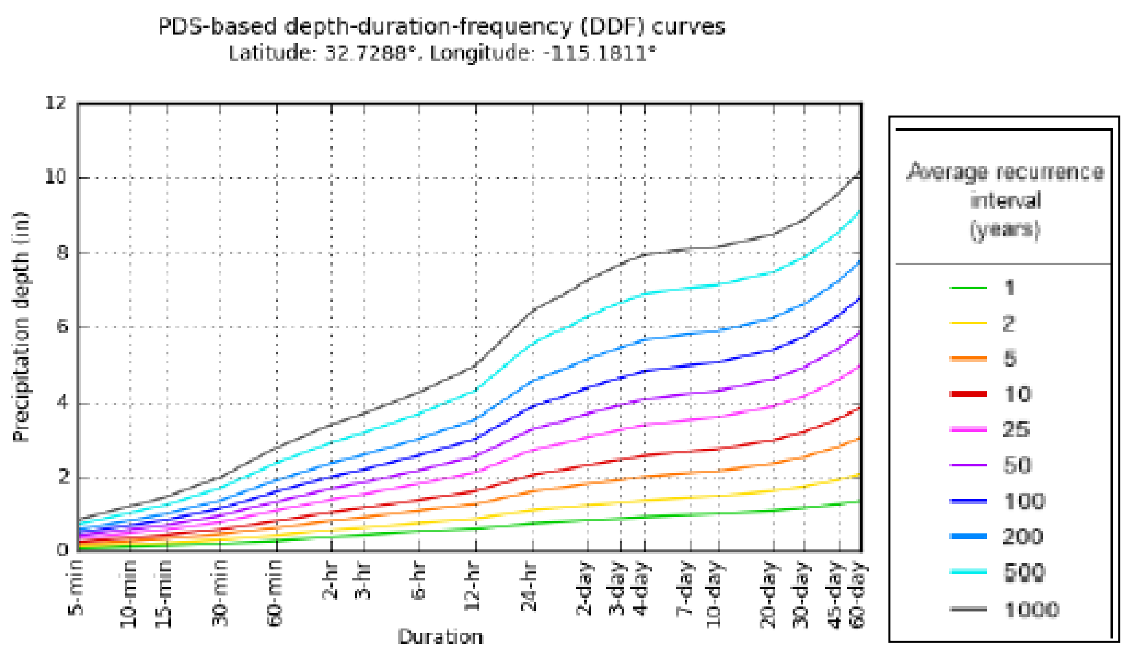

Figure 1-5 IDF Curves for the IP Perkins Study Area

1.5 Elevation & Slope

Topographic data for this analysis was obtained from two sources. For the IP Perkins study area, NextMap 5m digital terrain models were acquired from Intermap. This data source is currently the best available topographic data. For areas outside the boundaries of the study area, USGS 10m (1/3 Arc Second) bare earth digital elevation models were utilized. The composite Digital Elevation Model indicated a vertical grade change between the high (157 ft above MSL) and low points (22 ft above MSL) of the sub-watershed, over an approximate length of 98,400 feet (18.6 miles) which equates to an average slope of 0.1%. The change in grade is relatively gentle with few head cuts. The grade is sloping from East to West (See **Figure 1-6**) which is consistent given the geography of the Imperial Valley. Consequently, it would be expected that excess runoff would flow in a westerly direction.

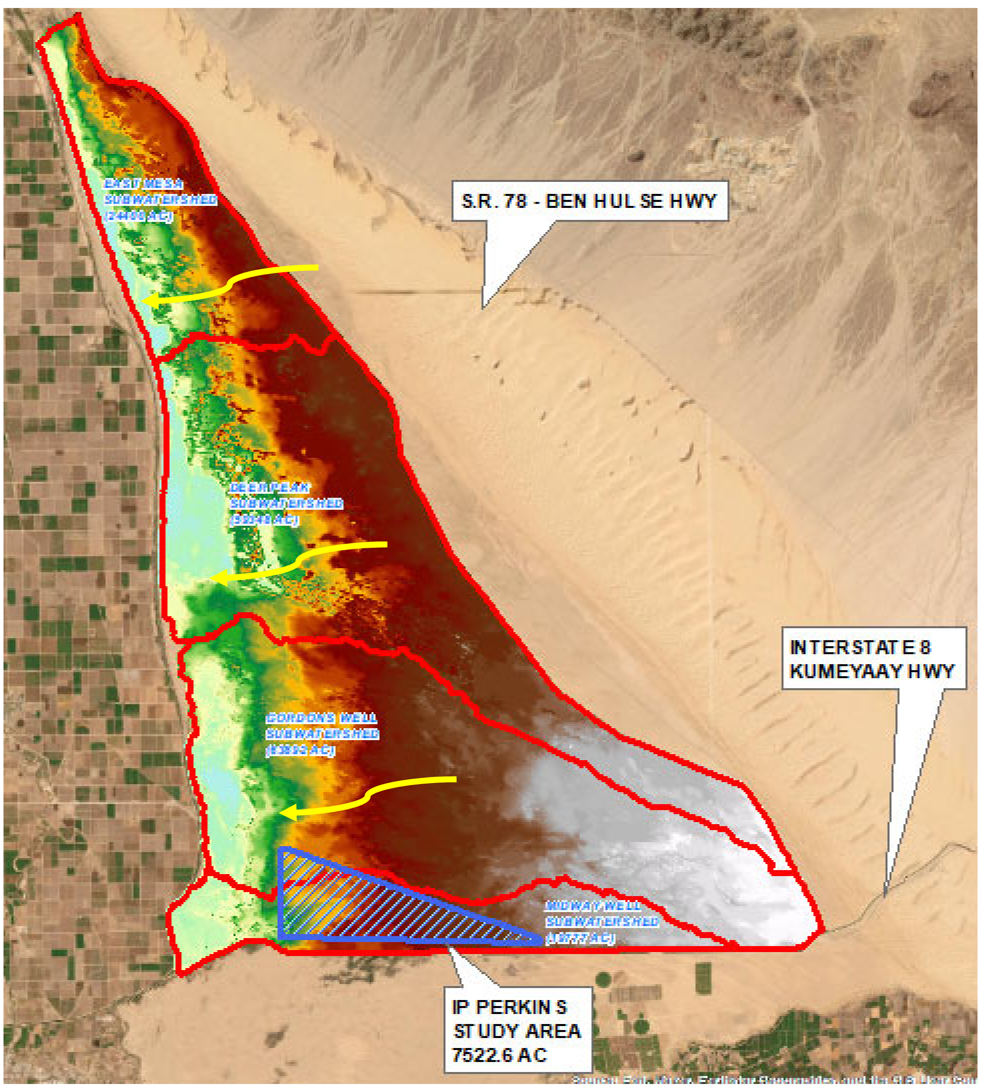

Figure 1-6 Elevation Model of the IP Perkins Study Area (Source: NextMap & USGS)

HYDROLOGIC & HYDRAULIC 2D ANALYSIS

As stated, the slope of the terrain is relatively gentle with the substantial majority of the IP Perkins study area having a slope between 0 to 2.5%, with some isolated pockets of gentle rolling hills exhibiting slopes of around 5 to 8% (See **Figure 1-7**). Due to the relatively flatter slopes, there are not any particularly well-defined hydrologic features which would indicate concentrated flow through the study area. The NHD flowline data layer does not even indicate any existing intermittent or ephemeral flowlines. The watershed boundary data layer identifies all four subwatersheds within the Deer Peak watershed, as closed basins which are more or less bowl shaped basins with no existing watershed outlet. This fact then suggests that a substantial amount of any significant rainfall infiltrates into the soil strata with any remaining excess runoff then concentrating into shallow pools distributed throughout the watershed and at the lowest points on the terrain. This type of runoff response would be consistent with the HSG classification shown in **Figure 1-12**, which indicates 95% of the soils are classified by the USGS as *Group A* soils (high infiltration). The 2D hydraulic model will seek to identify the low points of runoff concentration (shallow pooling) within the study area.

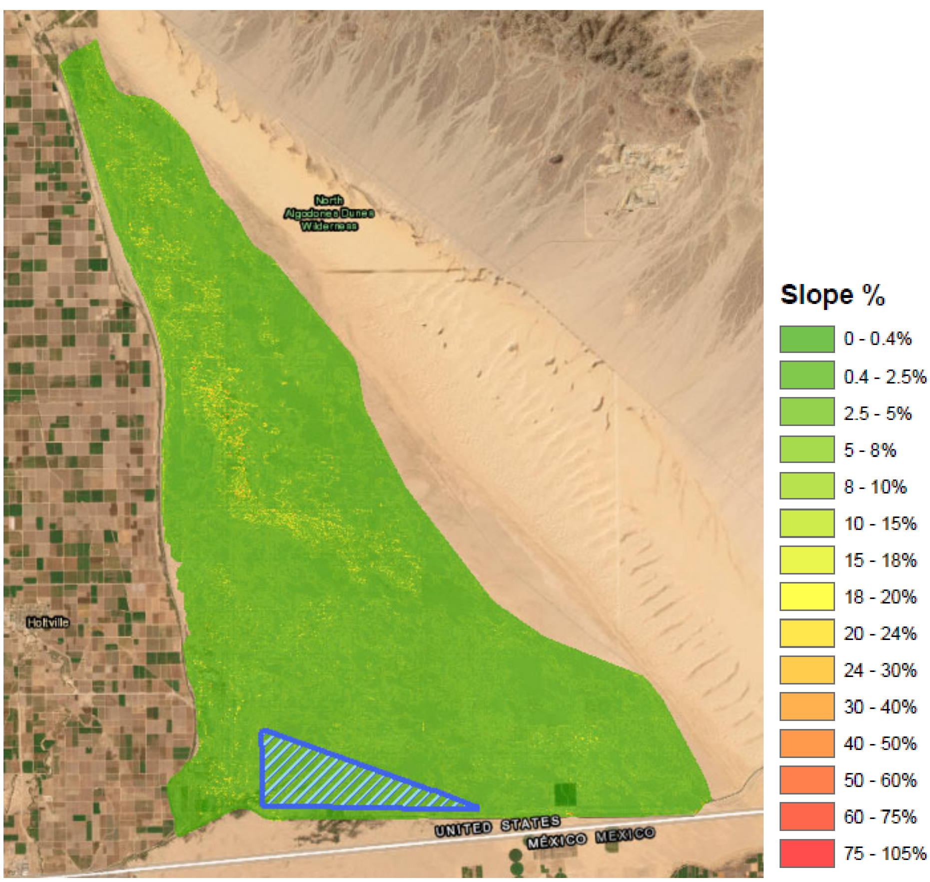

Figure 1-7 Slope Model of the IP Perkins Study Area

1.6 Land Cover

The IP Perkins study area is located in the southernmost eastern corner of Imperial County in Southern California, in an area where the land cover is best described as primarily desert shrub (See **Figure 1-8**). This area of California receives on average about 3 to 5 (See **Figure 1-4**) inches of rainfall or less annually. Therefore, the hydrologic features, where found in the vicinity are primarily "intermittent" or ephemeral features and most of the time are barren or void of any moisture. It should be noted that the National Hydrologic Dataset does not indicate the presence of any defined or intermittent features, and the entirety of the study area is barren and gently sloping from East to West over a 4 to 5 mile length. The study area is dry and arid. The hydrologic features are either non-existent or poorly defined and there is no consistent hydrologic network as the area has consistent gentle slopes which push surface runoff as sheet flow down-gradient, towards the lower western portions of these closed basins.

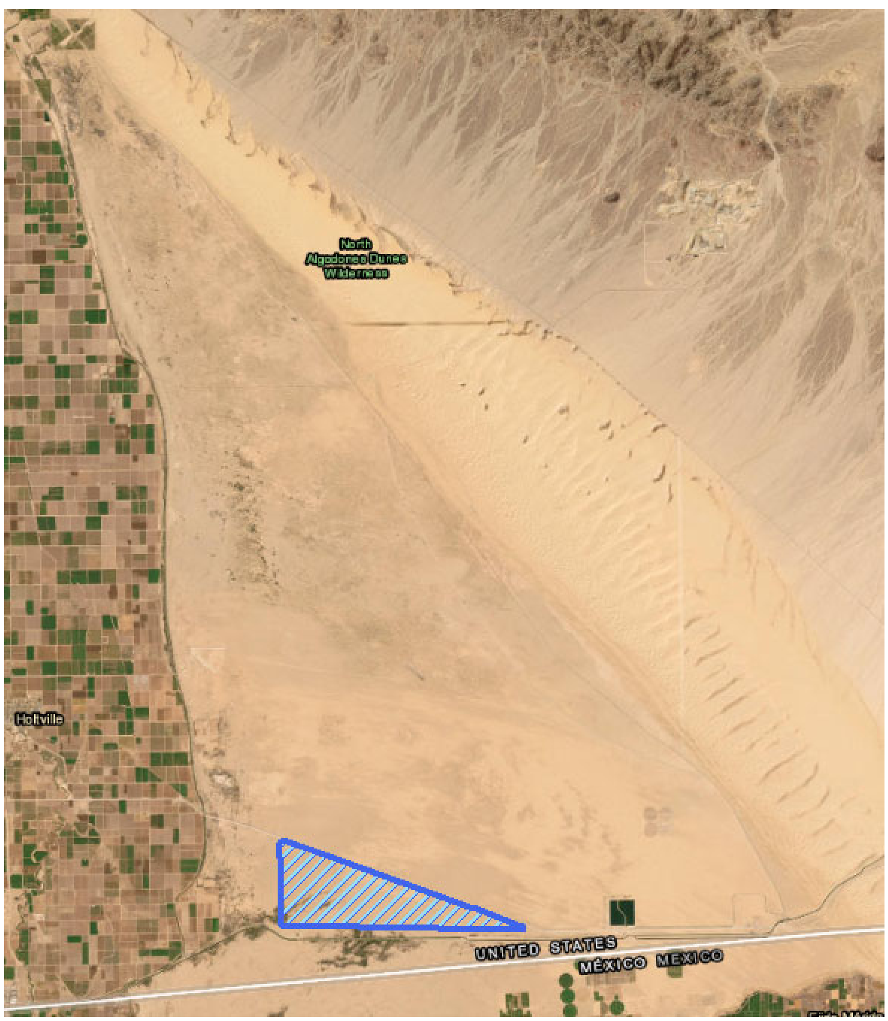

Figure 1-8 IP Perkins Study Area Aerial Imagery Showing Land Cover of Desert/Shrub

1.7 Manning's n

Land Cover categories are taken from the National Land Cover Database (2011) via USGS. The Land Cover categories were used to determine ground cover roughness characteristics which are necessary for performing the 2D hydraulic computations. Manning's "n" roughness values are taken from the literature and recommended roughness values provided by the NRCS (See **Table 1-8**). The two predominant land cover categories in the IP Perkins study area are Desert Shrub/Scrub (Manning's n of 0.100) and Barren Land (Manning's n of 0.025).

Table 1-8 NRCS Manning's n Coefficients for NLCD Land Cover Values

NLCD\1 Value	Normal Manning's n Value	Allowable Range of n values	Land Cover Definition	Reference
11	**0.040**	0.025--0.05	Open Water - All areas of open water, generally with less than 25% cover or vegetation or soil	\2 Table 5-6 D-1.a.3
21	**0.040**	0.03--0.05	Developed, Open Space - Includes areas with a mixture of some constructed materials, but mostly vegetation in the form of lawn grasses. Impervious surfaces account for less than 20 percent of total cover. These areas most commonly include large-lot single-family housing units, parks, golf courses, and vegetation planted in developed settings for recreation, erosion control, or aesthetic purposes.	\3 Figure 3-19
22	**0.100**	0.08--0.12	Developed, Low Intensity -Includes areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 20-49 percent of total cover. These areas most commonly include single-family housing units.	\3 Figure 3-19
23	**0.080**	0.06--0.14	Developed, Medium Intensity - Includes areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 50-79 percent of the total cover. These areas most commonly include single- family housing units.	\3 Figure 3-19
24	**0.150**	0.12-0.20	Developed, High Intensity - Includes highly developed areas where people reside or work in high numbers. Examples include apartment complexes, row houses and commercial/industrial. Impervious surfaces account for 80 to 100 percent of the total cover.	\3 Figure 3-19
31	**0.025**	0.023--0.030	Barren Land (Rock/Sand/Clay) - Barren areas of bedrock, desert pavement, scarps, talus, slides, volcanic material, glacial debris, sand dunes, strip mines, gravel pits and other accumulations of earthen material. Generally, vegetation accounts for less than 15% of total cover.	\2 Table 5-6 C.b.1
41	**0.160**	0.10--0.16	Deciduous Forest - Areas dominated by trees generally greater than 5 meters tall, and greater than 20% of total vegetation cover. More than 75 percent of the tree species shed foliage simultaneously in response to seasonal change.	\2 Table 5-6 D-2.d.5 Max. Debris
42	**0.160**	0.10--0.16	Evergreen Forest - Areas dominated by trees generally greater than 5 meters tall, and greater than 20% of total vegetation cover. More than 75 percent of the tree species maintain their leaves all year. Canopy is never without green foliage.	\2 Table 5-6 D-2.d.5 Max. Debris
43	**0.160**	0.10--0.16	Mixed Forest - Areas dominated by trees generally greater than 5 meters tall, and greater than 20% of total vegetation cover. Neither deciduous nor evergreen species are greater than 75 percent of total tree cover.	\2 Table 5-6 D-2.d.5 Max. Debris
52	**0.100**	0.07--0.16	Shrub/Scrub - Areas dominated by shrubs; less than 5 meters tall with shrub canopy typically greater than 20% of total vegetation. This class includes true shrubs, young trees in an early successional stage or trees stunted from environmental conditions.	\2 Table 5-6 D-2.c.5
71	**0.035**	0.025--0.050	Grassland/Herbaceous - Areas dominated by grammanoid or herbaceous vegetation, generally greater than 80% of total vegetation. These areas are not subject to intensive management such as tilling, but can be utilized for grazing.	\2 Table 5-6 D-2.a.2
81	**0.030**	0.025--0.050	Pasture/Hay - Areas of grasses, legumes, or grass-legume mixtures planted for livestock grazing or the production of seed or hay crops, typically on a perennial cycle. Pasture/hay vegetation accounts for greater than 20 percent of total vegetation.	\2 Table 5-6 D-2.a.1
82	**0.035**	0.025--0.050	Cultivated Crops - Areas used for the production of annual crops, such as corn, soybeans, vegetables, tobacco, and cotton, and also perennial woody crops such as orchards and vineyards. Crop vegetation accounts for greater than 20 percent of total vegetation. This class also includes all land being actively tilled.	\2 Table 5-6 D-2.b.2
90	**0.120**	0.045--0.15	Woody Wetlands - Areas Where forest or shrub land vegetation accounts for greater than 20 percent of r substrate is periodically saturated with or covered with water.	\2 Table 5-6 D-1.a.8
95	**0.070**	0.05--0.085	Emergent Herbaceous Wetlands - Areas where perennial herbaceous vegetation accounts for greater than 80 percent of vegetative cover and the soil or substrate is periodically saturated with or covered with water.	\2 Table 5-6 D-1.a.7

\1 2011 National Land Cover Data Set (NLCD)

\2 Open-Channel Hydraulics, by Chow, Ven Te, 1959

\3 HEC-RAS River Analysis System 2D Modeling User's Manual, Version 5.0, February 2016, Figure 3-19

1.8 Impervious Area

The IP Perkins study area is located in undeveloped desert shrublands (See **Figure 1-11**). The only existing impervious areas within proximity to the study area are paved highways including, SR 78, Ben Hulse Hwy. Ben Hulse Hwy is a 2-lane paved asphalt roadway (See **Figure 1-9**) which traverses the watershed on an east-west alignment. Likewise, to the South, Interstate 8, Kumeyaay Hwy traverses the watershed on an east-west alignment, just to the north of the IP Perkins study area. Kumeyaay Hwy is a 4-lane divided asphalt paved roadway (See **Figure 1-10**). Both roadways are elevated above the existing natural ground by about 2 feet. For the purpose of the hydrologic and 2D hydraulic analysis, all low, medium, and high density-developed land cover types are assumed to be 100% impervious.

Figure 1-9 SR 78 Ben Hulse Hwy North of IP Perkins Study Area

Figure 1-10 Interstate 8, Kumeyaay Hwy North of IP Perkins Study Area

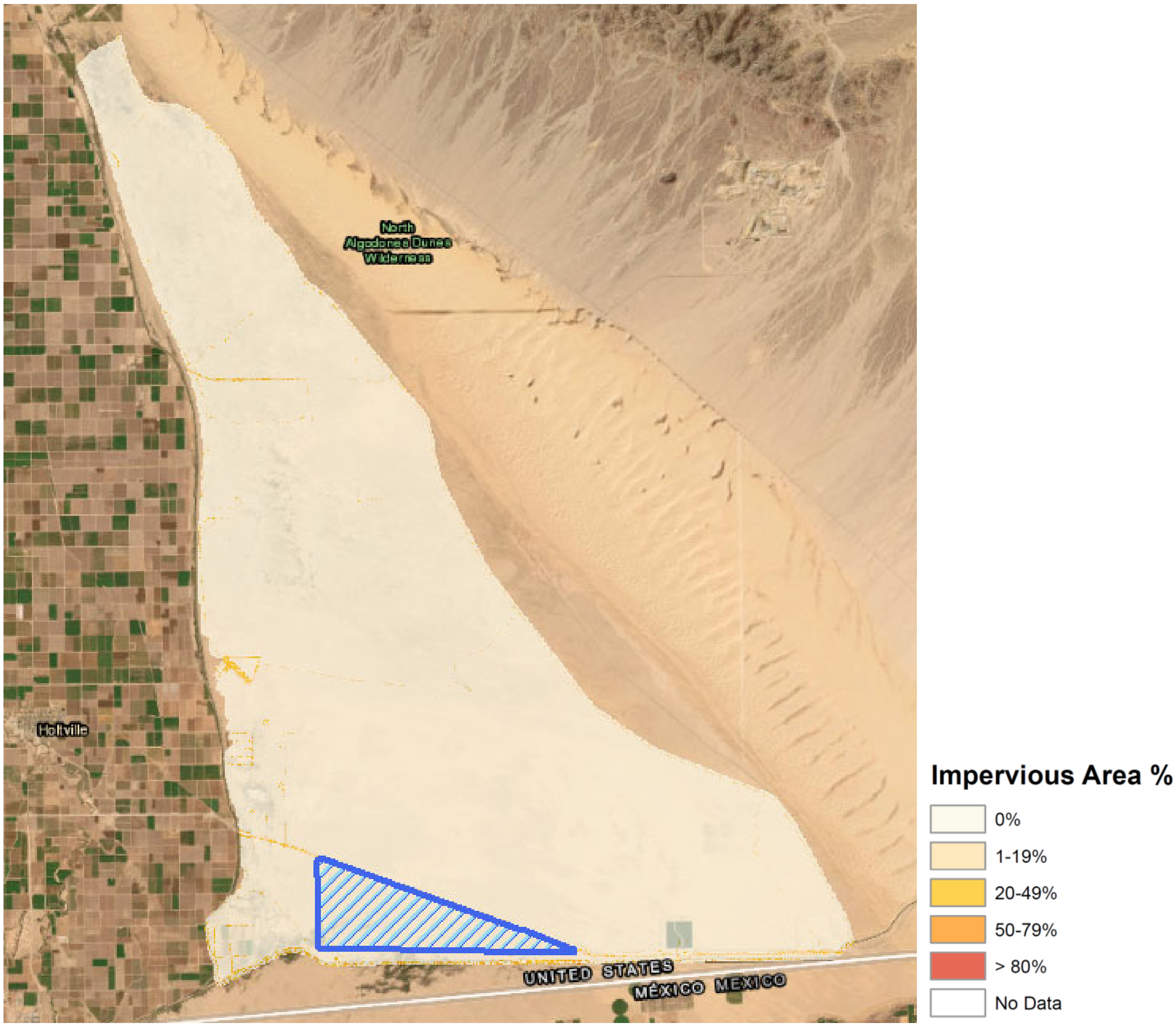

Figure 1-11 IP Perkins Study Area Impervious Area Percent Classification

1.9 Soils

Hydrologic soils were obtained from gSSURGO and the National Landcover Database, respectively. Soils data including both Hydrologic Soil Group and Map Unit symbols, were available for the entirety of the study area and NRCS soils reports are included in **Appendix B** for the study area. Any "unclassified" areas are assumed to be in hydrologic soil group D (poor infiltration). The dominant soil class for the IP Perkins Study area is primarily soil group A, which are soils with a higher rate of infiltration. The Hydrologic soil group raster data (See **Figure 1-12**) was coupled with impervious area percentages for the land cover types in order to characterize the infiltration of runoff within the model (See Infiltration). Map Books with Hydrologic Soil Group classification and Map Unit Symbols polygons are included in the map package of the deliverable. The Map Books can be cross referenced with **Tables 1-9 and 1-10** to identify soil names.

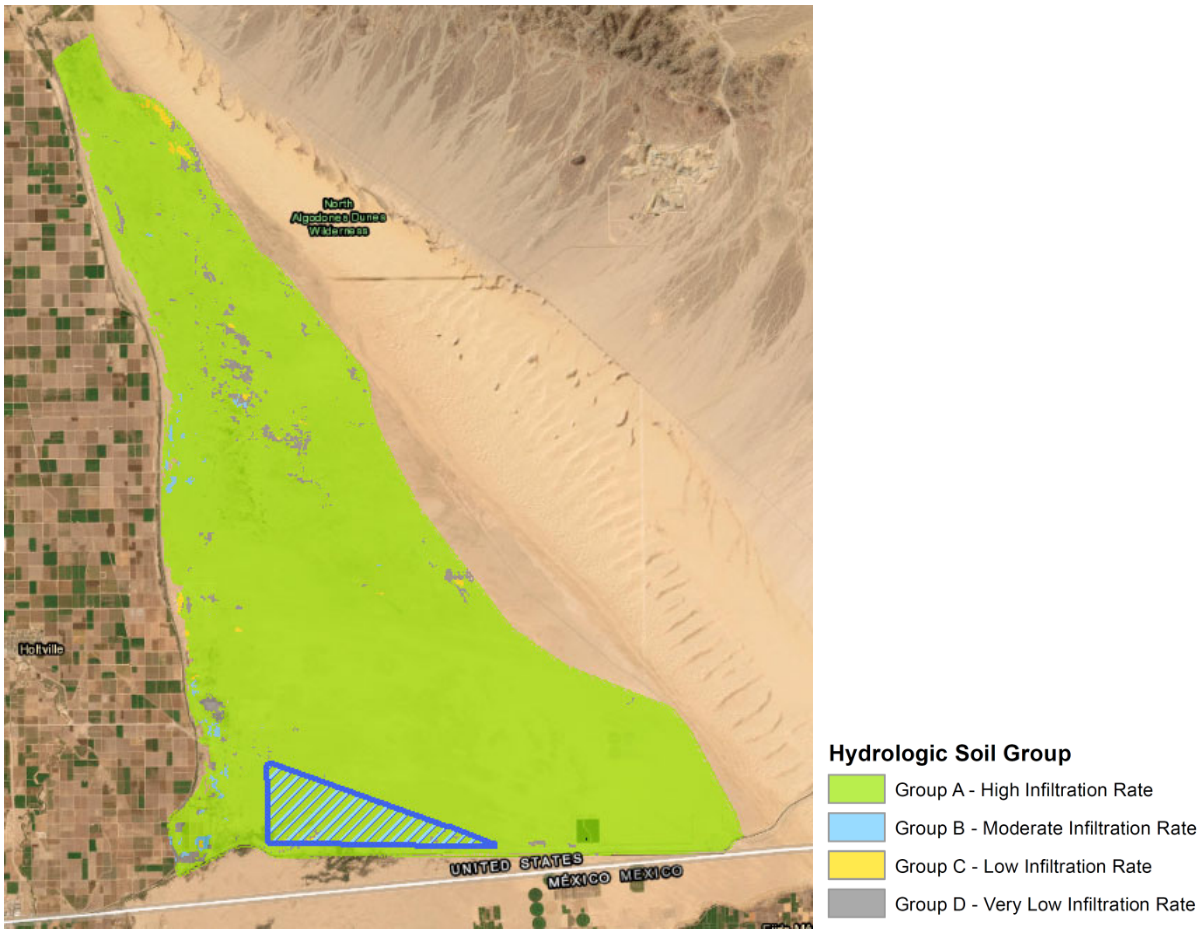

Figure 1-12 IP Perkins Study Area Hydrologic Soil Classification

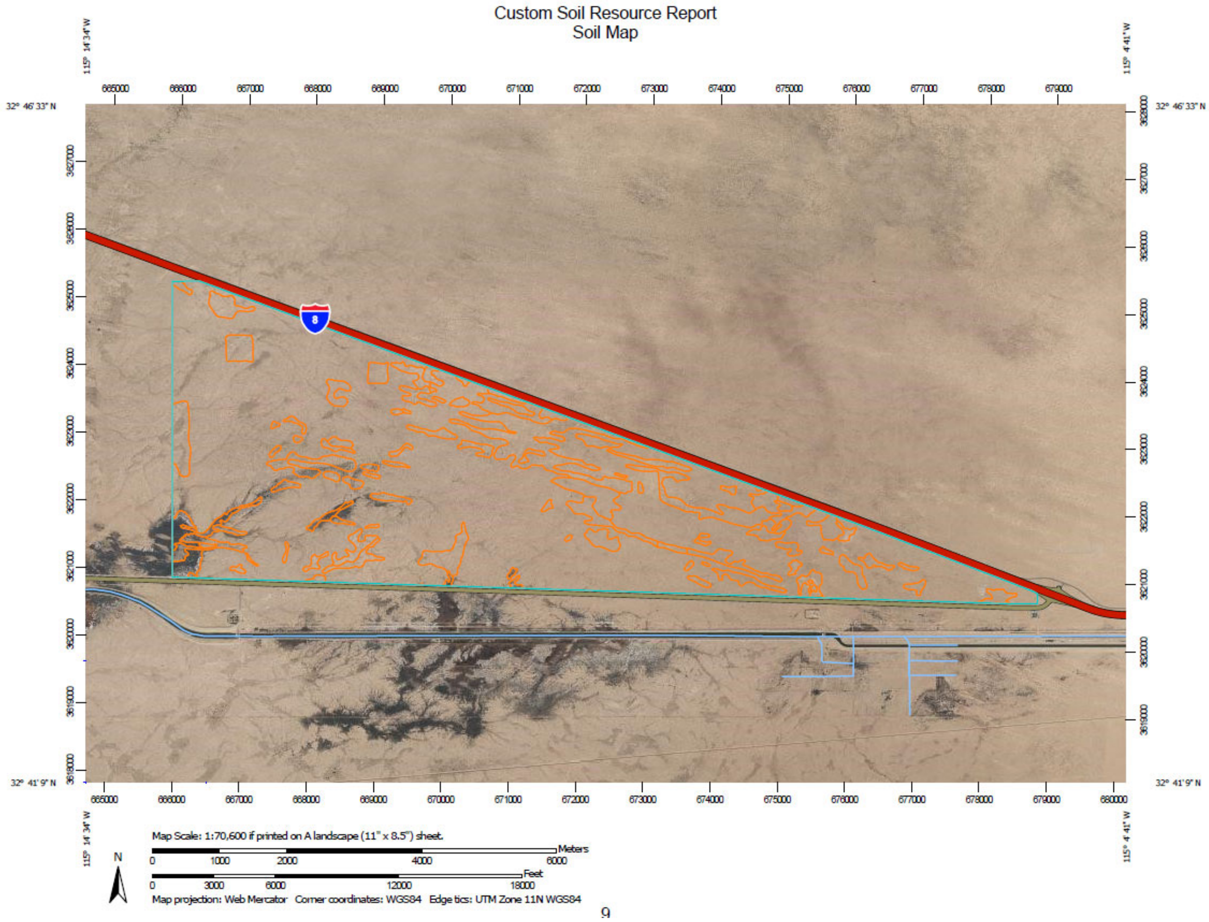

Figure 1-13 IP Perkins Soil Map Units

Table 1-9 IP Perkins Soil Percent Composition

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
100	Antho loamy fine sand	0.4	0.0%
108	Holtville loam	11.4	0.2%
111	Holtville-Imperial silty clay loams	80.5	1.1%
127	Niland loamy fine sand	35.1	0.5%
129	Pits	2.4	0.0%
132	Rositas fine sand, 0 to 2 percent slopes	852.8	11.3%
133	Rositas fine sand, 2 to 9 percent slopes	110.1	1.5%
135	Rositas fine sand, wet, 0 to 2 percent slopes	105.5	1.4%
136	Rositas loamy fine sand, 0 to 2 percent slopes	5,967.3	79.3%
139	Superstition loamy fine sand	354.7	4.7%
Totals for Area of Interest		**7,522.5**	**100.0%**

1.10 Infiltration

The selected infiltration method for the hydrologic model is the NRCS SCS Curve Number method. This method was implemented in HEC-RAS 6.0 by generating an infiltration layer through intersection of the Land Cover layer with the Soils layer. SCS Curve Numbers were taken from the literature and reflect the latest updates in Curve Number estimation. Curve Numbers were specified for each Hydrologic Soil Group given the NLCD Land Cover type. The infiltration layer in the model takes into consideration surface losses from a precipitation event in the 2D hydraulic computations. **Table 1-11** provides Curve Numbers applied in this analysis.

Table 1-10 SCS Curve Number for IP Perkins Study Area

SCS CURVE NUMBERS FOR EXCESS RUNOFF AND INFILTRATION					
NLCD ID	**NLCD Land Cover**	**A**	**B**	**C**	**D**
11	Open Water	100	100	100	100
21	Developed, Open Space	52	68	78	84
22	Developed, Low Intensity	81	88	90	93
23	Developed, Medium Intensity	84	89	93	94
24	Developed, High Intensity	88	92	93	94
31	Barren Land (Rock/Sand/Clay)	70	81	88	92
41	Deciduous Forest	30	55	70	77
42	Evergreen Forest	30	55	70	77
43	Mixed Forest	30	55	70	77
52	Shrub/Scrub	63	77	85	88
71	Grassland/Herbaceous	30	63	75	85
81	Pasture/Hay	40	61	73	79
82	Cultivated Crops	62	74	82	86
90	Woody Wetlands	86	86	86	86
95	Emergent Herbaceous Wetlands	80	80	80	80

1.11 Wetlands

Wetlands were absent from the study area due to the dry desert type land cover.

1.12 Existing Regulatory Effective FEMA Floodplains

The study area has never been mapped by FEMA and there are no existing regulatory floodplains on or near the study area.

Section 2 IP Perkins 2D Hydraulic Model

2.1 2D Hydraulic Model

A 2-Dimensional hydraulic analysis was performed in HEC-RAS Version 6.0, by generating a 2D mesh from the composite Digital Elevation Model (DEM) raster image, coupled with a land cover layer characterizing the manning's n surface roughness coefficients, the impervious area percentages for given land cover types, and the soils layer with HSG defined by the gSSURGO database. The model then generates an intersection of the Land Cover with the soils to compute infiltration losses. The model had an approximate 8 hour run time due to the large acreage involved.

2.2 Watershed Size and 2D Mesh Cell Size

The IP Perkins Study Area is approximately 7,522.5 acres (11.75 Sq. miles) total. The total contributing watershed size for IP Perkins is 83,668 Acres (130.7 Sq. miles). The 2D mesh cell size used to generate mesh is 200 ft x 200 ft for areas outside the study area boundary limits. This value is appropriate for a desktop analysis. Reasonable cell size for a watershed of this size is between 100 to 300 ft. For the IP Perkins study area within the study area boundary limit, the resolution of the 2D Mesh cell size was refined (See *refinement regions*) to 20 ft x 20 ft cells, to reflect the higher resolution of NextMap 5m terrain data used for the study area in the composite Digital Terrain Model.

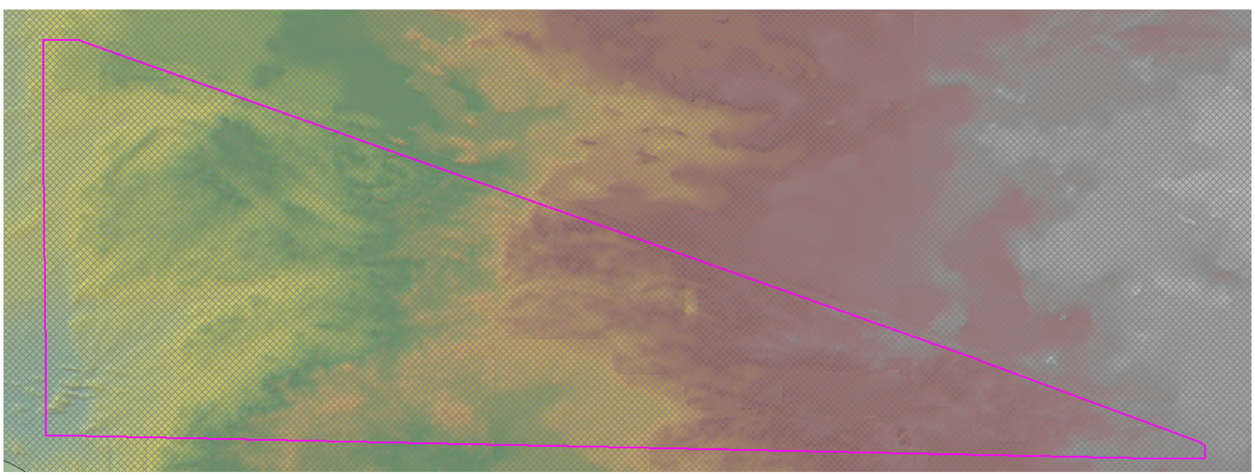

Figure 2-1 2D Mesh for IP Perkins Study Area

2.3 2D Refinement Regions

For this analysis, NextMap 5m Digital Terrain Model raster data was acquired, as this was the best available topographic data at the time of this analysis. The NextMap 5m data was merged with the USGS

10m (1/3 arc second) DEM bare earth terrain models into a composite terrain model. Since the areas within the limits of the study area have a higher resolution terrain than the areas outside the study limits, refinement regions in the 2D mesh were created with a smaller mesh cell size (20 ft x 20 ft) to reflect the higher resolution terrain within the study area limits.

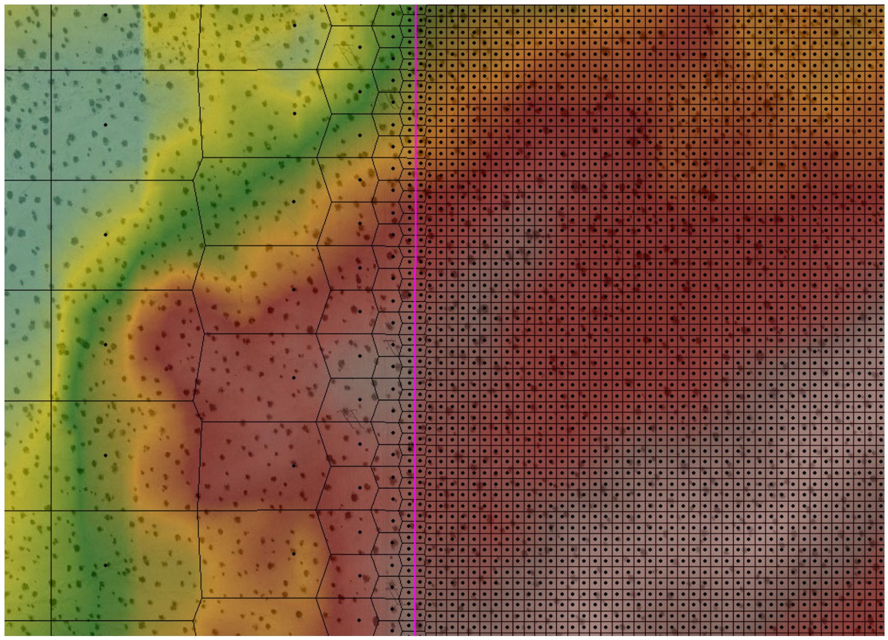

Figure 2-2 2D Mesh Refinement Region Within Study Area Limits

2.4 Boundary Conditions

Due to the hydrologic character of the subwatersheds as being closed basins, and a lack of existing defined hydrologic features the hydrology flow data was modeled using a single storage/2D Flow Area taken as the Deer Peak watershed boundary line, which was selected as the 2D flow area, with a direct precipitation boundary condition (or Rain-on-Mesh). The direct precipitation boundary condition was populated with the 100-YR event rainfall hyetograph values for a 24-hour duration. An unsteady flow date file was then generated as an input for the 2D analysis in HEC-RAS.

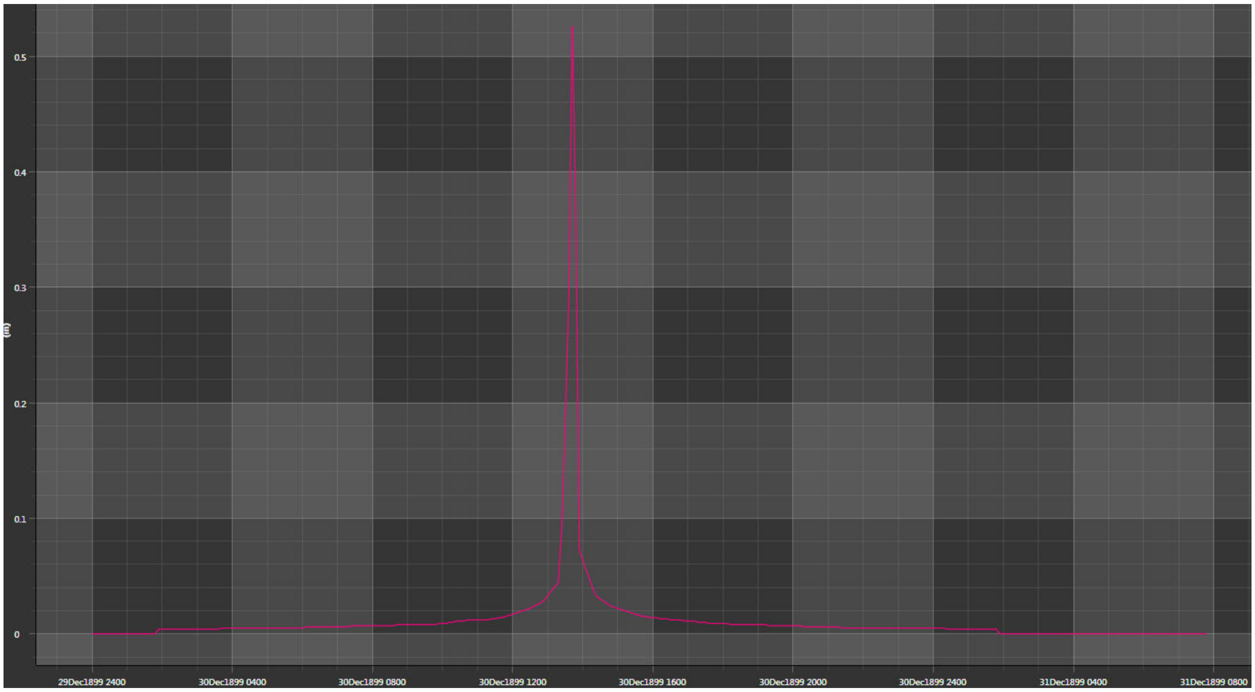

Figure 2-3 Unsteady Flow Data for the Direct Precipitation (Rain-on-Mesh) Boundary Condition

2.5 Time Step

The time step was controlled by a Courant Condition. An advanced time step control was utilized for an adjusted time step based on courant with a maximum courant of 10 seconds and a minimum courant of 0.5. The adjusted time step methodology used for the advanced time step control is the traditional Courant (Velocity * dt / Length). Maximum iterations were set at 20 with the Diffusion Wave equations set. Water Surface Tolerance 0.01, Volume Tolerance 0.01. The model's run time was approximately 8 hours, at this setting.

2.6 2D Flow Area Characteristics

The hydraulic characteristics of the study area are dry, flat desert shrub. Any excess runoff concentrates in shallow pools at low points in the terrain. Pooling of excess runoff is also concentrated near the roadway due to the runoff from the impervious paved asphalt roads. The topography is more or less consistently flat with a predominant slope of 0 to 2.5%. Excess runoff is distributed or dispersed into shallow sheet flow as it traverses the surface at low velocity of less than 1 fps. The runoff eventually reaches the lowest area of elevation and begins to form shallow pools.

2.7 Depth of Flow within Floodplain

The characteristics of the terrain coupled with the low rainfall volume produced in this area of the Southwestern US, produces a floodplain that is dispersed and not particularly well defined, except in those areas where runoff begins to pool at low elevation. The 100-year rainfall for this area is determined by Atlas 14 to be 3.84 inches, which is very low. The flat and gentle sloping of the topography at the foot of the Imperial Valley is a significant distance from the nearest mountainous area and distributes the rainfall uniformly across the watershed area into very shallow sheet flows. The maximum depth of the floodplain, where the water does not pool, is for the most part between 0 and 1 ft, with most flood depths shown by the model to be less than 1 foot for the vast majority of the IP Perkins Study Area. Water begins to pool at lower elevations towards the westerly side of the study area. Man-made grade breaks in the form of agricultural water supply ditches and roads border the agricultural areas surrounding the Eastern outer limits of the City of Holtville within the Imperial Valley agricultural areas to the West of the Study Area. The ditch systems to the west and south of the study area are primarily for irrigation purposes, including the All-American Canal which is operated by the Imperial Irrigation District upstream of the study area at the Imperial Diversion Dam. The All-American Canal is a man-made canal lined with concrete on both sides. The All-American canal is outside of the Deer Peak Watershed boundary and does not contribute any discharges into the watershed.

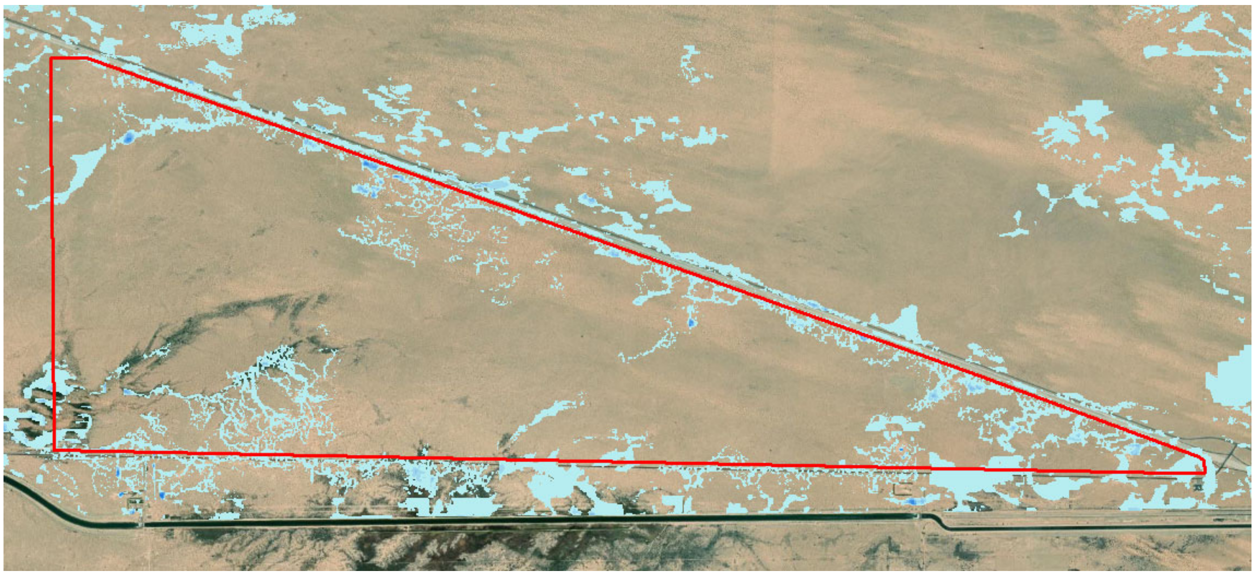

Figure 2-4 2D Max Floodplain Depth for IP Perkins

The locations within the study area most affected by the flood inundation from the 100-yr flood were shown to be those at the lowest elevations within the Terrain model which is consistent with a closed basin. *Given the limited extents, shallow depth and undefined character of the computed flood inundation boundaries, the desktop analysis indicates that the IP Perkins study area has a low flood risk profile, when considering that the rainfall event modeled is the 100-Yr/24-Hr (1% annual chance) storm event.*

2.8 Velocity of Flow within Floodplain

In general velocities within the floodplain were shown to be within 0 to 1 ft per second. In some isolated areas the velocity may reach 2 ft per second, however, these velocities would brief, as the flow velocity would drop significantly following the peak of the response to less than 1 fps. The flat nature of the study area effectively distributes the flow into low velocity distributed sheet flow.

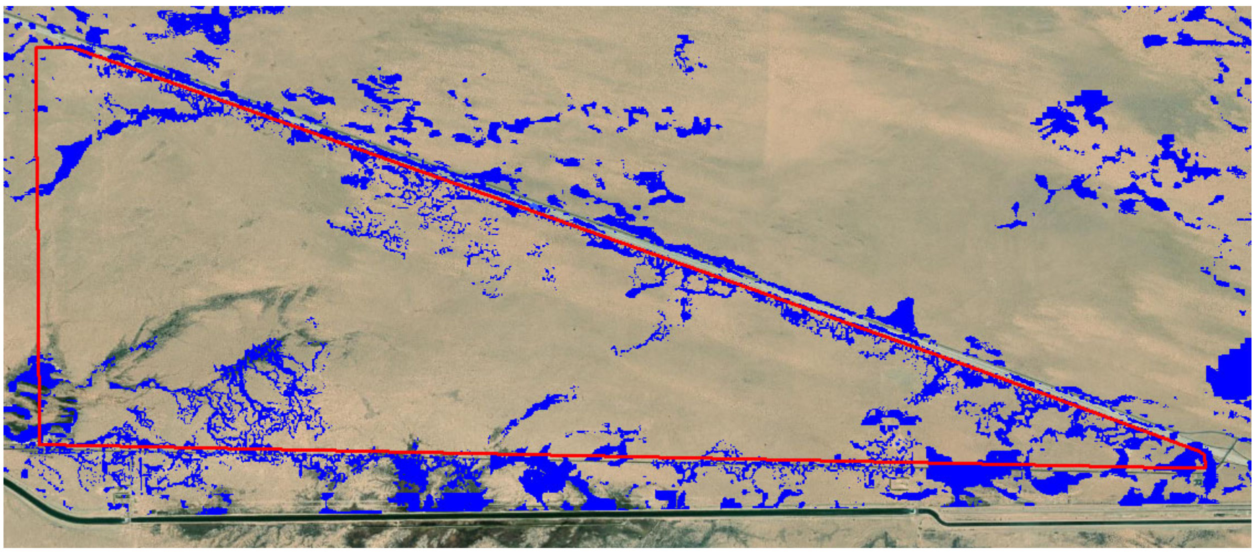

Figure 2-5 2D Max Floodplain Velocity for IP Perkins

2.9 Discussion of Results

The IP Perkins study area has a generally low maximum floodplain inundation depth of 1 foot or less, with velocities of 1 fps or less. Consequently, the IP Perkins Study area *has a low flood risk* which is consistent with the hydrologic characteristics, including Group A soils (high infiltration), low annual rainfall (3 inches +/-), and a low 100-YR/24-Hr point rainfall volume of 3.84 inches (NOAA Atlas 14).

The results shown by the model are in line with expectations given the dry and mostly flat topography of the study area. Due to the flat nature of the terrain in the vicinity of the study area, and the relatively low rainfall for the 100-year storm event, a more detailed analysis would likely not yield results that would produce a significantly different output. However, for the purposes of a desktop analysis, these results appear to show a reasonable output based on terrain and climate, the data sets utilized, the quality of the digital elevation model and the underlying assumptions used in the hydrologic and hydraulic models. Once LiDAR data becomes publicly available for the study area, this model might be enhanced with the 1-meter topographic data, and a 2-D analysis re-run to provide a more refined 2-D model. When and if this study area warrants a more detailed analysis, and at the request of the owner, the additional analysis and more refined topographic data could be taken and implemented into the existing model to ascertain a higher level of analysis and output.

Location name: Holtville, California, USA*
Latitude: 32.7288°, Longitude: -115.1811°
Elevation: 96.58 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.080 (0.068-0.096)	0.123 (0.104-0.147)	0.185 (0.156-0.222)	0.240 (0.201-0.290)	0.324 (0.261-0.406)	0.396 (0.312-0.507)	0.476 (0.366-0.626)	0.567 (0.423-0.768)	0.707 (0.504-1.00)	0.829 (0.571-1.22)
10-min	0.115 (0.098-0.137)	0.176 (0.149-0.211)	0.265 (0.224-0.318)	0.345 (0.288-0.416)	0.465 (0.375-0.582)	0.567 (0.448-0.726)	0.682 (0.524-0.897)	0.813 (0.607-1.10)	1.01 (0.723-1.43)	1.19 (0.818-1.75)
15-min	0.139 (0.118-0.166)	0.213 (0.181-0.255)	0.321 (0.271-0.384)	0.417 (0.348-0.503)	0.562 (0.453-0.703)	0.686 (0.541-0.879)	0.825 (0.634-1.09)	0.984 (0.734-1.33)	1.23 (0.874-1.73)	1.44 (0.989-2.11)
30-min	0.191 (0.162-0.228)	0.293 (0.248-0.350)	0.441 (0.372-0.528)	0.573 (0.479-0.692)	0.773 (0.623-0.967)	0.944 (0.744-1.21)	1.14 (0.872-1.49)	1.35 (1.01-1.83)	1.69 (1.20-2.38)	1.98 (1.36-2.90)
60-min	0.267 (0.226-0.318)	0.409 (0.346-0.489)	0.615 (0.519-0.737)	0.799 (0.668-0.966)	1.08 (0.869-1.35)	1.32 (1.04-1.69)	1.58 (1.22-2.08)	1.89 (1.41-2.56)	2.35 (1.68-3.33)	2.76 (1.90-4.05)
2-hr	0.371 (0.314-0.442)	0.551 (0.466-0.658)	0.809 (0.682-0.969)	1.04 (0.867-1.25)	1.38 (1.11-1.73)	1.67 (1.32-2.14)	1.99 (1.53-2.62)	2.35 (1.76-3.19)	2.91 (2.07-4.11)	3.39 (2.33-4.97)
3-hr	0.422 (0.358-0.503)	0.621 (0.525-0.741)	0.903 (0.762-1.08)	1.15 (0.963-1.39)	1.52 (1.23-1.91)	1.84 (1.45-2.35)	2.18 (1.68-2.87)	2.57 (1.92-3.49)	3.17 (2.26-4.48)	3.68 (2.53-5.40)
6-hr	0.513 (0.434-0.611)	0.747 (0.632-0.891)	1.08 (0.910-1.29)	1.37 (1.15-1.65)	1.80 (1.45-2.25)	2.16 (1.71-2.77)	2.56 (1.97-3.37)	3.01 (2.24-4.07)	3.68 (2.62-5.21)	4.25 (2.93-6.25)
12-hr	0.589 (0.499-0.702)	0.863 (0.730-1.03)	1.25 (1.06-1.50)	1.60 (1.33-1.93)	2.10 (1.70-2.63)	2.53 (1.99-3.24)	3.00 (2.30-3.94)	3.52 (2.62-4.76)	4.29 (3.06-6.07)	4.95 (3.41-7.27)
24-hr	0.732 (0.646-0.845)	1.08 (0.955-1.25)	1.58 (1.39-1.83)	2.02 (1.77-2.36)	2.68 (2.27-3.23)	3.23 (2.69-3.97)	3.84 (3.12-4.82)	4.52 (3.58-5.82)	5.53 (4.22-7.39)	6.39 (4.72-8.82)
2-day	0.821 (0.726-0.948)	1.22 (1.08-1.41)	1.79 (1.58-2.08)	2.30 (2.01-2.68)	3.05 (2.59-3.67)	3.68 (3.06-4.51)	4.37 (3.56-5.48)	5.14 (4.08-6.62)	6.29 (4.80-8.41)	7.26 (5.37-10.0)
3-day	0.870 (0.769-1.00)	1.30 (1.14-1.50)	1.91 (1.68-2.21)	2.44 (2.13-2.85)	3.24 (2.75-3.90)	3.91 (3.25-4.79)	4.64 (3.77-5.82)	5.45 (4.32-7.02)	6.66 (5.08-8.90)	7.68 (5.68-10.6)
4-day	0.909 (0.803-1.05)	1.35 (1.20-1.56)	1.99 (1.75-2.30)	2.55 (2.23-2.97)	3.37 (2.86-4.06)	4.06 (3.38-4.98)	4.81 (3.92-6.04)	5.65 (4.48-7.27)	6.88 (5.25-9.21)	7.93 (5.86-10.9)
7-day	0.961 (0.849-1.11)	1.43 (1.26-1.65)	2.09 (1.84-2.42)	2.66 (2.33-3.11)	3.51 (2.97-4.22)	4.21 (3.50-5.16)	4.97 (4.04-6.24)	5.81 (4.61-7.48)	7.05 (5.38-9.43)	8.09 (5.98-11.2)
10-day	0.990 (0.875-1.14)	1.47 (1.30-1.70)	2.14 (1.89-2.48)	2.73 (2.38-3.18)	3.58 (3.04-4.31)	4.29 (3.57-5.26)	5.05 (4.11-6.34)	5.89 (4.67-7.58)	7.12 (5.43-9.52)	8.15 (6.02-11.2)
20-day	1.08 (0.950-1.24)	1.60 (1.42-1.85)	2.34 (2.06-2.71)	2.96 (2.59-3.46)	3.87 (3.28-4.65)	4.60 (3.83-5.64)	5.39 (4.38-6.76)	6.24 (4.95-8.03)	7.46 (5.70-9.98)	8.47 (6.26-11.7)
30-day	1.15 (1.01-1.32)	1.72 (1.52-1.99)	2.52 (2.22-2.92)	3.19 (2.79-3.73)	4.16 (3.52-5.00)	4.93 (4.10-6.05)	5.75 (4.68-7.21)	6.63 (5.26-8.53)	7.88 (6.01-10.5)	8.89 (6.58-12.3)
45-day	1.25 (1.10-1.44)	1.90 (1.68-2.20)	2.78 (2.45-3.23)	3.53 (3.08-4.12)	4.58 (3.88-5.51)	5.41 (4.50-6.64)	6.28 (5.11-7.88)	7.21 (5.72-9.28)	8.51 (6.49-11.4)	9.55 (7.06-13.2)
60-day	1.34 (1.18-1.55)	2.06 (1.82-2.38)	3.03 (2.66-3.51)	3.84 (3.35-4.48)	4.96 (4.21-5.97)	5.86 (4.87-7.19)	6.78 (5.52-8.51)	7.76 (6.15-9.98)	9.11 (6.95-12.2)	10.2 (7.52-14.1)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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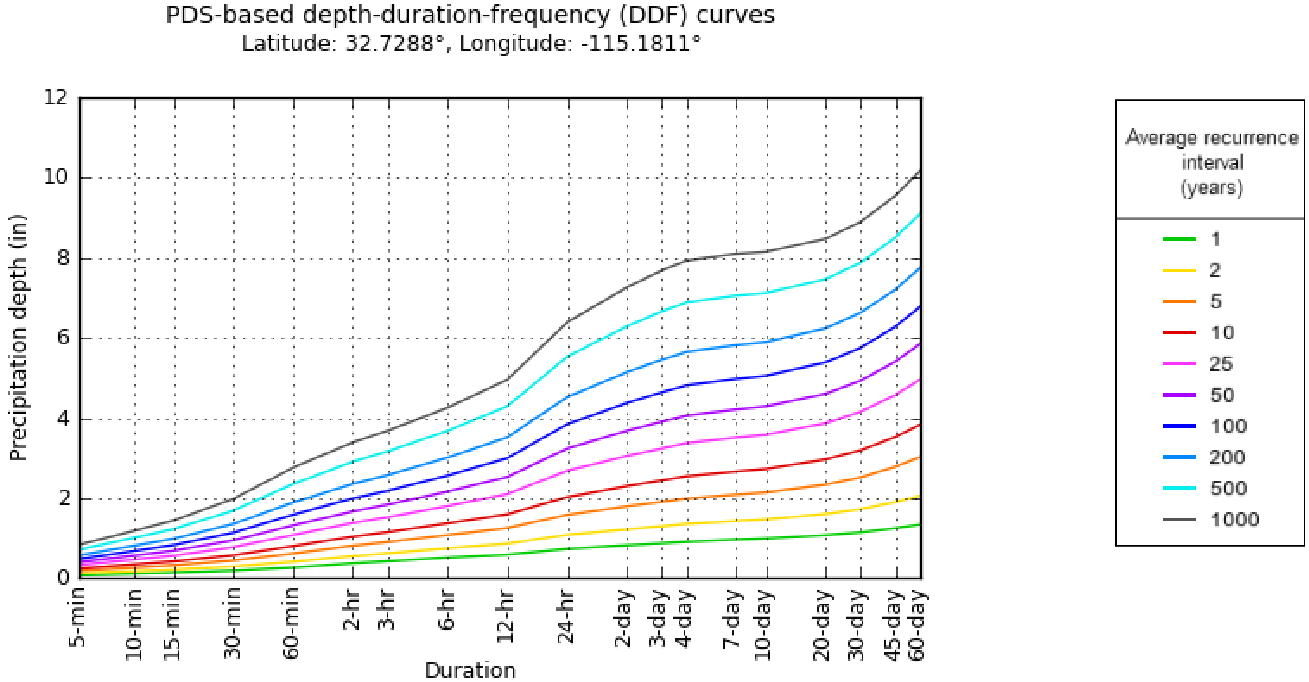
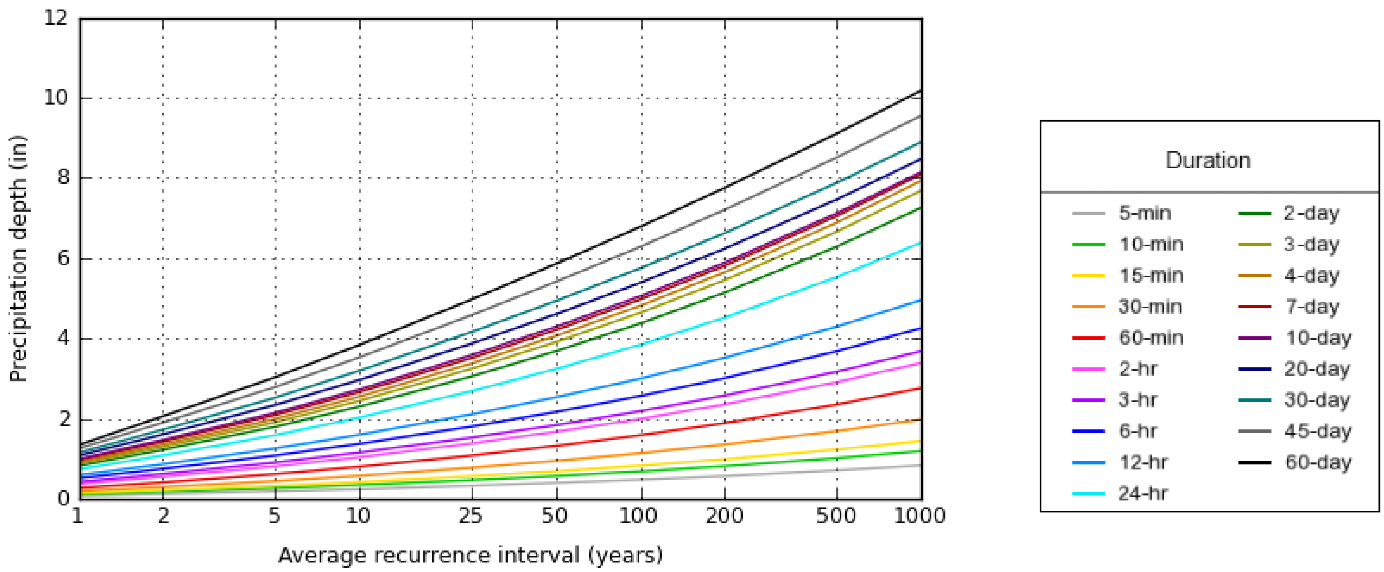
PF graphical





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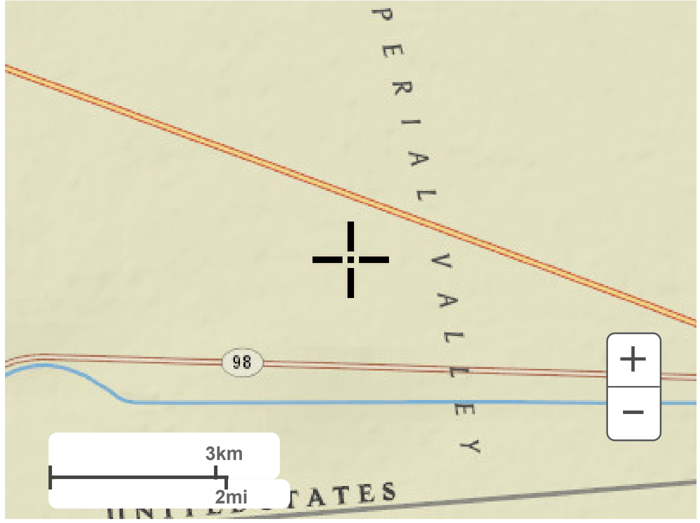
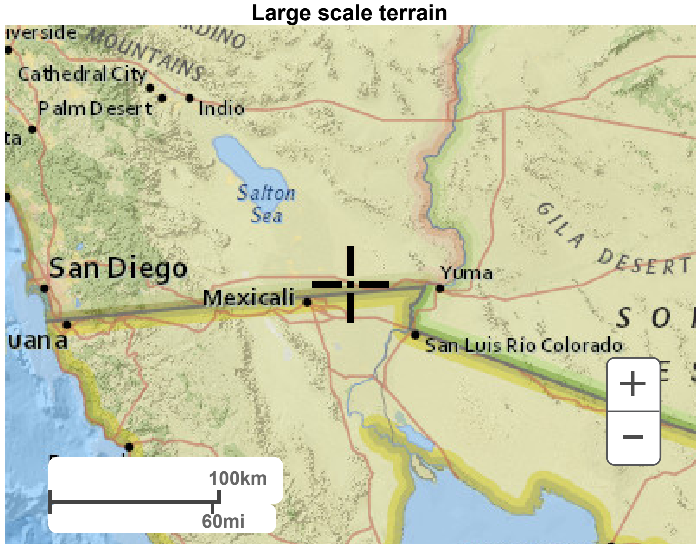
Maps & aerials

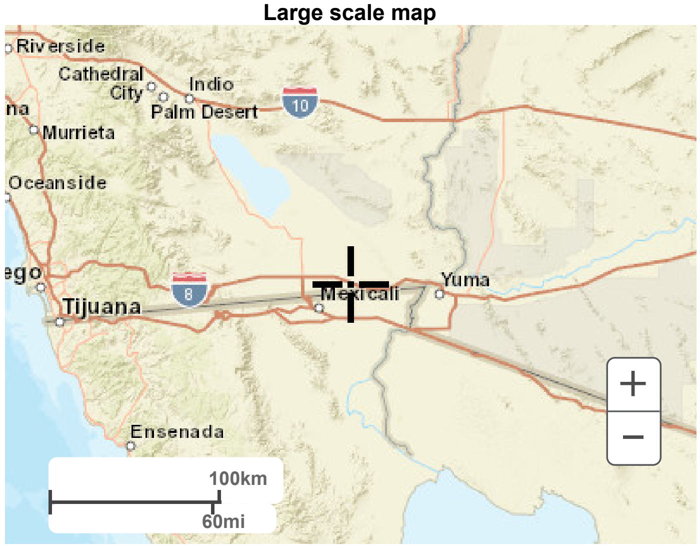
Small scale terrain



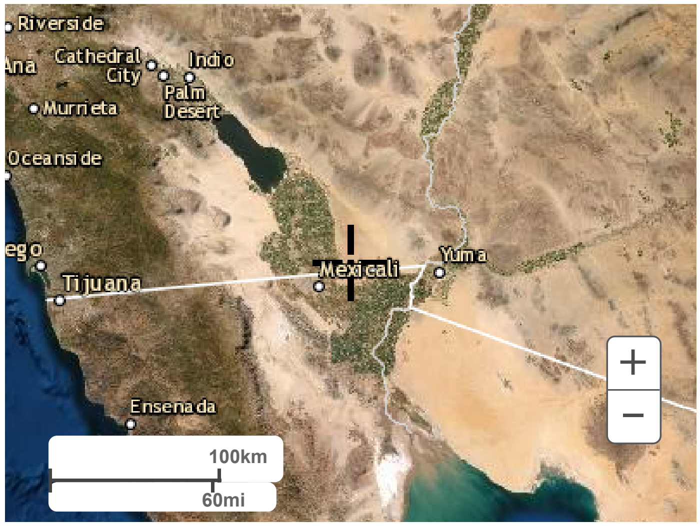
Large scale terrain



Large scale map



Large scale aerial



Riverside
Ana
Cathedral City
Indio
Palm Desert
Murrieta
Oceanside
ego
Tijuana
Mexicali
Yuma
Ensenada
100km
60mi

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United States Department of Agriculture

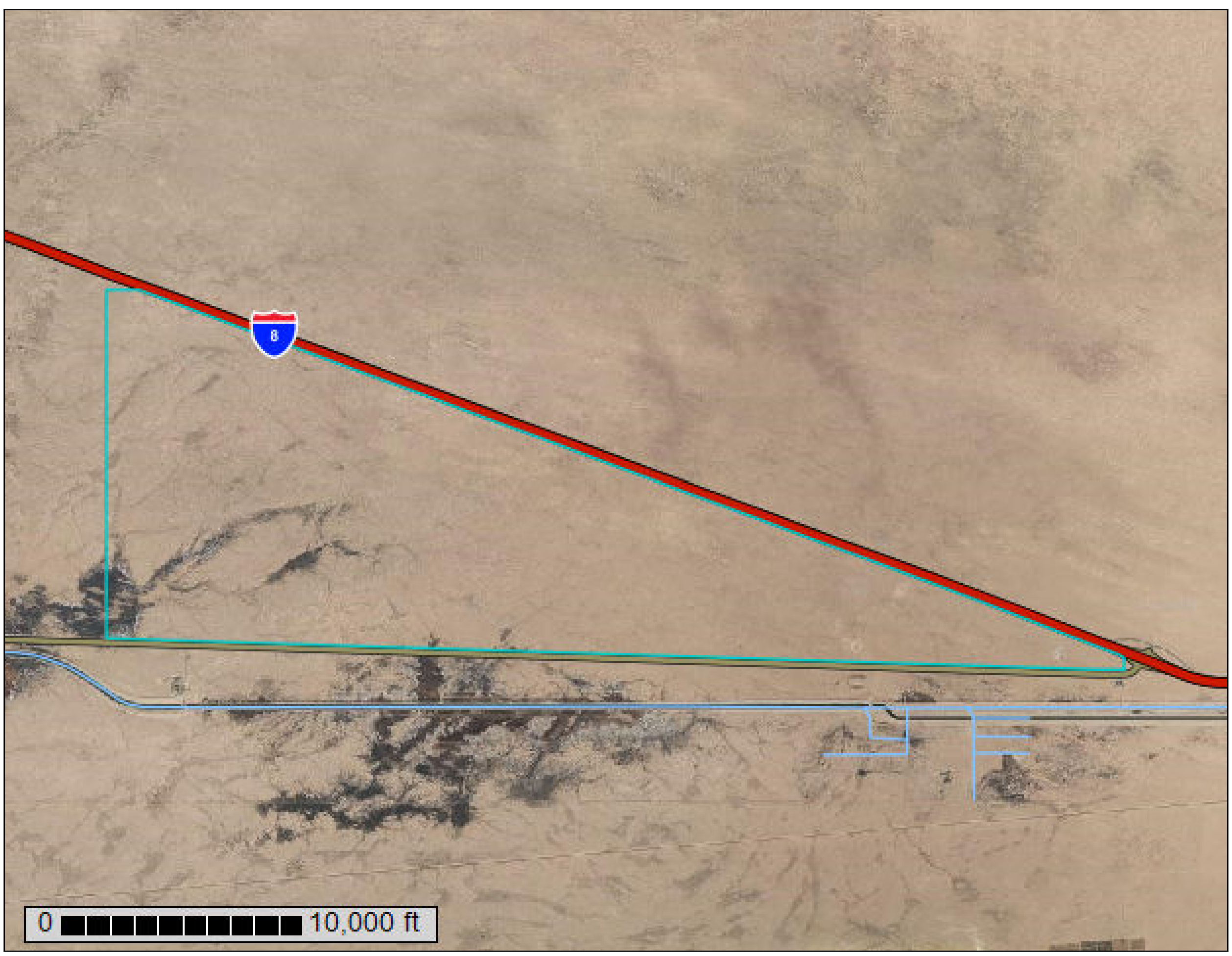
NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Imperial County, California, Imperial Valley Area

IP Perkins



January 19, 2024

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

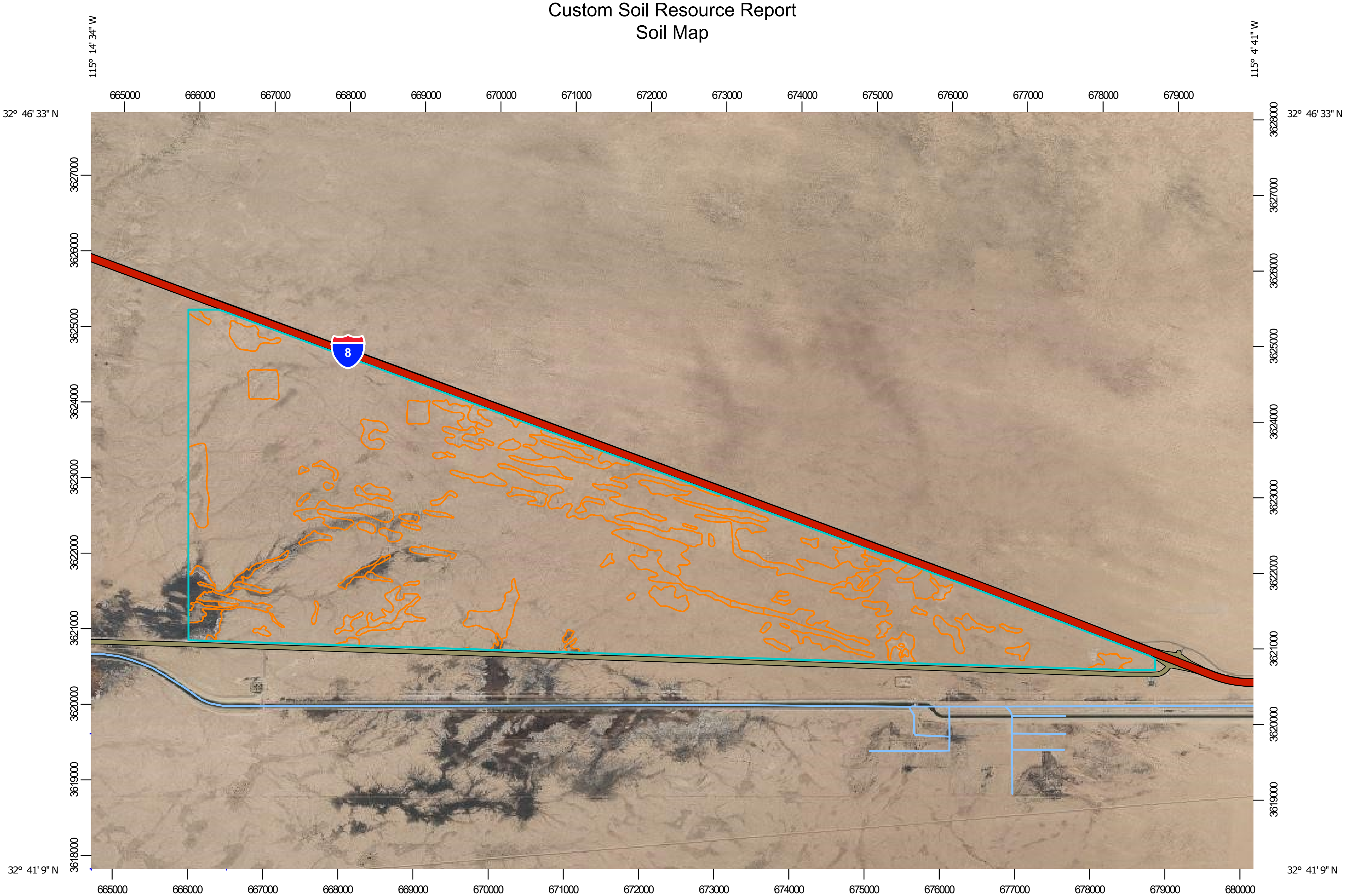
Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

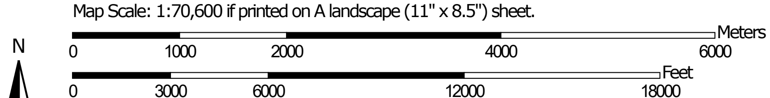
Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Soil Map



Map Scale: 1:70,600 if printed on A landscape (11" x 8.5") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

MAP LEGEND

Area of Interest (AOI)
Area of Interest (AOI)

Soils
Soil Map Unit Polygons
Soil Map Unit Lines
Soil Map Unit Points

Special Point Features
Blowout
Borrow Pit
Clay Spot
Closed Depression
Gravel Pit
Gravelly Spot
Landfill
Lava Flow
Marsh or swamp
Mine or Quarry
Miscellaneous Water
Perennial Water
Rock Outcrop
Saline Spot
Sandy Spot
Severely Eroded Spot
Sinkhole
Slide or Slip
Sodic Spot

Spoil Area
Stony Spot
Very Stony Spot
Wet Spot
Other
Special Line Features

Water Features
Streams and Canals

Transportation
Rails
Interstate Highways
US Routes
Major Roads
Local Roads

Background
Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Imperial County, California, Imperial Valley Area
Survey Area Data: Version 15, Aug 30, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 17, 2021—May 22, 2021

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
100	Antho loamy fine sand	0.4	0.0%
108	Holtville loam	11.4	0.2%
111	Holtville-Imperial silty clay loams	80.5	1.1%
127	Niland loamy fine sand	35.1	0.5%
129	Pits	2.4	0.0%
132	Rositas fine sand, 0 to 2 percent slopes	852.8	11.3%
133	Rositas fine sand, 2 to 9 percent slopes	110.1	1.5%
135	Rositas fine sand, wet, 0 to 2 percent slopes	105.5	1.4%
136	Rositas loamy fine sand, 0 to 2 percent slopes	5,967.3	79.3%
139	Superstition loamy fine sand	354.7	4.7%
Totals for Area of Interest		**7,522.5**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Imperial County, California, Imperial Valley Area

100—Antho loamy fine sand

Map Unit Setting

National map unit symbol: h8z6
Elevation: 30 to 350 feet
Mean annual precipitation: 0 to 3 inches
Mean annual air temperature: 72 to 75 degrees F
Frost-free period: 300 to 350 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Antho and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Antho

Setting

Landform: Basin floors
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from mixed sources

Typical profile

H1 - 0 to 13 inches: loamy fine sand
H2 - 13 to 60 inches: sandy loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 6.3 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Ecological site: R040XD007CA - Lacustrine Basin and Large RIver Floodplain
Hydric soil rating: No

Minor Components

Laveen

Percent of map unit: 5 percent
Hydric soil rating: No

Holtville

Percent of map unit: 5 percent
Hydric soil rating: No

108—Holtville loam

Map Unit Setting

National map unit symbol: h8zg
Elevation: 30 to 350 feet
Mean annual precipitation: 0 to 3 inches
Mean annual air temperature: 70 to 75 degrees F
Frost-free period: 300 to 350 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Holtville and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Holtville

Setting

Landform: Basin floors
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from mixed sources and/or lacustrine deposits derived from mixed sources

Typical profile

H1 - 0 to 14 inches: loam
H2 - 14 to 22 inches: clay
H3 - 22 to 60 inches: silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Very slightly saline to moderately saline (2.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum: 10.0
Available water supply, 0 to 60 inches: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: R040XD007CA - Lacustrine Basin and Large RIver Floodplain
Hydric soil rating: No

Minor Components

Imperial

Percent of map unit: 3 percent
Hydric soil rating: No

Superstition

Percent of map unit: 3 percent
Hydric soil rating: No

Antho, silty clay surface

Percent of map unit: 3 percent

Laveen

Percent of map unit: 3 percent
Hydric soil rating: No

Antho

Percent of map unit: 3 percent
Hydric soil rating: No

111—Holtville-Imperial silty clay loams

Map Unit Setting

National map unit symbol: h8zk
Elevation: -230 to 350 feet
Mean annual precipitation: 0 to 3 inches
Mean annual air temperature: 72 to 75 degrees F
Frost-free period: 300 to 350 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Holtville and similar soils: 50 percent
Imperial and similar soils: 40 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Holtville

Setting

Landform: Basin floors
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear

Parent material: Alluvium derived from mixed sources

Typical profile

H1 - 0 to 10 inches: silty clay loam
H2 - 10 to 22 inches: clay
H3 - 22 to 60 inches: silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Very slightly saline to moderately saline (2.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum: 10.0
Available water supply, 0 to 60 inches: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: R040XD007CA - Lacustrine Basin and Large RIver Floodplain
Hydric soil rating: No

Description of Imperial

Setting

Landform: Basin floors
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from mixed and/or lacustrine deposits

Typical profile

H1 - 0 to 12 inches: silty clay loam
H2 - 12 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum: 20.0
Available water supply, 0 to 60 inches: Moderate (about 8.6 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C
Ecological site: R040XD007CA - Lacustrine Basin and Large RIver Floodplain
Hydric soil rating: No

Minor Components

Niland

Percent of map unit: 5 percent
Hydric soil rating: No

Antho

Percent of map unit: 5 percent
Hydric soil rating: No

127—Niland loamy fine sand

Map Unit Setting

National map unit symbol: h902
Elevation: 30 to 310 feet
Mean annual precipitation: 0 to 3 inches
Mean annual air temperature: 70 to 75 degrees F
Frost-free period: 300 to 350 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Niland and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Niland

Setting

Landform: Basin floors
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from mixed

Typical profile

H1 - 0 to 23 inches: loamy fine sand
H2 - 23 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Very slightly saline to strongly saline (2.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 10.0
Available water supply, 0 to 60 inches: Moderate (about 6.5 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: C
Ecological site: R040XD007CA - Lacustrine Basin and Large RIver Floodplain
Hydric soil rating: No

Minor Components

Imperial

Percent of map unit: 4 percent
Hydric soil rating: No

Holtville

Percent of map unit: 4 percent
Hydric soil rating: No

Rositas

Percent of map unit: 4 percent
Hydric soil rating: No

Superstition

Percent of map unit: 3 percent
Hydric soil rating: No

129—Pits

Map Unit Setting

National map unit symbol: h904
Elevation: 30 to 300 feet
Mean annual precipitation: 0 to 3 inches
Mean annual air temperature: 72 to 75 degrees F
Frost-free period: 300 to 350 days
Farmland classification: Not prime farmland

Map Unit Composition

Pits: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pits

Setting

Landform: Basin floors
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

H1 - 0 to 60 inches: variable

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8e
Hydric soil rating: No

Minor Components

Unnamed

Percent of map unit: 10 percent
Landform: Sinkholes
Hydric soil rating: Yes

132—Rositas fine sand, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: h907
Elevation: -230 to 350 feet
Mean annual precipitation: 0 to 3 inches
Mean annual air temperature: 70 to 75 degrees F
Frost-free period: 300 to 350 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Rositas and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rositas

Setting

Landform: Basin floors
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from mixed and/or eolian deposits derived from mixed

Typical profile

H1 - 0 to 9 inches: fine sand
H2 - 9 to 60 inches: sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Very slightly saline to slightly saline (2.0 to 4.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Ecological site: R040XD025CA - Sandsheet [2-4" p.z.]
Hydric soil rating: No

Minor Components

Vint

Percent of map unit: 4 percent
Hydric soil rating: No

Niland

Percent of map unit: 4 percent
Hydric soil rating: No

Rositas

Percent of map unit: 4 percent
Hydric soil rating: No

Holtville

Percent of map unit: 1 percent
Hydric soil rating: No

Antho

Percent of map unit: 1 percent
Hydric soil rating: No

Superstition

Percent of map unit: 1 percent
Hydric soil rating: No

133—Rositas fine sand, 2 to 9 percent slopes

Map Unit Setting

National map unit symbol: h908
Elevation: -230 to 360 feet

Mean annual precipitation: 0 to 3 inches
Mean annual air temperature: 70 to 75 degrees F
Frost-free period: 300 to 350 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Rositas and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rositas

Setting

Landform: Sand sheets, alluvial fans
Landform position (three-dimensional): Tread, rise
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Eolian deposits derived from mixed

Typical profile

H1 - 0 to 9 inches: fine sand
H2 - 9 to 60 inches: sand

Properties and qualities

Slope: 2 to 9 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Very slightly saline to slightly saline (2.0 to 4.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Ecological site: R040XD025CA - Sandsheet [2-4" p.z.]
Hydric soil rating: No

Minor Components

Vint

Percent of map unit: 3 percent
Hydric soil rating: No

Antho

Percent of map unit: 3 percent
Hydric soil rating: No

Holtville

Percent of map unit: 3 percent
Hydric soil rating: No

Indio

Percent of map unit: 3 percent
Hydric soil rating: No

Superstition

Percent of map unit: 3 percent
Hydric soil rating: No

135—Rositas fine sand, wet, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: h90b
Elevation: -230 to 350 feet
Mean annual precipitation: 0 to 3 inches
Mean annual air temperature: 70 to 75 degrees F
Frost-free period: 300 to 350 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Rositas, wet, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rositas, Wet

Setting

Landform: Basin floors
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from mixed and/or eolian deposits derived from mixed

Typical profile

H1 - 0 to 9 inches: fine sand
H2 - 9 to 60 inches: sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Very slightly saline to slightly saline (2.0 to 4.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): 3w
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: A
Ecological site: R040XD025CA - Sandsheet [2-4" p.z.]
Hydric soil rating: No

Minor Components

Vint

Percent of map unit: 4 percent
Hydric soil rating: No

Superstition

Percent of map unit: 4 percent
Hydric soil rating: No

Carsitas

Percent of map unit: 4 percent
Hydric soil rating: No

Antho

Percent of map unit: 3 percent
Hydric soil rating: No

136—Rositas loamy fine sand, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: h90c
Elevation: 30 to 350 feet
Mean annual precipitation: 0 to 3 inches
Mean annual air temperature: 70 to 75 degrees F
Frost-free period: 300 to 350 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Rositas and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rositas

Setting

Landform: Basin floors
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from mixed sources and/or eolian deposits derived from mixed sources

Typical profile

H1 - 0 to 4 inches: loamy fine sand
H2 - 4 to 60 inches: sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Very slightly saline to slightly saline (2.0 to 4.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.7 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Ecological site: R040XD025CA - Sandsheet [2-4" p.z.]
Hydric soil rating: No

Minor Components

Antho

Percent of map unit: 5 percent
Hydric soil rating: No

Superstition

Percent of map unit: 5 percent
Hydric soil rating: No

Holtville

Percent of map unit: 3 percent
Hydric soil rating: No

Rositas

Percent of map unit: 2 percent

139—Superstition loamy fine sand

Map Unit Setting

National map unit symbol: h90g
Elevation: 30 to 350 feet
Mean annual precipitation: 0 to 3 inches
Mean annual air temperature: 72 to 75 degrees F
Frost-free period: 300 to 350 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Superstition and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Superstition

Setting

Landform: Alluvial fans
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from mixed

Typical profile

H1 - 0 to 6 inches: loamy fine sand
H2 - 6 to 60 inches: loamy fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.8 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Ecological site: R040XD025CA - Sandsheet [2-4" p.z.]
Hydric soil rating: No

Minor Components

Rositas

Percent of map unit: 4 percent
Hydric soil rating: No

Antho

Percent of map unit: 4 percent
Hydric soil rating: No

Holtville

Percent of map unit: 3 percent
Hydric soil rating: No

Laveen

Percent of map unit: 3 percent
Hydric soil rating: No

Superstition

Percent of map unit: 1 percent

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Appendix H Air Quality Technical Report

AIR QUALITY TECHNICAL REPORT

9 FEBRUARY 2024

PERKINS RENEWABLE ENERGY PROJECT
Imperial County, California

For:

Panorama Environmental, Inc.
San Francisco, California

21215-07

BASELINE
ENVIRONMENTAL CONSULTING

AIR QUALITY TECHNICAL REPORT

9 FEBRUARY 2024

PERKINS RENEWABLE
ENERGY PROJECT
Imperial County, California

For:
Panorama Environmental, Inc.
San Francisco, California

By:

BASELINE
ENVIRONMENTAL CONSULTING

Prepared By: ______________________ **Date:** __________

Patrick Sutton

Principal Environmental Engineer

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AIR QUALITY TECHNICAL REPORT

PERKINS RENEWABLE ENERGY PROJECT
Imperial County, California

1. INTRODUCTION

Baseline Environmental Consulting has prepared this Air Quality Technical Report for the Perkins Renewable Energy Project (Project) in Imperial County, California. The purpose of this technical report is to support environmental review of the Project under the California Environmental Quality Act (CEQA), as well as the California Energy Commission's (CEC) application for certification (AFC) program for licensing power plants (20 CCR, Div. 2, Ch. 5 App. B). This report describes the methodology and results for evaluating potential air quality and greenhouse gas (GHG) impacts from implementation of the proposed Project.

1.1 Project Description

IP Perkins, LLC (Applicant) and IP Perkins BAAH, LLC, subsidiaries of Intersect Power, LLC, propose to construct, operate, maintain, and decommission a 1,150 megawatt (MW) solar photovoltaic (PV) facility and battery energy storage system (BESS) on public lands administered by the U.S. Bureau of Land Management (BLM) and Bureau of Reclamation, as well as private lands located southeast of El Centro in Imperial County, California (**Figure 1**).

A fenced area referred to as the "Project site" would contain the solar plant, BESS, Project interconnection generation tie (gen-tie) line, Project substation, and operations and maintenance (O&M) yard and facility. The Project site would be constructed, owned, and operated by IP Perkins, LLC. The Project would also include a high-voltage breaker-and-a-half switchyard (BAAH switchyard) and two 500 kilovolt (kV) loop-in transmission lines, each within a 200-foot-wide loop-in transmission corridor, that would be required to interconnect to the existing San Diego Gas and Electric (SDG&E) Southwest Power Link (SWPL) 500 kV transmission line that traverses east–west to the south of the Project site. The BAAH switchyard would be constructed by IP Perkins BAAH, LLC and owned and operated by SDG&E, in coordination with Imperial Irrigation District (IID). San Diego Gas and Electric (SDG&E) would construct the two 500 KV loop-in transmission lines, which SDG&E would own, in coordination with IID, upon completion of construction. Together the Project site, the BAAH switchyard, and the 500 kV loop-in transmission corridors are referred to as the "Project Application Area" in the AFC (**Figure 2**).

The Project Application Area is in Imperial County, approximately 37 miles southeast of the Salton Sea. Imperial County is located in southern California, in the southwestern portion of the Colorado Desert. The Project Application Area is located approximately 1.2 miles north of the U.S.–Mexico border, in a region characterized by undeveloped desert and agricultural uses. The Imperial Valley, which is dominated by agricultural land, is located an estimated 2.5 miles west

Figure 1. Regional Setting

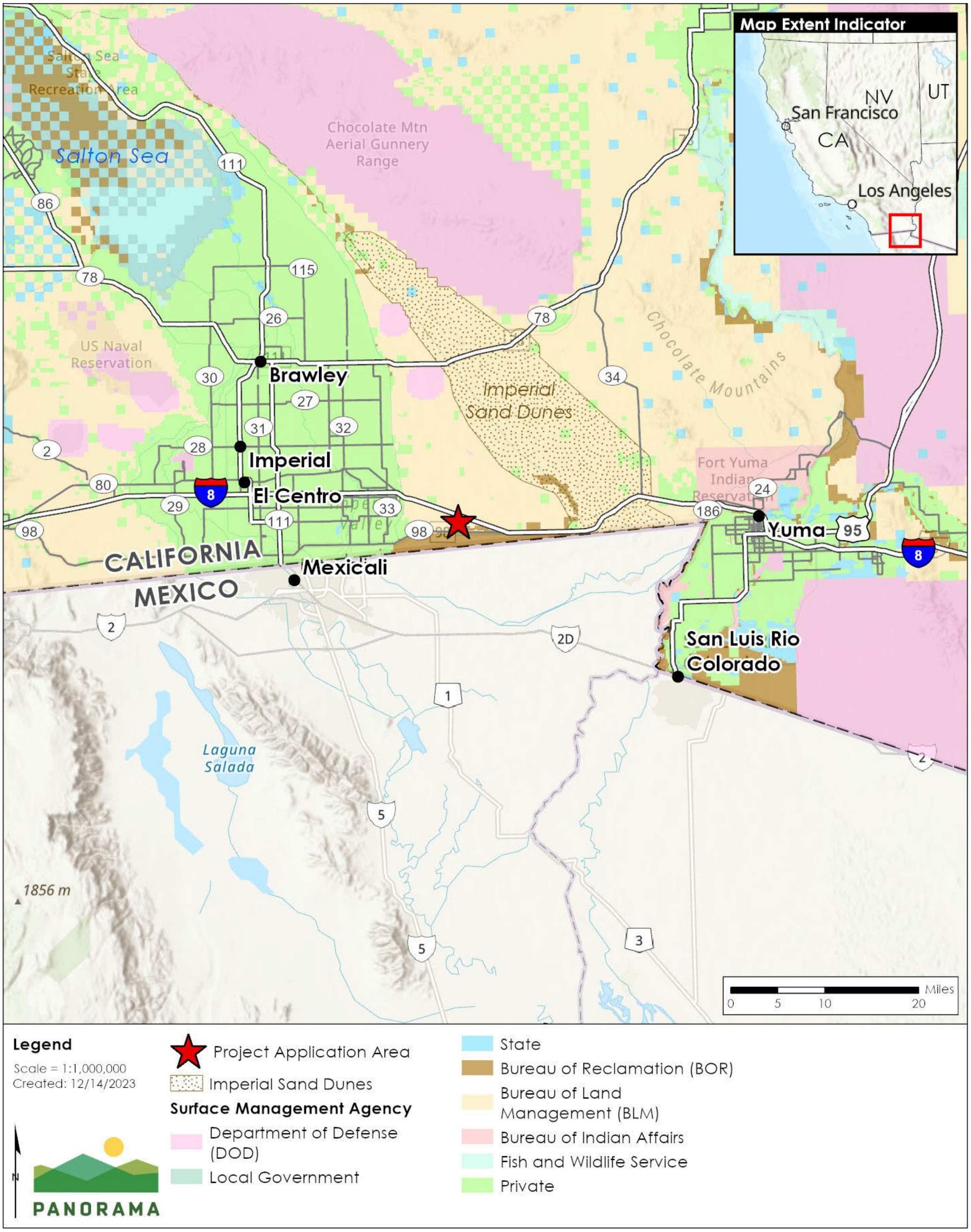
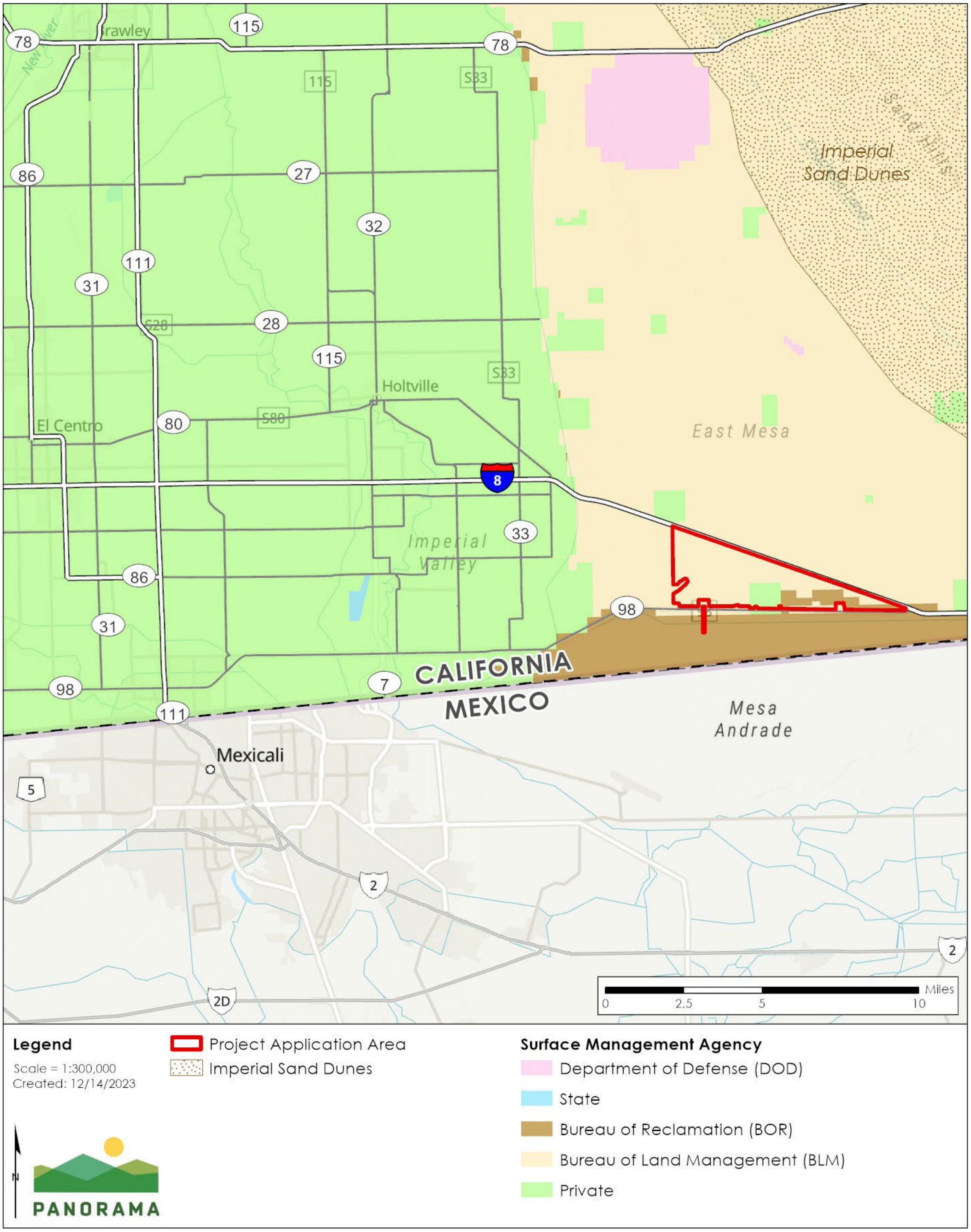


Figure 2. Project Vicinity



of the Project Application Area. The Imperial Sand Dunes, the largest mass of sand dunes in California, is located approximately 9 miles east of the Project Application Area.

1.1.1 Solar Facility Description

The Project site layout, including the solar PV facility, BESS, substation, and transmission facilities are shown in **Figure 3**. The solar facility includes the following components:

- Solar PV arrays
- Inverter-transformer stations and electrical collector lines
- BESS
- Operation and maintenance facilities
- Monitoring and telecommunication facilities
- Access roads
- Security fencing and lighting
- Septic system
- Emergency and auxiliary facilities

The Project also includes the Project substation, BAAH switchyard, and two 500 kV loop-in lines. **Table 1** lists the approximate acreages associated with each Project component for the Project site.

Table 1. Estimated Development Area for the Solar Site Permanent Components

Project Component	Approximate Acreage
Fenced solar PV facility with arrays, inverters, transformers, and internal access roads	5,985
BESS	35
Operation and maintenance yard and facility	10
Temporary parking and laydown areas	≤ 25

1.1.2 Solar Facility Construction

The majority of the Project site would be mowed rather than cleared of vegetation. Mass grading of the Project site would not be needed for site preparation due to the relatively flat terrain. Spot grading would be employed for select solar array and storage facility components, including the BESS, substation, and BAAH foundations. Best management practices (BMPs), Project Design Features, and Desert Renewable Energy Conservation Plan (DRECP) Conservation and Management Actions (CMAs) would be implemented during all grading, vegetation removal, and construction activities.

The BESS, operation and maintenance facility, and roads would require vegetation clearing, grading, and compaction. Inverter-transformer station locations would require light grubbing. Due to undulations within the Project site, some areas of grading would be needed within the solar arrays. Where solar site grading is necessary for discrete facilities or within the solar arrays, cut and fill would be balanced to the extent feasible. Some import and export of material would be necessary (**Table 2**). Where excavation is required, most construction activities would be limited to less than 6 feet in depth within the Project Site; however, some excavations, such as those undertaken for the installation of loop-in transmission line structures, may reach depths of 45 feet or more.

Within the solar arrays that do not require grading, mowing and grubbing would be conducted to allow for construction access and installation. Mowing and grubbing involves surface removal of vegetation, including mechanical mowing and removal of larger vegetation by hand cutting/trimming to the ground surface. The intent is to leave root balls and seeds in place to allow for regrowth of native vegetation after construction. During mowing, collection of mowed vegetation would be considered for future mulching to minimize dust and soil erosion on portions of the site and enhance restoration. A qualified restoration biologist would determine where the collected mulching material should be applied.

Non-native vegetation would be removed to the extent feasible during the construction phase via manual and mechanical methods and herbicide application. Any non-native species found in the Project Application Area that has not been evaluated for its potential to invade or alter surrounding natural lands would be considered a “weed” for purposes of the Restoration and Integrated Weed Management Plan implementation. Cutting, damaging, or uprooting microphyll woodland tree species would be avoided by Project design and BMPs, in accordance with the CMAs.

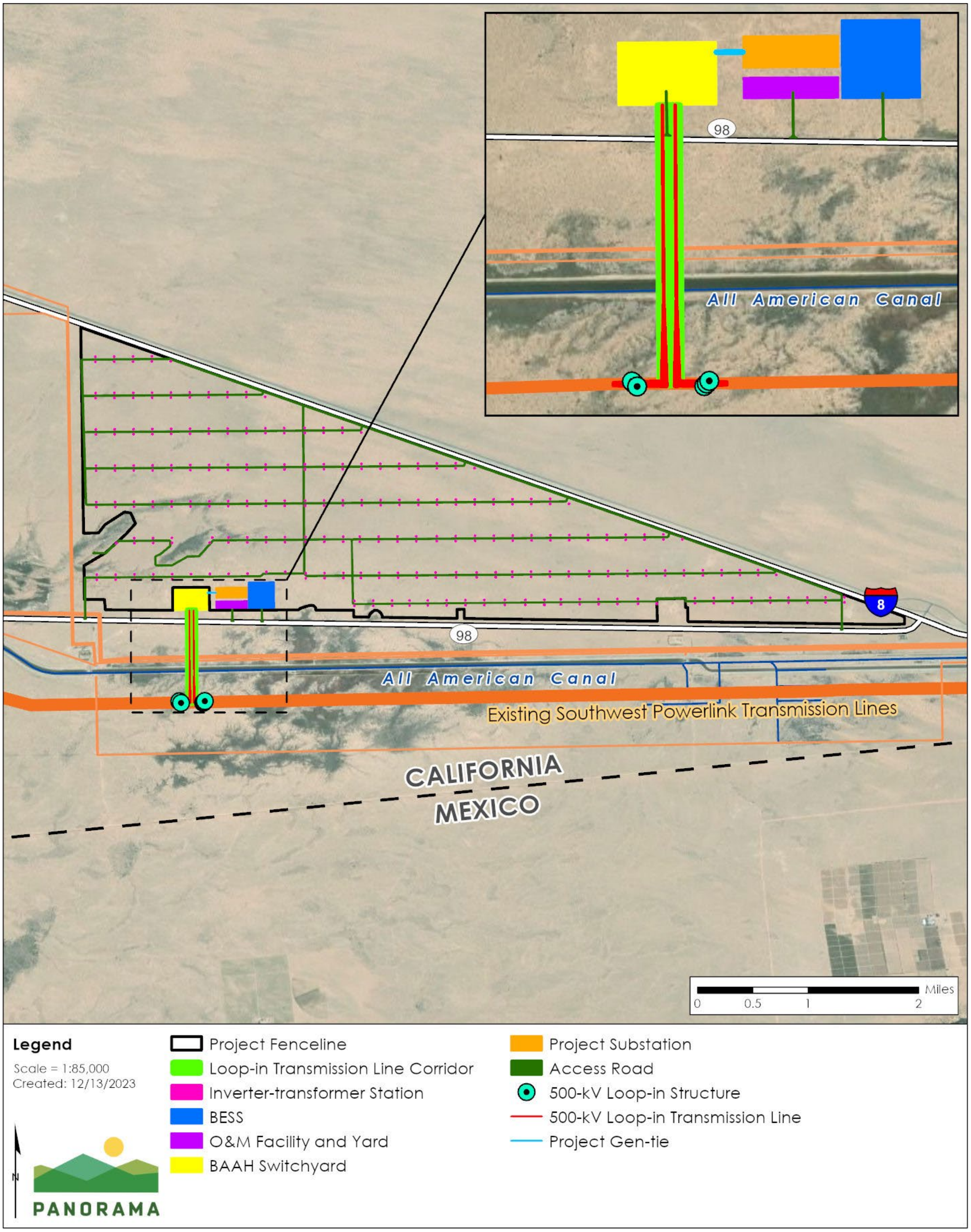
Table 2. Solar Facility Disturbance Details

Project Component	Cut/Fill Quantity	Type of Disturbance
Fenced solar facility with arrays and access roads	Balanced	Solar array areas to be mowed and grubbed to provide for construction access and installation
Inverter-transformer stations and electrical collection system	Balanced	Graded and backfilled to an elevation above surrounding grade to avoid flooding for inverter-transformer stations
BESS	54,466 cubic yards of import [a] material; excess soils from storm water basin excavations to also be used	Graded and backfilled to an elevation above surrounding grade to avoid flooding
Operation and maintenance yard and facility	Balanced	Operation and maintenance site to be graded and compacted
Temporary parking and laydown	Balanced	Temporary parking and laydown areas to be graded and compacted

Note:

[a] Estimated base for the areas requiring import of material is assumed to require a 12-inch depth.

Figure 3. Project Layout



Note: The project layout is approximate and may be subject to change.

1.1.3 Transmission System Description

The transmission system would include the following components:

- Substation(s)
- Project gen-tie lines
- BAAH switchyard
- 500 kV loop-in transmission lines

Table 3 lists the acreages associated with each Project component for the transmission system and lines.

Table 3. Estimated Development Area for the Transmission System Permanent Components

Proposed Component	Approximate acreage
Project substation	20
Project gen-tie lines	1
BAAH switchyard	40
500 kV loop-in transmission lines	≤ 35

1.1.4 Transmission Facility Construction

The transmission system components would require grading and excavation for installation and construction. Import of soil would be needed for several of the components, as detailed in **Table 4**.

Table 4. Transmission System Disturbance Details

Project Component	Cut/Fill Quantity	Type of Disturbance
Project substation [b]	32,266 cubic yards of import [a] material; excess soils from storm water basin excavations to also be used	Graded and backfilled to an elevation above surrounding grade to avoid flooding
BAAH switchyard	88,732 cubic yards of import [a] material on BLM land; excess soils from storm water basin excavations to also be used;	Graded and backfilled to an elevation above surrounding grade to avoid flooding
500 kV loop-in transmission lines	Balanced	Excavation for structure installation; grading for access roads

Note:

[a] Estimated base for the areas requiring import of material is assumed to require a 12-inch depth.

[b] Additional import may be needed if a second substation is constructed.

2. ENVIRONMENTAL SETTING

2.1 Regional Climate, Meteorology, and Topography

The Project site is located in the southern part of the Salton Sea Area Air Basin (SSAB). Air basins have natural characteristics that limit the ability of natural processes to either dilute or transport air pollutants. The major determinants of air pollution transport and dilution are climatic and topographic factors such as wind, atmospheric stability, terrain that influences air movement, and sunshine. Wind and terrain can combine to transport pollutants away from upwind areas, while exposure to sunshine can chemically transform pollutants in the air to create secondary photochemical pollutants such as ozone.

The SSAB is comprised of Imperial County and a portion of Riverside County. As an arid desert region, the SSAB climate is largely governed by the large-scale sinking and warming of air within the semi-permanent subtropical high-pressure center over the Pacific Ocean. When the fringes of mid-latitude storms pass through the Imperial Valley in winter, the coastal mountains create a strong “rain shadow” effect that makes Imperial Valley the second driest location in the U.S.

Imperial County experiences average temperatures as high as about 106 degrees (°) Fahrenheit in the summer and as low as of 40° Fahrenheit in the winter. The annual precipitation in this region is 2.9 inches, which mostly occurs during the months of December to March (U.S. Climate Data, 2024). Due to temperature inversions and light nighttime winds, local air pollution emissions can become trapped near the ground. The area is subject to frequent hazy conditions at sunrise, followed by rapid daytime dissipation as winds pick up and the temperature warms. During periods of strong solar heating and intense convection, turbulent motion creates good mixing and low levels of air pollution. Imperial County experiences surface inversions almost every day of the year. These inversions often last for long periods of time, which allows for air stagnation and buildup of pollutants, including ozone.

Winds in the area are driven by a complex pattern of local, regional, and global forces, but primarily reflect the temperature difference between the cool ocean to the west and the heated interior of the entire desert southwest. For much of the year, winds flow predominantly from the west to the east. In summer, intense solar heating in the Imperial Valley creates a more localized wind pattern, as air comes up from the southeast via the Gulf of California.

2.2 Air Pollutants of Concern

The California Air Resources Board (CARB) and United States (U.S.) Environmental Protection Agency (EPA) focus on the following air pollutants as regional indicators of ambient air quality:

- Ozone (O_3)
- Coarse particulate matter (PM_{10})
- Fine particulate matter ($PM_{2.5}$)
- Nitrogen dioxide (NO_2)
- Carbon monoxide (CO)

- Sulfur dioxide (SO_2)
- Lead

Because these are the most prevalent air pollutants known to be harmful to human health based on extensive criteria documents, they are referred to as "criteria air pollutants." In Imperial County, the primary criteria air pollutants of concern are ground-level ozone, which is formed through reactions of oxides of nitrogen (NOx) and reactive organic gases (ROG), PM_{10}, and $PM_{2.5}$. These regional air pollutants can be formed and/or transported over long distances and affect ambient air quality far from the emissions source. Imperial County is predominately agricultural land, which is a major factor in the regional ambient air quality levels. Agricultural production generates fugitive PM_{10} emissions (i.e., dust) from the use of agricultural equipment on unpaved roads, land preparation, and harvest practices. As a result, Imperial County experiences unhealthful air quality from the formation of ground-level ozone, including photochemical smog, and fugitive PM_{10} because of the agricultural activities and very arid climate. The magnitude and location of specific health effects from exposure to increased ozone and PM_{10} concentrations are the result of emissions generated throughout Imperial County, as opposed to a single project.

The Imperial County Air Pollution Control District (ICAPCD) and other air districts use regional air dispersion models to correlate the cumulative emissions of regional pollutants to potential community health effects. However, these dispersion models have limited sensitivity to the relatively small (or negligible) changes in criteria air pollutant concentrations associated with an individual project. Therefore, it is not feasible to provide reliable estimates of specific health risks associated with regional air pollutant emissions from an individual project.

The ICAPCD operates a network of air monitoring stations throughout Imperial County to monitor ambient levels of criteria pollutants such as ozone, PM_{10}, and $PM_{2.5}$. **Table 5** presents a five-year summary for the period from 2018 to 2022 of the highest annual concentrations of ozone, PM_{10}, and $PM_{2.5}$ measured at the two nearest monitoring stations:

- Calexico-Ethel Street located about 16 miles southwest of the Project site; and
- El Centro-9th Street located about 20 miles northwest of the Project site.

Table 5 also compares measured pollutant concentrations with applicable State and federal ambient air quality standards, which are discussed further under *Regulatory Framework*, below.

Localized air pollutants generally dissipate with distance from the emission source and can pose a health risk to nearby populations. Toxic air contaminants (TACs), such as diesel particulate matter (DPM), are considered localized pollutants. CO is also considered a localized air pollutant. Air dispersion models can be used to reliably quantify the health risks to nearby receptors associated with emissions of localized air pollutants from an individual project. The primary air pollutants of concern in Imperial County and their associated health risks are discussed further below.

Table 5. Regional Air Quality Trends

Pollutant	Standard	2018	2019	2020	2021	2022
Calexico-Ethel Street Station						
Ozone	Max 1-hour Concentration (ppm)	0.103	0.106	0.107	0.122	0.097
	Days > CAAQS (0.09 ppm)	2	4	6	4	1
	Max 8-hour Concentration (ppm)	0.084	0.089	0.087	0.090	0.083
	Days > CAAQS (0.070 ppm)	10	18	19	14	7
	Days > NAAQS (0.070 ppm)	9	17	16	13	6
Coarse Particulate Matter (PM_{10})	Max 24-hour Concentration (μg/m^3)	419.0	146.1	194.5	301.1	184.8
	Days > CAAQS (50 μg/m^3)	*	112.0	166.3	150.7	163.9
	Days > NAAQS (150 μg/m^3)	9.3	0.0	4.0	3.0	2.0
	Annual Arithmetic Mean (μg/m^3)	61.6	44.5	54.4	52.5	54.0
Fine Particulate Matter ($PM_{2.5}$)	Max 24-hour Concentration (μg/m^3)	90.6	53.1	46.1	60.8	41.9
	Days > NAAQS (35 μg/m^3)	*	1.1	5.4	2.1	5.1
	Annual Arithmetic Mean (μg/m^3)	*	10.7	12.0	10.3	11.0
El Centro – 9th Street Station						
Ozone	Max 1-hour Concentration (ppm)	0.102	0.080	0.097	0.096	0.113
	Days > CAAQS (0.09 ppm)	2	0	1	1	2
	Max 8-hour Concentration (ppm)	0.090	0.071	0.077	0.084	0.079
	Days > CAAQS (0.070 ppm)	15	1	2	7	10
	Days > NAAQS (0.070 ppm)	14	1	2	6	10
Coarse Particulate Matter (PM_{10})	Max 24-hour Concentration (μg/m^3)	256.3	130.0	197.7	194.5	554.6
	Days > CAAQS (50 μg/m^3)	113	53.7	92.0	88.6	99.3
	Days > NAAQS (150 μg/m^3)	5.1	0.0	2.0	1.0	2.1
	Annual Arithmetic Mean (μg/m^3)	47.3	35.6	41.5	41.8	45.5
Fine Particulate Matter ($PM_{2.5}$)	Max 24-hour Concentration (μg/m^3)	22.4	21.4	28.5	19.1	30.3
	Days > NAAQS (35 μg/m^3)	0.0	0.0	0.0	0.0	0.0
	Annual Arithmetic Mean (μg/m^3)	8.7	7.9	9.8	8.4	8.9

Notes: CAAQS = California ambient air quality standards; μg/m^3 = micrograms per cubic meter; NAAQS = National ambient air quality standards; ppm = parts per million; * = insufficient data available to determine the value. State statistics are based on California-approved samplers, whereas national statistics are based on samplers using federal reference or equivalent methods. State and national statistics may therefore be based on different samplers. When the measured state and national concentrations varied due to different sample methods, the highest concentration was reported in the summary table.
Source: California Air Resources Board (CARB) 2024.

2.2.1 Ozone

While ozone serves a beneficial purpose in the upper atmosphere (stratosphere) by reducing ultraviolet radiation, it can be harmful to the human respiratory system and to sensitive species of plants when it reaches elevated concentrations in the lower atmosphere. Ozone is not emitted directly into the environment but is formed in the atmosphere by chemical reactions between ROG and NOx in the presence of sunlight. Ozone formation is greatest during periods of little or no wind, bright sunshine, and high temperatures. As a result, levels of ozone usually build up during the day and peak in the afternoon.

Sources of ROG and NOx are vehicle tailpipe emissions; evaporation of solvents, paints, and fuels; and biogenic emissions. Short-term ozone exposure can reduce lung function in children, facilitate respiratory infections, and produce symptoms of respiratory distress. Long-term exposure can impair lung defense mechanisms and lead to emphysema and chronic bronchitis. Ozone can also damage plants and trees and materials such as rubber and fabrics.

2.2.2 Particulate Matter

PM_{10} and $PM_{2.5}$ consist of extremely small, suspended particles or droplets that are 10 microns and 2.5 microns or smaller in diameter, respectively. Some sources of particulate, such as pollen, forest fires, and windblown dust matter, are naturally occurring. In populated areas, however, most particulate matter is caused by road dust, combustion by-products, abrasion of tires and brakes, and construction activities. Particulate matter can also be formed in the atmosphere by condensation of SO_2 and ROG.

Exposure to particulate matter can affect breathing, aggravate existing respiratory and cardiovascular disease, alter the body's defense systems against foreign materials, and damage lung tissue, contributing to cancer and premature death. Individuals with chronic obstructive pulmonary or cardiovascular disease, asthmatics, the elderly, and children are most sensitive to the effects of particulate matter.

2.2.3 Carbon Monoxide (CO)

CO is an odorless and colorless gas formed by the incomplete combustion of fuels. When inhaled at high concentrations, CO combines with hemoglobin in the blood and reduces the oxygen-carrying capacity of the blood. This results in reduced oxygen reaching the brain, heart, and other body tissues. This condition is especially critical for people with cardiovascular diseases, chronic lung disease or anemia, as well as fetuses. Even healthy people exposed to high CO concentrations can experience headaches, dizziness, fatigue, unconsciousness, and even death.

2.2.4 Toxic Air Contaminants (TACs)

TACs include a diverse group of air pollutants that can adversely affect human health. Unlike criteria air pollutants, which generally affect regional air quality, TAC emissions are evaluated based on estimations of localized concentrations and risk assessments. The adverse health effects a person may experience following exposure to any chemical depend on several factors, including the amount (dose), duration, chemical form, and any simultaneous exposure to other chemicals.

For risk assessment purposes, TACs are separated into carcinogens and non-carcinogens. Carcinogens are assumed to have no safe threshold below which health impacts would not occur, and cancer risk is expressed as excess cancer cases per 1 million exposed individuals over a lifetime of exposure. Non-carcinogenic substances are generally assumed to have a safe threshold below which health impacts would not occur. Acute and chronic exposure to non-carcinogens is expressed as a hazard index, which is the sum of expected exposure levels divided by the corresponding acceptable exposure levels.

Emissions of DPM generated from the exhaust of diesel-powered engines are a complex mixture of soot, ash particulates, metallic abrasion particles, volatile organic compounds, and other components that can penetrate deeply into the lungs and contribute to a range of health problems. In 1998, CARB identified DPM from diesel-powered engines as a TAC based on its potential to cause cancer and other adverse health effects (CARB, 1998). While diesel exhaust is a complex mixture that includes hundreds of individual constituents, DPM is used as a surrogate measure of exposure, under California regulatory guidelines, for the mixture of chemicals that make up diesel exhaust as a whole. More than 90 percent of DPM is less than 1 micron in diameter and is thus a subset of PM_{10} (CARB, 2016). The estimated cancer risk from exposure to diesel exhaust is much higher than the risk associated with any other TAC routinely measured in the region.

2.3 Sensitive Receptors

Sensitive receptors are areas where individuals are more susceptible to the adverse effects of poor air quality. Sensitive receptors include, but are not limited to, hospitals, schools, daycare facilities, elderly housing, and convalescent facilities. Residential areas are also considered sensitive receptors because people are often at home for extended periods, thereby increasing the duration of exposure to potential air contaminants. The Project site is located in a relatively remote region of Imperial County. There are no sensitive receptors within approximately three miles of the Project Application Area.

2.4 Climate Change and GHG Emissions

Climate change refers to change in the Earth’s weather patterns, including the rise in average global temperature due to an increase in heat-trapping GHGs in the atmosphere. Existing GHGs allow about two-thirds of the visible and ultraviolet light from the sun to pass through the atmosphere and be absorbed by the Earth’s surface. To balance the absorbed incoming energy, the surface radiates thermal energy back to space at longer wavelengths primarily in the infrared part of the spectrum. Much of the thermal radiation emitted from the surface is absorbed by the GHGs in the atmosphere and is re-radiated in all directions. Since part of the re-radiation is back toward the surface and the lower atmosphere, the global surface temperatures are elevated above what they would be in the absence of GHGs. This process of trapping heat in the lower atmosphere is known as the greenhouse effect.

An increase of GHGs in the atmosphere affects the energy balance of the Earth and results in a global warming trend. Increases in global average temperatures have been observed since the mid-20th century and have been linked to observed increases in GHG emissions from anthropogenic sources. The primary GHG emissions of concern are carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). Other GHGs of concern include hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6), but their contribution to climate change is less than 1 percent of the total GHGs that are well-mixed (i.e., that have atmospheric lifetimes long enough to be homogeneously mixed in the troposphere) (IPCC, 2013). Each GHG has a different global warming potential. For instance, CH_4 traps about 28 times more heat per molecule than CO_2 (IPCC, 2014). As a result, emissions of GHGs are reported in metric tons of carbon dioxide equivalents (CO_2e), wherein each GHG is weighted by its global warming potential relative to CO_2.

Ice-core records of historical atmospheric CO_2 concentrations, which currently extend back about 800,000 years, indicate that CO_2 concentrations naturally fluctuate between glacial and interglacial periods. According to the Intergovernmental Panel on Climate Change (IPCC), over the past few hundred years the atmospheric concentrations of CO_2 have increased to unprecedented levels compared to previous fluctuations in CO_2 concentrations observed over the past 800,000 years due to anthropogenic sources. In 2011, concentrations of CO_2, CH_4, and N_2O exceeded the pre-industrial era (before 1750) by about 40, 150, and 20 percent, respectively (BAAQMD, 2015). Based on measurements of the Earth's global average surface temperature, eight of the top 10 warmest years on record since 1880 have occurred in the last decade (NASA, 2022).

The global increases in CO_2 concentration are due primarily to fossil fuel combustion and land use change (e.g., deforestation). The dominant anthropogenic sources of CH_4 are from ruminant livestock, fossil fuel extraction and use, rice paddy agriculture, and landfills, while the dominant anthropogenic sources of N_2O are from ammonia for fertilizer and industrial activity. Emissions of HFCs, PFCs, and SF_6 are not naturally occurring; they originate from industrial processes such as semiconductor manufacturing, their use as refrigerants and other products, and electric power transmission and distribution (BAAQMD, 2015).

2.5 Effects of GHG Emissions

Some of the potential effects of increased GHG emissions and associated climate change may include loss of snowpack (affecting water supply), more frequent extreme weather events, more large forest fires, more drought years, and sea level rise. In addition, climate change may increase electricity demand for cooling, decrease the availability of hydroelectric power, and affect regional air quality and public health (BAAQMD, 2017a).

In October 2018, the IPCC published a special report on potential long-term climate change impacts based on the projected increases in temperature due to global climate change. The IPCC report found that the Earth is already seeing the consequences of global warming due to a 1° Celsius increase in pre-industrial levels, such as extreme weather, rising sea levels, and diminishing Arctic sea ice. Global warming is likely to reach 1.5° Celsius above pre-industrial levels between 2030 and 2050 if it continues to increase at the current rate. Some of the impacts due to ongoing global warming could be avoided by limiting future global warming to 1.5° Celsius compared to 2° Celsius. For example, by limiting global warming to 1.5° Celsius or lower, the likelihood of an Arctic Ocean free of sea ice in summer would be ten times lower compared to the likelihood under the scenario of a 2° Celsius increase. Beyond the 1.5° Celsius threshold, there would be significant increases in the risk associated with long-lasting or irreversible changes, such as the loss of ecosystems. The IPCC states that to limit the global warming to 1.5° Celsius, rapid transitions are needed in land, energy, industry, building, transport, and urban sectors to reach the goal of carbon neutrality by 2050, which means that the Earth's anthropogenic GHG emissions each year would be removed completely through carbon offsetting, sequestration, or other means (IPCC, 2018).

3. REGULATORY FRAMEWORK

3.1 Federal and State Regulations

3.1.1 Federal and State Air Quality Regulations

The U.S. EPA is responsible for implementing the programs established under the Federal Clean Air Act, such as establishing and reviewing the National Ambient Air Quality Standards (NAAQS) and judging the adequacy of State Implementation Plans to attain the NAAQS. A State Implementation Plan must integrate federal, state, and local plan components and regulations to identify specific measures to reduce pollution in nonattainment areas, using a combination of performance standards and market-based programs. If a state fails to enforce its implementation of approved regulations, or if the U.S. EPA determines that a State Implementation Plan is inadequate, the U.S. EPA is required to prepare and enforce a Federal Implementation Plan to promulgate comprehensive control measures for a given State Implementation Plan.

CARB is responsible for establishing and reviewing the California Ambient Air Quality Standards (CAAQS), developing and managing the California State Implementation Plans, identifying TACs, and overseeing the activities of regional air quality management districts. In California, mobile emissions sources (e.g., construction equipment, trucks, and automobiles) are regulated by CARB and stationary emissions sources (e.g., industrial facilities) are regulated by the regional air quality management districts.

The CAAQS and NAAQS, which were developed for criteria air pollutants, are intended to incorporate an adequate margin of safety to protect the public health and welfare. California also has ambient air quality standards for sulfates, visibility-reducing particles, hydrogen sulfide, and vinyl chloride. To achieve CAAQS, criteria air pollutant emissions are managed through control measures described in regional air quality plans as well as emission limitations placed on permitted stationary sources. The CAAQS and NAAQS are summarized in **Table 6**.

Table 6. Ambient Air Quality Standards

Pollutant	Averaging Time	CAAQS Concentration	NAAQS Concentration
Ozone	1-Hour	0.09 ppm	Revoked in 2005
	8-Hour	0.070 ppm	0.070 ppm
Coarse Particulate Matter (PM_{10})	24-Hour	50 µg/m^3	150 µg/m^3
	Annual	20 µg/m^3	---
Fine Particulate Matter ($PM_{2.5}$)	24-Hour	---	35 µg/m^3
	Annual	12 µg/m^3	12 µg/m^3
Nitrogen Dioxide (NO_2)	1-Hour	0.18 ppm	0.100 ppm
	Annual	0.030 ppm	0.053 ppm
Carbon Monoxide (CO)	1-Hour	20 ppm	35 ppm
	8-Hour	9.0 ppm	9 ppm
Sulfer Dioxide (SO_2)	1-Hour	0.25 ppm	0.075 ppm
	24-Hour	0.04 ppm	0.14 ppm
	Annual	---	0.030 ppm
Lead	30-Day	1.5 µg/m^3	---
	Calendar Quarter	---	1.5 µg/m^3
	Rolling 3-Month	---	0.15 µg/m^3
Sulfates	24-Hour	25 µg/m3	---
Hydrogen Sulfide	1-Hour	0.03 ppm	---
Vinyl Chloride	24-Hour	0.010 ppm	---
Visibility Reducing Particles	8-Hour	---	---

Notes: ppm = parts per million; µg/m^3 = micrograms per cubic meter.
Source: BAAQMD, 2017b.

In accordance with the Federal Clean Air Act and California Clean Air Act, areas in California are classified as either in attainment, maintenance (i.e., former nonattainment), or nonattainment of the NAAQS and CAAQS for each criteria air pollutant. As shown in **Table 7**, Imperial County (specifically the portion where the Project site is located) is designated as a nonattainment area for ozone and PM_{10} under the State standards, a marginal nonattainment area for ozone under the federal standards, and an attainment or unclassified area for all other ambient air quality standards.

Table 7. Attainment Status for Imperial County

Pollutant	State Designation	Federal Designation
Ozone	Nonattainment	Moderate-Nonattainment[1]
Coarse Particulate Matter (PM_{10})	Nonattainment	Maintenance / Attainment[2]
Fine Particulate Matter ($PM_{2.5}$)	Attainment[3]	Attainment[4]
Nitrogen Dioxide (NO_2)	Attainment	Unclassified / Attainment
Carbon Monoxide (CO)	Attainment	Unclassified / Attainment
Sulfer Dioxide (SO_2)	Attainment	Unclassified / Attainment
Lead	Attainment	Unclassified / Attainment
Sulfates	Attainment	---
Hydrogen Sulfide	Unclassified	---
Vinyl Chloride	Unclassified	---
Visibility Reducing Particles	Unclassified	---

Notes:
[1] Imperial County is designated a marginal nonattainment area for the 2015 ozone standard and a moderate attainment area for the 2008 standard.
[2] Imperial County was previously designated a serious-nonattainment area for PM_{10}, but the U.S. EPA approved redesignation as an attainment area on September 18, 2020.
[3] The City of Calexico, which is within the Salton Sea Air Basin and shares a border with Imperial County, is designated a nonattainment area for $PM_{2.5}$, but Imperial County (which includes the Project site) is designated an attainment area.
[4] A portion of the Imperial Valley in south-central Imperial County is designated a moderate nonattainment area for $PM_{2.5}$, but the remainder of Imperial County (which includes the Project site) is designated an attainment area.
Sources: CARB, 2020; CARB, 2022a; U.S. EPA, 2023.

Regulation of TACs, referred to as hazardous air pollutants (HAPs) under federal regulations, is achieved through federal, state, and local controls on individual sources. The air toxics provisions of the Federal Clean Air Act require the U.S. EPA to identify HAPs that are known or suspected to cause cancer or other serious health effects to protect public health and welfare, and to establish National Emission Standards for Hazardous Air Pollutants. California regulates TACs primarily through the Tanner Air Toxics Act (Assembly Bill [AB] 1807) and the Air Toxics Hot Spots Information and Assessment Act of 1987 (AB 2588). The Tanner Act created California's program to identify and reduce exposure to TACs. To date, CARB has identified over 21 TACs and adopted the EPA's list of 189 HAPs as TACs. The Hot Spots Act supplements the Tanner Act by requiring a statewide air toxics inventory, notification of people exposed to a significant health risk, and facility plans to reduce these risks.

3.1.2 Federal Climate Action Goals

The U.S. participates in the United Nations Framework Convention on Climate Change. In 1998, the U.S. signed the Kyoto Protocol, which would have required reductions in GHGs; however, the protocol did not become binding in the U.S. as it was never ratified by Congress. Instead, the federal government chose voluntary and incentive-based programs to reduce emissions and has established programs to promote climate technology and science. In 2002, the U.S. announced a strategy to reduce the GHG intensity of the American economy by 18 percent over a 10-year period from 2002 to 2012. In 2015, the U.S. submitted its "intended nationally determined contribution" to the framework convention, which targets to cut net GHG emissions by 26 to 28 percent below 2005 levels by 2025.

The U.S. EPA is responsible for enforcing the Federal Clean Air Act and the 1990 amendments to it. On April 2, 2007, the U.S. Supreme Court ruled that CO_2 is an air pollutant as defined under the Clean Air Act, and that the EPA has the authority to regulate emissions of GHGs (U.S. Supreme Court, 2007). The EPA made two distinct findings regarding GHGs under Section 202(a) of the Clean Air Act, as follows:

- Endangerment Finding: The current and projected concentrations of the six key well-mixed GHGs (CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6) in the atmosphere threaten the public health and welfare of current and future generations.

- Cause or Contribute Finding: 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.

These findings do not themselves impose any requirements on industry or other entities. However, they were a prerequisite for implementing GHG emissions standards for vehicles.

3.1.3 Federal Vehicle Emission Regulations

The U.S. EPA has established national GHG emission and fuel economy regulations for vehicles that would achieve substantial GHG emissions reductions along with reductions in other criteria pollutants. Some of the key U.S. EPA regulations related to GHG emissions from vehicles are as follows:

- In 2010, the U.S. EPA in collaboration with the National Highway Traffic Safety Administration (NHTSA) finalized updated Corporate Average Fuel Economy (CAFE) and GHG emissions standards for passenger cars and light trucks light-duty vehicles for model years 2012 to 2016.

- In 2012, the U.S. EPA and NHTSA extended the CAFE and GHG emissions standards for light-duty vehicles for model years 2017 to 2025. Combined with the 2012 to 2016 standards, the regulation will result in vehicles emitting 50 percent less than 2010 levels in 2025.

- In 2016, the U.S. EPA and NHTSA finalized national GHG emission and fuel economy standards for medium- and heavy-duty vehicles that would cover model years 2018 to 2027 for certain trailers and model years 2021 to 2027 for semi-trucks, large pickup trucks, vans, and all types and sizes of buses and work trucks.

- In 2020, the U.S. EPA and NHTSA finalized updated CAFE and GHG emissions standards for passenger cars and light trucks and established new standards, covering model years 2021 through 2026.

- In 2021, the U.S. EPA revised the GHG emissions standards for passenger cars and light trucks for model years 2023 through 2026 to leverage advances in clean car technology.

- In 2022, the NHSTA revised the CAFE standards for passenger cars and light trucks for model years 2024 to 2026. These standards are expected to result in average fuel economy label values of 49 miles per gallon.

3.1.4 California Climate Action Goals

The State of California has established the following long-term climate action goals:

- **Assembly Bill (AB) 32:** Reduce GHG emissions to 1990 levels by 2020.

- **Senate Bill (SB) 32:** Reduce GHG emissions to 40 percent below 1990 levels by 2030.

- **AB 1279:** Achieve carbon neutrality as soon as possible, but no later than 2045 and maintain net negative GHG emissions thereafter; and reduce GHG emissions to 85 percent below 1990 levels by 2045.

3.1.5 California Vehicle Emission Regulations

The State of California has established statewide GHG emission and fuel economy regulations for vehicles that align with or supersede the national standards. The key state regulations related to GHG emissions from vehicles are as follows:

- The Pavley Regulations (AB 1493), as amended in 2009, required a 30 percent reduction in state GHG emissions from new passenger vehicles from 2009 through 2016.

- The Advanced Clean Cars Program extends the Pavley Regulations beyond 2016 and established a technology mandate for zero-emission vehicles.

- The Advanced Clean Cars II Program requires all new passenger cars, trucks, and sport utility vehicles sold in California to be zero-emission vehicles by 2035.

- The Low-Carbon Fuel Standard (Executive Order S-1-07), as amended in 2019, requires a 20 percent reduction in the carbon intensity of California's transportation fuels by 2030.

SB 375 establishes regional GHG reduction targets from passenger vehicles for the years 2020 and 2035 by requiring metropolitan planning organizations to develop and implement Sustainable Communities Strategies that align regional transportation planning efforts with regional housing allocation needs.

3.1.6 California Energy Efficiency Regulations

The State of California has established statewide energy efficiency regulations, including programs that increase the statewide procurement of renewable energy. The key state regulations related to GHG emissions from energy use are as follows:

- The Renewable Portfolio Standard Program, as updated in 2018 (SB 100), requires the state to procure 60 percent of its electricity from renewable sources by 2030 and 100 percent from carbon-free sources by 2045.

- SB 1020 expanded on SB 100 to require 90 percent of all retail electricity sales by 2035 and 95 percent of all retail electricity sales by 2040 to be supplied by renewable energy resources and zero-carbon resources.

- Title 24 Building Efficiency Standards are updated every three years with the long-term vision to support zero-net energy for all new single-family and low-rise residential buildings by 2020 and new high-rise residential and nonresidential buildings by 2030.

Title 24 California Green Building Standards, referred to as the CALGreen Code, aim to improve public health, safety, and general welfare by enhancing the design and construction of buildings through the use of building concepts having a positive environmental impact and encouraging sustainable construction practices in the following categories: (1) planning and design, (2) energy efficiency, (3) water efficiency and conservation, (4) material conservation and resource efficiency, and (5) environmental air quality.

3.1.7 California Cap-and-Trade Program

The Cap-and-Trade Program is a key element of California's strategy to reduce GHG emissions from covered entities[1] that are responsible for about 85 percent of California's GHG emissions. The program establishes a declining limit on major sources of GHG emissions throughout California, and it creates a powerful economic incentive for significant investment in cleaner and more efficient technologies. CARB creates allowances equal to the total amount of permissible GHG emissions (i.e., the "cap"). Each year, fewer allowances are created and the annual cap declines. As a result, the annual auction reserve price for allowances increases, which creates a steady and sustained carbon price signal to incentivize actions to reduce GHG emissions and enable a smooth transition to a cleaner economy.

3.1.8 California's Short-Lived Climate Pollutant Reduction Strategy

The Short-Lived Climate Pollutant (SLCP) Reduction Strategy is California's plan for reducing emissions of high global-warming potential gases with short atmospheric lifetimes (CARB, 2017a). SLCPs include methane, HFCs, and anthropogenic black carbon. In accordance with SB 1383, the SLCP Reduction Strategy has set the following targets for statewide reductions in SLCP emissions:

- 40 percent below 2013 levels by 2030 for methane and HFCs.

- 50 percent below 2013 levels by 2030 for anthropogenic black carbon.

[1] The program's covered entities include electric power plants, fuel distributors (natural gas and petroleum), and large industrial facilities that emit more than 25,000 million metric tons of CO_2e per year.

The SLCP Reduction Strategy also provides specific direction for reductions from dairy and livestock operations and from landfills by diverting organic materials.

3.1.9 California's Climate Change Scoping Plan

In December 2008, CARB adopted the Climate Change Scoping Plan to identify how the state can achieve its 2020 climate action goal under AB 32. In 2017, CARB updated the Scoping Plan to identify how the state can achieve its 2030 climate action goal under SB 32, and substantially advance toward its 2050 climate action goal under Executive Order S-3-05. The 2017 Scoping Plan includes the regulatory programs identified above, such as the Advanced Clean Cars Program, Low-Carbon Fuel Standard, Renewable Portfolio Standard Program, energy efficiency standards, SLCP Reduction Strategy, and Cap-and-Trade Program (CARB, 2017b).

In December 2022, CARB adopted the 2022 Scoping Plan for Achieving Carbon Neutrality (2022 Scoping Plan), which outlines a roadmap to achieve targets for carbon neutrality and reduce anthropogenic GHG emissions by 85 percent below 1990 levels no later than 2045 (CARB, 2022b). Building on the 2017 Scoping Plan, the 2022 Scoping Plan evaluates the progress made toward meeting the 2030 GHG reduction target established in SB 32 and identifies a technologically feasible, cost-effective, and equity-focused path to achieve carbon neutrality by 2045. The 2022 Scoping Plan presents an approach for an aggressive reduction of fossil fuels and a rapid transition to renewable energy resources and zero-emission vehicles. The 2022 Scoping Plan identifies actions and outcomes such as rapidly moving to zero-emission transportation; electrifying cars, buses, trains, and trucks; phasing out the use of fossil gas used for heating homes and buildings; clamping down on chemicals and refrigerants; providing communities with sustainable options for walking, biking, and public transit; building out clean, renewable energy resources (such as solar arrays and wind turbine capacity) to displace fossil-fuel fired electrical generation; and scaling up new options such as renewable hydrogen and biomethane. Appendix D of the 2022 Scoping Plan includes recommendations for local government to take actions that align with the state's climate goals, with a focus on local climate action plans and local authority over new residential and mixed-use development. Appendix D of the 2022 Scoping Plan recommends for local jurisdictions to focus on three priority areas when preparing a climate action plan: transportation electrification, vehicle miles travelled reduction, and building decarbonization.

3.1.10 California's Sulfur Hexafluoride Regulation

High-voltage equipment that transmits and distributes electricity has typically used SF_6 as an electrical insulator. Fugitive emissions of SF_6 can escape from gas insulated substations and switchgear through seals and can also be released during equipment installation and when equipment is opened for servicing.

As required by AB 32, CARB approved the reduction of SF_6 emissions from electricity transmission and distribution equipment as an early action measure in 2007. In 2010, CARB adopted the Regulation for Reducing Sulfur Hexafluoride Emissions from Gas Insulated Switchgear, which requires switchgear owners to reduce their SF_6 emission rates to 1 percent by 2020. CARB amended the regulation in 2021 to phase out the acquisition of SF_6 gas-insulated equipment. Other changes are also adopted to cover other GHGs beyond SF_6 and enhance accuracy of emissions accounting and reporting. The amended regulation became effective January 1, 2022.

3.2 Regional Regulations

3.2.1 ICAPCD Rules and Responsibilities

ICAPCD is primarily responsible for ensuring that the NAAQS and CAAQS are attained and maintained in the SSAB. ICAPCD fulfills this responsibility by adopting and enforcing rules and regulations concerning air pollutant sources, issuing permits, inspecting stationary sources of air pollutants, responding to citizen complaints, and monitoring ambient air quality and meteorological conditions. **Table 8** summarizes the ICAPCD's rules and regulations relevant to controlling emissions from the Project.

Table 8. ICAPCD Rules and Regulations

Pollutant	Description
Rule 207 - New and Modified Stationary Source Review	Establishes preconstruction review requirements for new and modified stationary sources (e.g., standby generators) to ensure the operations of equipment does not interfere with attainment or maintenance of ambient air quality standards.
Rule 208 – Permit to Operate	Allows the ICAPCD to inspect and evaluate a permitted facility to ensure the facility will operate to comply with the provisions of the Authority to Construct permit (see Rule 207) and comply with all applicable laws, rules, standards, and guidelines.
Regulation VIII – Fugitive Dust Rules (Rules 800 to 806)	Sets forth rules regarding the control of fugitive dust, including fugitive dust from construction activities. The regulation requires implementation of fugitive dust control measures to reduce emissions from earthmoving, unpaved roads, handling of bulk materials, and control of track-out/carry-out dust from active construction sites. For construction of non-residential developments greater than 5 acres, a dust control plan must be prepared and implemented, and the ICAPCD must be notified 10 days prior to the commencement of any construction activities. The dust control plan must identify Best Available Control Measures to reduce fugitive dust during construction activities, which may include but are not limited to following: • Phase work to minimize the amount of disturbed surface area at any one time. • Apply water or chemical stabilizers to disturbed soils. • Construct and maintain wind barriers. • Cover bulk materials stored outdoors. • Use track-out control devices or wash down systems at access points to paved roads.

Source: ICAPCD, 2024.

3.2.2 CEQA Air Quality Handbook

In 2017, ICAPCD published the *CEQA Air Quality Handbook* that include guidelines and thresholds of significance to assist lead agencies in evaluating and mitigating air quality impacts under CEQA (ICAPCD, 2017a). ICAPCD's thresholds establish levels at which emissions of criteria air pollutants and precursors, TACs, and odors could cause significant air quality impacts.

3.2.3 Air Quality Plans

In accordance with the California Clean Air Act, ICAPCD is required to prepare and update air quality plans that outline measures by which both stationary and mobile sources of pollutants can be controlled to achieve the NAAQS and CAAQS in areas designated as nonattainment.

- In 2017, ICAPCD adopted the *Imperial County Plan for the 2008 8-hour Ozone Standard* (2017 Ozone Plan), which includes the identification of control measures to reduce ozone precursors (ICAPCD, 2017b).

- In 2018, ICAPCD adopted the *Redesignation Request and Maintenance Plan for Particulate Matter Less than 10 microns in Diameter* (2018 PM_{10} Plan), which shows that Imperial County has attained and will maintain the 24-hour PM_{10} standard out to 2030 and addresses all requirements under the Federal Clean Air Act (ICAPCD, 2018a). On September 18, 2020, the U.S. EPA approved the 2018 PM_{10} Plan, including the State's request to redesignate Imperial County from nonattainment to attainment for the federal PM_{10} air quality standard (U.S. EPA, 2020).

- In 2014, ICAPCD adopted the *Imperial County 2013 State Implementation Plan for the 2006 24-Hour $PM_{2.5}$ Moderate Nonattainment Area* (ICAPCD, 2014); however, this only applies to the non-attainment status in the south-central portion of Imperial County which does not include the Project site.

- In 2018, ICAPCD adopted the Imperial County *2018 Annual Particulate Matter Less than 2.5 Microns in Diameter State Implementation Plan* (ICAPCD, 2018b); however, this only applies to the non-attainment status in the south-central portion of Imperial County which does not include the Project site.

3.2.4 Imperial County General Plan

The Conservation and Open Space Element of the Imperial County General Plan (Imperial County Planning and Development Services Department, 2016) includes the following policy and program related to air quality and GHG emissions that would be applicable to the Project:

> **Policy:** Reduce PM_{10} and $PM_{2.5}$ emissions from unpaved roads, agricultural fields, and exposed Salton Sea lakebed.
>
> **Program:** Implement all ICAPCD particulate matter (PM) emission controls including the Final PM10 2009 State Implementation Plan and the 2013 State Implementation Plan for the 2006 24-Hour PM2.5 Moderate Nonattainment Area.

3.2.5 Desert Renewable Energy Conservation Plan

The entirety of the Project Application Area within BLM-administered public land is designated a Development Focus Area under the Desert Renewable Energy Conservation Plan (DRECP) and its associated Record of Decision (BLM, 2016a). The DRECP was developed to advance federal and state natural resource conservation goals and other state laws while facilitating a timely and streamlined permit process for renewable energy projects (BLM, 2015). A Development Focus Area is considered an area suitable for renewable energy development under the DRECP.

Conservation and Management Actions (CMAs) are required mitigation measures for Development Focus Areas in California. These were identified in the 2016 DRECP Land Use Plan Amendment (LUPA) (BLM, 2016b), which are applicable for some BLM-administered lands in southern California. The CMAs were designed to achieve the goals and objectives for activities within the LUPA's various land use allocations. These measures identify a specific set of avoidance, minimization, and compensation measures, and allowable and non-allowable actions for siting, design, pre-construction, construction, maintenance, implementation, operation, and decommissioning activities on BLM-managed lands. The intent of these is to provide certainty on what avoidance and minimization measures, design features, and compensation/mitigation measures would be required for a particular action within any one of the LUPA's land use allocation types. Some CMAs apply planning-area wide, whereas others apply only within specific land use allocations.

3.3 Project Best Management Practices and Design Features

In December 2023, the Applicant adopted the *Preliminary Best Management Practices and Project Design Features for the Project* (IP Perkins, LLC, 2023a), which identifies preliminary best management practices (BMPs) and Project design features associated with the siting and design, construction, operation and maintenance, and decommissioning of the Project: these are subject to change as the Project proceeds through the permitting process. BMPs are state-of-the-art measures applied on a site-specific basis to avoid, minimize, reduce, rectify, or compensate for adverse environmental or social impacts. They are selectively applied to aid in achieving desired outcomes for safe, environmentally responsible development, by preventing, minimizing, or mitigating adverse impacts and reducing conflicts. Design features are requirements that must be incorporated into Project-specific plans and implemented by the contractor team. In general, the design features are accepted practices that are known to be effective when implemented properly.

Table 9 summarized the BMPs related to air quality that would be incorporated into the Project. Implementation of BMPs would comply with the CMAs identified in the 2016 DRECP LUPA.

Table 9. Best Management Practices for Air Quality

No.	Topic	Description of Measures	Phase
1	Emissions	Vehicle use shall be reduced to the extent feasible. Carpooling will be used to reduce the amount of daily vehicle trips to the project site. The project will comply with LUPA-AIR-3.	C, O, D
2	Emissions	Idling of diesel equipment shall be limited to no more than 5 minutes unless idling must be maintained for proper operation (e.g., drilling, hoisting, and trenching). The project will comply with LUPA-AIR-3.	C, O, D
3	Emissions	Consider using electric vehicles, biodiesel, or alternative fuels where feasible during construction and operation phases to reduce the project's criteria and GHG pollutant emissions. The project will comply with LUPA-AIR-3.	C, O, D
4	Fugitive Dust	Workers shall be trained to comply with the speed limit, use good engineering practices, minimize drop height of materials, and minimize disturbed areas. The project will comply with LUPA-AIR-5.	C, O, D
5	Fugitive Dust	Construction shall be staged to limit the amount of exposed area at any time, whenever practical. The project will comply with LUPA-AIR-5.	C, O, D
6	Fugitive Dust	Access to the construction site and staging areas shall be limited to authorized vehicles only on the designated treated roads. The project will comply with LUPA-AIR-5.	C, O, D
7	Fugitive Dust	Access roads, on-site roads, and parking lots shall be surfaced with aggregate with hardness sufficient to prevent vehicles from crushing the aggregate and thus causing dust or compacted soil conditions. Paving could also be used on access roads and parking lots. Alternatively, agency-approved chemical dust suppressants (calcium chloride, FSB-100, Plas-Tex, Soil Sement, SRB-1000, etc.) or durable polymeric soil stabilizers shall be used on these locations (e.g., Gorilla-Snot, Soiltac, or Earthguard pellets). The project will comply with LUPA-AIR-5.	C, O, D
8	Fugitive Dust	All unpaved roads, disturbed areas (e.g., areas of scraping, excavation, backfilling, grading, and compacting), and loose materials generated during project activities shall be watered as frequently as necessary to minimize fugitive dust generation. In water-deprived locations, water spraying shall be limited to active disturbance areas only and non-water-based dust control measures shall be implemented in areas with intermittent or non-heavy use, such as stockpiles or access roads. The project will comply with LUPA-AIR-5.	C, O, D
9	Fugitive Dust	Speed limits (e.g., 15 mph) within the construction site shall be posted with visible signs and enforced to minimize airborne fugitive dust. The project will comply with LUPA-AIR-5.	C, D
10	Fugitive Dust	All vehicles transporting loose materials traveling on public roads shall be covered, and loads shall be sufficiently wet and kept below the freeboard of the truck. The project will comply with LUPA-AIR-5.	C, O, D
11	Fugitive Dust	Tires of all construction-related vehicles shall be inspected and cleaned as necessary to be free of dirt prior to entering paved public roadways. The project will comply with LUPA-AIR-5.	C, D
12	Fugitive Dust	Visible track-out or runoff dirt on public roadways from the construction site shall be cleaned (e.g., through street vacuum sweeping). The project will comply with LUPA-AIR-5.	C, D
13	Fugitive Dust	Use wind erosion control techniques (such as windbreaks, water, chemical dust suppressants, and/or vegetation) where soils are disturbed in construction, access and maintenance routes, and materials stockpile areas. Keep related windbreaks in place until the soil is stabilized or permanently covered with vegetation. The project will comply with LUPA-AIR-5.	C, O, D

No.	Topic	Description of Measures	Phase
14	Fugitive Dust	All soil disturbance activities and travel on unpaved roads shall be minimized. The project will comply with LUPA-AIR-5.	C, O, D
15	Fugitive Dust	Any stockpiles shall be sprayed with water, covered with tarpaulins, and/or treated with appropriate dust suppressants, especially in preparation for high wind or storm conditions. Chemical dust suppressants that emit volatile organic compounds (VOCs) shall be avoided within or near zone nonattainment areas. The project will comply with LUPA-AIR-5.	C
16	Fugitive Dust	Potential environmental impacts from the use of dust palliatives shall be minimized by taking all necessary measures to keep the chemicals out of sensitive soil and streams. In addition, the application of dust palliatives shall comply with federal, state, and local laws and regulations. The project will comply with LUPA-AIR-5.	C, O, D

Notes: C = Construction, O = Operations, D = Decommissioning

The Project Design Features that would be incorporated into the Project are summarized in **Table 10**. It should be noted that the design feature PDF AQ-1, *Fugitive Dust Control Plan*, has already been prepared in accordance with the ICAPCD Regulation VIII fugitive dust rules (IP Perkins, LLC, 2023b).

Table 10. Project Design Features for Air Quality

No.	Description of Measures	Phase
PDF AQ-1	**Fugitive Dust Control Plan.** The project owner or owner's contractor shall prepare and implement a Fugitive Dust Control Plan to reduce fugitive dust emissions during project construction. The project owner shall maintain and implement equivalent fugitive dust control strategies during operation, maintenance, and decommissioning. The plan would apply to activities including, but not limited to, development of laydown and staging areas, site grading, vegetation management, and installing all project facilities through post-construction cleanup. The project owner or owner's contractor shall take every reasonable precaution to prevent all airborne fugitive dust plumes from leaving the project site and to prevent visible particulate matter from being deposited upon public roadways. Where specified below, loose materials and soils shall be stabilized with a non-toxic soil stabilizer or soil weighting agent or watered two times daily or as frequently as necessary to minimize fugitive dust generation. Non-water-based soil stabilizers shall be as efficient as or more efficient for fugitive dust control than CARB-approved soil stabilizers and shall not increase any other environmental impacts, including loss of vegetation, adverse odors, or emissions of ozone precursor reactive organic gases (ROG) or volatile organic compounds (VOC). The Fugitive Dust Control Plan shall be submitted to the ICAPCD and reviewed for compliance with the standards in ICAPCD Rule 801, Section F, Best Available Control Measures for Fugitive Dust, and recordkeeping requirements in ICAPCD Rule 801, Section G, Record of Control Implementation. Records shall be readily accessible for two years after the date of each entry and shall be provided to the lead agency and/or ICAPCD upon request. The following control measures would be included within the plan:	C, O, D

No.	Description of Measures	Phase
	• All disturbed areas, including bulk material storage which is not being actively utilized, shall be effectively stabilized and visible emissions shall be limited to no greater than 20 percent opacity for dust emissions by using water, chemical stabilizers, dust suppressants, tarps or other suitable material such as vegetative ground cover. • All on site unpaved roads will be effectively stabilized and visible emissions shall be limited to no greater than 20 percent opacity for dust emissions by paving, chemical stabilizers, dust suppressants and/or watering. • All unpaved traffic areas one (1) acre or more with 75 or more average vehicle trips per day will be effectively stabilized and visible emissions shall be limited to no greater than 20 percent opacity for dust emissions by paving, chemical stabilizers, dust suppressants and/or watering. • The transport of bulk materials shall be completely covered unless six inches of freeboard space from the top of the container is maintained with no spillage and loss of bulk material. In addition, the cargo compartment of all haul trucks is to be cleaned and/or washed at delivery site after removal of bulk material. • All track-out or carry-out will be cleaned at the end of each workday or immediately when mud or dirt extends a cumulative distance of 50 linear feet or more onto a paved road. • Movement of bulk material handling or transfer shall be stabilized prior to handling or at points of transfer with application of sufficient water, chemical stabilizers or by sheltering or enclosing the operation and transfer line. • Temporary unpaved roads shall be effectively stabilized, and visible emissions shall be limited to no greater than 20 percent opacity for dust emission by paving, chemical stabilizers, dust suppressants and/or watering. • Replace or revegetate ground cover in disturbed areas as quickly as possible. • Install automatic sprinkler systems on soil piles, if visible dust emissions are observed. • Vehicle speed for all construction vehicles shall not exceed 15 mph on any unpaved surface at the construction site. • Vehicle travel shall be minimized through a trip reduction plan to achieve a target of 2 occupants per vehicle for construction employees.	
PDF AQ-2	**Control On-Site Off-Road Equipment Emissions.** The Project owner, its contractor, and its subcontractors, when entering into construction contracts or when procuring off-road equipment or vehicles for on-site construction or O&M activities, shall ensure that only new model year equipment or vehicles are obtained. The following measures shall be included with contract or procurement specifications: • All construction diesel engines not registered under California Air Resources Board's Statewide Portable Equipment Registration Program, with a rating of 50 hp or higher shall meet the Tier 4 California Emission Standards for Off-Road Compression-Ignition Engines, as specified in California Code of Regulations, Title 13, section 2423(b)(1), unless a good faith effort demonstrates that such engine is not available for a particular item of equipment. In the event that a Tier 4 engine is not available for any off-road equipment larger than 50 hp, a Tier 3 engine shall be used or that equipment shall be equipped with retrofit controls to reduce exhaust emissions of nitrogen oxides (NOx) and diesel particulate matter (DPM) to no more than Tier 3 levels unless certified by the engine manufacturers that the use of such devices is not practical for specific engine types. • The contractor shall provide equipment logs demonstrating Tier level compliance for all off-road diesel equipment and registration of portable diesel equipment. • All diesel-fueled engines used in the construction of the facility shall have clearly visible tags showing that the engine meets the standards of this measure. Records of inspections of visible tags shall be maintained and readily accessible for two years	C, O, D

No.	Description of Measures	Phase
	after the date of each entry and shall be provided to the lead agency and/or ICAPCD upon request. • All equipment and trucks used in the construction or O&M of the facility shall be properly maintained and the engines tuned to the engine manufacturer's specifications. • All diesel heavy construction equipment shall not idle for more than five minutes. Vehicles that need to idle as part of their normal operation (such as concrete trucks) are exempted from this requirement. • Diesel and gasoline-fueled equipment shall be replaced with electrically driven equivalents, provided they are not run via a portable generator set, where practical.	

Notes: C = Construction, O = Operations, D = Decommissioning

4. SIGNIFICANCE CRITERIA

Based on Appendix G of the CEQA Guidelines, implementation of the Project would result in a significant air quality impact if it would:

1) Conflict with or obstruct implementation of the applicable air quality plan;
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;
3) Expose sensitive receptors to substantial pollutant concentrations; or
4) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

Implementation of the proposed project would result in a significant GHG impact if it would:

5) Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment; or
6) Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs.

The ICAPCD's recommended thresholds of significance for CEQA analysis establish levels at which emissions of air pollutants and precursors (ROG, NOx, PM_{10}, CO, SO_2, $PM_{2.5}$, and TACs) could cause significant air quality impacts (ICAPCD, 2017). The ICAPCD's thresholds of significance used in this analysis are summarized in **Table 11**. According to the ICAPCD, a project that exceeds these thresholds is required to implement all standard mitigation measures as well as all feasible discretionary mitigation measures listed in Sections 7.2 and 7.3 of the ICAPCD's *Air Quality Handbook*. The Imperial County has not established formal quantitative or qualitative GHG thresholds for CEQA analysis.

Table 11. CEQA Thresholds of Significance

Impact Analysis	Pollutant	Threshold of Significance
Construction	ROG	75 lbs/day
	NOx	100 lbs/day
	PM_{10}	150 lbs/day
	CO	550 lbs/day
Operation	ROG	137 lbs/day
	NOx	137 lbs/day
	PM10	150 lbs/day
	SOx [1]	150 lbs/day
	CO	550 lbs/day
	$PM_{2.5}$	550 lbs/day

Notes: lbs = pounds
[1] Emissions that lead to high concentrations of SO_2 generally also lead to the formation of other sulfur oxides (SOx). Therefore, emissions of SO_2 are used as an indicator for SOx in this analysis.
Source: ICAPCD, 2017a.

5. METHODOLOGY AND ASSUMPTIONS

The Project's potential environmental impacts related to air quality and GHGs are evaluated in accordance with the significance criteria as described above. The Project's emissions of criteria air pollutants and precursors and GHGs during construction and operation were estimated based on project-specific information provided by the Applicant.

During construction, sources of criteria air pollutant and GHG emissions include off-road construction equipment, on-road construction vehicles related to worker vehicles, vendor trucks, and haul trucks, helicopters, and water usage (GHG only). The Project's construction criteria air pollutant and GHG emissions from off-road construction equipment, on-road construction vehicles, and water usage (GHG only) were estimated using the California Emissions Estimator Model (CalEEMod) version 2022.1.1, as well as spreadsheets based on CalEEMod methodology. CalEEMod uses widely accepted models for emission estimates combined with appropriate default data for a variety of land-use projects that can be used if site-specific information is not available. Criteria air pollutant and GHG emissions from helicopter usage were estimated based on the *Guidance on the Determination of Helicopter Emissions* (FOCA, 2015). The primary input data used to estimate emissions associated with construction of the Project were provided by the Applicant and contain information on the anticipated construction schedule and duration; construction equipment inventory and usage for each phase of construction (including the type, quantity, and hours of operation); construction trip rates for each phase of construction; helicopter usage; and water usage. Project design features presented in **Table 10** were incorporated in the calculations. The modeling assumptions, input parameters, methodology, and model outputs are documented in **Appendix A** and **Appendix B**.

During operation, sources of criteria air pollutant and GHG emissions include operation and maintenance activities, on-road vehicles, an emergency diesel generator, and SF_6 leakage from gas-insulated equipment (GHG only). In addition, construction of the Project would result in the removal of existing vegetation, which provide carbon uptake and act as a CO_2 sink. The loss of natural carbon uptake due to land-use conversion were estimated for the Project. Criteria air pollutant and GHG emissions from all the sources described above, except for SF_6 leakage, were estimated using the methodology from CalEEMod version 2022.1.1. GHG emissions from SF_6 leakage were calculated based on the methodology documented in U.S. EPA 40 CFR 98, Subpart A.

After commencing operation, the Project would deliver 1,150 MW of clean, renewable solar energy to California ratepayers. The renewable electricity generated by the Project would displace electricity generated by fossil fuels for meeting energy demand. The avoided GHG emissions from conventional power plants were estimated based on Project electricity production and CO_2 emissions factors for conventional generation technologies for marginal generation obtained from the CEC's *Estimated Cost of New Utility-Scale Generation in California: 2018 Update* (CEC, 2019).

6. ENVIRONMENTAL IMPACT ANALYSIS

6.1 Consistency with Applicable Air Quality Plans

There are two air quality plans that would apply to the Project the 2017 Ozone Plan and the 2018 PM_{10} Plan. These plans outline measures by which both stationary, area, and mobile sources of pollutants can be controlled to achieve the NAAQS and CAAQS in areas designated as nonattainment or maintenance.

The 2017 Ozone Plan identifies control measures for stationary sources, area sources, and transportation to reduce emissions of ozone precursors. The ICAPCD has the primary responsibility for regulating emissions from stationary sources as well as from some area sources found within the County. Operation and maintenance of the proposed emergency diesel generator at the Project site will be required to comply with ICAPCD Rule 207 - *New and Modified Stationary Source Review* and Rule 208 - *Permit to Operate* to ensure the stationary source operations do not interfere with attainment or maintenance of ambient air quality standards. At the state level, CARB is responsible for regulating on-road motor vehicles, some off-road mobile sources, consumer products, as well as setting motor vehicle fuel specifications in California. The Project would provide a new source of renewable energy that will facilitate in California's transition from fossil fuel to clean electrical power for on-road motor vehicles. In addition, the Applicant has adopted BMP 3 and the Project would implement PDF AQ-2, which would involve use of zero emission vehicles where available and increased efficiency in all construction equipment to reduce ozone emissions. The Project would not introduce any major area sources for ozone emissions, such as consumer products, and the use of off-road equipment during construction would be temporary. Therefore, the Project would support and be consistent with the control measures identified in the 2017 Ozone Plan.

The 2018 PM_{10} Plan identifies control measures to ensure Imperial County continues to maintain the 24-hour PM_{10} standard out to 2030. The ICAPCD Regulation VIII fugitive dust rules form the core control measures for reducing PM_{10} emissions in the County. Implementation of Project design feature PDF AQ-1, *Fugitive Dust Control Plan*, would ensure that the Project would comply with the ICAPCD Regulation VIII fugitive dust rules. It should also be noted that implementation of Project design feature PDF AQ-1, *Fugitive Dust Control Plan*, would be consistent with the policy and program for reducing particulate matter emissions in the Conservation and Open Space Element of the Imperial County General Plan. In addition, the Applicant has adopted BMPs 4 through 16 to help reduce fugitive dust emissions during all phases of the Project. Therefore, the Project would be consistent with the control measures identified in the 2018 PM_{10} Plan.

Overall, the Project would not conflict with or obstruct implementation of the applicable air quality plans.

6.2 Criteria Air Pollutant Emissions

6.2.1 Construction

Construction of the Project is expected to commence in January 2026 and extend to December 2027 for a duration of 24 months. Project construction includes six phases with the potential to overlap: 1) site preparation; 2) installation of solar PV panel system; 3) installation of inverters, substation, and electrical collector system; 4) construction of 500 kV gen-tie and loop-in transmission lines; 5) BESS installation; and 6) construction of the BAAH switchyard.

Project construction activities would generate criteria air pollutant emissions and precursors that could potentially affect regional air quality. During construction, the primary pollutant emissions of concern would be ROG, NOx, CO, and PM_{10} from the exhaust of off-road construction equipment, helicopters, and on-road construction vehicles related to worker vehicles, vendor trucks, and haul trucks. In addition, grading activities during construction would generate fugitive dust emissions of PM_{10}.

The average daily construction emissions for ROG, NOx, CO, and PM_{10} were estimated for each phase of construction. Project design features PDF AQ-1 and PDF AQ-2 to control fugitive dust emissions and on-site off-road equipment emissions, respectively, were incorporated in the calculations. The results are summarized in **Table 12** and compared to the ICAPCD's recommended thresholds of significance for construction. To be conservative, the peak average daily emissions of criteria pollutants and precursors were also estimated for each year of construction based on the anticipated overlap between phases. As shown in **Table 12**, the Project's average daily construction emissions of NOx, CO, and PM_{10} would exceed the ICAPCD's thresholds of significance, requiring mitigation. It should be noted that over 97 percent of the total PM_{10} emissions would be generated by fugitive dust emissions from off-site vehicles trips and not by exhaust or on-site construction activities.

Table 12. Average Daily Construction Emissions for Criteria Air Pollutants (Pounds per Day)

Emission Scenario	ROG	NOx	CO	PM_{10} [1]
Average Daily Emissions by Phase				
Phase 1: Site Preparation	4.60	38.45	220.04	123.67
Phase 2: Solar Panel System Installation	10.08	**149.88**	436.76	**401.21**
Phase 3: Inverters, Substation, and Electrical Installation	19.94	59.71	217.38	**388.54**
Phase 4: Gen-tie and Loop-In Transmission Construction	15.88	32.63	58.70	117.14
Phase 5: BESS Installation	2.16	34.79	92.41	117.04
Phase 6: BAAH Switchyard Construction	1.67	33.41	72.52	86.12
Peak Average Daily Emissions by Overlapping Phases				
Peak Day of Emissions - 2026	30.02	**209.58**	**656.80**	**789.74**
Peak Day of Emissions - 2027	39.65	**160.54**	441.01	**708.84**
ICAPCD Thresholds	75	100	550	150

Notes: **Bold and blue shaded** values indicate exceedance of the threshold of significance.
[1] Over 97 percent of the total PM_{10} emissions are due to fugitive dust generated by on-road vehicles traveling to and from the Project Application Area.
Source: **Appendix A** and **Appendix B.**

Project design feature PDF AQ-1 for the control of fugitive dust emissions is consistent with the standard and discretionary mitigation measures for fugitive PM_{10} emissions recommended by the ICAPCD's *CEQA Air Quality Handbook* and the ICAPCD Regulation VIII fugitive dust rules. Project design feature PDF AQ-2 for the control of on-site off-road equipment emissions is consistent with the standard and discretionary mitigation measures for NOx and PM_{10} emissions from construction combustion equipment recommended by the ICAPCD's *CEQA Air Quality Handbook*. In addition, the Applicant has adopted BMPs 1 through 3 (e.g., encouraging carpooling and use of electric vehicles) to reduce exhaust emissions and BMPs 4 through 16 (e.g., posting 15 mph speed limits) to reduce fugitive dust emissions during all phases of construction. The Applicant will also implement Mitigation Measure AIR-1 to reduce NOx and Mitigation Measure AIR-2 to reduce PM10 emissions below ICAPCD's threshold.

In accordance with the ICAPCD's Off-Site Mitigation/In-Lieu Fee Policy, when a project has exhausted all feasible on-site mitigation measures, additional off-site mitigation may be required to further reduce air pollutant emissions as described under Mitigation Measures AIR-1 and AIR-2.

Mitigation Measure AIR-1: Ozone Mitigation

In accordance with ICAPCD Policy Number 5, "Off-site Mitigation/In-lieu Fee", the Applicant shall prepare and implement the following mitigation measures, as approved by the ICAPCD, to reduce construction emissions of NOx and CO below the applicable ICAPCD construction thresholds:

1) Propose an off-site mitigation project providing supporting documentation that the reductions are met, or

2) Pay an in-lieu mitigation fee in accordance with the ICAPCD's Off-Site Mitigation/In-Lieu Fee Policy.

Mitigation Measure AIR-2: PM_{10} (Fugitive Dust) Mitigation

The ICAPCD's Rule 310 for operational sources of fugitive dust shall be applied to the Project's construction phase emissions. In accordance with ICAPCD Rule 310, the Applicant shall prepare and implement the following mitigation measures, as approved by the ICAPCD, to reduce construction emissions of PM_{10} (fugitive dust) below the applicable ICAPCD construction thresholds:

1) Propose an off-site mitigation project or program providing supporting documentation that the reductions are met; or

2) Pay an in-lieu mitigation fee in accordance with the ICAPCD's Off-Site Mitigation/In-Lieu Fee Policy.

Implementation of Mitigation Measures AIR-1 and AIR-2, together with Project design features PDF AQ-1 and PDF AQ-2, would reduce the Project's average daily construction emissions of NOx, CO, and exhaust PM_{10} below the ICAPCD threshold of significance.

6.2.2 Operation

Project operation would generate criteria air pollutant emissions that could potentially affect regional air quality. The primary pollutant emissions of concern during Project operation would be ROG, NOx, CO, SO_2, PM_{10}, and $PM_{2.5}$ from operation and maintenance activities, on-road vehicles, and an emergency diesel generator. Project operational emissions were estimated using CalEEMod 2022.1.1.

Project emissions were estimated for 2028, which is the earliest expected year of operation. Since statewide vehicle emission standards are required to improve over time in accordance with the Advanced Clean Cars II Program and associated vehicle emission regulations, estimating emissions for the earliest year of operation provides the maximum expected annual emissions. The estimated operational maximum daily emissions for the Project are presented in **Table 13**.

Table 13. Average Daily Operation Emissions for Criteria Air Pollutants (Pounds per day)

Emission Scenario	ROG	NOx	CO	SO_2	PM_{10}	$PM_{2.5}$
Mobile	0.43	2.86	21.00	0.07	65.20	7.41
Area	0.10	0.01	0.13	0.01	0.01	0.01
Stationary	0.05	0.16	0.18	0.01	0.01	0.01
Total	0.58	3.03	21.31	0.08	65.22	7.43
ICAPCD Thresholds	137	137	550	150	150	550
Threshold Exceedance?	No	No	No	No	No	No

Source: **Appendix A** and **Appendix B.**

As shown in **Table 13**, the increase in operational emissions from the Project would not exceed the ICAPCD recommended thresholds of significance for ROG, NOx, CO, SO_2, PM_{10}, and $PM_{2.5}$. In addition, operation and maintenance of the proposed emergency diesel generator at the Project site will be required to comply with ICAPCD Rule 207 – *New and Modified Stationary Source Review* to ensure the stationary source operations do not interfere with attainment or maintenance of ambient air quality standards. Therefore, operation of the Project would not result in a cumulatively considerable net increase in criteria air pollutants for which the region is in nonattainment.

6.3 Local Community Risks and Hazards

6.3.1 Toxic Air Contaminants (TACs)

Construction activities would generate DPM emissions from off-road diesel construction equipment, helicopters, and on-road heavy-duty diesel trucks accessing the Project site that could potentially result in elevated health risks at nearby sensitive receptors. As described in Section 2.3, the Project site is located in a relatively remote region of Imperial County and there are no sensitive receptors within approximately three miles of the Project Application Area. According to CARB's *Land Use Compatibility Handbook* (CARB, 2005), concentrations of DPM are reduced substantially and can even be indistinguishable from upwind background concentrations at a distance of 1,000 feet downwind from sources such as freeways or large distribution centers. Therefore, sensitive receptors located more than three miles away are not expected to be affected by DPM emissions associated with the Project.

In addition, with implementation Project design feature PDF AQ-2, most of the construction offroad equipment that would be used for this Project would be equipped with Tier 4 engines, which are considered the best available technology for reducing DPM emissions. As discussed above, operation of stationary sources is subject to ICAPCD Rule 207 – *New and Modified Stationary Source Review*, ensuring operation and maintenance of the emergency generator does not interfere with attainment or maintenance of ambient air quality standards, which would help to reduce the associated DPM emissions. Therefore, construction and operation of the Project would not expose existing sensitive receptors to substantial concentrations of TACs.

6.3.2 Valley Fever

Valley fever, also known as coccidioidomycosis, is a disease caused by inhaling spores of the fungus Coccidioides from airborne dust and soil. Coccidioides are thought to grow best in soil after heavy rainfall and then disperse into the air most effectively during hot, dry conditions. In California, most cases of Valley fever are reported among people residing in counties of the southern Central Valley and Central Coast. Coccidioides usually infect the lungs and can cause respiratory symptoms including cough, fever, chest pain, and tiredness.

Project construction activities such as grading would disturb the soil, which can cause fugitive dust emissions. The Project includes design feature PDF AQ-1 to control fugitive dust emissions during construction. As discussed above, PDF AQ-1 is consistent with the standard and discretionary mitigation measures for fugitive PM_{10} emissions recommended by the ICAPCD's *CEQA Air Quality Handbook* and the ICAPCD Regulation VIII fugitive dust rules. With implementation of PDF AQ-1, the Project would not expose existing people to substantial concentrations of fugitive dust that could potentially contain spores of the fungus Coccidioides.

6.4 Odors and Other Emissions

PV facility and BESS operations associated with the Project would not be expected to generate significant odors or other emissions for a substantial duration. Therefore, the Project would not generate odors or other emissions that would adversely affect a substantial number of people.

6.5 Greenhouse Gas Emissions

During construction, the Project would generate temporary GHG emissions through construction activities, such as operation of on-site heavy construction equipment, helicopters, water usage, and off-site construction vehicle trips. During operation, primary sources of GHG emissions would include operation and maintenance activities, on-road vehicles, land-use conversion, and SF_6 leakage from gas-insulated equipment. In addition, after commencing operation, the renewable electricity generated by the Project would displace the electricity generated by fossil fuels to meet energy demand.

There are two ways in which the Project could offset generation from conventional power sources: (1) production of solar power during daylight hours that displaces the daytime production from conventional, fossil fuel powered generators, and (2) discharge of stored energy from the BESS during evening or nighttime hours when the demand for conventional, fossil fuel powered generators is typical highest, thereby displacing evening/nighttime fossil generation.

While the solar PV component of the Project would provide power to the grid during daylight hours, the BESS component allows that power to be stored and discharged during high demand periods. The BESS component and energy storage in general helps to reduce the swing in demand for electricity from conventional, fossil fuel powered generators that is depicted by California's "duck curve." The "duck curve" is defined by the shape of net electricity demand over a typical day, where net demand, also referred to as net load, is the demand for electricity remaining after all electricity from variable sources of renewable electricity (e.g., solar, wind) have been dispatched. The pattern is characterized by drastic increases in net demand during the evening hours as solar generation decreases, and a net peak occurs later in the evening when solar generation fully drops off (U.S. EIA, 2023).

Energy storage provides an economic opportunity to shift the production of the Project to the hours of highest demand for electricity from dispatchable resources. The Project's dispatch strategy would use the BESS to respond to power price differentials. The battery system would be charged fully during the cheapest CAISO generation hours (i.e., during middle of the day when solar generation is highest and power prices are lowest across the grid, commonly referred to as the "belly of the duck"). Energy from the BESS would then be dispatched during the evening ramp after the sun goes down and power prices peak as natural gas-fired power plants must be dispatched rapidly to meet evening demand. The most common form of generation used to meet CAISO's evening demand peak is conventional combined cycle natural gas, so the above dispatch strategy for the BESS is expected be both charged and discharged fully each day.

This analysis demonstrates that by discharging stored energy to displace natural gas resources, the Perkins Project would avoid a greater quantity of GHG emissions being generated off-site than it would cause on-site. Detailed summaries of the estimated CO_2e emissions from Project construction and operation, as well as the avoided emissions by producing renewal electricity, are provided in **Appendix B** and **Appendix C**. The estimated GHG emissions for the Project are summarized in **Table 14**.

As shown in **Table 14**, the avoided GHG emissions by producing renewable electricity would significantly offset the GHG emissions from Project construction and operation. The Project would result in a net reduction in GHG emissions of approximately 251,953 metric tons of CO_2e per year. Therefore, Project construction and operation would not result in a cumulatively considerable net increase in GHG emissions.

Table 14. Annual Greenhouse Gas Emissions (Metric Tons per Year)

Source Scenario	CO_2e
Project Construction (30-year Amortized)[1]	553
Project Operation	988
Effects of Land Use Conversion	2,205
Gas-Insulated Equipment SF_6 Leakage	982
GHG Emissions Avoided by Producing Renewable Energy	-256,681
Total GHG Emissions	-251,953

Notes:
[1] GHG emissions during construction were amortized over the 30-year life of the project.
Source: **Appendix B** and **Appendix C.**

6.6 Greenhouse Gas Plans, Policies, and Regulations

Local climate action plans have not been adopted in the Project vicinity. The 2022 Scoping Plan outlines a roadmap for the State to achieve targets for carbon neutrality and reduce anthropogenic GHG emissions by 85 percent below 1990 levels no later than 2045 (CARB, 2022b). The 2022 Scoping Plan identifies actions and outcomes such as rapidly moving to zero-emission transportation; electrifying cars, buses, trains, and trucks; phasing out the use of fossil gas used for heating homes and buildings; clamping down on chemicals and refrigerants; providing communities with sustainable options for walking, biking, and public transit; building out clean, renewable energy resources (such as solar arrays and wind turbine capacity) to displace fossil-fuel fired electrical generation; and scaling up new options such as renewable hydrogen and biomethane.

The Project would build a PV facility and BESS, supporting the displacement of electrical generation by fossil fuels from conventional power plants with a renewable energy resource. Therefore, the Project would not conflict with the 2022 Scoping Plan.

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APPENDICES

APPENDIX A

AIR QUALITY AND GREENHOUSE GAS EMISSION CALCULATION DETAILS

IP Perkins, LLC - Construction, Activity Estimates

Construction - Phasing Assumptions, input to CalEEMod

20	work days per month

Total (months)	Start	End
24	1/2/2026	1/2/2028

Seq.	Phase	Duration (work days)	Duration (months)	Start	End
1	Ph 1: Site Preparation (~5,800 acres)	100	5	1/2/2026	6/2/2026
2	Ph 2: PV Panel System (500-1,150 MW)	150	8	4/2/2026	11/2/2026
3	Ph 3: Inverters, Substation, Electrical	150	8	9/2/2026	4/2/2027
4	Ph 4: Gen-tie and Loop-in Transmission	30	2	2/2/2027	3/2/2027
5	Ph 5: Battery Storage (500-1,150 MW)	160	8	2/2/2027	10/2/2027
6	Ph 6: Utility Switchyard (500 kV)	200	10	2/2/2027	12/2/2027

For CalEEMod Assumptions:

Basis: Project Description: Plan of Development, v8, circa 11/30/2023

- Work occurs 5 days a week, up to 10 hr/day; ~ 6,125 ac site. Appx 24-month construction duration.
- POD for PV generation between 500 to 1,150 MW, w/ storage BESS.
- On-road motor vehicle trips are counted as one-way for emissions. Average haul trip length to APCD boundary = 70 mi. Hauling up to 110 RT/d includes water delivery.
- On-road hauling up to 220 one-way (110 roundtrips) per day includes 80 for materials plus 30 water trucks.

IP Perkins - Construction, Air Pollutants - Unmitigated

Duration of Construction: **24 months**

Peak Days, Unmitigated Emissions Summary (lbs/day)

	ROG	NOX	CO	SO2	PM10	PM2.5
Ph 1 + Ph 2	60.58	541.71	647.72	1.01	564.07	80.14
Ph 2 + Ph 3	65.02	434.33	634.74	0.96	812.63	102.13
Ph 3 + Ph 4 + Ph 5 + Ph 6	53.07	262.14	412.83	0.78	716.86	84.40
Peak Day of Emissions (lbs/day)	65.02	541.71	647.72	1.01	812.63	102.13

Unmitigated - Duration of Construction (tons)

ROG	NOX	CO	SO2	PM10	PM2.5
7.14	54.53	72.88	0.12	88.21	11.30

Phased Unmitigated Emissions Summary (lbs/day)

	ROG	NOX	CO	SO2	PM10	PM2.5
Ph 1: Site Preparation (~5,800 acres)	20.69	211.90	219.96	0.35	142.99	22.93
Ph 2: PV Panel System (500-1,150 MW)	39.90	329.81	427.75	0.66	421.08	57.21
Ph 3: Inverters, Substation, Electrical	25.12	104.52	206.98	0.30	391.55	44.92
Ph 4: Gen-tie and Loop-in Transmission	17.01	37.25	54.40	0.12	118.02	13.61
Ph 5: Battery Storage (500-1,150 MW)	5.78	61.98	84.08	0.18	119.19	14.66
Ph 6: Utility Switchyard (500 kV)	5.16	58.39	67.38	0.17	88.09	11.21
Daily Emissions by Phase (lbs/day)	39.90	329.81	427.75	0.66	421.08	57.21

Unmitigated - Duration of Construction, Annual Average Rate (tons/year)

ROG	NOX	CO	SO2	PM10	PM2.5
3.57	27.26	36.44	0.06	44.11	5.65

Unmitigated - Duration of Construction, Average Daily Rate (lbs/day)

ROG	NOX	CO	SO2	PM10	PM2.5
19.57	149.39	199.68	0.34	241.68	30.97

Offroad Equipment by Phase / **Offroad, Daily Emissions (lbs/day)**

Offroad Equipment by Phase	Duration (work days)	ROG	NOX	CO	SO2	PM10	PM2.5
Ph 1: Site Preparation (~5,800 acres)	100	19.41	205.19	183.39	0.31	8.44	7.77
Ph 2: PV Panel System (500-1,150 MW)	150	36.18	298.15	323.64	0.49	13.77	12.65
Ph 3: Inverters, Substation, Electrical	150	6.81	68.10	84.98	0.14	2.93	2.70
Ph 4: Gen-tie and Loop-in Transmission	30	1.72	17.95	23.57	0.04	0.60	0.55
Ph 5: Battery Storage (500-1,150 MW)	160	4.90	49.29	62.14	0.10	1.99	1.83
Ph 6: Utility Switchyard (500 kV)	200	4.65	46.31	55.44	0.09	1.79	1.64

Offroad, Subtotals (tons)

ROG	NOX	CO	SO2	PM10	PM2.5
0.97	10.26	9.17	0.02	0.42	0.39
2.71	22.36	24.27	0.04	1.03	0.95
0.51	5.11	6.37	0.01	0.22	0.20
0.03	0.27	0.35	0.00	0.01	0.01
0.39	3.94	4.97	0.01	0.16	0.15
0.46	4.63	5.54	0.01	0.18	0.16

Grading, Daily Emissions (lbs/day) / **Grading, Subtotals (tons)**

Offroad, Grading Equipment Passes	Duration (work days)	PM10 (lbs/day)	PM2.5 (lbs/day)	PM10 (tons)	PM2.5 (tons)
Ph 1: Site Preparation (~5,800 acres)	100	13.26	2.21	0.66	0.11
Ph 2: PV Panel System (500-1,150 MW)	150	7.95	1.32	0.60	0.10

Offroad, Emissions on Peak Days (lbs/day)

Offroad Equipment and Grading on Peak Days	ROG	NOX	CO	SO2	PM10	PM2.5
Ph 1 + Ph 2	55.58	503.34	507.04	0.80	43.41	23.96
Ph 2 + Ph 3	42.99	366.24	408.62	0.63	24.65	16.68
Ph 3 + Ph 4 + Ph 5 + Ph 6	18.08	181.65	226.12	0.38	7.31	6.73

Onroad, Daily Emissions (lbs/day)

Onroad Vehicles by Phase	Duration (work days)	ROG	NOX	CO	SO2	PM10	PM2.5
Ph 1: Site Preparation (~5,800 acres)	100	1.28	6.71	36.57	0.04	121.30	12.95
Ph 2: PV Panel System (500-1,150 MW)	150	3.72	31.66	104.11	0.17	399.36	43.23
Ph 3: Inverters, Substation, Electrical	150	3.68	29.81	103.61	0.16	388.40	42.00
Ph 4: Gen-tie and Loop-in Transmission	30	0.66	12.69	12.44	0.08	117.20	12.83
Ph 5: Battery Storage (500-1,150 MW)	160	0.88	12.69	21.94	0.08	117.20	12.83
Ph 6: Utility Switchyard (500 kV)	200	0.51	12.08	11.94	0.08	86.30	9.57

Onroad, Subtotals (tons)

ROG	NOX	CO	SO2	PM10	PM2.5
0.06	0.34	1.83	0.00	6.07	0.65
0.28	2.37	7.81	0.01	29.95	3.24
0.28	2.24	7.77	0.01	29.13	3.15
0.01	0.19	0.19	0.00	1.76	0.19
0.07	1.02	1.76	0.01	9.38	1.03
0.05	1.21	1.19	0.01	8.63	0.96

Onroad, Emissions on Peak Days (lbs/day)

Onroad Vehicles on Peak Days	ROG	NOX	CO	SO2	PM10	PM2.5
Ph 1 + Ph 2	5.00	38.37	140.68	0.21	520.66	56.18
Ph 2 + Ph 3	7.40	61.47	207.72	0.33	787.76	85.23
Ph 3 + Ph 4 + Ph 5 + Ph 6	5.73	67.27	149.93	0.40	709.10	77.23

IP Perkins - Construction, Air Pollutants - Unmitigated

Helicopters	Duration (work days)
Ph 3: Inverters, Substation, Electrical	150
Ph 4: Gen-tie and Loop-in Transmission	30

Helicopter, Daily Emissions (lbs/day)					
ROG	NOX	CO	SO2	PM10	PM2.5
14.63	6.61	18.39		0.22	0.22
14.63	6.61	18.39		0.22	0.22

Helicopter, Subtotals (tons)					
ROG	NOX	CO	SO2	PM10	PM2.5
1.10	0.50	1.38	0.00	0.02	0.02
0.22	0.10	0.28	0.00	0.00	0.00

IP Perkins - Construction, Air Pollutants - Mitigated

Duration of Construction: **24 months**

Peak Days, Mitigated Emissions Summary (lbs/day)

	ROG	NOX	CO	SO2	PM10	PM2.5
Ph 1 + Ph 2	14.69	188.32	656.80	1.01	524.88	58.24
Ph 2 + Ph 3	30.02	209.58	654.14	0.96	789.74	86.82
Ph 3 + Ph 4 + Ph 5 + Ph 6	39.65	160.54	441.01	0.78	708.84	78.25
Peak Day of Emissions (lbs/day)	39.65	209.58	656.80	1.01	789.74	86.82

Mitigated - Duration of Construction (tons)

ROG	NOX	CO	SO2	PM10	PM2.5
3.06	24.26	75.59	0.12	85.15	9.41

Phased Mitigated Emissions Summary (lbs/day)

	ROG	NOX	CO	SO2	PM10	PM2.5
Ph 1: Site Preparation (~5,800 acres)	4.60	38.45	220.04	0.35	123.67	13.88
Ph 2: PV Panel System (500-1,150 MW)	10.08	149.88	436.76	0.66	401.21	44.37
Ph 3: Inverters, Substation, Electrical	19.94	59.71	217.38	0.30	388.54	42.46
Ph 4: Gen-tie and Loop-in Transmission	15.88	32.63	58.70	0.12	117.14	13.09
Ph 5: Battery Storage (500-1,150 MW)	2.16	34.79	92.41	0.18	117.04	12.99
Ph 6: Utility Switchyard (500 kV)	1.67	33.41	72.52	0.17	86.12	9.71
Daily Emissions by Phase (lbs/day)	19.94	149.88	436.76	0.66	401.21	44.37

Mitigated - Duration of Construction, Annual Average Rate (tons/year)

ROG	NOX	CO	SO2	PM10	PM2.5
1.53	12.13	37.79	0.06	42.57	4.71

Mitigated - Duration of Construction, Average Daily Rate (lbs/day)

ROG	NOX	CO	SO2	PM10	PM2.5
8.38	66.45	207.09	0.34	233.28	25.79

Offroad Equipment by Phase

Offroad Equipment by Phase	Duration (work days)
Ph 1: Site Preparation (~5,800 acres)	100
Ph 2: PV Panel System (500-1,150 MW)	150
Ph 3: Inverters, Substation, Electrical	150
Ph 4: Gen-tie and Loop-in Transmission	30
Ph 5: Battery Storage (500-1,150 MW)	160
Ph 6: Utility Switchyard (500 kV)	200

Offroad, Daily Emissions (lbs/day)

ROG	NOX	CO	SO2	PM10	PM2.5
3.32	31.74	183.47	0.31	0.61	0.61
6.36	118.22	332.65	0.49	0.97	0.97
1.63	23.29	95.38	0.14	0.27	0.27
0.59	13.33	27.87	0.04	0.08	0.08
1.28	22.10	70.47	0.10	0.20	0.20
1.16	21.33	60.58	0.09	0.18	0.18

Offroad, Subtotals (tons)

ROG	NOX	CO	SO2	PM10	PM2.5
0.17	1.59	9.17	0.02	0.03	0.03
0.48	8.87	24.95	0.04	0.07	0.07
0.12	1.75	7.15	0.01	0.02	0.02
0.01	0.20	0.42	0.00	0.00	0.00
0.10	1.77	5.64	0.01	0.02	0.02
0.12	2.13	6.06	0.01	0.02	0.02

Offroad, Grading Equipment Passes

Offroad, Grading Equipment Passes	Duration (work days)
Ph 1: Site Preparation (~5,800 acres)	100
Ph 2: PV Panel System (500-1,150 MW)	150

Grading, Daily Emissions (lbs/day)

PM10	PM2.5
2.12	0.35
1.27	0.21

Grading, Subtotals (tons)

PM10	PM2.5
0.11	0.02
0.10	0.02

Offroad Equipment and Grading on Peak Days

Offroad, Emissions on Peak Days (lbs/day)

	ROG	NOX	CO	SO2	PM10	PM2.5
Ph 1 + Ph 2	9.69	149.95	516.12	0.80	4.98	2.15
Ph 2 + Ph 3	7.99	141.50	428.03	0.63	2.52	1.46
Ph 3 + Ph 4 + Ph 5 + Ph 6	4.65	80.05	254.30	0.38	0.73	0.73

Onroad Vehicles by Phase

Onroad Vehicles by Phase	Duration (work days)
Ph 1: Site Preparation (~5,800 acres)	100
Ph 2: PV Panel System (500-1,150 MW)	150
Ph 3: Inverters, Substation, Electrical	150
Ph 4: Gen-tie and Loop-in Transmission	30
Ph 5: Battery Storage (500-1,150 MW)	160
Ph 6: Utility Switchyard (500 kV)	200

Onroad, Daily Emissions (lbs/day)

ROG	NOX	CO	SO2	PM10	PM2.5
1.28	6.71	36.57	0.04	120.94	12.91
3.72	31.66	104.11	0.17	398.96	43.18
3.68	29.81	103.61	0.16	388.04	41.96
0.66	12.69	12.44	0.08	116.84	12.79
0.88	12.69	21.94	0.08	116.84	12.79
0.51	12.08	11.94	0.08	85.94	9.53

Onroad, Subtotals (tons)

ROG	NOX	CO	SO2	PM10	PM2.5
0.06	0.34	1.83	0.00	6.05	0.65
0.28	2.37	7.81	0.01	29.92	3.24
0.28	2.24	7.77	0.01	29.10	3.15
0.01	0.19	0.19	0.00	1.75	0.19
0.07	1.02	1.76	0.01	9.35	1.02
0.05	1.21	1.19	0.01	8.59	0.95

Onroad Vehicles on Peak Days

Onroad, Emissions on Peak Days (lbs/day)

	ROG	NOX	CO	SO2	PM10	PM2.5
Ph 1 + Ph 2	5.00	38.37	140.68	0.21	519.90	56.09
Ph 2 + Ph 3	7.40	61.47	207.72	0.33	787.00	85.14
Ph 3 + Ph 4 + Ph 5 + Ph 6	5.73	67.27	149.93	0.40	707.66	77.07

IP Perkins - Construction, Air Pollutants - Mitigated

Helicopters	Duration (work days)
Ph 3: Inverters, Substation, Electrical	150
Ph 4: Gen-tie and Loop-in Transmission	30

Helicopter, Daily Emissions (lbs/day)					
ROG	NOX	CO	SO2	PM10	PM2.5
14.63	6.61	18.39		0.22	0.22
14.63	6.61	18.39		0.22	0.22

Helicopter, Subtotals (tons)					
ROG	NOX	CO	SO2	PM10	PM2.5
1.10	0.50	1.38	0.00	0.02	0.02
0.22	0.10	0.28	0.00	0.00	0.00

IP Perkins - Construction, GHG Emissions

Construction,GHG Emissions - by Phase, by Activity	CO2e (MT)
Offroad Equipment	
Ph 1: Site Preparation (~5,800 acres)	1,476
Ph 2: PV Panel System (500-1,150 MW)	3,624
Ph 3: Inverters, Substation, Electrical	991
Ph 4: Gen-tie and Loop-in Transmission	59
Ph 5: Battery Storage (500-1,150 MW)	785
Ph 6: Utility Switchyard (500 kV)	861
Helicopters	362
Onroad Vehicles	
2026	4,568
2027	3,528
Subtotal Offroad Equipment, Helicopters, Vehicles	8,157
Subtotal Onroad Vehicles	8,096
Subtotal Construction Water Use	321
Total, Duration of Construction	**16,574**

Offroad Equipment	Days/Phase	CO2	CH4	N2O	CO2e
			(MT)		
Ph 1: Site Preparation (~5,800 acres)	100	1,471	5.85E-02	1.11E-02	1,476
Ph 2: PV Panel System (500-1,150 MW)	150	3,612	1.45E-01	2.84E-02	3,624
Ph 3: Inverters, Substation, Electrical	150	988	3.93E-02	7.56E-03	991
Ph 4: Gen-tie and Loop-in Transmission	30	59	2.35E-03	4.55E-04	59
Ph 5: Battery Storage (500-1,150 MW)	160	782	3.11E-02	6.01E-03	785
Ph 6: Utility Switchyard (500 kV)	200	858	3.42E-02	6.64E-03	861
	Total (MT)	**7,770**	**0.31**	**0.06**	**7,795**

Onroad Vehicles by Year	CO2e (MT)
2026	4,568
2027	3,528

Helicopters	CO2e (MT)
Helicoper, e.g. Ph 3 to Ph 4	362.0

Energy Intensity of Water Supply	CO2e (MT)
Construction Water Use	321.1

IP Perkins - Construction, Offroad Equipment - Unmitigated

Offroad Equipment Use	CalEEMod Type Offroad Equipment	Hours Per Day	Fuel Type	Rating (hp)	Load Factor	500 MW Quantity	1150 MW Quantity	Unmitigated Emission Factors (g/hp-hr)							Unmitigated Max Daily Emissions (1150MW) (lbs/day)						
								TOG	ROG	NOX	CO	SO2	PM10	PM2.5	TOG	ROG	NOX	CO	SO2	PM10	PM2.5
Ph 1: Site Preparation (~5,800 acres)	Skid Steer Loaders	8	Diesel	65	0.37	6	15	0.159	0.134	1.807	3.245	0.005	0.051	0.047	1.01	0.85	11.50	20.65	0.03	0.32	0.30
	Rubber Tired Dozers	8	Diesel	247	0.40	6	15	0.567	0.477	5.081	3.568	0.005	0.225	0.207	14.82	12.47	132.81	93.26	0.13	5.88	5.41
	Tractors/Loaders/Backhoes	8	Diesel	97	0.37	6	15	0.219	0.184	1.885	3.481	0.005	0.063	0.058	2.08	1.75	17.90	33.05	0.05	0.60	0.55
	Graders	8	Diesel	187	0.41	5	10	0.261	0.219	2.119	1.197	0.005	0.071	0.066	3.53	2.96	28.65	16.19	0.07	0.96	0.89
	Rollers	8	Diesel	80	0.38	4	8	0.274	0.231	2.484	3.411	0.005	0.116	0.106	1.18	0.99	10.65	14.63	0.02	0.50	0.45
	Forklifts	8	Diesel	89	0.20	2	5	0.293	0.246	2.342	3.579	0.005	0.112	0.103	0.46	0.39	3.68	5.62	0.01	0.18	0.16
															23.08	**19.41**	**205.19**	**183.39**	**0.31**	**8.44**	**7.77**
Ph 2: PV Panel System (500-1,150 MW)	Cranes	8	Diesel	231	0.29	2	5	0.297	0.25	2.511	1.484	0.005	0.104	0.096	1.75	1.48	14.83	8.77	0.03	0.61	0.57
	Aerial Lifts	8	Diesel	63	0.31	4	10	0.122	0.103	1.553	3.162	0.005	0.031	0.028	0.42	0.35	5.35	10.89	0.02	0.11	0.10
	Skid Steer Loaders	8	Diesel	65	0.37	5	15	0.159	0.134	1.807	3.245	0.005	0.051	0.047	1.01	0.85	11.50	20.65	0.03	0.32	0.30
	Rubber Tired Dozers	8	Diesel	247	0.40	4	8	0.567	0.477	5.081	3.568	0.005	0.225	0.207	7.90	6.65	70.83	49.74	0.07	3.14	2.89
	Rubber Tired Loaders	8	Diesel	203	0.36	0	0	0.208	0.175	1.337	1.166	0.005	0.045	0.041	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Welders	8	Diesel	46	0.45	2	5	0.562	0.465	3.57	4.493	0.007	0.095	0.088	1.03	0.85	6.52	8.20	0.01	0.17	0.16
	Trenchers	8	Diesel	78	0.50	2	5	0.45	0.378	3.728	3.617	0.005	0.232	0.213	1.55	1.30	12.82	12.44	0.02	0.80	0.73
	Forklifts	8	Diesel	89	0.20	8	16	0.293	0.246	2.342	3.579	0.005	0.112	0.103	1.47	1.24	11.76	17.98	0.03	0.56	0.52
	Bore/Drill Rigs	8	Diesel	221	0.50	2	3	0.139	0.116	1.073	1.061	0.005	0.035	0.032	0.81	0.68	6.27	6.20	0.03	0.20	0.19
	Graders	8	Diesel	187	0.41	3	7	0.261	0.219	2.119	1.197	0.005	0.071	0.066	2.47	2.07	20.06	11.33	0.05	0.67	0.62
	Rollers	8	Diesel	80	0.38	3	7	0.274	0.231	2.484	3.411	0.005	0.116	0.106	1.03	0.87	9.32	12.80	0.02	0.44	0.40
	Tractors/Loaders/Backhoes	8	Diesel	97	0.37	10	20	0.219	0.184	1.885	3.481	0.005	0.063	0.058	2.77	2.33	23.86	44.07	0.06	0.80	0.73
	Other Construction Equipment	9	Diesel	48	0.45	30	60	0.811	0.681	4.084	4.689	0.005	0.231	0.212	20.85	17.51	105.02	120.58	0.13	5.94	5.45
															43.07	**36.18**	**298.15**	**323.64**	**0.49**	**13.77**	**12.65**
Ph 3: Inverters, Substation, Electrical	Skid Steer Loaders	8	Diesel	65	0.37	3	7	0.159	0.134	1.807	3.245	0.005	0.051	0.047	0.47	0.40	5.37	9.63	0.01	0.15	0.14
	Cranes	8	Diesel	231	0.29	2	5	0.297	0.25	2.511	1.484	0.005	0.104	0.096	1.75	1.48	14.83	8.77	0.03	0.61	0.57
	Aerial Lifts	8	Diesel	63	0.31	2	5	0.122	0.103	1.553	3.162	0.005	0.031	0.028	0.21	0.18	2.67	5.45	0.01	0.05	0.05
	Forklifts	8	Diesel	89	0.20	5	12	0.293	0.246	2.342	3.579	0.005	0.112	0.103	1.10	0.93	8.82	13.48	0.02	0.42	0.39
	Trenchers	8	Diesel	78	0.50	3	7	0.45	0.378	3.728	3.617	0.005	0.232	0.213	2.17	1.82	17.95	17.42	0.02	1.12	1.03
	Welders	8	Diesel	46	0.45	2	5	0.562	0.465	3.57	4.493	0.007	0.095	0.088	1.03	0.85	6.52	8.20	0.01	0.17	0.16
	Tractors/Loaders/Backhoes	8	Diesel	97	0.37	4	10	0.219	0.184	1.885	3.481	0.005	0.063	0.058	1.39	1.16	11.93	22.03	0.03	0.40	0.37
															8.12	**6.81**	**68.10**	**84.98**	**0.14**	**2.93**	**2.70**
Ph 4: Gen-tie and Loop-in Transmission	Skid Steer Loaders	8	Diesel	65	0.37	1	2	0.159	0.134	1.807	3.245	0.005	0.051	0.047	0.13	0.11	1.53	2.75	0.00	0.04	0.04
	Cranes	8	Diesel	231	0.29	1	2	0.297	0.25	2.511	1.484	0.005	0.104	0.096	0.70	0.59	5.93	3.51	0.01	0.25	0.23
	Aerial Lifts	8	Diesel	63	0.31	3	8	0.122	0.103	1.553	3.162	0.005	0.031	0.028	0.34	0.28	4.28	8.71	0.01	0.09	0.08
	Welders	10	Diesel	46	0.45	1	2	0.562	0.465	3.57	4.493	0.007	0.095	0.088	0.51	0.42	3.26	4.10	0.01	0.09	0.08
	Forklifts	8	Diesel	89	0.20	2	4	0.293	0.246	2.342	3.579	0.005	0.112	0.103	0.37	0.31	2.94	4.49	0.01	0.14	0.13
															2.05	**1.72**	**17.95**	**23.57**	**0.04**	**0.60**	**0.55**
Ph 5: Battery Storage (500-1,150 MW)	Skid Steer Loaders	8	Diesel	65	0.37	4	6	0.159	0.134	1.807	3.245	0.005	0.051	0.047	0.40	0.34	4.60	8.26	0.01	0.13	0.12
	Cranes	8	Diesel	231	0.29	2	4	0.297	0.25	2.511	1.484	0.005	0.104	0.096	1.40	1.18	11.87	7.01	0.02	0.49	0.45
	Aerial Lifts	8	Diesel	63	0.31	3	7	0.122	0.103	1.553	3.162	0.005	0.031	0.028	0.29	0.25	3.74	7.62	0.01	0.07	0.07
	Forklifts	8	Diesel	89	0.20	6	7	0.293	0.246	2.342	3.579	0.005	0.112	0.103	0.64	0.54	5.15	7.87	0.01	0.25	0.23
	Trenchers	8	Diesel	78	0.50	2	4	0.45	0.378	3.728	3.617	0.005	0.232	0.213	1.24	1.04	10.26	9.95	0.01	0.64	0.59
	Welders	10	Diesel	46	0.45	2	4	0.562	0.465	3.57	4.493	0.007	0.095	0.088	1.03	0.85	6.52	8.20	0.01	0.17	0.16
	Tractors/Loaders/Backhoes	8	Diesel	97	0.37	4	6	0.219	0.184	1.885	3.481	0.005	0.063	0.058	0.83	0.70	7.16	13.22	0.02	0.24	0.22
															5.84	**4.90**	**49.29**	**62.14**	**0.10**	**1.99**	**1.83**
Ph 6: Utility Switchyard (500 kV)	Cranes	8	Diesel	231	0.29	1	2	0.297	0.25	2.511	1.484	0.005	0.104	0.096	0.70	0.59	5.93	3.51	0.01	0.25	0.23
	Aerial Lifts	8	Diesel	63	0.31	4	8	0.122	0.103	1.553	3.162	0.005	0.031	0.028	0.34	0.28	4.28	8.71	0.01	0.09	0.08
	Skid Steer Loaders	8	Diesel	65	0.37	2	4	0.159	0.134	1.807	3.245	0.005	0.051	0.047	0.27	0.23	3.07	5.51	0.01	0.09	0.08
	Rubber Tired Loaders	8	Diesel	203	0.36	1	1	0.208	0.175	1.337	1.166	0.005	0.045	0.041	0.27	0.23	1.72	1.50	0.01	0.06	0.05
	Rubber Tired Dozers	8	Diesel	247	0.40	1	1	0.567	0.477	5.081	3.568	0.005	0.225	0.207	0.99	0.83	8.85	6.22	0.01	0.39	0.36
	Welders	10	Diesel	46	0.45	3	5	0.562	0.465	3.57	4.493	0.007	0.095	0.088	1.28	1.06	8.15	10.25	0.02	0.22	0.20

IP Perkins - Construction, Offroad Equipment - Unmitigated

Offroad Equipment Use

	CalEEMod Type Offroad Equipment	Hours Per Day	Fuel Type	Rating (hp)	Load Factor	500 MW Quantity	1150 MW Quantity	Unmitigated Emission Factors (g/hp-hr)							Unmitigated Max Daily Emissions (1150MW) (lbs/day)						
								TOG	ROG	NOX	CO	SO2	PM10	PM2.5	TOG	ROG	NOX	CO	SO2	PM10	PM2.5
	Trenchers	8	Diesel	78	0.50	1	2	0.45	0.378	3.728	3.617	0.005	0.232	0.213	0.62	0.52	5.13	4.98	0.01	0.32	0.29
	Forklifts	8	Diesel	89	0.20	2	4	0.293	0.246	2.342	3.579	0.005	0.112	0.103	0.37	0.31	2.94	4.49	0.01	0.14	0.13
	Bore/Drill Rigs	10	Diesel	221	0.50	0	0	0.139	0.116	1.073	1.061	0.005	0.035	0.032	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Graders	8	Diesel	187	0.41	0	0	0.261	0.219	2.119	1.197	0.005	0.071	0.066	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Rollers	8	Diesel	80	0.38	1	2	0.274	0.231	2.484	3.411	0.005	0.116	0.106	0.29	0.25	2.66	3.66	0.01	0.12	0.11
	Tractors/Loaders/Backhoes	8	Diesel	97	0.37	2	3	0.219	0.184	1.885	3.481	0.005	0.063	0.058	0.42	0.35	3.58	6.61	0.01	0.12	0.11
															5.54	**4.65**	**46.31**	**55.44**	**0.09**	**1.79**	**1.64**

IP Perkins - Construction, Offroad Equipment - Unmitiga

Offroad Equipment Use

	CalEEMod Type Offroad Equipment	GHG (g/hp-hr)			GHG (MT/day)		
		CO2	CH4	N2O	CO2	CH4	N2O
Ph 1: Site Preparation (~5,800 acres)	Skid Steer Loaders	528.621	0.021	0.004	1.53	6.06E-05	1.15E-05
	Rubber Tired Dozers	528.489	0.021	0.004	6.27	2.49E-04	4.74E-05
	Tractors/Loaders/Backhoes	529.707	0.021	0.004	2.28	9.04E-05	1.72E-05
	Graders	527.697	0.021	0.004	3.24	1.29E-04	2.45E-05
	Rollers	528.012	0.021	0.004	1.03	4.09E-05	7.78E-06
	Forklifts	527.097	0.021	0.004	0.38	1.50E-05	2.85E-06
					14.71	**5.85E-04**	**1.11E-04**
Ph 2: PV Panel System (500-1,150 MW)	Cranes	527.563	0.021	0.004	1.41	5.63E-05	1.07E-05
	Aerial Lifts	527.871	0.021	0.004	0.82	3.28E-05	6.25E-06
	Skid Steer Loaders	528.621	0.021	0.004	1.53	6.06E-05	1.15E-05
	Rubber Tired Dozers	528.489	0.021	0.004	3.34	1.33E-04	2.53E-05
	Rubber Tired Loaders	526.593	0.021	0.004	0.00	0.00E+00	0.00E+00
	Welders	568.291	0.023	0.005	0.47	1.90E-05	4.14E-06
	Trenchers	529.355	0.021	0.004	0.83	3.28E-05	6.24E-06
	Forklifts	527.097	0.021	0.004	1.20	4.78E-05	9.11E-06
	Bore/Drill Rigs	525.411	0.021	0.004	1.39	5.57E-05	1.06E-05
	Graders	527.697	0.021	0.004	2.27	9.02E-05	1.72E-05
	Rollers	528.012	0.021	0.004	0.90	3.58E-05	6.81E-06
	Tractors/Loaders/Backhoes	529.707	0.021	0.004	3.04	1.21E-04	2.30E-05
	Other Construction Equipment	589.469	0.024	0.005	6.88	2.80E-04	5.83E-05
					24.08	**9.64E-04**	**1.89E-04**
Ph 3: Inverters, Substation, Electrical	Skid Steer Loaders	528.621	0.021	0.004	0.71	2.83E-05	5.39E-06
	Cranes	527.563	0.021	0.004	1.41	5.63E-05	1.07E-05
	Aerial Lifts	527.871	0.021	0.004	0.41	1.64E-05	3.12E-06
	Forklifts	527.097	0.021	0.004	0.90	3.59E-05	6.84E-06
	Trenchers	529.355	0.021	0.004	1.16	4.59E-05	8.74E-06
	Welders	568.291	0.023	0.005	0.47	1.90E-05	4.14E-06
	Tractors/Loaders/Backhoes	529.707	0.021	0.004	1.52	6.03E-05	1.15E-05
					6.59	**2.62E-04**	**5.04E-05**
Ph 4: Gen-tie and Loop-in Transmission	Skid Steer Loaders	528.621	0.021	0.004	0.20	8.08E-06	1.54E-06
	Cranes	527.563	0.021	0.004	0.57	2.25E-05	4.29E-06
	Aerial Lifts	527.871	0.021	0.004	0.66	2.62E-05	5.00E-06
	Welders	568.291	0.023	0.005	0.24	9.52E-06	2.07E-06
	Forklifts	527.097	0.021	0.004	0.30	1.20E-05	2.28E-06
					1.96	**7.83E-05**	**1.52E-05**
Ph 5: Battery Storage (500-1,150 MW)	Skid Steer Loaders	528.621	0.021	0.004	0.61	2.42E-05	4.62E-06
	Cranes	527.563	0.021	0.004	1.13	4.50E-05	8.57E-06
	Aerial Lifts	527.871	0.021	0.004	0.58	2.30E-05	4.37E-06
	Forklifts	527.097	0.021	0.004	0.53	2.09E-05	3.99E-06
	Trenchers	529.355	0.021	0.004	0.66	2.62E-05	4.99E-06
	Welders	568.291	0.023	0.005	0.47	1.90E-05	4.14E-06
	Tractors/Loaders/Backhoes	529.707	0.021	0.004	0.91	3.62E-05	6.89E-06
					4.89	**1.95E-04**	**3.76E-05**
Ph 6: Utility Switchyard (500 kV)	Cranes	527.563	0.021	0.004	0.57	2.25E-05	4.29E-06
	Aerial Lifts	527.871	0.021	0.004	0.66	2.62E-05	5.00E-06
	Skid Steer Loaders	528.621	0.021	0.004	0.41	1.62E-05	3.08E-06
	Rubber Tired Loaders	526.593	0.021	0.004	0.31	1.23E-05	2.34E-06
	Rubber Tired Dozers	528.489	0.021	0.004	0.42	1.66E-05	3.16E-06
	Welders	568.291	0.023	0.005	0.59	2.38E-05	5.18E-06

IP Perkins - Construction, Offroad Equipment - Unmitiga

Offroad Equipment Use

	CalEEMod Type Offroad Equipment	GHG (g/hp-hr)			GHG (MT/day)		
		CO2	**CH4**	**N2O**	**CO2**	**CH4**	**N2O**
	Trenchers	529.355	0.021	0.004	0.33	1.31E-05	2.50E-06
	Forklifts	527.097	0.021	0.004	0.30	1.20E-05	2.28E-06
	Bore/Drill Rigs	525.411	0.021	0.004	0.00	0.00E+00	0.00E+00
	Graders	527.697	0.021	0.004	0.00	0.00E+00	0.00E+00
	Rollers	528.012	0.021	0.004	0.26	1.02E-05	1.95E-06
	Tractors/Loaders/Backhoes	529.707	0.021	0.004	0.46	1.81E-05	3.45E-06
					4.29	**0.000**	**0.000**

IP Perkins - Construction, Offroad Equipment - Mitigated

Offroad Equipment Use

	CalEEMod Type Offroad Equipment	Hours Per Day	Fuel Type	Rating (hp)	Load Factor	500 MW Quantity	1150 MW Quantity	Mitigated Emission Factors (g/hp-hr)							Mitigated Max Daily Emissions (lbs/day)						
								TOG	ROG	NOX	CO		PM10	PM2.5	TOG	ROG	NOX	CO		PM10	PM2.5
Ph 1: Site Preparation (~5,800 acres)	Skid Steer Loaders	8	Diesel	65	0.37	6	15	0.09	0.09	2.74	3.7		0.01	0.01	0.57	0.57	17.43	23.54		0.06	0.06
	Rubber Tired Dozer	8	Diesel	247	0.40	6	15	0.05	0.05	0.26	2.6		0.01	0.01	1.31	1.31	6.80	67.96		0.26	0.26
	Tractor/Loader/Backhoe	8	Diesel	97	0.37	6	15	0.05	0.05	0.26	3.7		0.01	0.01	0.47	0.47	2.47	35.13		0.09	0.09
	Grader	8	Diesel	187	0.41	5	10	0.05	0.05	0.26	2.6		0.01	0.01	0.68	0.68	3.52	35.16		0.14	0.14
	Roller	8	Diesel	80	0.38	4	8	0.05	0.05	0.26	3.7		0.01	0.01	0.21	0.21	1.12	15.87		0.04	0.04
	Forklift	8	Diesel	89	0.20	2	5	0.05	0.05	0.26	3.7		0.01	0.01	0.08	0.08	0.41	5.81		0.02	0.02
															3.32	**3.32**	**31.74**	**183.47**		**0.61**	**0.61**
Ph 2: PV Panel System (500-1,150 MW)	Crane	8	Diesel	231	0.29	2	5	0.05	0.05	0.26	2.6		0.01	0.01	0.30	0.30	1.54	15.36		0.06	0.06
	Aerial Lift	8	Diesel	63	0.31	4	10	0.09	0.09	2.74	3.7		0.01	0.01	0.31	0.31	9.44	12.74		0.03	0.03
	Skid Steer Loaders	8	Diesel	65	0.37	5	15	0.09	0.09	2.74	3.7		0.01	0.01	0.57	0.57	17.43	23.54		0.06	0.06
	Rubber Tired Dozers	8	Diesel	247	0.40	4	8	0.05	0.05	0.26	2.6		0.01	0.01	0.70	0.70	3.62	36.24		0.14	0.14
	Rubber Tired Loaders	8	Diesel	203	0.36	0	0	0.05	0.05	0.26	2.6		0.01	0.01	0.00	0.00	0.00	0.00		0.00	0.00
	Welders	8	Diesel	46	0.45	2	5	0.09	0.09	2.75	4.1		0.01	0.01	0.16	0.16	5.02	7.48		0.02	0.02
	Trencher	8	Diesel	78	0.50	2	5	0.05	0.05	0.26	3.7		0.01	0.01	0.17	0.17	0.89	12.73		0.03	0.03
	Forklift	8	Diesel	89	0.20	8	16	0.05	0.05	0.26	3.7		0.01	0.01	0.25	0.25	1.31	18.59		0.05	0.05
	Bore/Drill Rig	8	Diesel	221	0.50	2	3	0.05	0.05	0.26	2.6		0.01	0.01	0.29	0.29	1.52	15.20		0.06	0.06
	Grader	8	Diesel	187	0.41	3	7	0.05	0.05	0.26	2.6		0.01	0.01	0.47	0.47	2.46	24.61		0.09	0.09
	Roller	8	Diesel	80	0.38	3	7	0.05	0.05	0.26	3.7		0.01	0.01	0.19	0.19	0.98	13.89		0.04	0.04
	Tractor/Loader/Backhoe	8	Diesel	97	0.37	10	20	0.05	0.05	0.26	3.7		0.01	0.01	0.63	0.63	3.29	46.84		0.13	0.13
	Other Construction Equipment	9	Diesel	48	0.45	30	60	0.09	0.09	2.75	4.1		0.01	0.01	2.31	2.31	70.72	105.43		0.26	0.26
															6.36	**6.36**	**118.22**	**332.65**		**0.97**	**0.97**
Ph 3: Inverters, Substation, Electrical	Skid Steer Loaders	8	Diesel	65	0.37	3	7	0.09	0.09	2.74	3.7		0.01	0.01	0.27	0.27	8.14	10.99		0.03	0.03
	Crane	8	Diesel	231	0.29	2	5	0.05	0.05	0.26	2.6		0.01	0.01	0.30	0.30	1.54	15.36		0.06	0.06
	Aerial Lift	8	Diesel	63	0.31	2	5	0.09	0.09	2.74	3.7		0.01	0.01	0.16	0.16	4.72	6.37		0.02	0.02
	Forklift	8	Diesel	89	0.20	5	12	0.05	0.05	0.26	3.7		0.01	0.01	0.19	0.19	0.98	13.94		0.04	0.04
	Trencher	8	Diesel	78	0.50	3	7	0.05	0.05	0.26	3.7		0.01	0.01	0.24	0.24	1.25	17.82		0.05	0.05
	Welders	8	Diesel	46	0.45	2	5	0.09	0.09	2.75	4.1		0.01	0.01	0.16	0.16	5.02	7.48		0.02	0.02
	Tractor/Loader/Backhoe	8	Diesel	97	0.37	4	10	0.05	0.05	0.26	3.7		0.01	0.01	0.32	0.32	1.65	23.42		0.06	0.06
															1.63	**1.63**	**23.29**	**95.38**		**0.27**	**0.27**
Ph 4: Gen-tie and Loop-in Transmission	Skid Steer Loaders	8	Diesel	65	0.37	1	2	0.09	0.09	2.74	3.7		0.01	0.01	0.08	0.08	2.32	3.14		0.01	0.01
	Crane	8	Diesel	231	0.29	1	2	0.05	0.05	0.26	2.6		0.01	0.01	0.12	0.12	0.61	6.14		0.02	0.02
	Aerial Lift	8	Diesel	63	0.31	3	8	0.09	0.09	2.74	3.7		0.01	0.01	0.25	0.25	7.55	10.20		0.03	0.03
	Welders	10	Diesel	46	0.45	1	2	0.09	0.09	2.75	4.1		0.01	0.01	0.08	0.08	2.51	3.74		0.01	0.01
	Forklift	8	Diesel	89	0.20	2	4	0.05	0.05	0.26	3.7		0.01	0.01	0.06	0.06	0.33	4.65		0.01	0.01
															0.59	**0.59**	**13.33**	**27.87**		**0.08**	**0.08**
Ph 5: Battery Storage (500-1,150 MW)	Skid Steer Loaders	8	Diesel	65	0.37	4	6	0.09	0.09	2.74	3.7		0.01	0.01	0.23	0.23	6.97	9.42		0.03	0.03
	Crane	8	Diesel	231	0.29	2	4	0.05	0.05	0.26	2.6		0.01	0.01	0.24	0.24	1.23	12.29		0.05	0.05
	Aerial Lift	8	Diesel	63	0.31	3	7	0.09	0.09	2.74	3.7		0.01	0.01	0.22	0.22	6.61	8.92		0.02	0.02
	Forklift	8	Diesel	89	0.20	6	7	0.05	0.05	0.26	3.7		0.01	0.01	0.11	0.11	0.57	8.13		0.02	0.02
	Trencher	8	Diesel	78	0.50	2	4	0.05	0.05	0.26	3.7		0.01	0.01	0.14	0.14	0.72	10.18		0.03	0.03
	Welders	10	Diesel	46	0.45	2	4	0.09	0.09	2.75	4.1		0.01	0.01	0.16	0.16	5.02	7.48		0.02	0.02
	Tractor/Loader/Backhoe	8	Diesel	97	0.37	4	6	0.05	0.05	0.26	3.7		0.01	0.01	0.19	0.19	0.99	14.05		0.04	0.04
															1.28	**1.28**	**22.10**	**70.47**		**0.20**	**0.20**

IP Perkins - Construction, Offroad Equipment - Mitigated

Offroad Equipment Use

	CalEEMod Type Offroad Equipment	Hours Per Day	Fuel Type	Rating (hp)	Load Factor	500 MW Quantity	1150 MW Quantity	Mitigated Emission Factors (g/hp-hr)							Mitigated Max Daily Emissions (lbs/day)						
								TOG	ROG	NOX	CO		PM10	PM2.5	TOG	ROG	NOX	CO		PM10	PM2.5
Ph 6: Utility Switchyard (500 kV)	Crane	8	Diesel	231	0.29	1	2	0.05	0.05	0.26	2.6		0.01	0.01	0.12	0.12	0.61	6.14		0.02	0.02
	Aerial Lift	8	Diesel	63	0.31	4	8	0.09	0.09	2.74	3.7		0.01	0.01	0.25	0.25	7.55	10.20		0.03	0.03
	Skid Steer Loaders	8	Diesel	65	0.37	2	4	0.09	0.09	2.74	3.7		0.01	0.01	0.15	0.15	4.65	6.28		0.02	0.02
	Rubber Tired Loaders	8	Diesel	203	0.36	1	1	0.05	0.05	0.26	2.6		0.01	0.01	0.06	0.06	0.34	3.35		0.01	0.01
	Rubber Tired Dozer	8	Diesel	247	0.40	1	1	0.05	0.05	0.26	2.6		0.01	0.01	0.09	0.09	0.45	4.53		0.02	0.02
	Welders	10	Diesel	46	0.45	3	5	0.09	0.09	2.75	4.1		0.01	0.01	0.21	0.21	6.27	9.36		0.02	0.02
	Trencher	8	Diesel	78	0.50	1	2	0.05	0.05	0.26	3.7		0.01	0.01	0.07	0.07	0.36	5.09		0.01	0.01
	Forklift	8	Diesel	89	0.20	2	4	0.05	0.05	0.26	3.7		0.01	0.01	0.06	0.06	0.33	4.65		0.01	0.01
	Bore/Drill Rig	10	Diesel	221	0.50	0	0	0.05	0.05	0.26	2.6		0.01	0.01	0.00	0.00	0.00	0.00		0.00	0.00
	Grader	8	Diesel	187	0.41	0	0	0.05	0.05	0.26	2.6		0.01	0.01	0.00	0.00	0.00	0.00		0.00	0.00
	Roller	8	Diesel	80	0.38	1	2	0.05	0.05	0.26	3.7		0.01	0.01	0.05	0.05	0.28	3.97		0.01	0.01
	Tractor/Loader/Backhoe	8	Diesel	97	0.37	2	3	0.05	0.05	0.26	3.7		0.01	0.01	0.09	0.09	0.49	7.03		0.02	0.02
															1.16	**1.16**	**21.33**	**60.58**		**0.18**	**0.18**

IP Perkins - Construction, Grading Equipment Passes

Construction Phase - Fugitive Dust, per CalEEMod Factors for Grading Equipment Passes

CalEEMod User Guide, Appendix C - 4.4.1 Grading Equipment Passes

Basis: Section 11.9 of USEPA's AP-42 (USEPA 1998b)

EFPM15 = 0.051 × (S)2.0, and EFPM10 = EFPM15 × FPM10

EFTSP = 0.04 × (S)2.5, and EFPM2.5 = EFTSP × FPM2.5

CalEEMod User Guide (2022), Activity Factors: Table G-14. Daily Acres Graded by Equipment Type

Equipment	Acres Graded per 8 Hour Day
Crawler Tractors	0.5
Graders	0.5
Rubber Tired Dozers	0.5
Scrapers	1

Source: South Coast Air Quality Management District Construction Survey.

CalEEMod User Guide (2022), Emission Factors, without mitigation

Where:

		PM10	PM2.5
F - scaling factor (AP-42)		0.6	0.031
S (mph)		7.1	7.1
EF (lb/VMT)		1.543	0.167

Dust Control Plan Mitigation % - 84% 84%

VMT = As/Wb × UC1 ÷ UC2

Wb (blade, ft)	12
UC1 (sqft/ac)	43560
UC2 (ft/mile)	5280

	Graders / or / Rubber Tire Dozer (equipment / day)	As (ac/day)	VMT per day	Unmitigated PM10 (lb/day)	Unmitigated PM2.5 (lb/day)	Mitigated PM10 (lb/day)	Mitigated PM2.5 (lb/day)
Ph 1: Site Preparation (~5,800 acres)	25	12.5	8.59375	13.26	2.21	2.12	0.35
Ph 2: PV Panel System (500-1,150 MW)	15	7.5	5.15625	7.95	1.32	1.27	0.21

IP Perkins - Construction, Helicopter Emission Factors and Activity Estimates

Construction Phase - Helicopter Activity during Construction: Add to CalEEMod Results

Basis: Swiss Confederation, FOCA, 2015 (Guidance on the Determination of Helicopter Emissions, Edition 2, Dec 2015, FOCA, CH-3003 Bern)

Criteria Air Pollutant Emission Factors

		Rating (shp/engine)	# engines	LTO Fuel (kg)	LTO HC (g)	LTO NOx (g)	LTO CO (g)	LTO PM (g)	One-hour Fuel (kg)	One-hour HC (kg)	One-hour NOx (kg)	One-hour CO (kg)	One-hour PM (kg)
H500 - Hughes 500 (DDA250-C18)		317	1	16.4	438.2	59.5	571.2	2.3	98.8	0.96	0.48	1.2	0.016

single engine, turboshaft (typ ops) 10 min per LTO (ground idle plus TO or App)

0.0273 LTO avg rate Fuel Use (kg/sec)
5.39 LTO Fuel Use (gal)

0.0274 One-hour Fuel Use (kg/sec)
32.46 One-hour Fuel Use (gal/hr)

Jet fuel A, density std conditions (appx)
804 kg/m3
3.04 kg/gal
0.135 MMBtu/gal

Emissions per LTO

ROG (lb/LTO)	NOx (lb/LTO)	CO (lb/LTO)	PM (lb/LTO)
0.97	0.13	1.26	0.01

Emissions per Hour

ROG (lb/hr)	NOx (lb/hr)	CO (lb/hr)	PM (lb/hr)
2.12	1.06	2.65	0.04

GHG Emission Factors

	CO2 (kg/MMBtu)	CH4 (kg/MMBtu)	N2O (kg/MMBtu)
Factors for: Kerosene-Type Jet Fuel			
US EPA, 40 CFR 98, Subchapter C Table C-1:	72.22	0.003	0.0006
	CO2 (g/gal)	CH4 (g/gal)	N2O (g/gal)
	9749.7	0.405	0.081

Emissions per LTO

CO2e (lb/LTO)	CO2 (lb/LTO)	CH4 (lb/LTO)	N2O (lb/LTO)
116.23	115.82	0.005	0.001

Emissions per Hour

CO2e (lb/hr)	CO2 (lb/hr)	CH4 (lb/hr)	N2O (lb/hr)
700.21	697.76	0.029	0.006

Helicopter Activity Estimates

Helicopter Activity, Phase 3 Peak Day	Activity
Days in phase	150
Helicopters per day	1

		ROG (lbs/day)	NOx (lbs/day)	CO (lbs/day)	PM (lbs/day)	CO2e (MT total)
Overall LTO	300	1.93	0.26	2.52	0.01	15.8
Overall Hours	900	12.70	6.35	15.87	0.21	285.9
Phase 3, Daily:		14.63	6.61	18.39	0.222	301.7

Helicopter Activity, Phase 4 Peak Day	Activity
Days in phase	30
Helicopters per day	1

		ROG (lbs/day)	NOx (lbs/day)	CO (lbs/day)	PM (lbs/day)	CO2e (MT total)
Overall LTO	60	1.93	0.26	2.52	0.01	3.2
Overall Hours	180	12.70	6.35	15.87	0.21	57.2
Phase 4, Daily:		14.63	6.61	18.39	0.222	60.3

	CO2e (MT total)
Total GHG (MT):	362.0

IP Perkins - Construction, GHG related to Water Supply

Construction Phase - Water Use during Construction: Add to CalEEMod Results

Water Energy Intensity Factors: CalEEMod, v. 2022.1.1.3. Table G-32

Construction Water Use : 1,000 acre-feet per entire construction
325.85 million gallons

Hydrologic Region	Supply Water (kWh/million gallons)	Treat Water (kWh/million gallons)	Distribute Water (kWh/million gallons)	Wastewater Treatment (kWh/million gallons)	Sum (kWh/million gallons)
Colorado River Basin	2304	748	166	1519	4,737

CalEEMod (v.2022.1.1.3) for IID: GHG Intensity of Electricity

CO2 (lb/MWh)	CH4 (lb/MWh)	N2O (lb/MWh)
456.54	0.033	0.004

	MWh	CO2e Factor (MT/MWh)
Construction Water Supply, Electricity Use :	1,544	0.208

	Water Use CO2e (MT)
Construction Water Supply, GHG Emissions :	321.1

IP Perkins - Operational Activities, Emissions Estimates

Operation Phase - Emissions Summary from CalEEMod Results

Operation includes:
- O&M building at 3,000 sf.
- Water supply of 50 acre-feet annually for panel washing, minimal indoor water uses.
- Standby generator (rated at 45 kW or ~ 61 hp)

Operation Phase - Annual Typical O&M

Operations Emissions by Sector, Annual

	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Category	tons/yr										MT/yr						
Mobile	0.06	0.44	2.30	0.01	0.01	10.10	10.10	0.01	1.14	1.15		958	958	0	0	1	973
Area	0.02	< 0.005	0.01	< 0.005	< 0.005		< 0.005	< 0.005		< 0.005		0	0	< 0.005	< 0.005		0
Energy	0.00	0.00	0.00	0.00	0.00		0.00	0.00		0.00		0	0	0	0		0
Water											0	12	12	0	< 0.005		13
Waste											0	0	0	0	0		1
Refrig.																0	0
Stationary	< 0.005	0.01	0.01	< 0.005	< 0.005	0.00	< 0.005	< 0.005	0.00	< 0.005	0	1	1	< 0.005	< 0.005	0	1
Vegetation												2,205	2,205				2,205
Total	**0.08**	**0.44**	**2.32**	**0.01**	**0.01**	**10.10**	**10.10**	**0.01**	**1.14**	**1.15**	**1**	**3,176**	**3,176**	**0**	**0**	**1**	**3,193**

Operations Emissions by Sector, Maximum Daily (Winter or Summer)

	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T
Category	lb/day									
Mobile	0.43	2.86	21.00	0.07	0.05	65.20	65.20	0.05	7.36	7.41
Area	0.10	0.01	0.13	0.01	0.01	0.00	0.01	0.01	0.00	0.01
Stationary	0.05	0.16	0.18	0.01	0.01	0.00	0.01	0.01	0.00	0.01
Total	**0.58**	**3.03**	**21.31**	**0.08**	**0.07**	**65.20**	**65.22**	**0.07**	**7.36**	**7.43**

IP Perkins - GHG Emissions, Combined Construction and Operations

GHG Summary, Duration of Construction (one-time and Annualized) plus Operation

Construction GHG Emissions by Activity, Summary	Construction One-Time (MTCO2e)	Construction, Total divided by 30 years (MTCO2e per year)
Subtotal Offroad Equipment, Helicopters, Vehicles	8,157	272
Subtotal Onroad Vehicles	8,096	270
Subtotal Construction Water Use	321	11
GHG Emissions, Construction Total (one-time)	**16,574**	
GHG Emissions, Construction Amortized (per year, 30-year life)		**552**

Operations GHG Emissions by Source Type or Activity, Summary	Operation, Annual Emissions (MTCO2e per year)
Operation and Maintenance	988
Effects of Land Use Conversion	2,205
Gas-Insulated Equipment (SF6 Leaks, in CO2e)	982
Emissions Avoided by Producing Electricity	-256,681
GHG Emissions, Operation (per year)	**-252,506**
Total GHG Emissions, Construction Amortized and Operations (per year)	**-251,953**

GHG, Gas-Insulated Equipment

Operations GHG Subtotal, Gas-Insulated Switchgear

SF6 GWP (100-yr basis) per U.S. EPA 40 CFR 98, Subpt.A - Table A-1

22,800

Location	Components	Count ("k")	SF6 Contained per device "k" (lb SF6 / k)	(kg SF6 / k)	(MTCO2e / k)	industry-anticipated leakage (loss / year)	GHG Emisisons, leakage (MTCO2e / year)
Substation	3-ph breaker	9	1500	680	15,510	0.005	698
BAAH	3-ph breaker	3	1500	680	15,510	0.005	233
BAAH	single-phase	2	500	227	5,170	0.005	52
						Total GHG for Gas-Insulated Equipment	**982**

APPENDIX B

CALEEMOD REPORTS

Perkins onroad w-ops v231219 Detailed Report

Table of Contents

1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	Perkins onroad w-ops v231219
Construction Start Date	1/2/2026
Operational Year	2028
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	3.40
Precipitation (days)	4.80
Location	32.725196893913576, -115.13972167427241
County	Imperial
City	Unincorporated
Air District	Imperial County APCD
Air Basin	Salton Sea
TAZ	5614
EDFZ	19
Electric Utility	Imperial Irrigation District
Gas Utility	Southern California Gas
App Version	2022.1.1.21

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description

General Heavy Industry	8,712	1000sqft	200	0.00	0.00	0.00	—	Substation
General Light Industry	3.00	1000sqft	0.07	3,000	0.00	0.00	—	O&M Building

1.3. User-Selected Emission Reduction Measures by Emissions Sector

Sector	#	Measure Title
Construction	C-2*	Limit Heavy-Duty Diesel Vehicle Idling
Construction	C-10-A	Water Exposed Surfaces
Construction	C-10-C	Water Unpaved Construction Roads

* Qualitative or supporting measure. Emission reductions not included in the mitigated emissions results.

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	8.67	7.41	55.2	208	0.33	0.93	786	787	0.93	84.2	85.1	—	76,718	76,718	1.32	8.21	201	79,400
Mit.	8.67	7.41	55.2	208	0.33	0.93	785	786	0.93	84.1	85.0	—	76,718	76,718	1.32	8.21	201	79,400
% Reduced	—	—	—	—	—	—	< 0.5%	< 0.5%	—	< 0.5%	< 0.5%	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	7.49	6.21	66.2	115	0.40	1.11	786	787	1.11	84.2	85.1	—	74,334	74,334	1.36	9.43	5.21	77,180
Mit.	7.49	6.21	66.2	115	0.40	1.11	785	786	1.11	84.1	85.0	—	74,334	74,334	1.36	9.43	5.21	77,180

% Reduced	—	—	—	—	—	—	< 0.5%	< 0.5%	—	< 0.5%	< 0.5%	—	—	—	—	—	—	—
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	2.90	2.44	21.6	55.1	0.12	0.33	285	285	0.33	30.5	30.9	—	26,682	26,682	0.49	2.91	31.6	27,593
Mit.	2.90	2.44	21.6	55.1	0.12	0.33	285	285	0.33	30.5	30.8	—	26,682	26,682	0.49	2.91	31.6	27,593
% Reduced	—	—	—	—	—	—	< 0.5%	< 0.5%	—	< 0.5%	< 0.5%	—	—	—	—	—	—	—
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.53	0.45	3.95	10.0	0.02	0.06	52.0	52.1	0.06	5.57	5.63	—	4,418	4,418	0.08	0.48	5.23	4,568
Mit.	0.53	0.45	3.95	10.0	0.02	0.06	52.0	52.0	0.06	5.57	5.63	—	4,418	4,418	0.08	0.48	5.23	4,568
% Reduced	—	—	—	—	—	—	< 0.5%	< 0.5%	—	< 0.5%	< 0.5%	—	—	—	—	—	—	—

2.2. Construction Emissions by Year, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	8.67	7.41	55.2	208	0.33	0.93	786	787	0.93	84.2	85.1	—	76,718	76,718	1.32	8.21	201	79,400
2027	5.86	4.92	47.9	128	0.32	0.89	591	591	0.89	63.5	64.3	—	63,520	63,520	0.99	7.59	150	65,958
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	7.49	6.21	61.5	115	0.33	0.93	786	787	0.93	84.2	85.1	—	72,172	72,172	1.36	8.22	5.21	74,660
2027	5.40	4.32	66.2	83.5	0.40	1.11	708	709	1.11	76.1	77.2	—	74,334	74,334	1.21	9.43	4.75	77,180
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

2026	2.90	2.44	21.6	55.1	0.12	0.33	285	285	0.33	30.5	30.9	—	26,682	26,682	0.49	2.91	31.6	27,593
2027	1.52	1.23	18.0	25.1	0.11	0.32	176	176	0.32	18.9	19.2	—	20,493	20,493	0.30	2.65	21.0	21,311
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	0.53	0.45	3.95	10.0	0.02	0.06	52.0	52.1	0.06	5.57	5.63	—	4,418	4,418	0.08	0.48	5.23	4,568
2027	0.28	0.22	3.28	4.58	0.02	0.06	32.0	32.1	0.06	3.46	3.51	—	3,393	3,393	0.05	0.44	3.47	3,528

2.3. Construction Emissions by Year, Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	8.67	7.41	55.2	208	0.33	0.93	785	786	0.93	84.1	85.0	—	76,718	76,718	1.32	8.21	201	79,400
2027	5.86	4.92	47.9	128	0.32	0.89	590	590	0.89	63.3	64.2	—	63,520	63,520	0.99	7.59	150	65,958
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	7.49	6.21	61.5	115	0.33	0.93	785	786	0.93	84.1	85.0	—	72,172	72,172	1.36	8.22	5.21	74,660
2027	5.40	4.32	66.2	83.5	0.40	1.11	706	707	1.11	75.9	77.0	—	74,334	74,334	1.21	9.43	4.75	77,180
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	2.90	2.44	21.6	55.1	0.12	0.33	285	285	0.33	30.5	30.8	—	26,682	26,682	0.49	2.91	31.6	27,593
2027	1.52	1.23	18.0	25.1	0.11	0.32	175	175	0.32	18.9	19.2	—	20,493	20,493	0.30	2.65	21.0	21,311
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	0.53	0.45	3.95	10.0	0.02	0.06	52.0	52.0	0.06	5.57	5.63	—	4,418	4,418	0.08	0.48	5.23	4,568
2027	0.28	0.22	3.28	4.58	0.02	0.06	32.0	32.0	0.06	3.45	3.50	—	3,393	3,393	0.05	0.44	3.47	3,528

2.4. Operations Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.61	0.57	2.69	21.3	0.07	0.06	65.2	65.2	0.06	7.36	7.42	3.33	20,642	20,646	0.41	0.33	20.5	20,775
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.51	0.49	3.03	11.3	0.06	0.06	65.2	65.2	0.06	7.36	7.42	3.33	19,829	19,832	0.40	0.34	1.29	19,946
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.44	0.43	2.43	12.7	0.06	0.05	55.2	55.2	0.05	6.24	6.28	3.33	19,180	19,184	0.40	0.29	8.08	19,289
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.08	0.08	0.44	2.32	0.01	0.01	10.1	10.1	0.01	1.14	1.15	0.55	3,176	3,176	0.07	0.05	1.34	3,193

2.5. Operations Emissions by Sector, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.53	0.43	2.53	21.0	0.07	0.05	65.2	65.2	0.05	7.36	7.41	—	7,228	7,228	0.07	0.33	19.7	7,347
Area	0.02	0.10	< 0.005	0.13	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.54	0.54	< 0.005	< 0.005	—	0.54
Energy	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Water	—	—	—	—	—	—	—	—	—	—	—	1.33	69.7	71.0	0.14	< 0.005	—	75.7
Waste	—	—	—	—	—	—	—	—	—	—	—	2.00	0.00	2.00	0.20	0.00	—	7.01
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.78	0.78
Stationary	0.05	0.05	0.16	0.18	< 0.005	0.01	0.00	0.01	0.01	0.00	0.01	0.00	25.6	25.6	< 0.005	< 0.005	0.00	25.7

Vegetatio	—	—	—	—	—	—	—	—	—	—	—	—	13,318	13,318	—	—	—	13,318
Total	0.61	0.57	2.69	21.3	0.07	0.06	65.2	65.2	0.06	7.36	7.42	3.33	20,642	20,646	0.41	0.33	20.5	20,775
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.46	0.36	2.86	11.1	0.06	0.05	65.2	65.2	0.05	7.36	7.41	—	6,415	6,415	0.06	0.34	0.51	6,518
Area	—	0.08	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Water	—	—	—	—	—	—	—	—	—	—	—	1.33	69.7	71.0	0.14	< 0.005	—	75.7
Waste	—	—	—	—	—	—	—	—	—	—	—	2.00	0.00	2.00	0.20	0.00	—	7.01
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.78	0.78
Stationary	0.05	0.05	0.16	0.18	< 0.005	0.01	0.00	0.01	0.01	0.00	0.01	0.00	25.6	25.6	< 0.005	< 0.005	0.00	25.7
Vegetation	—	—	—	—	—	—	—	—	—	—	—	—	13,318	13,318	—	—	—	13,318
Total	0.51	0.49	3.03	11.3	0.06	0.06	65.2	65.2	0.06	7.36	7.42	3.33	19,829	19,832	0.40	0.34	1.29	19,946
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.41	0.33	2.39	12.6	0.06	0.05	55.2	55.2	0.04	6.24	6.28	—	5,785	5,785	0.05	0.29	7.30	5,880
Area	0.01	0.09	< 0.005	0.06	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.26	0.26	< 0.005	< 0.005	—	0.27
Energy	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Water	—	—	—	—	—	—	—	—	—	—	—	1.33	69.7	71.0	0.14	< 0.005	—	75.7
Waste	—	—	—	—	—	—	—	—	—	—	—	2.00	0.00	2.00	0.20	0.00	—	7.01
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.78	0.78
Stationary	0.02	0.01	0.04	0.05	< 0.005	< 0.005	0.00	< 0.005	< 0.005	0.00	< 0.005	0.00	7.02	7.02	< 0.005	< 0.005	0.00	7.04
Vegetation	—	—	—	—	—	—	—	—	—	—	—	—	13,318	13,318	—	—	—	13,318
Total	0.44	0.43	2.43	12.7	0.06	0.05	55.2	55.2	0.05	6.24	6.28	3.33	19,180	19,184	0.40	0.29	8.08	19,289
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Mobile	0.08	0.06	0.44	2.30	0.01	0.01	10.1	10.1	0.01	1.14	1.15	—	958	958	0.01	0.05	1.21	973
Area	< 0.005	0.02	< 0.005	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.04	0.04	< 0.005	< 0.005	—	0.04
Energy	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Water	—	—	—	—	—	—	—	—	—	—	—	0.22	11.5	11.8	0.02	< 0.005	—	12.5
Waste	—	—	—	—	—	—	—	—	—	—	—	0.33	0.00	0.33	0.03	0.00	—	1.16
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.13	0.13
Stationary	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	0.00	< 0.005	< 0.005	0.00	< 0.005	0.00	1.16	1.16	< 0.005	< 0.005	0.00	1.17
Vegetation	—	—	—	—	—	—	—	—	—	—	—	—	2,205	2,205	—	—	—	2,205
Total	0.08	0.08	0.44	2.32	0.01	0.01	10.1	10.1	0.01	1.14	1.15	0.55	3,176	3,176	0.07	0.05	1.34	3,193

2.6. Operations Emissions by Sector, Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.53	0.43	2.53	21.0	0.07	0.05	65.2	65.2	0.05	7.36	7.41	—	7,228	7,228	0.07	0.33	19.7	7,347
Area	0.02	0.10	< 0.005	0.13	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.54	0.54	< 0.005	< 0.005	—	0.54
Energy	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Water	—	—	—	—	—	—	—	—	—	—	—	1.33	69.7	71.0	0.14	< 0.005	—	75.7
Waste	—	—	—	—	—	—	—	—	—	—	—	2.00	0.00	2.00	0.20	0.00	—	7.01
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.78	0.78
Stationary	0.05	0.05	0.16	0.18	< 0.005	0.01	0.00	0.01	0.01	0.00	0.01	0.00	25.6	25.6	< 0.005	< 0.005	0.00	25.7
Vegetation	—	—	—	—	—	—	—	—	—	—	—	—	13,318	13,318	—	—	—	13,318
Total	0.61	0.57	2.69	21.3	0.07	0.06	65.2	65.2	0.06	7.36	7.42	3.33	20,642	20,646	0.41	0.33	20.5	20,775

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.46	0.36	2.86	11.1	0.06	0.05	65.2	65.2	0.05	7.36	7.41	—	6,415	6,415	0.06	0.34	0.51	6,518
Area	—	0.08	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Water	—	—	—	—	—	—	—	—	—	—	—	1.33	69.7	71.0	0.14	< 0.005	—	75.7
Waste	—	—	—	—	—	—	—	—	—	—	—	2.00	0.00	2.00	0.20	0.00	—	7.01
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.78	0.78
Stationary	0.05	0.05	0.16	0.18	< 0.005	0.01	0.00	0.01	0.01	0.00	0.01	0.00	25.6	25.6	< 0.005	< 0.005	0.00	25.7
Vegetation	—	—	—	—	—	—	—	—	—	—	—	—	13,318	13,318	—	—	—	13,318
Total	0.51	0.49	3.03	11.3	0.06	0.06	65.2	65.2	0.06	7.36	7.42	3.33	19,829	19,832	0.40	0.34	1.29	19,946
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.41	0.33	2.39	12.6	0.06	0.05	55.2	55.2	0.04	6.24	6.28	—	5,785	5,785	0.05	0.29	7.30	5,880
Area	0.01	0.09	< 0.005	0.06	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.26	0.26	< 0.005	< 0.005	—	0.27
Energy	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Water	—	—	—	—	—	—	—	—	—	—	—	1.33	69.7	71.0	0.14	< 0.005	—	75.7
Waste	—	—	—	—	—	—	—	—	—	—	—	2.00	0.00	2.00	0.20	0.00	—	7.01
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.78	0.78
Stationary	0.02	0.01	0.04	0.05	< 0.005	< 0.005	0.00	< 0.005	< 0.005	0.00	< 0.005	0.00	7.02	7.02	< 0.005	< 0.005	0.00	7.04
Vegetation	—	—	—	—	—	—	—	—	—	—	—	—	13,318	13,318	—	—	—	13,318
Total	0.44	0.43	2.43	12.7	0.06	0.05	55.2	55.2	0.05	6.24	6.28	3.33	19,180	19,184	0.40	0.29	8.08	19,289
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.08	0.06	0.44	2.30	0.01	0.01	10.1	10.1	0.01	1.14	1.15	—	958	958	0.01	0.05	1.21	973
Area	< 0.005	0.02	< 0.005	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.04	0.04	< 0.005	< 0.005	—	0.04

Energy	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Water	—	—	—	—	—	—	—	—	—	—	—	0.22	11.5	11.8	0.02	< 0.005	—	12.5
Waste	—	—	—	—	—	—	—	—	—	—	—	0.33	0.00	0.33	0.03	0.00	—	1.16
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.13	0.13
Stationary	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	0.00	< 0.005	< 0.005	0.00	< 0.005	0.00	1.16	1.16	< 0.005	< 0.005	0.00	1.17
Vegetation	—	—	—	—	—	—	—	—	—	—	—	—	2,205	2,205	—	—	—	2,205
Total	0.08	0.08	0.44	2.32	0.01	0.01	10.1	10.1	0.01	1.14	1.15	0.55	3,176	3,176	0.07	0.05	1.34	3,193

3. Construction Emissions Details

3.1. Ph 1 Site Preparation (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dust From Material Movement	—	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	0.01	0.01	0.31	0.14	< 0.005	< 0.005	0.70	0.70	< 0.005	0.08	0.08	—	181	181	< 0.005	0.03	0.35	190
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dust From Material Movement	—	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—

Onsite truck	0.01	0.01	0.33	0.15	< 0.005	< 0.005	0.70	0.70	< 0.005	0.08	0.08	—	182	182	< 0.005	0.03	0.01	190
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dust From Material Movement	—	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.09	0.04	< 0.005	< 0.005	0.19	0.19	< 0.005	0.02	0.02	—	49.7	49.7	< 0.005	0.01	0.04	52.1
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dust From Material Movement	—	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	0.03	0.03	< 0.005	< 0.005	< 0.005	—	8.23	8.23	< 0.005	< 0.005	0.01	8.62
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	1.37	1.21	1.82	35.6	0.00	0.00	98.7	98.7	0.00	10.4	10.4	—	5,194	5,194	0.17	0.16	17.2	5,261
Vendor	0.06	0.04	1.67	0.49	0.02	0.03	10.9	10.9	0.03	1.19	1.22	—	2,047	2,047	0.02	0.28	5.32	2,136
Hauling	0.04	0.02	2.18	0.33	0.02	0.05	10.9	11.0	0.05	1.20	1.25	—	2,278	2,278	0.02	0.36	4.88	2,390
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	1.16	1.01	2.11	19.0	0.00	0.00	98.7	98.7	0.00	10.4	10.4	—	4,384	4,384	0.18	0.16	0.44	4,435
Vendor	0.05	0.04	1.86	0.48	0.02	0.03	10.9	10.9	0.03	1.19	1.22	—	2,047	2,047	0.02	0.28	0.14	2,131
Hauling	0.04	0.02	2.41	0.33	0.02	0.05	10.9	11.0	0.05	1.20	1.25	—	2,278	2,278	0.02	0.36	0.13	2,386
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.33	0.29	0.58	6.83	0.00	0.00	26.7	26.7	0.00	2.83	2.83	—	1,292	1,292	0.05	0.04	2.03	1,308

Vendor	0.02	0.01	0.50	0.14	< 0.005	0.01	2.94	2.95	0.01	0.32	0.33	—	561	561	< 0.005	0.08	0.63	584
Hauling	0.01	0.01	0.65	0.09	< 0.005	0.01	2.96	2.97	0.01	0.33	0.34	—	624	624	< 0.005	0.10	0.58	654
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.05	0.10	1.25	0.00	0.00	4.87	4.87	0.00	0.52	0.52	—	214	214	0.01	0.01	0.34	217
Vendor	< 0.005	< 0.005	0.09	0.02	< 0.005	< 0.005	0.54	0.54	< 0.005	0.06	0.06	—	92.8	92.8	< 0.005	0.01	0.10	96.8
Hauling	< 0.005	< 0.005	0.12	0.02	< 0.005	< 0.005	0.54	0.54	< 0.005	0.06	0.06	—	103	103	< 0.005	0.02	0.10	108

3.2. Ph 1 Site Preparation (2026) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dust From Material Movement	—	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	0.01	0.01	0.31	0.14	< 0.005	< 0.005	0.34	0.34	< 0.005	0.04	0.04	—	181	181	< 0.005	0.03	0.35	190
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dust From Material Movement	—	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	0.01	0.01	0.33	0.15	< 0.005	< 0.005	0.34	0.34	< 0.005	0.04	0.04	—	182	182	< 0.005	0.03	0.01	190
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Dust From Material Movement	—	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.09	0.04	< 0.005	< 0.005	0.09	0.09	< 0.005	0.01	0.01	—	49.7	49.7	< 0.005	0.01	0.04	52.1
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dust From Material Movement	—	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	< 0.005	—	8.23	8.23	< 0.005	< 0.005	0.01	8.62
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	1.37	1.21	1.82	35.6	0.00	0.00	98.7	98.7	0.00	10.4	10.4	—	5,194	5,194	0.17	0.16	17.2	5,261
Vendor	0.06	0.04	1.67	0.49	0.02	0.03	10.9	10.9	0.03	1.19	1.22	—	2,047	2,047	0.02	0.28	5.32	2,136
Hauling	0.04	0.02	2.18	0.33	0.02	0.05	10.9	11.0	0.05	1.20	1.25	—	2,278	2,278	0.02	0.36	4.88	2,390
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	1.16	1.01	2.11	19.0	0.00	0.00	98.7	98.7	0.00	10.4	10.4	—	4,384	4,384	0.18	0.16	0.44	4,435
Vendor	0.05	0.04	1.86	0.48	0.02	0.03	10.9	10.9	0.03	1.19	1.22	—	2,047	2,047	0.02	0.28	0.14	2,131
Hauling	0.04	0.02	2.41	0.33	0.02	0.05	10.9	11.0	0.05	1.20	1.25	—	2,278	2,278	0.02	0.36	0.13	2,386
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.33	0.29	0.58	6.83	0.00	0.00	26.7	26.7	0.00	2.83	2.83	—	1,292	1,292	0.05	0.04	2.03	1,308
Vendor	0.02	0.01	0.50	0.14	< 0.005	0.01	2.94	2.95	0.01	0.32	0.33	—	561	561	< 0.005	0.08	0.63	584
Hauling	0.01	0.01	0.65	0.09	< 0.005	0.01	2.96	2.97	0.01	0.33	0.34	—	624	624	< 0.005	0.10	0.58	654
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	0.06	0.05	0.10	1.25	0.00	0.00	4.87	4.87	0.00	0.52	0.52	—	214	214	0.01	0.01	0.34	217
Vendor	< 0.005	< 0.005	0.09	0.02	< 0.005	< 0.005	0.54	0.54	< 0.005	0.06	0.06	—	92.8	92.8	< 0.005	0.01	0.10	96.8
Hauling	< 0.005	< 0.005	0.12	0.02	< 0.005	< 0.005	0.54	0.54	< 0.005	0.06	0.06	—	103	103	< 0.005	0.02	0.10	108

3.3. Ph 2 PV Panel System (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dust From Material Movemen:	—	—	—	—	—	—	0.06	0.06	—	0.01	0.01	—	—	—	—	—	—	—
Onsite truck	0.01	0.01	0.31	0.14	< 0.005	< 0.005	0.70	0.70	< 0.005	0.08	0.08	—	181	181	< 0.005	0.03	0.35	190
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dust From Material Movemen:	—	—	—	—	—	—	0.06	0.06	—	0.01	0.01	—	—	—	—	—	—	—
Onsite truck	0.01	0.01	0.33	0.15	< 0.005	< 0.005	0.70	0.70	< 0.005	0.08	0.08	—	182	182	< 0.005	0.03	0.01	190
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dust From Material Movemen:	—	—	—	—	—	—	0.02	0.02	—	< 0.005	< 0.005	—	—	—	—	—	—	—

Onsite truck	0.01	< 0.005	0.13	0.06	< 0.005	< 0.005	0.28	0.28	< 0.005	0.03	0.03	—	74.6	74.6	< 0.005	0.01	0.06	78.1
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dust From Material Movement	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	0.05	0.05	< 0.005	0.01	0.01	—	12.3	12.3	< 0.005	< 0.005	0.01	12.9
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	3.85	3.41	5.13	100	0.00	0.00	278	278	0.00	29.4	29.4	—	14,608	14,608	0.48	0.44	48.2	14,798
Vendor	0.11	0.08	3.33	0.99	0.03	0.06	21.8	21.8	0.06	2.38	2.44	—	4,094	4,094	0.03	0.56	10.6	4,272
Hauling	0.39	0.22	19.6	2.97	0.14	0.42	98.4	98.8	0.42	10.8	11.3	—	20,500	20,500	0.15	3.22	43.9	21,508
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	3.27	2.83	5.92	53.4	0.00	0.00	278	278	0.00	29.4	29.4	—	12,329	12,329	0.50	0.44	1.25	12,473
Vendor	0.11	0.07	3.71	0.97	0.03	0.06	21.8	21.8	0.06	2.38	2.44	—	4,094	4,094	0.03	0.56	0.28	4,262
Hauling	0.38	0.21	21.7	3.00	0.14	0.42	98.4	98.8	0.42	10.8	11.3	—	20,505	20,505	0.15	3.22	1.14	21,471
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	1.41	1.23	2.43	28.8	0.00	0.00	113	113	0.00	11.9	11.9	—	5,451	5,451	0.20	0.18	8.56	5,518
Vendor	0.05	0.03	1.51	0.41	0.01	0.03	8.83	8.86	0.03	0.97	0.99	—	1,682	1,682	0.01	0.23	1.89	1,753
Hauling	0.16	0.09	8.78	1.23	0.06	0.17	39.9	40.1	0.17	4.40	4.58	—	8,425	8,425	0.06	1.32	7.79	8,829
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.26	0.22	0.44	5.26	0.00	0.00	20.5	20.5	0.00	2.18	2.18	—	902	902	0.03	0.03	1.42	914
Vendor	0.01	0.01	0.28	0.07	< 0.005	< 0.005	1.61	1.62	< 0.005	0.18	0.18	—	279	279	< 0.005	0.04	0.31	290
Hauling	0.03	0.02	1.60	0.22	0.01	0.03	7.29	7.32	0.03	0.80	0.83	—	1,395	1,395	0.01	0.22	1.29	1,462

3.4. Ph 2 PV Panel System (2026) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dust From Material Movement	—	—	—	—	—	—	0.02	0.02	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.01	0.01	0.31	0.14	< 0.005	< 0.005	0.34	0.34	< 0.005	0.04	0.04	—	181	181	< 0.005	0.03	0.35	190
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dust From Material Movement	—	—	—	—	—	—	0.02	0.02	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.01	0.01	0.33	0.15	< 0.005	< 0.005	0.34	0.34	< 0.005	0.04	0.04	—	182	182	< 0.005	0.03	0.01	190
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dust From Material Movement	—	—	—	—	—	—	0.01	0.01	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.01	< 0.005	0.13	0.06	< 0.005	< 0.005	0.14	0.14	< 0.005	0.02	0.02	—	74.6	74.6	< 0.005	0.01	0.06	78.1
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Dust From Material Movement	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	0.02	0.03	< 0.005	< 0.005	< 0.005	—	12.3	12.3	< 0.005	< 0.005	0.01	12.9
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	3.85	3.41	5.13	100	0.00	0.00	278	278	0.00	29.4	29.4	—	14,608	14,608	0.48	0.44	48.2	14,798
Vendor	0.11	0.08	3.33	0.99	0.03	0.06	21.8	21.8	0.06	2.38	2.44	—	4,094	4,094	0.03	0.56	10.6	4,272
Hauling	0.39	0.22	19.6	2.97	0.14	0.42	98.4	98.8	0.42	10.8	11.3	—	20,500	20,500	0.15	3.22	43.9	21,508
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	3.27	2.83	5.92	53.4	0.00	0.00	278	278	0.00	29.4	29.4	—	12,329	12,329	0.50	0.44	1.25	12,473
Vendor	0.11	0.07	3.71	0.97	0.03	0.06	21.8	21.8	0.06	2.38	2.44	—	4,094	4,094	0.03	0.56	0.28	4,262
Hauling	0.38	0.21	21.7	3.00	0.14	0.42	98.4	98.8	0.42	10.8	11.3	—	20,505	20,505	0.15	3.22	1.14	21,471
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	1.41	1.23	2.43	28.8	0.00	0.00	113	113	0.00	11.9	11.9	—	5,451	5,451	0.20	0.18	8.56	5,518
Vendor	0.05	0.03	1.51	0.41	0.01	0.03	8.83	8.86	0.03	0.97	0.99	—	1,682	1,682	0.01	0.23	1.89	1,753
Hauling	0.16	0.09	8.78	1.23	0.06	0.17	39.9	40.1	0.17	4.40	4.58	—	8,425	8,425	0.06	1.32	7.79	8,829
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.26	0.22	0.44	5.26	0.00	0.00	20.5	20.5	0.00	2.18	2.18	—	902	902	0.03	0.03	1.42	914
Vendor	0.01	0.01	0.28	0.07	< 0.005	< 0.005	1.61	1.62	< 0.005	0.18	0.18	—	279	279	< 0.005	0.04	0.31	290
Hauling	0.03	0.02	1.60	0.22	0.01	0.03	7.29	7.32	0.03	0.80	0.83	—	1,395	1,395	0.01	0.22	1.29	1,462

3.5. Ph 3 Inverters, Transformers, Substation, Electrical (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.01	0.01	0.31	0.14	< 0.005	< 0.005	0.70	0.70	< 0.005	0.08	0.08	—	181	181	< 0.005	0.03	0.35	190
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.01	0.01	0.33	0.15	< 0.005	< 0.005	0.70	0.70	< 0.005	0.08	0.08	—	182	182	< 0.005	0.03	0.01	190
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.08	0.03	< 0.005	< 0.005	0.16	0.16	< 0.005	0.02	0.02	—	43.0	43.0	< 0.005	0.01	0.04	45.0
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	0.03	0.03	< 0.005	< 0.005	< 0.005	—	7.11	7.11	< 0.005	< 0.005	0.01	7.45
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	3.85	3.41	5.13	100	0.00	0.00	278	278	0.00	29.4	29.4	—	14,608	14,608	0.48	0.44	48.2	14,798
Vendor	0.06	0.04	1.67	0.49	0.02	0.03	10.9	10.9	0.03	1.19	1.22	—	2,047	2,047	0.02	0.28	5.32	2,136
Hauling	0.39	0.22	19.6	2.97	0.14	0.42	98.4	98.8	0.42	10.8	11.3	—	20,500	20,500	0.15	3.22	43.9	21,508
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	3.27	2.83	5.92	53.4	0.00	0.00	278	278	0.00	29.4	29.4	—	12,329	12,329	0.50	0.44	1.25	12,473
Vendor	0.05	0.04	1.86	0.48	0.02	0.03	10.9	10.9	0.03	1.19	1.22	—	2,047	2,047	0.02	0.28	0.14	2,131

Hauling	0.38	0.21	21.7	3.00	0.14	0.42	98.4	98.8	0.42	10.8	11.3	—	20,505	20,505	0.15	3.22	1.14	21,471
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.81	0.71	1.40	16.6	0.00	0.00	64.9	64.9	0.00	6.87	6.87	—	3,141	3,141	0.12	0.10	4.93	3,179
Vendor	0.01	0.01	0.44	0.12	< 0.005	0.01	2.55	2.55	0.01	0.28	0.29	—	485	485	< 0.005	0.07	0.54	505
Hauling	0.09	0.05	5.06	0.71	0.03	0.10	23.0	23.1	0.10	2.54	2.64	—	4,855	4,855	0.04	0.76	4.49	5,087
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.15	0.13	0.26	3.03	0.00	0.00	11.8	11.8	0.00	1.25	1.25	—	520	520	0.02	0.02	0.82	526
Vendor	< 0.005	< 0.005	0.08	0.02	< 0.005	< 0.005	0.46	0.47	< 0.005	0.05	0.05	—	80.2	80.2	< 0.005	0.01	0.09	83.6
Hauling	0.02	0.01	0.92	0.13	0.01	0.02	4.20	4.22	0.02	0.46	0.48	—	804	804	0.01	0.13	0.74	842

3.6. Ph 3 Inverters, Transformers, Substation, Electrical (2026) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.01	0.01	0.31	0.14	< 0.005	< 0.005	0.34	0.34	< 0.005	0.04	0.04	—	181	181	< 0.005	0.03	0.35	190
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.01	0.01	0.33	0.15	< 0.005	< 0.005	0.34	0.34	< 0.005	0.04	0.04	—	182	182	< 0.005	0.03	0.01	190
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.08	0.03	< 0.005	< 0.005	0.08	0.08	< 0.005	0.01	0.01	—	43.0	43.0	< 0.005	0.01	0.04	45.0
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Onsite truck	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	7.11	7.11	< 0.005	< 0.005	0.01	7.45
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	3.85	3.41	5.13	100	0.00	0.00	278	278	0.00	29.4	29.4	—	14,608	14,608	0.48	0.44	48.2	14,798
Vendor	0.06	0.04	1.67	0.49	0.02	0.03	10.9	10.9	0.03	1.19	1.22	—	2,047	2,047	0.02	0.28	5.32	2,136
Hauling	0.39	0.22	19.6	2.97	0.14	0.42	98.4	98.8	0.42	10.8	11.3	—	20,500	20,500	0.15	3.22	43.9	21,508
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	3.27	2.83	5.92	53.4	0.00	0.00	278	278	0.00	29.4	29.4	—	12,329	12,329	0.50	0.44	1.25	12,473
Vendor	0.05	0.04	1.86	0.48	0.02	0.03	10.9	10.9	0.03	1.19	1.22	—	2,047	2,047	0.02	0.28	0.14	2,131
Hauling	0.38	0.21	21.7	3.00	0.14	0.42	98.4	98.8	0.42	10.8	11.3	—	20,505	20,505	0.15	3.22	1.14	21,471
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.81	0.71	1.40	16.6	0.00	0.00	64.9	64.9	0.00	6.87	6.87	—	3,141	3,141	0.12	0.10	4.93	3,179
Vendor	0.01	0.01	0.44	0.12	< 0.005	0.01	2.55	2.55	0.01	0.28	0.29	—	485	485	< 0.005	0.07	0.54	505
Hauling	0.09	0.05	5.06	0.71	0.03	0.10	23.0	23.1	0.10	2.54	2.64	—	4,855	4,855	0.04	0.76	4.49	5,087
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.15	0.13	0.26	3.03	0.00	0.00	11.8	11.8	0.00	1.25	1.25	—	520	520	0.02	0.02	0.82	526
Vendor	< 0.005	< 0.005	0.08	0.02	< 0.005	< 0.005	0.46	0.47	< 0.005	0.05	0.05	—	80.2	80.2	< 0.005	0.01	0.09	83.6
Hauling	0.02	0.01	0.92	0.13	0.01	0.02	4.20	4.22	0.02	0.46	0.48	—	804	804	0.01	0.13	0.74	842

3.7. Ph 3 Inverters, Transformers, Substation, Electrical (2027) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.01	0.01	0.30	0.14	< 0.005	< 0.005	0.70	0.70	< 0.005	0.08	0.08	—	177	177	< 0.005	0.03	0.32	186
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.01	0.01	0.33	0.15	< 0.005	< 0.005	0.70	0.70	< 0.005	0.08	0.08	—	178	178	< 0.005	0.03	0.01	186
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.06	0.03	< 0.005	< 0.005	0.12	0.12	< 0.005	0.01	0.01	—	31.9	31.9	< 0.005	0.01	0.03	33.5
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	< 0.005	—	5.29	5.29	< 0.005	< 0.005	< 0.005	5.55
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	3.69	3.26	4.71	90.6	0.00	0.00	278	278	0.00	29.4	29.4	—	14,353	14,353	0.48	0.44	43.9	14,539
Vendor	0.06	0.04	1.57	0.43	0.02	0.03	10.9	10.9	0.03	1.19	1.22	—	2,005	2,005	0.02	0.28	4.63	2,093
Hauling	0.39	0.22	19.1	2.83	0.14	0.42	98.4	98.8	0.42	10.8	11.3	—	20,031	20,031	0.15	3.22	40.7	21,036
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	2.78	2.34	5.51	47.9	0.00	0.00	278	278	0.00	29.4	29.4	—	12,120	12,120	0.50	0.44	1.13	12,263
Vendor	0.04	0.04	1.75	0.42	0.02	0.03	10.9	10.9	0.03	1.19	1.22	—	2,005	2,005	0.02	0.28	0.12	2,089
Hauling	0.37	0.21	21.1	2.87	0.14	0.42	98.4	98.8	0.42	10.8	11.3	—	20,036	20,036	0.15	3.22	1.06	21,001
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.60	0.52	0.92	11.4	0.00	0.00	49.3	49.3	0.00	5.23	5.23	—	2,347	2,347	0.09	0.08	3.41	2,375

Vendor	0.01	0.01	0.31	0.08	< 0.005	0.01	1.94	1.94	0.01	0.21	0.22	—	361	361	< 0.005	0.05	0.36	376
Hauling	0.07	0.04	3.74	0.51	0.03	0.08	17.5	17.6	0.08	1.93	2.00	—	3,607	3,607	0.03	0.58	3.17	3,783
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.11	0.09	0.17	2.07	0.00	0.00	9.00	9.00	0.00	0.95	0.95	—	389	389	0.01	0.01	0.56	393
Vendor	< 0.005	< 0.005	0.06	0.01	< 0.005	< 0.005	0.35	0.35	< 0.005	0.04	0.04	—	59.8	59.8	< 0.005	0.01	0.06	62.3
Hauling	0.01	0.01	0.68	0.09	< 0.005	0.01	3.19	3.21	0.01	0.35	0.37	—	597	597	< 0.005	0.10	0.53	626

3.8. Ph 3 Inverters, Transformers, Substation, Electrical (2027) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.01	0.01	0.30	0.14	< 0.005	< 0.005	0.34	0.34	< 0.005	0.04	0.04	—	177	177	< 0.005	0.03	0.32	186
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.01	0.01	0.33	0.15	< 0.005	< 0.005	0.34	0.34	< 0.005	0.04	0.04	—	178	178	< 0.005	0.03	0.01	186
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.06	0.03	< 0.005	< 0.005	0.06	0.06	< 0.005	0.01	0.01	—	31.9	31.9	< 0.005	0.01	0.03	33.5
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	5.29	5.29	< 0.005	< 0.005	< 0.005	5.55
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	3.69	3.26	4.71	90.6	0.00	0.00	278	278	0.00	29.4	29.4	—	14,353	14,353	0.48	0.44	43.9	14,539
Vendor	0.06	0.04	1.57	0.43	0.02	0.03	10.9	10.9	0.03	1.19	1.22	—	2,005	2,005	0.02	0.28	4.63	2,093
Hauling	0.39	0.22	19.1	2.83	0.14	0.42	98.4	98.8	0.42	10.8	11.3	—	20,031	20,031	0.15	3.22	40.7	21,036
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	2.78	2.34	5.51	47.9	0.00	0.00	278	278	0.00	29.4	29.4	—	12,120	12,120	0.50	0.44	1.13	12,263
Vendor	0.04	0.04	1.75	0.42	0.02	0.03	10.9	10.9	0.03	1.19	1.22	—	2,005	2,005	0.02	0.28	0.12	2,089
Hauling	0.37	0.21	21.1	2.87	0.14	0.42	98.4	98.8	0.42	10.8	11.3	—	20,036	20,036	0.15	3.22	1.06	21,001
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.60	0.52	0.92	11.4	0.00	0.00	49.3	49.3	0.00	5.23	5.23	—	2,347	2,347	0.09	0.08	3.41	2,375
Vendor	0.01	0.01	0.31	0.08	< 0.005	0.01	1.94	1.94	0.01	0.21	0.22	—	361	361	< 0.005	0.05	0.36	376
Hauling	0.07	0.04	3.74	0.51	0.03	0.08	17.5	17.6	0.08	1.93	2.00	—	3,607	3,607	0.03	0.58	3.17	3,783
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.11	0.09	0.17	2.07	0.00	0.00	9.00	9.00	0.00	0.95	0.95	—	389	389	0.01	0.01	0.56	393
Vendor	< 0.005	< 0.005	0.06	0.01	< 0.005	< 0.005	0.35	0.35	< 0.005	0.04	0.04	—	59.8	59.8	< 0.005	0.01	0.06	62.3
Hauling	0.01	0.01	0.68	0.09	< 0.005	0.01	3.19	3.21	0.01	0.35	0.37	—	597	597	< 0.005	0.10	0.53	626

3.9. Ph 4 Gen Tie (2027) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.01	0.01	0.33	0.15	< 0.005	< 0.005	0.70	0.70	< 0.005	0.08	0.08	—	178	178	< 0.005	0.03	0.01	186
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.03	0.01	< 0.005	< 0.005	0.06	0.06	< 0.005	0.01	0.01	—	14.6	14.6	< 0.005	< 0.005	0.01	15.3
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	2.41	2.41	< 0.005	< 0.005	< 0.005	2.53
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.62	0.52	1.22	10.6	0.00	0.00	61.7	61.7	0.00	6.53	6.53	—	2,693	2,693	0.11	0.10	0.25	2,725
Vendor	0.04	0.04	1.75	0.42	0.02	0.03	10.9	10.9	0.03	1.19	1.22	—	2,005	2,005	0.02	0.28	0.12	2,089
Hauling	0.17	0.09	9.39	1.27	0.06	0.19	43.7	43.9	0.19	4.82	5.00	—	8,905	8,905	0.07	1.43	0.47	9,334
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.05	0.09	1.15	0.00	0.00	5.00	5.00	0.00	0.53	0.53	—	238	238	0.01	0.01	0.35	241
Vendor	< 0.005	< 0.005	0.14	0.04	< 0.005	< 0.005	0.88	0.89	< 0.005	0.10	0.10	—	165	165	< 0.005	0.02	0.16	172
Hauling	0.01	0.01	0.76	0.10	0.01	0.02	3.55	3.56	0.02	0.39	0.41	—	732	732	0.01	0.12	0.64	768
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.02	0.21	0.00	0.00	0.91	0.91	0.00	0.10	0.10	—	39.4	39.4	< 0.005	< 0.005	0.06	39.9
Vendor	< 0.005	< 0.005	0.03	0.01	< 0.005	< 0.005	0.16	0.16	< 0.005	0.02	0.02	—	27.3	27.3	< 0.005	< 0.005	0.03	28.5
Hauling	< 0.005	< 0.005	0.14	0.02	< 0.005	< 0.005	0.65	0.65	< 0.005	0.07	0.07	—	121	121	< 0.005	0.02	0.11	127

3.10. Ph 4 Gen Tie (2027) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.01	0.01	0.33	0.15	< 0.005	< 0.005	0.34	0.34	< 0.005	0.04	0.04	—	178	178	< 0.005	0.03	0.01	186
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.03	0.01	< 0.005	< 0.005	0.03	0.03	< 0.005	< 0.005	< 0.005	—	14.6	14.6	< 0.005	< 0.005	0.01	15.3
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	—	2.41	2.41	< 0.005	< 0.005	< 0.005	2.53
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.62	0.52	1.22	10.6	0.00	0.00	61.7	61.7	0.00	6.53	6.53	—	2,693	2,693	0.11	0.10	0.25	2,725
Vendor	0.04	0.04	1.75	0.42	0.02	0.03	10.9	10.9	0.03	1.19	1.22	—	2,005	2,005	0.02	0.28	0.12	2,089
Hauling	0.17	0.09	9.39	1.27	0.06	0.19	43.7	43.9	0.19	4.82	5.00	—	8,905	8,905	0.07	1.43	0.47	9,334
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.05	0.09	1.15	0.00	0.00	5.00	5.00	0.00	0.53	0.53	—	238	238	0.01	0.01	0.35	241

Vendor	< 0.005	< 0.005	0.14	0.04	< 0.005	< 0.005	0.88	0.89	< 0.005	0.10	0.10	—	165	165	< 0.005	0.02	0.16	172
Hauling	0.01	0.01	0.76	0.10	0.01	0.02	3.55	3.56	0.02	0.39	0.41	—	732	732	0.01	0.12	0.64	768
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.02	0.21	0.00	0.00	0.91	0.91	0.00	0.10	0.10	—	39.4	39.4	< 0.005	< 0.005	0.06	39.9
Vendor	< 0.005	< 0.005	0.03	0.01	< 0.005	< 0.005	0.16	0.16	< 0.005	0.02	0.02	—	27.3	27.3	< 0.005	< 0.005	0.03	28.5
Hauling	< 0.005	< 0.005	0.14	0.02	< 0.005	< 0.005	0.65	0.65	< 0.005	0.07	0.07	—	121	121	< 0.005	0.02	0.11	127

3.11. Ph 5 Battery Storage (2027) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Paving	—	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.01	0.01	0.30	0.14	< 0.005	< 0.005	0.70	0.70	< 0.005	0.08	0.08	—	177	177	< 0.005	0.03	0.32	186
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Paving	—	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.01	0.01	0.33	0.15	< 0.005	< 0.005	0.70	0.70	< 0.005	0.08	0.08	—	178	178	< 0.005	0.03	0.01	186
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Paving	—	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.01	< 0.005	0.14	0.06	< 0.005	< 0.005	0.30	0.30	< 0.005	0.03	0.03	—	77.7	77.7	< 0.005	0.01	0.06	81.6
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Paving	—	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Onsite truck	< 0.005	< 0.005	0.03	0.01	< 0.005	< 0.005	0.06	0.06	< 0.005	0.01	0.01	—	12.9	12.9	< 0.005	< 0.005	0.01	13.5
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.82	0.73	1.05	20.1	0.00	0.00	61.7	61.7	0.00	6.53	6.53	—	3,190	3,190	0.11	0.10	9.75	3,231
Vendor	0.06	0.04	1.57	0.43	0.02	0.03	10.9	10.9	0.03	1.19	1.22	—	2,005	2,005	0.02	0.28	4.63	2,093
Hauling	0.17	0.10	8.48	1.26	0.06	0.19	43.7	43.9	0.19	4.82	5.00	—	8,903	8,903	0.07	1.43	18.1	9,349
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.62	0.52	1.22	10.6	0.00	0.00	61.7	61.7	0.00	6.53	6.53	—	2,693	2,693	0.11	0.10	0.25	2,725
Vendor	0.04	0.04	1.75	0.42	0.02	0.03	10.9	10.9	0.03	1.19	1.22	—	2,005	2,005	0.02	0.28	0.12	2,089
Hauling	0.17	0.09	9.39	1.27	0.06	0.19	43.7	43.9	0.19	4.82	5.00	—	8,905	8,905	0.07	1.43	0.47	9,334
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.32	0.28	0.50	6.14	0.00	0.00	26.7	26.7	0.00	2.83	2.83	—	1,270	1,270	0.05	0.04	1.85	1,285
Vendor	0.02	0.02	0.76	0.19	0.01	0.01	4.71	4.72	0.01	0.52	0.53	—	879	879	0.01	0.12	0.88	916
Hauling	0.07	0.04	4.05	0.55	0.03	0.08	18.9	19.0	0.08	2.09	2.17	—	3,903	3,903	0.03	0.63	3.43	4,094
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.05	0.09	1.12	0.00	0.00	4.87	4.87	0.00	0.52	0.52	—	210	210	0.01	0.01	0.31	213
Vendor	< 0.005	< 0.005	0.14	0.03	< 0.005	< 0.005	0.86	0.86	< 0.005	0.09	0.10	—	146	146	< 0.005	0.02	0.15	152
Hauling	0.01	0.01	0.74	0.10	0.01	0.01	3.45	3.47	0.01	0.38	0.40	—	646	646	< 0.005	0.10	0.57	678

3.12. Ph 5 Battery Storage (2027) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Paving	—	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.01	0.01	0.30	0.14	< 0.005	< 0.005	0.34	0.34	< 0.005	0.04	0.04	—	177	177	< 0.005	0.03	0.32	186
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Paving	—	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.01	0.01	0.33	0.15	< 0.005	< 0.005	0.34	0.34	< 0.005	0.04	0.04	—	178	178	< 0.005	0.03	0.01	186
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Paving	—	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.01	< 0.005	0.14	0.06	< 0.005	< 0.005	0.15	0.15	< 0.005	0.02	0.02	—	77.7	77.7	< 0.005	0.01	0.06	81.6
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Paving	—	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.03	0.01	< 0.005	< 0.005	0.03	0.03	< 0.005	< 0.005	< 0.005	—	12.9	12.9	< 0.005	< 0.005	0.01	13.5
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.82	0.73	1.05	20.1	0.00	0.00	61.7	61.7	0.00	6.53	6.53	—	3,190	3,190	0.11	0.10	9.75	3,231
Vendor	0.06	0.04	1.57	0.43	0.02	0.03	10.9	10.9	0.03	1.19	1.22	—	2,005	2,005	0.02	0.28	4.63	2,093
Hauling	0.17	0.10	8.48	1.26	0.06	0.19	43.7	43.9	0.19	4.82	5.00	—	8,903	8,903	0.07	1.43	18.1	9,349
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.62	0.52	1.22	10.6	0.00	0.00	61.7	61.7	0.00	6.53	6.53	—	2,693	2,693	0.11	0.10	0.25	2,725

Vendor	0.04	0.04	1.75	0.42	0.02	0.03	10.9	10.9	0.03	1.19	1.22	—	2,005	2,005	0.02	0.28	0.12	2,089
Hauling	0.17	0.09	9.39	1.27	0.06	0.19	43.7	43.9	0.19	4.82	5.00	—	8,905	8,905	0.07	1.43	0.47	9,334
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.32	0.28	0.50	6.14	0.00	0.00	26.7	26.7	0.00	2.83	2.83	—	1,270	1,270	0.05	0.04	1.85	1,285
Vendor	0.02	0.02	0.76	0.19	0.01	0.01	4.71	4.72	0.01	0.52	0.53	—	879	879	0.01	0.12	0.88	916
Hauling	0.07	0.04	4.05	0.55	0.03	0.08	18.9	19.0	0.08	2.09	2.17	—	3,903	3,903	0.03	0.63	3.43	4,094
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.05	0.09	1.12	0.00	0.00	4.87	4.87	0.00	0.52	0.52	—	210	210	0.01	0.01	0.31	213
Vendor	< 0.005	< 0.005	0.14	0.03	< 0.005	< 0.005	0.86	0.86	< 0.005	0.09	0.10	—	146	146	< 0.005	0.02	0.15	152
Hauling	0.01	0.01	0.74	0.10	0.01	0.01	3.45	3.47	0.01	0.38	0.40	—	646	646	< 0.005	0.10	0.57	678

3.13. Ph 6 Utility Switchyard (2027) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.01	0.01	0.30	0.14	< 0.005	< 0.005	0.70	0.70	< 0.005	0.08	0.08	—	177	177	< 0.005	0.03	0.32	186
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.01	0.01	0.33	0.15	< 0.005	< 0.005	0.70	0.70	< 0.005	0.08	0.08	—	178	178	< 0.005	0.03	0.01	186
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.01	0.01	0.17	0.08	< 0.005	< 0.005	0.38	0.38	< 0.005	0.04	0.04	—	97.2	97.2	< 0.005	0.02	0.08	102

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.03	0.01	< 0.005	< 0.005	0.07	0.07	< 0.005	0.01	0.01	—	16.1	16.1	< 0.005	< 0.005	0.01	16.9
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.41	0.36	0.52	10.1	0.00	0.00	30.8	30.8	0.00	3.27	3.27	—	1,595	1,595	0.05	0.05	4.87	1,615
Vendor	0.06	0.04	1.57	0.43	0.02	0.03	10.9	10.9	0.03	1.19	1.22	—	2,005	2,005	0.02	0.28	4.63	2,093
Hauling	0.17	0.10	8.48	1.26	0.06	0.19	43.7	43.9	0.19	4.82	5.00	—	8,903	8,903	0.07	1.43	18.1	9,349
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.31	0.26	0.61	5.32	0.00	0.00	30.8	30.8	0.00	3.27	3.27	—	1,347	1,347	0.06	0.05	0.13	1,363
Vendor	0.04	0.04	1.75	0.42	0.02	0.03	10.9	10.9	0.03	1.19	1.22	—	2,005	2,005	0.02	0.28	0.12	2,089
Hauling	0.17	0.09	9.39	1.27	0.06	0.19	43.7	43.9	0.19	4.82	5.00	—	8,905	8,905	0.07	1.43	0.47	9,334
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.20	0.18	0.31	3.84	0.00	0.00	16.7	16.7	0.00	1.77	1.77	—	794	794	0.03	0.03	1.15	803
Vendor	0.03	0.02	0.95	0.24	0.01	0.02	5.89	5.91	0.02	0.64	0.66	—	1,099	1,099	0.01	0.15	1.10	1,146
Hauling	0.09	0.05	5.06	0.69	0.03	0.10	23.7	23.8	0.10	2.61	2.71	—	4,879	4,879	0.04	0.78	4.29	5,118
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.03	0.06	0.70	0.00	0.00	3.04	3.04	0.00	0.32	0.32	—	131	131	< 0.005	< 0.005	0.19	133
Vendor	0.01	< 0.005	0.17	0.04	< 0.005	< 0.005	1.07	1.08	< 0.005	0.12	0.12	—	182	182	< 0.005	0.03	0.18	190
Hauling	0.02	0.01	0.92	0.13	0.01	0.02	4.32	4.34	0.02	0.48	0.49	—	808	808	0.01	0.13	0.71	847

3.14. Ph 6 Utility Switchyard (2027) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.01	0.01	0.30	0.14	< 0.005	< 0.005	0.34	0.34	< 0.005	0.04	0.04	—	177	177	< 0.005	0.03	0.32	186
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.01	0.01	0.33	0.15	< 0.005	< 0.005	0.34	0.34	< 0.005	0.04	0.04	—	178	178	< 0.005	0.03	0.01	186
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.01	0.01	0.17	0.08	< 0.005	< 0.005	0.18	0.18	< 0.005	0.02	0.02	—	97.2	97.2	< 0.005	0.02	0.08	102
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.03	0.01	< 0.005	< 0.005	0.03	0.03	< 0.005	< 0.005	< 0.005	—	16.1	16.1	< 0.005	< 0.005	0.01	16.9
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.41	0.36	0.52	10.1	0.00	0.00	30.8	30.8	0.00	3.27	3.27	—	1,595	1,595	0.05	0.05	4.87	1,615
Vendor	0.06	0.04	1.57	0.43	0.02	0.03	10.9	10.9	0.03	1.19	1.22	—	2,005	2,005	0.02	0.28	4.63	2,093
Hauling	0.17	0.10	8.48	1.26	0.06	0.19	43.7	43.9	0.19	4.82	5.00	—	8,903	8,903	0.07	1.43	18.1	9,349
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.31	0.26	0.61	5.32	0.00	0.00	30.8	30.8	0.00	3.27	3.27	—	1,347	1,347	0.06	0.05	0.13	1,363
Vendor	0.04	0.04	1.75	0.42	0.02	0.03	10.9	10.9	0.03	1.19	1.22	—	2,005	2,005	0.02	0.28	0.12	2,089
Hauling	0.17	0.09	9.39	1.27	0.06	0.19	43.7	43.9	0.19	4.82	5.00	—	8,905	8,905	0.07	1.43	0.47	9,334
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	0.20	0.18	0.31	3.84	0.00	0.00	16.7	16.7	0.00	1.77	1.77	—	794	794	0.03	0.03	1.15	803
Vendor	0.03	0.02	0.95	0.24	0.01	0.02	5.89	5.91	0.02	0.64	0.66	—	1,099	1,099	0.01	0.15	1.10	1,146
Hauling	0.09	0.05	5.06	0.69	0.03	0.10	23.7	23.8	0.10	2.61	2.71	—	4,879	4,879	0.04	0.78	4.29	5,118
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.03	0.06	0.70	0.00	0.00	3.04	3.04	0.00	0.32	0.32	—	131	131	< 0.005	< 0.005	0.19	133
Vendor	0.01	< 0.005	0.17	0.04	< 0.005	< 0.005	1.07	1.08	< 0.005	0.12	0.12	—	182	182	< 0.005	0.03	0.18	190
Hauling	0.02	0.01	0.92	0.13	0.01	0.02	4.32	4.34	0.02	0.48	0.49	—	808	808	0.01	0.13	0.71	847

4. Operations Emissions Details

4.1. Mobile Emissions by Land Use

4.1.1. Unmitigated

Mobile source emissions results are presented in Sections 2.6. No further detailed breakdown of emissions is available.

4.1.2. Mitigated

Mobile source emissions results are presented in Sections 2.5. No further detailed breakdown of emissions is available.

4.2. Energy

4.2.1. Electricity Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Heavy Industry	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00

General Light Industry	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Heavy Industry	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Heavy Industry	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00

4.2.2. Electricity Emissions By Land Use - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Heavy Industry	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00

General Light Industry	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Heavy Industry	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Heavy Industry	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00

4.2.3. Natural Gas Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Heavy Industry	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00

General Light Industry	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Heavy Industry	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
General Light Industry	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Heavy Industry	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
General Light Industry	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00

4.2.4. Natural Gas Emissions By Land Use - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Heavy Industry	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00

General Light Industry	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Heavy Industry	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
General Light Industry	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Heavy Industry	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
General Light Industry	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00

4.3. Area Emissions by Source

4.3.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Consumer Products	—	0.06	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	0.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.02	0.02	< 0.005	0.13	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.54	0.54	< 0.005	< 0.005	—	0.54
Total	0.02	0.10	< 0.005	0.13	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.54	0.54	< 0.005	< 0.005	—	0.54
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	—	0.06	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	0.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	0.08	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	—	0.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	< 0.005	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	< 0.005	< 0.005	< 0.005	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.04	0.04	< 0.005	< 0.005	—	0.04
Total	< 0.005	0.02	< 0.005	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.04	0.04	< 0.005	< 0.005	—	0.04

4.3.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	—	0.06	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	0.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.02	0.02	< 0.005	0.13	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.54	0.54	< 0.005	< 0.005	—	0.54
Total	0.02	0.10	< 0.005	0.13	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.54	0.54	< 0.005	< 0.005	—	0.54
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	—	0.06	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	0.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	0.08	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	—	0.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	< 0.005	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Landscape Equipme	< 0.005	< 0.005	< 0.005	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.04	0.04	< 0.005	< 0.005	—	0.04
Total	< 0.005	0.02	< 0.005	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.04	0.04	< 0.005	< 0.005	—	0.04

4.4. Water Emissions by Land Use

4.4.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Heavy Industry	—	—	—	—	—	—	—	—	—	—	—	0.00	65.6	65.6	< 0.005	< 0.005	—	65.9
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	1.33	4.11	5.44	0.14	< 0.005	—	9.83
Total	—	—	—	—	—	—	—	—	—	—	—	1.33	69.7	71.0	0.14	< 0.005	—	75.7
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Heavy Industry	—	—	—	—	—	—	—	—	—	—	—	0.00	65.6	65.6	< 0.005	< 0.005	—	65.9
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	1.33	4.11	5.44	0.14	< 0.005	—	9.83
Total	—	—	—	—	—	—	—	—	—	—	—	1.33	69.7	71.0	0.14	< 0.005	—	75.7
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

General Heavy Industry	—	—	—	—	—	—	—	—	—	—	—	0.00	10.9	10.9	< 0.005	< 0.005	—	10.9
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	0.22	0.68	0.90	0.02	< 0.005	—	1.63
Total	—	—	—	—	—	—	—	—	—	—	—	0.22	11.5	11.8	0.02	< 0.005	—	12.5

4.4.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Heavy Industry	—	—	—	—	—	—	—	—	—	—	—	0.00	65.6	65.6	< 0.005	< 0.005	—	65.9
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	1.33	4.11	5.44	0.14	< 0.005	—	9.83
Total	—	—	—	—	—	—	—	—	—	—	—	1.33	69.7	71.0	0.14	< 0.005	—	75.7
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Heavy Industry	—	—	—	—	—	—	—	—	—	—	—	0.00	65.6	65.6	< 0.005	< 0.005	—	65.9
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	1.33	4.11	5.44	0.14	< 0.005	—	9.83
Total	—	—	—	—	—	—	—	—	—	—	—	1.33	69.7	71.0	0.14	< 0.005	—	75.7
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

General Heavy Industry	—	—	—	—	—	—	—	—	—	—	—	0.00	10.9	10.9	< 0.005	< 0.005	—	10.9
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	0.22	0.68	0.90	0.02	< 0.005	—	1.63
Total	—	—	—	—	—	—	—	—	—	—	—	0.22	11.5	11.8	0.02	< 0.005	—	12.5

4.5. Waste Emissions by Land Use

4.5.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Heavy Industry	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	2.00	0.00	2.00	0.20	0.00	—	7.01
Total	—	—	—	—	—	—	—	—	—	—	—	2.00	0.00	2.00	0.20	0.00	—	7.01
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Heavy Industry	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	2.00	0.00	2.00	0.20	0.00	—	7.01
Total	—	—	—	—	—	—	—	—	—	—	—	2.00	0.00	2.00	0.20	0.00	—	7.01

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Heavy Industry	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	0.33	0.00	0.33	0.03	0.00	—	1.16
Total	—	—	—	—	—	—	—	—	—	—	—	0.33	0.00	0.33	0.03	0.00	—	1.16

4.5.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Heavy Industry	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	2.00	0.00	2.00	0.20	0.00	—	7.01
Total	—	—	—	—	—	—	—	—	—	—	—	2.00	0.00	2.00	0.20	0.00	—	7.01
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Heavy Industry	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	2.00	0.00	2.00	0.20	0.00	—	7.01
Total	—	—	—	—	—	—	—	—	—	—	—	2.00	0.00	2.00	0.20	0.00	—	7.01
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

General Heavy Industry	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	0.33	0.00	0.33	0.03	0.00	—	1.16
Total	—	—	—	—	—	—	—	—	—	—	—	0.33	0.00	0.33	0.03	0.00	—	1.16

4.6. Refrigerant Emissions by Land Use

4.6.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.78	0.78
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.78	0.78
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.78	0.78
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.78	0.78
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.13	0.13
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.13	0.13

4.6.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.78	0.78
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.78	0.78
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.78	0.78
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.78	0.78
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.13	0.13
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.13	0.13

4.7. Offroad Emissions By Equipment Type

4.7.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.7.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.8. Stationary Emissions By Equipment Type

4.8.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipme Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Emergency Generator	0.05	0.05	0.16	0.18	< 0.005	0.01	0.00	0.01	0.01	0.00	0.01	0.00	25.6	25.6	< 0.005	< 0.005	0.00	25.7
Total	0.05	0.05	0.16	0.18	< 0.005	0.01	0.00	0.01	0.01	0.00	0.01	0.00	25.6	25.6	< 0.005	< 0.005	0.00	25.7
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Emergency Generator	0.05	0.05	0.16	0.18	< 0.005	0.01	0.00	0.01	0.01	0.00	0.01	0.00	25.6	25.6	< 0.005	< 0.005	0.00	25.7
Total	0.05	0.05	0.16	0.18	< 0.005	0.01	0.00	0.01	0.01	0.00	0.01	0.00	25.6	25.6	< 0.005	< 0.005	0.00	25.7
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Emergency Generator	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	0.00	< 0.005	< 0.005	0.00	< 0.005	0.00	1.16	1.16	< 0.005	< 0.005	0.00	1.17
Total	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	0.00	< 0.005	< 0.005	0.00	< 0.005	0.00	1.16	1.16	< 0.005	< 0.005	0.00	1.17

4.8.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Emergency	0.05	0.05	0.16	0.18	< 0.005	0.01	0.00	0.01	0.01	0.00	0.01	0.00	25.6	25.6	< 0.005	< 0.005	0.00	25.7
Total	0.05	0.05	0.16	0.18	< 0.005	0.01	0.00	0.01	0.01	0.00	0.01	0.00	25.6	25.6	< 0.005	< 0.005	0.00	25.7
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Emergency Generator	0.05	0.05	0.16	0.18	< 0.005	0.01	0.00	0.01	0.01	0.00	0.01	0.00	25.6	25.6	< 0.005	< 0.005	0.00	25.7
Total	0.05	0.05	0.16	0.18	< 0.005	0.01	0.00	0.01	0.01	0.00	0.01	0.00	25.6	25.6	< 0.005	< 0.005	0.00	25.7
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Emergency Generator	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	0.00	< 0.005	< 0.005	0.00	< 0.005	0.00	1.16	1.16	< 0.005	< 0.005	0.00	1.17
Total	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	0.00	< 0.005	< 0.005	0.00	< 0.005	0.00	1.16	1.16	< 0.005	< 0.005	0.00	1.17

4.9. User Defined Emissions By Equipment Type

4.9.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.9.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Cropland	—	—	—	—	—	—	—	—	—	—	—	—	13,318	13,318	—	—	—	13,318
Total	—	—	—	—	—	—	—	—	—	—	—	—	13,318	13,318	—	—	—	13,318

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Cropland	—	—	—	—	—	—	—	—	—	—	—	—	13,318	13,318	—	—	—	13,318
Total	—	—	—	—	—	—	—	—	—	—	—	—	13,318	13,318	—	—	—	13,318
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Cropland	—	—	—	—	—	—	—	—	—	—	—	—	2,205	2,205	—	—	—	2,205
Total	—	—	—	—	—	—	—	—	—	—	—	—	2,205	2,205	—	—	—	2,205

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.4. Soil Carbon Accumulation By Vegetation Type - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Cropland	—	—	—	—	—	—	—	—	—	—	—	—	13,318	13,318	—	—	—	13,318
Total	—	—	—	—	—	—	—	—	—	—	—	—	13,318	13,318	—	—	—	13,318
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Cropland	—	—	—	—	—	—	—	—	—	—	—	—	13,318	13,318	—	—	—	13,318
Total	—	—	—	—	—	—	—	—	—	—	—	—	13,318	13,318	—	—	—	13,318
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Cropland	—	—	—	—	—	—	—	—	—	—	—	—	2,205	2,205	—	—	—	2,205
Total	—	—	—	—	—	—	—	—	—	—	—	—	2,205	2,205	—	—	—	2,205

4.10.5. Above and Belowground Carbon Accumulation by Land Use Type - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.6. Avoided and Sequestered Emissions by Species - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description
Ph 1 Site Preparation	Site Preparation	01/2/2026	6/2/2026	5.00	100	—
Ph 2 PV Panel System	Grading	4/2/2026	11/2/2026	5.00	150	—
Ph 3 Inverters, Transformers, Substation, Electrical	Building Construction	9/2/2026	4/2/2027	5.00	150	—
Ph 4 Gen Tie	Building Construction	2/2/2027	3/2/2027	5.00	30.0	—
Ph 5 Battery Storage	Paving	2/2/2027	10/2/2027	5.00	160	—
Ph 6 Utility Switchyard	Trenching	2/2/2027	12/2/2027	5.00	200	—

5.2. Off-Road Equipment

5.2.1. Unmitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor

5.2.2. Mitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Ph 1 Site Preparation	—	—	—	—
Ph 1 Site Preparation	Worker	160	40.0	LDA,LDT1,LDT2
Ph 1 Site Preparation	Vendor	10.0	70.0	HHDT,MHDT
Ph 1 Site Preparation	Hauling	10.0	70.0	HHDT
Ph 1 Site Preparation	Onsite truck	10.0	5.00	HHDT
Ph 2 PV Panel System	—	—	—	—
Ph 2 PV Panel System	Worker	450	40.0	LDA,LDT1,LDT2
Ph 2 PV Panel System	Vendor	20.0	70.0	HHDT,MHDT
Ph 2 PV Panel System	Hauling	90.0	70.0	HHDT
Ph 2 PV Panel System	Onsite truck	10.0	5.00	HHDT
Ph 3 Inverters, Transformers, Substation, Electrical	—	—	—	—
Ph 3 Inverters, Transformers, Substation, Electrical	Worker	450	40.0	LDA,LDT1,LDT2
Ph 3 Inverters, Transformers, Substation, Electrical	Vendor	10.0	70.0	HHDT,MHDT
Ph 3 Inverters, Transformers, Substation, Electrical	Hauling	90.0	70.0	HHDT
Ph 3 Inverters, Transformers, Substation, Electrical	Onsite truck	10.0	5.00	HHDT

Ph 4 Gen Tie	—	—	—	—
Ph 4 Gen Tie	Worker	100	40.0	LDA,LDT1,LDT2
Ph 4 Gen Tie	Vendor	10.0	70.0	HHDT,MHDT
Ph 4 Gen Tie	Hauling	40.0	70.0	HHDT
Ph 4 Gen Tie	Onsite truck	10.0	5.00	HHDT
Ph 5 Battery Storage	—	—	—	—
Ph 5 Battery Storage	Worker	100	40.0	LDA,LDT1,LDT2
Ph 5 Battery Storage	Vendor	10.0	70.0	HHDT,MHDT
Ph 5 Battery Storage	Hauling	40.0	70.0	HHDT
Ph 5 Battery Storage	Onsite truck	10.0	5.00	HHDT
Ph 6 Utility Switchyard	—	—	—	—
Ph 6 Utility Switchyard	Worker	50.0	40.0	LDA,LDT1,LDT2
Ph 6 Utility Switchyard	Vendor	10.0	70.0	HHDT,MHDT
Ph 6 Utility Switchyard	Hauling	40.0	70.0	HHDT
Ph 6 Utility Switchyard	Onsite truck	10.0	5.00	HHDT

5.3.2. Mitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Ph 1 Site Preparation	—	—	—	—
Ph 1 Site Preparation	Worker	160	40.0	LDA,LDT1,LDT2
Ph 1 Site Preparation	Vendor	10.0	70.0	HHDT,MHDT
Ph 1 Site Preparation	Hauling	10.0	70.0	HHDT
Ph 1 Site Preparation	Onsite truck	10.0	5.00	HHDT
Ph 2 PV Panel System	—	—	—	—
Ph 2 PV Panel System	Worker	450	40.0	LDA,LDT1,LDT2
Ph 2 PV Panel System	Vendor	20.0	70.0	HHDT,MHDT
Ph 2 PV Panel System	Hauling	90.0	70.0	HHDT

Ph 2 PV Panel System	Onsite truck	10.0	5.00	HHDT
Ph 3 Inverters, Transformers, Substation, Electrical	—	—	—	—
Ph 3 Inverters, Transformers, Substation, Electrical	Worker	450	40.0	LDA,LDT1,LDT2
Ph 3 Inverters, Transformers, Substation, Electrical	Vendor	10.0	70.0	HHDT,MHDT
Ph 3 Inverters, Transformers, Substation, Electrical	Hauling	90.0	70.0	HHDT
Ph 3 Inverters, Transformers, Substation, Electrical	Onsite truck	10.0	5.00	HHDT
Ph 4 Gen Tie	—	—	—	—
Ph 4 Gen Tie	Worker	100	40.0	LDA,LDT1,LDT2
Ph 4 Gen Tie	Vendor	10.0	70.0	HHDT,MHDT
Ph 4 Gen Tie	Hauling	40.0	70.0	HHDT
Ph 4 Gen Tie	Onsite truck	10.0	5.00	HHDT
Ph 5 Battery Storage	—	—	—	—
Ph 5 Battery Storage	Worker	100	40.0	LDA,LDT1,LDT2
Ph 5 Battery Storage	Vendor	10.0	70.0	HHDT,MHDT
Ph 5 Battery Storage	Hauling	40.0	70.0	HHDT
Ph 5 Battery Storage	Onsite truck	10.0	5.00	HHDT
Ph 6 Utility Switchyard	—	—	—	—
Ph 6 Utility Switchyard	Worker	50.0	40.0	LDA,LDT1,LDT2
Ph 6 Utility Switchyard	Vendor	10.0	70.0	HHDT,MHDT
Ph 6 Utility Switchyard	Hauling	40.0	70.0	HHDT
Ph 6 Utility Switchyard	Onsite truck	10.0	5.00	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Control Strategies Applied	PM10 Reduction	PM2.5 Reduction
Apply dust suppressants to unpaved roads	84%	84%
Limit vehicle speeds on unpaved roads to 25 mph	44%	44%
Sweep paved roads once per month	9%	9%

5.5. Architectural Coatings

Phase Name	Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (Cubic Yards)	Material Exported (Cubic Yards)	Acres Graded (acres)	Material Demolished (sq. ft.)	Acres Paved (acres)
Ph 1 Site Preparation	0.00	—	2,900	0.00	—
Ph 2 PV Panel System	113,000	—	2,900	0.00	—
Ph 5 Battery Storage	0.00	0.00	0.00	0.00	0.00

5.6.2. Construction Earthmoving Control Strategies

Non-applicable. No control strategies activated by user.

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
General Heavy Industry	0.00	0%
General Light Industry	0.00	0%

5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O
2027	0.00	457	0.03	< 0.005
2026	0.00	457	0.03	< 0.005

5.9. Operational Mobile Sources

5.9.1. Unmitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
Total all Land Uses	80.0	40.0	40.0	25,029	8,000	4,000	4,000	2,502,857

5.9.2. Mitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
Total all Land Uses	80.0	40.0	40.0	25,029	8,000	4,000	4,000	2,502,857

5.10. Operational Area Sources

5.10.1. Hearths

5.10.1.1. Unmitigated

5.10.1.2. Mitigated

5.10.2. Architectural Coatings

Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
0	0.00	4,500	1,500	—

5.10.3. Landscape Equipment

Season	Unit	Value
Snow Days	day/yr	0.00
Summer Days	day/yr	180

5.10.4. Landscape Equipment - Mitigated

Season	Unit	Value
Snow Days	day/yr	0.00
Summer Days	day/yr	180

5.11. Operational Energy Consumption

5.11.1. Unmitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
General Heavy Industry	0.00	457	0.0330	0.0040	0.00
General Light Industry	0.00	457	0.0330	0.0040	0.00

5.11.2. Mitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
General Heavy Industry	0.00	457	0.0330	0.0040	0.00
General Light Industry	0.00	457	0.0330	0.0040	0.00

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
General Heavy Industry	0.00	16,290,000
General Light Industry	693,750	0.00

5.12.2. Mitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
General Heavy Industry	0.00	16,290,000
General Light Industry	693,750	0.00

5.13. Operational Waste Generation

5.13.1. Unmitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
General Heavy Industry	0.00	—
General Light Industry	3.72	—

5.13.2. Mitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
General Heavy Industry	0.00	—
General Light Industry	3.72	—

5.14. Operational Refrigeration and Air Conditioning Equipment

5.14.1. Unmitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced

General Light Industry	Other commercial A/C and heat pumps	R-410A	2,088	0.30	4.00	4.00	18.0

5.14.2. Mitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced
General Light Industry	Other commercial A/C and heat pumps	R-410A	2,088	0.30	4.00	4.00	18.0

5.15. Operational Off-Road Equipment

5.15.1. Unmitigated

Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor

5.15.2. Mitigated

Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor

5.16. Stationary Sources

5.16.1. Emergency Generators and Fire Pumps

Equipment Type	Fuel Type	Number per Day	Hours per Day	Hours per Year	Horsepower	Load Factor
Emergency Generator	Diesel	1.00	0.50	50.0	61.0	0.73

5.16.2. Process Boilers

Equipment Type	Fuel Type	Number	Boiler Rating (MMBtu/hr)	Daily Heat Input (MMBtu/day)	Annual Heat Input (MMBtu/yr)

5.17. User Defined

Equipment Type	Fuel Type

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres
Cropland	>70% Sand	6,125	0.00

5.18.1.2. Mitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres
Cropland	>70% Sand	6,125	0.00

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.1.2. Mitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.2. Sequestration

5.18.2.1. Unmitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

5.18.2.2. Mitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

Climate Hazard	Result for Project Location	Unit
Temperature and Extreme Heat	28.3	annual days of extreme heat
Extreme Precipitation	0.75	annual days with precipitation above 20 mm
Sea Level Rise	—	meters of inundation depth
Wildfire	0.00	annual hectares burned

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about ¾ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (Radke et al., 2017, CEC-500-2017-008), and consider inundation location and depth for the San Francisco Bay, the Sacramento-San Joaquin River Delta and California coast resulting different increments of sea level rise coupled with extreme storm events. Users may select from four scenarios to view the range in potential inundation depth for the grid cell. The four scenarios are: No rise, 0.5 meter, 1.0 meter, 1.41 meters
Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

6.2. Initial Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	2	0	0	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	N/A	N/A	N/A	N/A
Wildfire	N/A	N/A	N/A	N/A

Flooding	N/A	N/A	N/A	N/A
Drought	0	0	0	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	N/A	N/A	N/A	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.

The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.

The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

6.3. Adjusted Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	2	1	1	3
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	N/A	N/A	N/A	N/A
Wildfire	N/A	N/A	N/A	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	1	1	1	2
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	N/A	N/A	N/A	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.

The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.

The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Exposure Indicators	—
AQ-Ozone	35.2
AQ-PM	13.7
AQ-DPM	0.98
Drinking Water	94.8
Lead Risk Housing	11.3
Pesticides	61.3
Toxic Releases	25.4
Traffic	2.58
Effect Indicators	—
CleanUp Sites	84.6
Groundwater	39.4
Haz Waste Facilities/Generators	1.80
Impaired Water Bodies	99.2
Solid Waste	78.3
Sensitive Population	—
Asthma	56.9
Cardio-vascular	67.9
Low Birth Weights	—
Socioeconomic Factor Indicators	—
Education	29.3
Housing	—
Linguistic	12.3
Poverty	71.4

Unemployment	—

7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Economic	—
Above Poverty	—
Employed	—
Median HI	—
Education	—
Bachelor's or higher	—
High school enrollment	—
Preschool enrollment	—
Transportation	—
Auto Access	—
Active commuting	—
Social	—
2-parent households	—
Voting	—
Neighborhood	—
Alcohol availability	—
Park access	—
Retail density	—
Supermarket access	—
Tree canopy	—
Housing	—
Homeownership	—

Housing habitability	—
Low-inc homeowner severe housing cost burden	—
Low-inc renter severe housing cost burden	—
Uncrowded housing	—
Health Outcomes	—
Insured adults	—
Arthritis	0.0
Asthma ER Admissions	15.0
High Blood Pressure	0.0
Cancer (excluding skin)	0.0
Asthma	0.0
Coronary Heart Disease	0.0
Chronic Obstructive Pulmonary Disease	0.0
Diagnosed Diabetes	0.0
Life Expectancy at Birth	0.0
Cognitively Disabled	3.3
Physically Disabled	3.3
Heart Attack ER Admissions	40.8
Mental Health Not Good	0.0
Chronic Kidney Disease	0.0
Obesity	0.0
Pedestrian Injuries	0.0
Physical Health Not Good	0.0
Stroke	0.0
Health Risk Behaviors	—
Binge Drinking	0.0
Current Smoker	0.0

No Leisure Time for Physical Activity	0.0
Climate Change Exposures	—
Wildfire Risk	0.0
SLR Inundation Area	0.0
Children	97.4
Elderly	0.3
English Speaking	0.0
Foreign-born	0.0
Outdoor Workers	1.3
Climate Change Adaptive Capacity	—
Impervious Surface Cover	93.0
Traffic Density	0.0
Traffic Access	23.0
Other Indices	—
Hardship	0.0
Other Decision Support	—
2016 Voting	0.0

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	51.0
Healthy Places Index Score for Project Location (b)	—
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	No
Project Located in a Low-Income Community (Assembly Bill 1550)	Yes
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.
b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

7.4. Health & Equity Measures

No Health & Equity Measures selected.

7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

8. User Changes to Default Data

Screen	Justification
Construction: Construction Phases	24-mo schedule per POD v8 circa 11/28/2023
Construction: Trips and VMT	POD v8 Nov 2023, peak workforce w double-occupancy LDA, LDTs, w HHDT for water delivery
Construction: On-Road Fugitive Dust	10 percent unpaved for onsite trucks, with dust suppressants for control
Land Use	Up to 1,150 MW with peak 1000 person construction workforce. 3,000 sq ft O&M building. 200 ac for substation - switchyard - BESS.
Construction: Off-Road Equipment	separate spreadsheet for off-road equipment
Construction: Dust From Material Movement	Import material for Substation, BAAH, and BESS
Construction: Architectural Coatings	no notable construction coatings
Operations: Road Dust	final mile on unpaved
Operations: Water and Waste Water	up to 50 acre-feet or 16.29 million gal annually for panel washing, minimal indoor water use
Operations: Energy Use	no notable onsite use of grid supply electricity or natural gas use
Operations: Refrigerants	O&M building refrigerant
Operations: Fleet Mix	Fleet mix includes 5 pct HHDT - water delivery, panel washing during operation
Operations: Solid Waste	Municipal solid waste stream for O&M building
Operations: Emergency Generators and Fire Pumps	optional backup generator, 45 kW rating

APPENDIX C

AVOIDED GREENHOUSE GAS EMISSION CALCULATIONS

Avoided GHG Emissions - Electricity Production

Operation - Emissions Avoided by Producing Electricity

Generation Project - approximate production minus transmission losses

Generation Capacity (MW)	**1,150**
Capacity Factor (est.)	0.204
Transmission Line Loss Factor	7.8%
1,894,799	**MWh/yr**

Basis: production = MW Capacity * Capacity Factor * (1 - Transmission Loss) * 8760 hr/year

DC Capacity Factor estimate from NREL PVWatts calculator: Holtville, CA

BESS Component - discharged, annual estimate

500 MW PV w/BESS	**1,150 MW PV w/BESS**
(MWh/yr)	**(MWh/yr)**
688,000	1,582,400

GHG Emission Factors - for conventional generation technologies for marginal generation

Notes: Marginal generation is from less efficient (higher emitting) generators in the mix of dispatchable resources.

e.g., avoided emissions from power plants that would turn down to accommodate additional renewable generation. (CPUC 2022)

Estimated CO2 Emission Factors (CEC 2019, Table B-22)			**500 MW PV w/BESS**	**1,150 MW PV w/BESS**
Technology	**Low Case (lbs/MWh)**	**Low Case (MTCO2/MWh)**	**Avoided (MTCO2/yr)**	**Avoided (MTCO2/yr)**
Conventional Combustion Turbines	1,167.70	0.530	364,410	838,142
Advanced Combustion Turbines	1,123.20	0.509	350,522	806,201
Conventional Combined Cycle Technologies	822.5	0.373	256,681	590,367
Conventional Combined Cycle w/Duct Firing	822.5	0.373	256,681	590,367

References:

CEC (California Energy Commission) . 2019. :

Staff Report. Estimated Cost of New Utility-Scale Generation in California: 2018 Update. CEC-200-2019-500. May.

CPUC (California Public Utilities Commission) . 2022. :

Greenhouse Gas and Criteria Pollutant Accounting Methodology for use in Load -Serving Entity Portfolio Development in 2022 Integrated Resource Plans. July.

GHG Emission Factors - for electricity imported from an "unspecified" source for marginal generation

			500 MW PV w/BESS	**1,150 MW PV w/BESS**
Unspecified Resources CO2 Emission Factor		**Unspecified (MTCO2/MWh)**	**Avoided (MTCO2/yr)**	**Avoided (MTCO2/yr)**
Open Market Purchases, western power system GHG		0.428	294,464	677,267

California ARB (Air Resources Board) . Regulation for Mandatory Reporting of GHG Emissions (17 CCR 95111).

California ARB . July 2017. Final Statement of Reasons. Amendments to the Regulation for the Mandatory Reporting of GHG Emissions.

IP Perkins - GHG Balance of Construction Emissions for Year 1

Months to balance one-time Construction emissions - offset by the combined effects of O&M, Land Use Conversion, and Emissions Avoided by Producing Electricity

	Construction (MTCO2e)	Operations (MTCO2e/yr)
Construction Total (one-time)	16,577	
Operation and Maintenance		988
Land Use Conversion		2,205
Gas-Insulated Equipment		982

	Operations	500 MW PV w/BESS	1,150 MW PV w/BESS		500 MW PV w/BESS	1,150 MW PV w/BESS
After Commencing Operation	(MTCO2e/yr)	Avoided (MTCO2/yr)	Avoided (MTCO2/yr)		Construction Balance, Year 1 (MT)	Construction Balance, Year 1 (MT)
Year 1 of Operation	4,175	-256,681	-590,367		-235,929	-569,615
Rolling Months 1 through 12	**(MTCO2e/month)**	**(MTCO2/month)**	**(MTCO2/month)**		**Running Balance**	**Running Balance**
Month 1	348	-21,390	-49,197		-4,465	-32,272
Month 2	348	-21,390	-49,197		-25,507	-81,122
Month 3	348	-21,390	-49,197		-46,550	-129,971
Month 4	348	-21,390	-49,197		-67,592	-178,820
Month 5	348	-21,390	-49,197		-88,634	-227,670
Month 6	348	-21,390	-49,197		-109,676	-276,519
Month 7	348	-21,390	-49,197		-130,718	-325,368
Month 8	348	-21,390	-49,197		-151,760	-374,218
Month 9	348	-21,390	-49,197		-172,803	-423,067
Month 10	348	-21,390	-49,197		-193,845	-471,916
Month 11	348	-21,390	-49,197		-214,887	-520,766
Month 12	348	-21,390	-49,197		-235,929	-569,615
Year 1, Sum of Months 1 through 12	4,175	-256,681	-590,367			

IP Perkins - GHG Balance of Life-of-Project Emissions

Years to balance 30-year Life-of-Project Construction, O&M, Land Use Conversion - offset by Emissions Avoided by Producing Electricity

	Construction (MTCO2e)	Operations (MTCO2e/life-of-project)
Construction Total (one-time)	16,577	
Operation and Maintenance		29,640
Land Use Conversion		66,150
Gas-Insulated Equipment		29,469

	500 MW PV w/BESS Avoided (MTCO2)	1,150 MW PV w/BESS Avoided (MTCO2)		500 MW PV w/BESS Project Lifetime Balance (MT)	1,150 MW PV w/BESS Project Lifetime Balance (MT)
After Commencing Operation 30 years Life-of-Project	-7,700,445	-17,711,022		-7,558,608	-17,569,186

Rolling Years 1 through 30	**Avoided (MTCO2/yr)**	**Avoided (MTCO2/yr)**		**Running Balance**	**Running Balance**
Year 1	-256,681	-590,367		-114,845	-448,531
Year 2	-256,681	-590,367		-371,527	-1,038,898
Year 3	-256,681	-590,367		-628,208	-1,629,266
Year 4	-256,681	-590,367		-884,890	-2,219,633
Year 5	-256,681	-590,367		-1,141,571	-2,810,001
Year 6	-256,681	-590,367		-1,398,253	-3,400,368
Year 7	-256,681	-590,367		-1,654,934	-3,990,736
Year 8	-256,681	-590,367		-1,911,615	-4,581,103
Year 9	-256,681	-590,367		-2,168,297	-5,171,470
Year 10	-256,681	-590,367		-2,424,978	-5,761,838
Year 11	-256,681	-590,367		-2,681,660	-6,352,205
Year 12	-256,681	-590,367		-2,938,341	-6,942,573
Year 13	-256,681	-590,367		-3,195,023	-7,532,940
Year 14	-256,681	-590,367		-3,451,704	-8,123,307
Year 15	-256,681	-590,367		-3,708,386	-8,713,675
Year 16	-256,681	-590,367		-3,965,067	-9,304,042
Year 17	-256,681	-590,367		-4,221,749	-9,894,410
Year 18	-256,681	-590,367		-4,478,430	-10,484,777
Year 19	-256,681	-590,367		-4,735,112	-11,075,144
Year 20	-256,681	-590,367		-4,991,793	-11,665,512
Year 21	-256,681	-590,367		-5,248,475	-12,255,879
Year 22	-256,681	-590,367		-5,505,156	-12,846,247
Year 23	-256,681	-590,367		-5,761,838	-13,436,614
Year 24	-256,681	-590,367		-6,018,519	-14,026,982
Year 25	-256,681	-590,367		-6,275,201	-14,617,349
Year 26	-256,681	-590,367		-6,531,882	-15,207,716
Year 27	-256,681	-590,367		-6,788,564	-15,798,084
Year 28	-256,681	-590,367		-7,045,245	-16,388,451
Year 29	-256,681	-590,367		-7,301,927	-16,978,819
Year 30	-256,681	-590,367		-7,558,608	-17,569,186
Life-of-Project, Sum of Years 1 through 30	-7,700,445	-17,711,022			

Appendix I Management Plans

Appendix I.1 Fugitive Dust Control Plan

FUGITIVE DUST CONTROL PLAN

Perkins Renewable Energy Project

Prepared for

IP Perkins, LLC and
IP Perkins BAAH, LLC
subsidiaries of Intersect Power, LLC

January 2024

CONTENTS

1. INTRODUCTION

IP Perkins, LLC and IP Perkins BAAH, LLC (Applicants or Proponents), subsidiaries of Intersect Power, LLC, proposes to construct, operate and decommission the Perkins Renewable Energy Project (Project), a utility-scale solar photovoltaic (PV) electrical generating and battery energy storage facility, and associated infrastructure to generate, store, and deliver renewable electricity to the statewide electricity transmission grid. The proposed Project is located on a combination of Bureau of Land Management (BLM)-managed lands, Bureau of Reclamation (BOR)-managed lands, and private lands located in Imperial County east of El Centro, California (see POD [Plan of Development] Appendix A, Figure 1). The Project 500 kV loop-in transmission lines will traverse Bureau of Reclamation (BOR) lands.

The objective of the Fugitive Dust Control Plan (Plan) is to address fugitive dust emissions during Project construction and to detail practices designed to minimize the dust emissions that result from construction of the Perkins Renewable Energy Project. The Fugitive Dust Control Plan has been developed in accordance with Imperial County Air Pollution Control District (ICAPCD) Regulation VIII Rules and will be addressed in future mitigation measures. The purpose of the ICAPCD Fugitive Dust Rules is to reduce the amount of fine Particulate Matter (PM-10) entrained in the ambient air as a result of emissions generated from Construction and other Earthmoving Activities by requiring actions to prevent, reduce, or mitigate PM-10 emissions. With this intent, mitigation measures to address fugitive dust could include:

- Limiting Visible Dust Emissions (VDE) to 20% opacity in the Project Area.
- Watering access roads one or more times daily or as frequently as necessary to minimize fugitive and implementing speed limits. Approved soil stabilizers or paving may also be used.
- Phasing grading and earthwork activities to minimize the amount of exposed or disturbed area at any one time.
- Installing one or more Track-Out Prevention Devices where unpaved traffic surfaces adjoin paved roads.
- Daily or as needed sweeping of all paved roads within the construction site to clean up any bulk material tracked out or carried onto paved roads.

2. FUGITIVE DUST GENERATING ACTIVITIES

Construction of the solar PV panels, two new 500 kV loop-in transmission lines, a new gen-tie line, ancillary facilities, and associated traffic could directly generate fugitive dust, especially in areas cleared of vegetation. The following construction-related activities have been identified as having the potential sources for generating fugitive dust. Section 7 provides best available control measures to reduce fugitive dust generation.

- Preparation of and vehicle and motorized equipment movement on unpaved access roads and staging areas;
- Site preparation, including grubbing and clearing of vegetation, weed abatement;
- Topsoil removal;
- Trench excavation, installation, and backfilling of underground utilities;
- Preparation and installation of fencing;
- Preparation and installation of solar panels;

- Preparation and installation of gen-tie line and 500 kV loop-in transmission lines, including pull sites;
- Preparation and installation of the new high-voltage breaker and a half (BAAH) switchyard.
- Preparation of substation and BESS locations;
- Bulk material loading, hauling, and unloading;
- Use of material storage piles;
- Use of parking, staging, and storage areas; and
- Track-out onto paved roads.

It is the responsibility of all Project personnel to ensure identification of all sources of fugitive dust and to take every reasonable precaution to prevent all airborne fugitive dust plumes from leaving the Project site and to prevent visible particulate matter from being deposited upon public roadways.

3. ROLES AND RESPONSIBILITIES

The following describes the roles and responsibilities of key parties to be involved in all aspects of the Plan. A Designated Representative would be identified who is:

- Employed by or contracted with the property owner or developer.
- Responsible for and have the full authority to implement the measures in the Dust Control Plan.

The Designated Representative would also:

- Have the Plan available at the construction site at all times during construction.
- Implement the Plan and ensure that all employees, workers, and subcontractors know their responsibilities regarding dust control.
- Monitor construction activity to ensure compliance with the Plan.
- Report incidents.
- Identify when reasonably available and best available control measures are not adequate and when contingency control measures (e.g., increased watering) shall be implemented.

The Designated Representative contact information is as follows:

- Name, Phone Number, Email address [To be completed when EPC comes onboard.]

The Project contractor would use Environmental Monitors to monitor compliance with the Plan. The Environmental Monitors would be responsible for recording and reporting any incidents related to dust control.

4. FUGITIVE DUST SOURCES AND BEST AVAILABLE CONTROL MEASURES

Controlling fugitive dust sources would be accomplished through a range of Best Available Control Measures (BACMs) consistent with those specified by Regulation VIII (Fugitive Dust Rules) provided by ICAPCD, including the following:

- Reducing vehicle and equipment speeds on unpaved surfaces.
- Minimizing the amount of new exposed soil/surface disturbance.
- Periodic application of clean water as directed by the environmental monitors to exposed disturbed surface areas (application of water would be via water trucks) to control fugitive dust during construction.
- Cover open-bodied trucks transporting materials likely to become airborne.

- Remove earth or other materials that may become airborne promptly from paved roads.

The Environmental Monitor and Designated Representative would monitor construction to ensure that dust does not accumulate over 20% opacity or on adjacent dwellings or roadways.

Project-specific requirements to be incorporated into mitigation measures are listed below:

- Prior to construction and earthmoving activities, the area to be disturbed should be pre-watered sufficiently to limit Visible Dust Emissions (VDE) to 20% opacity.
- During construction, all unpaved roads, disturbed areas (e.g., areas of scraping, excavation, backfilling, grading, and compacting), and loose materials generated during construction activities shall be stabilized with water or chemical stabilization. Water should be applied one or more times daily or as frequently as necessary to minimize fugitive dust generation to limit VDE to 20% opacity.
- Materials used for chemical stabilization of soils, including petroleum resins, asphaltic emulsions, acrylics, and adhesives shall not violate State Water Quality Control Board standards for use as a soil stabilizer. Materials accepted by the California Air Resources Board (ARB) and the United States Environmental Protection Agency (EPA), and which meet State water quality standards, shall be considered acceptable to the ICAPCD.
- The main access roads through the site shall be either paved or stabilized using chemical stabilization to provide a stabilized surface that is similar for the purposes of dust control to paving (RULE 805 F.1). Gravel, recrushed/recycled asphalt or other material of low silt (<5%) content to a depth of three or more inches may be applied. Other methods may be applied that will effectively limit VDE to 20% opacity and meet the conditions of a stabilized unpaved road.
- Grading and earthwork activities, including vegetation removal, cut and fill movement, and soil compacting, shall be phased across the site to minimize the amount of exposed or disturbed area at any one time.
- No vehicle shall exceed 15 miles per hour on unpaved areas within the construction site. This measure is for protection of wildlife and also serves as a dust control measure.
- Visible speed limit signs shall be posted at the construction site entrances.
- All sites with access to a paved road and with 150 or more average vehicle trips per day, or 20 or more average vehicle trips per day by vehicles with three or more axles, shall install one or more Track-Out Prevention Devices or other Imperial County Air Pollution Control Officer (APCO) approved Track-out control device or wash down system at access points where unpaved traffic surfaces adjoin paved roads or apply and maintain paving, chemical stabilization, or at least 3 inch depth of gravel (using gravel or other low silt (<5%) content material), for a distance of 50 or more consecutive feet at access points where unpaved roads adjoin paved roads (RULE 803 F.1.c).
- All paved roads within the construction site shall be swept daily or as needed (less during periods of precipitation) on days when construction activity occurs to clean up any bulk material tracked out or carried onto paved roads.
- At least the first 50 feet of any paved public roadway exiting the construction site or exiting other unpaved roads to access the construction site or staging areas shall be swept as needed when dirt or runoff resulting from the construction activities is visible on the paved public roadway.

ICAPCD Regulation VIII – Fugitive Dust Rules (Rule 801-805 Revised October 16, 2012)

Rule 801 Construction and earthmoving activities - Best Available Control Measures for

Fugitive Dust (PM-10)

- Dust Control Plan - A dust control plan shall contain all of the following information:
  - Name, address, and phone number of the Person responsible for the preparation, submittal, and implementation of the dust control plan and responsible for the project site.
  - A plot plan which shows the type and location of each project.
  - The total area of land surface to be disturbed, estimated daily throughput volume of earthmoving in cubic yards, and total area in acres of the entire project site.
  - The expected start and completion dates of dust generating and soil disturbance activities to be performed on the site.
  - The actual and potential sources of Fugitive Dust emissions on the site and the location of Bulk Material handling and storage areas, Paved and Unpaved Roads, entrances and exits where Track Out/Carry Out may occur, and Unpaved Traffic Areas.
  - Dust Suppressants to be applied, including: product specifications; manufacturer's usage instructions (method, frequency, and intensity of application); type, number, and capacity of application equipment; and information on environmental impacts and approvals or certifications related to appropriate and safe use for ground application.
  - Specific surface treatment(s) and/or control measures utilized to control Track Out/Carry Out, and sedimentation where unpaved and/or access points join paved public access roads.
  - The dust control plan should describe all Fugitive Dust control measures to be implemented before, during, and after any dust generating activity.
- Pre-activity
  - Pre-water site sufficient to limit VDE to 20% opacity, and
  - Phase work to minimize the amount of disturbed surface area at any one time.
- During active Operations
  - Apply water or Chemical Stabilization as directed by product manufacturer to limit VDE to 20% opacity, or
  - Construct and maintain wind barriers sufficient to limit VDE to 20% opacity. If utilizing wind barriers, control measure water or chemical stabilization shall also be implemented.
  - Apply water or Chemical Stabilization as directed by product manufacturer to unpaved haul/access roads and Unpaved Traffic Areas sufficient to limit VDE to 20% opacity and meet the conditions of a Stabilized Unpaved Road.
- Temporary Stabilization During Periods of Inactivity
  - Restrict vehicular access to the area by fencing or signage; and
  - Apply water or Chemical Stabilization, as directed by product manufacturer, sufficient to comply with the conditions of a Stabilized Surface. If an area having 0.5 acres or more of disturbed surface area remains unused for seven or more days, the area must comply with the conditions for a Stabilized Surface area.

Rule 802 Bulk Materials - Best Available Control Measures for Fugitive Dust (PM-10)

- Bulk Material Handling/Transfer:
  - Spray with water prior to handling and/or at points of transfer; or
  - Apply and maintain Chemical Stabilization, or
  - Protect from wind erosion by sheltering or enclosing the operation and transfer line.
- Bulk Material Storage
  - When storing Bulk Materials, comply with the conditions for a Stabilized Surface; or
  - Cover Bulk Materials stored outdoors with tarps, plastic, or other suitable material and anchor in

  such a manner that prevents the cover from being removed by wind action, or
  - Construct and maintain barriers with less than 50% porosity. If utilizing fences or wind barriers, apply water or chemical/organic stabilizers/suppressants, or
  - Utilize a 3-side structure with a height at least equal to the height of the storage pile and with less than 50% porosity.

- Material Transport/Hauling
  - Completely cover or enclose all Haul Truck Loads of Bulk Material.
  - Haul Trucks transporting loads of Aggregate Materials shall not be required to cover their loads if the load, where it contacts the side, front, and back of the cargo container area remains six inches from the upper area of the container area, and if the load does not extend, at its peak, above any part of the upper edge of the cargo container area (as defined in Section 23114 of the California Vehicle Code for both public and private roads).
  - The cargo compartment(s) of all Haul Trucks are to be constructed and maintained so that no spillage and loss of Bulk Material can occur from holes or other openings in the cargo compartment's floor, side, and/or tailgate. Seals on any openings used to empty the load including, but not limited to, bottom-dump release gates and tailgates to be properly maintained to prevent the loss of Bulk Material from those areas.
  - The cargo compartment of all Haul Trucks is to be cleaned and/or washed at delivery site after removal of Bulk Material.

Rule 803 – Carry-out and Track-out - Best Available Control Measures for Fugitive Dust (PM-10)

- Clean up any Bulk Material tracked out or carried out onto a Paved Road on the following time-schedule:
  - Within urban areas, immediately, when Track-Out or Carry-Out extends a cumulative distance of 50 linear feet or more; and
  - At the end of the workday, for all other Track-Out or Carry-Out.

- In addition to the above, all sites with access to a Paved Road and with 150 or more Average Vehicle Trips per Day, or 20 or more Average Vehicle Trips per Day by vehicles with three or more axles shall install one or more Track-Out Prevention Devices or other APCO approved Track-Out control device or wash down system at access points where unpaved traffic surfaces adjoin Paved Roads; or

- In addition to the above, all sites with access to a Paved Road and with 150 or more Average Vehicle Trips per Day, or 20 or more Average Vehicle Trips per Day by vehicles with three or more axles shall apply and maintain paving, Chemical Stabilization, or at least 3 inch depth of Gravel (using Gravel or other low Silt (<5%) content material), for a distance of 50 or more consecutive feet at access points where Unpaved Roads adjoin Paved Roads.

Rule 804 – Open Areas - Best Available Control Measures for Fugitive Dust (PM10)

Any combination of BACM and Alternative BACM is permissible:

- Apply and maintain water or dust suppressant(s) to all unvegetated areas.
- Establish vegetation on all previously disturbed areas.
- Pave, apply and maintain Gravel, or apply and maintain Chemical Stabilizers/Suppressants
- Implement Alternative BACM for exposed playa at the Salton Sea if approved by both the APCD and EPA. Alternative BACM may be approved by the APCD and EPA in accordance with a technical evaluation demonstrating that the proposed Alternative BACM achieves PM10 emission reductions

equivalent to BACM measures identified above and that the dust control method will achieve a STABILIZED SURFACE and meet the 20% opacity requirement in accordance with U.S. EPA Test Method 9.

Rule 805 – Paved and Unpaved Roads - Best Available Control Measures for Fugitive Dust (PM10)

- Unpaved Roads, Including Unpaved Haul and Access Roads
  - Pave.
  - Apply Chemical Stabilization as directed by product manufacturer to control dust on Unpaved Roads.
  - Apply and maintain Gravel, recrushed/recycled asphalt or other material of low Silt (<5%) content to a depth of three or more inches.
  - Wetting. Apply water one or more times daily
  - Permanent road closusre
  - Restrict unauthorized vehicle access
  - Any other method that effectively limits VDE to 20% opacity and meets the conditions of a Stabilized Unpaved Road.
- Unpaved Traffic Areas
  - Pave
  - Apply Chemical Stabilization as directed by product manufacturer to control dust on Unpaved Roads.
  - Apply and maintain Gravel, recrushed/recycled asphalt or other material of low silt (<5%) content to a depth of three or more inches.
  - Wetting. Apply water one or more times daily.

5. LONG-TERM SITE OPERATIONS, MAINTENANCE, AND DECOMMISSIONING

At the time of Project construction, ICAPCD does not have any regulations regarding long-term site operations, maintenance, and decommissioning activities. ICAPCD dust control regulations will continually be reviewed so that as such time as new regulations are implemented, the Perkins Renewable Energy Project will comply with all new dust control measures.

Appendix I.2 Fire Management and Prevention Plan

FIRE MANAGEMENT AND PREVENTION PLAN

Perkins Renewable Energy Project

Prepared for

Intersect Power

IP Perkins, LLC and
IP Perkins BAAH, LLC
subsidiaries of Intersect Power, LLC

January 2024

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1. INTRODUCTION

IP Perkins, LLC and IP Perkins BAAH, LLC (Applicants or Proponents), subsidiaries of Intersect Power, LLC, proposes to construct, operate, and decommission the Perkins Renewable Energy Project (Project), a utility-scale solar photovoltaic (PV) electrical generating and storage facility, and associated infrastructure to generate and deliver renewable electricity to the statewide electricity transmission grid. The proposed Project site is located on a combination of Bureau of Land Management (BLM)-managed lands, Bureau of Reclamation (BOR)-managed lands, and private lands located in Imperial County east of El Centro, California (see POD [Plan of Development] Appendix A, Figure 1) . The Project 500kV loop-in transmission lines will traverse Bureau of Reclamation (BOR) lands.

The objective of the Fire Management and Prevention Plan (Fire Plan) is to provide safe procedural practices, environmental protection measures, and other specific stipulations and methods to prevent and respond to fires during construction and operation of the Perkins Renewable Energy Project (Project).

This Fire Plan identifies measures to minimize fire risk during construction and operational activities associated with the solar facility, battery storage system, breaker and a half switchyard, two new 500 kV transmission loop-in lines, gen-tie line, and associated components. It will be the responsibility of the Proponent and its Project contractors, working with designated environmental inspectors, to comply with measures identified in this Fire Plan. The BLM is responsible for responding to wildfires located within BLM Direct Protection Areas in conjunction with the Imperial County Fire Department (ICFD). IP Perkins, LLC and IP Perkins BAAH, LLC (or the Project operator at the time), the Engineering, Procurement, and Construction (EPC) Contractor, and all personnel working at the Project site are advised to stay in touch with local fire dispatch offices via the E-911 system to be of service and for personal safety.

1.1. Regulatory Requirements

The proposed Project is located entirely within an area designated as Federal Responsibility Area (FRA), with some adjacent areas of Unincorporated Local Responsibility Area (LRA) (CAL FIRE, 2007). Agencies that are likely to provide wildfire protection to the Project would be ICFD and BLM Fire and Aviation Program. Because the Project is not located in a State Responsibility Area, CAL FIRE would not have primary responsibility for fire management or suppression activities in this area. While individual fire agencies have primary responsibility for specific geographic areas, under interagency cooperative and mutual aid agreements, fire agencies throughout the region aid each other as needed. The Imperial County General Plan identifies unincorporated areas of the County as generally low risk for potential major fires (Imperial County Planning & Development Services, 2023). As such, the most significant regulatory codes for fire safety are fire prevention and building codes. The County implements the Uniform Building Code (UBC) and the Uniform Fire Code (UFC). These uniform codes are intended to serve only as minimum standards.

1.2. Mitigation Measures

This Fire Plan has been prepared to proactively address potential impacts to wildland fire that may result from the Project to help prevent fire-related loss of life, property, and resource damage and to manage fire risk during construction. Fire management and prevention will also be addressed in future mitigation measures that will be incorporated in all Project engineering, procurement, and construction contract(s) that will reference or clearly state any fire prevention requirements. Based on approved solar projects in BLM Direct Protection Areas, these measures should include:

- Procedures for minimizing potential ignition, including, but not limited to, vegetation clearing, parking requirements/restrictions, idling restrictions, smoking restrictions, proper use of gas-powered equipment, and hot work restrictions.
- All internal combustion engines used at the Project site shall be equipped with spark arrestors. Spark arrestors shall be in good working order.
- Once initial two-track roads have been cut and initial fencing completed, light trucks and cars shall be used only on roads where the roadway is cleared of vegetation. Mufflers on all cars and light trucks shall be maintained in good working order.
- Fire rules shall be posted on the Project bulletin board at the contractor's field office and areas visible to employees.
- Equipment parking areas and small stationary engine sites shall be cleared of all flammable materials.
- Smoking shall be prohibited in all vegetated areas and within 50 feet of combustible materials storage and shall be limited to paved areas or areas cleared of all vegetation.
- Each construction site (if construction occurs simultaneously at various locations) shall be equipped with fire extinguishers and fire-fighting equipment sufficient to extinguish small fires.
- The Project owner shall coordinate with the BLM and ICFD to create a training component for emergency first responders to prepare for specialized emergency incidents that may occur at the Project site, including incidents such as fire or explosion at or with the BESS.
- The plan shall include information about the type of BESS technology on site, potential hazards, and procedures for disconnecting or shutting down the BESS in case of fire or to reduce the chance of fire.
- All construction workers, plant personnel, and maintenance workers visiting the plant and/or transmission lines to perform maintenance activities shall receive training on fire prevention procedures, the proper use of fire-fighting equipment, and procedures to be followed in the event of a fire. Training records shall be maintained and be available for review by the BLM. Fire prevention procedures shall be included in the Project's Worker Environmental Awareness Program (WEAP).
- Vegetation near all solar panel arrays, ancillary equipment, and access roads shall be controlled through periodic cutting and spraying of weeds, in accordance with the Weed Management Plan.
- The BLM shall be consulted during plan preparation and fire safety measures recommended by these agencies included in the plan.
- The plan shall list fire prevention procedures and specific emergency response and evacuation measures that would be required to be followed during emergency situations.
- All on-site employees shall participate in annual fire prevention and response training exercises with the BLM.
- The plan shall list all applicable wildland fire management plans and policies established by state and local agencies and demonstrate how the Project will comply with these requirements.

- The Project owner shall designate an emergency services coordinator from among the full-time on-site employees who shall perform routine patrols of the site during the fire season equipped with a portable fire extinguisher and communications equipment. The Project owner shall notify the BLM of the name and contact information of the current emergency services coordinator in the event of any change.
- Remote monitoring of all major electrical equipment (transformers and inverters) will screen for unusual operating conditions. Higher than nominal temperatures, for example, can be compared with other operational factors to indicate the potential for overheating, which under certain conditions, could precipitate a fire. Units could then be shut down or generation curtailed remotely until corrective actions are taken.
- Fires ignited on site shall be immediately reported to BLM and the ICFD.
- The engineering, procurement, and construction contract(s) for the Project shall provide reference to or clearly state the requirements of this mitigation measure.
- The Project owner must provide the Fire management and Prevention Plan to the BLM for review and approval before construction.

2. METHODS

2.1. Fire Prevention and Risk Reduction Responsibilities

Implementation of the Fire Plan is the responsibility of all facility employees and contractors, in cooperation with BLM. This plan is subject to revision if there is a change of ownership, a natural disaster, and/or construction or decommissioning activities that have the potential to alter site conditions in ways that affect fire risk and/or fire management.

All Project employees and contractors are required to demonstrate knowledge of the elements of the Fire Plan and to carry out responsibilities as outlined below.

Emergency Services Coordinator

Emergency Services Coordinator will be responsible for the following safety measures:

- Be in charge of overseeing the Fire Plan implementation
- Train assigned employees in the safe storage, use and handling of flammable materials, the use of firefighting equipment to fight incipient-stage fires, and the requirements of this fire plan
- Ensure that flammable material storage areas are properly maintained
- Ensure that fire control equipment and systems are properly maintained
- Manage fire fuel source hazards
- Perform routine patrols of the site during fire season equipped with a portable fire extinguisher and communications equipment
- Monitor fire weather conditions (red flag days and other fire danger designations) and restrict activities during such conditions
- Maintain contacts with area fire agencies. The BLM will be notified of the name and contact information of the current emergency services coordinator in the event of any change.

- Ensure that appropriate training for all employees and regular site contractors is implemented annually to ensure all personnel are adequately prepared in the event of an emergency, and document that training has occurred. (See Appendix A for Fire Plan Training Log).

Employees and Contractors

Employees and contractors will be responsible for the following safety measures:

- Complete all required training
- Conduct construction activities safely to limit the risk of fire
- Report potential fire hazards to their supervisors
- Follow fire emergency procedures

3. CONSTRUCTION ACTIVITIES

3.1. Fire Hazard Control

During construction, fires could be caused by a variety of factors, including vehicle exhaust, sparks associated with grading activities, welding activities, parking on dry vegetation, and the overall temporary increase in human activity. Accidental ignition could result in a fire, which, depending on the location, could spread. The consequences of a such a fire could be severe depending on weather conditions at the time and the ability of on-site firefighting personnel to quickly respond to the fire.

Pursuant to the Code of Federal Regulations, Title 29, Part 1926.24 (29 Code of Federal Regulations [CFR] 1926.24), the Project operator would be responsible for the development and maintenance of an effective fire protection and prevention program through all phases of construction, repair, alteration, or demolition work for the solar facility, Battery Energy Storage System (BESS), Project substation, breaker and a half switch yard, 500 kV loop-in transmission lines, gen-tie line, and associated components. The Project operator would ensure the availability of the fire protection and suppression equipment required by this regulation.

Fire protection and suppression equipment during construction and operations will include water trucks with hoses, fire extinguishers, and shovels.

In addition, the Project owner and/or EPC contractor would present basic fire-prevention training to all personnel working at the Project site, maintain documentation of all training, and implement the following:

- All employees, contractors, and employees of contractors will do everything reasonable within their power, expertise, and assessment of human safety, both independently and upon request of the BLM, to prevent and suppress fires resulting from construction or maintenance activities of the Project. If the Project operator suppresses fire, the operator will report its occurrence to BLM. The operator is responsible for all suppression costs and resource damage rehabilitation costs resulting from the suppression of any fire resulting from its operations and practices.

- The operator must ensure that each employee, subcontractor, or any other individual or company working on the Project site is aware of the provisions of this fire plan, is familiar with the location and proper use of firefighting equipment and conducts themselves in a fire-safe manner.

- Vegetation will be removed prior to construction to minimize fire risk. Measures to minimize fire risk will include removal of dry vegetation and/or other combustible materials within 30 feet of any hazardous material storage, compressed gas storage, or equipment/vehicle that has the potential to spark a fire.

- All electric inverters and the transformer would be constructed on concrete foundation structures or steel skids and tested prior to use to ensure safe operations and avoid fire risks.

3.2. Red Flag Warning Days

A Red Flag Warning is issued by the National Weather Service for weather events which may result in extreme fire behavior within 24 hours. Upon issuance of a Red Flag Warning, the Emergency Service Coordinator will coordinate with BLM to determine if any Project activities are allowed to continue under these conditions.

3.3. Welding and Cutting

Welding operations are subject to the following provisions:

- No welding can occur when winds are over 15 miles per hour, and
- Welding will occur only in areas cleared of all flammable vegetation and materials at a minimum radius of 30 feet from the welding operation.
- A fire-patrol person/fire watch will be designated to observe and monitor the area for potential fire ignition during and for at least 1 hour after welding is completed.
- Welding rigs will be equipped with a minimum of one 20 pound or two 10-pound fire extinguishers, and a minimum of 5 gallons of water in a pressurized water tank.

Appropriate hot work permits/approvals (for activities such as welding and metal cutting) will be obtained from the jurisdictional fire agency.

3.4. Equipment Operation and Storage

All internal combustion construction equipment and construction vehicles will be equipped with an acceptable muffler and effective spark arresters in proper working order. All equipment and work vehicles will be required to carry shovels (size “O” or larger and not less than 46 inches in overall length) and one 5-pound ABC fire extinguisher.

Construction staging areas, worker parking areas, and access roads will be designated and cleared of vegetation. No parking or construction activities will be allowed in non-designated areas. Vehicle idling will be limited.

3.5. Storage, Use, and Handling of Oils, Flammable Liquids, Hazardous Materials, and Vehicle Fuels

Fuels, and flammable materials, if required, will be in accordance with all applicable state and federal laws. Refer to the Hazardous Materials Management Plan, which established standard procedures for reporting, handling, disposal, and cleanup of hazardous material spills and releases.

3.6. Smoking and Fire Rules

Smoking shall be prohibited in all vegetated areas and within 50 feet of combustible materials storage and limited to paved areas or areas cleared of all vegetation.

Fire rules will be posted on the Project bulletin board at the contractor's field office and areas visible to employees. All construction workers, plant personnel, and maintenance workers visiting the transmission lines to perform maintenance activities will receive training on the procedures to be followed in the event of a fire. Training records will be maintained and available for review by the BLM.

3.7. Firefighting Equipment

3.7.1. Fire Extinguishers

A portable fire extinguisher is very effective when used for combating incipient-stage fires. The use of a fire extinguisher that matches the class of fire and is operated by a person who is well trained can save both lives and property. Locations of portable fire extinguishers (5-pound Class A-B-C at minimum) will be placed at, but not limited to, each construction site (if construction occurs simultaneously at various locations), office spaces, hot work areas, flammable storage areas, and mobile equipment such as work trucks or other vehicles. All fire-fighting equipment will be marked conspicuously and be accessible.

It is the responsibility of the Environmental Service Coordinator to oversee the inspection, maintenance, and testing of fire extinguishers to ensure that they are in proper working condition and maintained in accordance with local and federal Occupational Safety and Health Administration (OSHA) requirements and have not been tampered with or physically damaged.

3.7.2. Water

The contractor shall furnish water trucks with hoses. The trucks may serve a dual purpose. The truck may be used to spray water on roads and work areas to suppress dust per Fugitive Dust Control Plan requirements.

4. OPERATIONS, MAINTENANCE AND DECOMMISSIONING ACTIVITIES

4.1. Fire Prevention and Risk Reduction Responsibilities

Solar arrays and PV modules are fire-resistant, as they are constructed largely of steel, glass, aluminum, or components housed within steel enclosures. As the tops and sides of the panels are constructed from glass and aluminum, PV modules are not vulnerable to ignition from firebrands from wildland fires. In a wildfire situation, the panels would be rotated and stowed in a panel-up position. The rotation of the tracker rows would be controlled remotely via a wireless local area network. All trackers could be rotated simultaneously in a hazard situation. Fire safety and suppression measures, such as smoke detectors and extinguishers, will be installed and available at the O&M facility. In addition, the operator will implement the following during operations, maintenance, and decommissioning:

- Train all workers to prevent fires and to respond quickly and effectively if an incident occurs.
- Inspect and maintain a fire extinguisher and any other BLM-required fire prevention equipment

in each vehicle.

- Prohibit smoking outside of designated smoking areas.
- Perform “hot work” (i.e., welding or working with an open flame or other ignition sources) in controlled areas. Hot work areas will be wetted down as necessary before hot work is performed. At a minimum, a one-hour fire watch will be required after hot work is completed.
- Welding, cutting, grinding, or other flame- or spark- producing operations near the turbines should be minimized and, if required, closely supervised, with fire extinguishing equipment at hand.
- Remote monitoring of all major electrical equipment (transformers and inverters) will be used to screen for unusual operating conditions. Higher than nominal temperatures, for example, can be compared with other operational factors to indicate the potential for overheating which, under certain conditions, could precipitate a fire. Units could then be shut down or generation curtailed remotely until corrective actions are taken.
- On-site vegetation near all solar arrays, ancillary equipment, and access roads shall be trimmed approximately once every three years, as needed. For the first year, weed management and control would be performed quarterly. For the next two to four years, weed control would be performed annually in compliance with the BLM-approved Integrated Weed Management Plan.
- Schedule maintenance activities outside of the fire season, when possible, to minimize activity during high fire risk days.
- To mitigate fire risk, weather conditions will be monitored on site and operations and activities will be adjusted based on those conditions. Fire danger potential can be monitored using the following hyperlinked websites:

  National Weather Service Fire Weather Hazards: http://www.nws.noaa.gov/largemap.php

  Southern California Fire Weather Planning Forecast (National Weather Service Zone 261): http://www.wrh.noaa.gov/firewx/cafw/display_cafwfzone.php?sid=sgx&zone=261
- A Hazardous Materials Management Plan and Oil Spill Response Plan (see POD Appendix O), which establishes standard procedures for reporting, handling, disposal, and cleanup of hazardous material spills and releases, is in place.
- Keep equipment in good working order (i.e., inspect electrical wiring and appliances regularly and keep motors and tools free of dust and grease).
- Ensure that all exit or evacuation routes are free of obstructions.
- Prohibit non-essential heavy equipment operations for road maintenance during Red Flag Warning events.
- Turn off idling vehicles.
- Do not park over dry vegetation and inspect under parked vehicles before moving them to ensure desert tortoises are not present.

4.2. Battery Energy Storage System (BESS)

Battery energy storage systems (BESS) can assist grid operators in more effectively integrating intermittent renewable resources, such as PV solar generation, into the statewide grid. The Project will include an AC-coupled battery or other similar storage system capable of storing up to 500 to 1,150 MW of electricity, requiring up to 35 acres that would be located near the substation. The proposed BESS area would be cleared and graded, as the storage facility must be nearly level. The storage system would consist of battery or flywheel banks housed in electrical enclosures and buried electrical conduit. The battery system would be located near the Project switching station to facilitate interconnection and metering. Equipment would be delivered to the site on trucks.

The Project could use any commercially available battery technology, including but not limited to lithium ion, lead acid, sodium sulfur, and sodium or nickel hydride.

The BESS will be designed, constructed, operated, and maintained in accordance with applicable industry best practices, regulatory requirements, and with the current California Fire Code (CFC), which governs the code requirements to minimize the risk of fire and life safety hazards specific to battery energy storage systems used for load shedding, load sharing, and other grid services (Chapter 12, Section 1206, of the 2019 CFC). In accordance with the CFC, the battery enclosure and the site installation design are all required to be signed off by the State Fire Marshal. The battery will be certified and tested to UL 9540A, a test method intended to document the fire characteristics associated with thermal event or fire and would confirm that the system would self-extinguish without active fire-fighting measures. The results of the UL 9540A test would show that any internal fire is contained within the enclosure and not spread to the other parts of the facility. If applicable, the system will use a chemical agent suppressant-based system to detect and suppress fires. If smoke or heat were detected, or if the system were manually triggered, an alarm would sound, horn strobes would flash, and the system would release suppressant, typically FM 200, NOVEC 1230 or similar from pressurized storage cylinders.

The Project owner shall coordinate with the BLM to create a training component for emergency first responders to prepare for specialized emergency incidents that may occur at the Project site, including incidents such as fire or explosion at or with the BESS. The Project owner shall also prepare procedures for disconnecting or shutting down the BESS in case of fire or to reduce the chance of fire.

5. WILDFIRE DETECTION AND SUPPRESSION

5.1. Wildland Fire Management Plans and Policies

Federal, state, and local laws, regulations, and policies applicable to the Project are described below. All fire mitigation measures included in the Fire Plan meet the requirements of all federal, state, and local laws, and regulations.

Federal Law, Regulations, and Policies

Federal Wildland Fire Management Policy. On BLM-administered lands in the California Desert, the BLM implements Federal Wildland Fire Management policies and objectives in coordination with state and other federal agencies as part of the California Desert Interagency Fire Management Organization. The Federal Wildland Fire Management Policy was developed by a federal multi-agency group that establishes consistent and coordinated fire management policy across multiple federal jurisdictions. The policy acknowledges the essential role of fire in maintaining natural ecosystems, but also prioritizes firefighter and public safety first in every fire management activity and focuses on risk management as a foundation for all fire management activities. The policy promotes basing responses to wildland fires on approved Fire Management

Plans and land management plans, regardless of ignition source or the location of the ignition.

National Electric Safety Code (NESC) and American National Standards Institute (ANSI) Guidelines. A variety of line and tower clearance standards are used throughout the electric transmission industry. Nationally, most transmission line owners follow the NESC rules or ANSI guidelines, or both, when managing vegetation around transmission system equipment. The NESC deals with electric safety rules, including transmission wire clearance standards, whereas the applicable ANSI code deals with the practice of pruning and removal of vegetation.

5.2. Detection and Reporting

All fires shall be reported to the BLM and ICFD immediately. Table 1 provides applicable emergency services contact information.

Table 1. Emergency Contacts

Contact	Phone	Procedure
Fire	**911**	ALL fires (on and within sight of the Project) shall be immediately reported. When reporting an incident, you need the following information: ■ Type of incident (fire, explosion, etc.) ■ Location of incident ■ Time of incident ■ Information on any injury or fatality ■ Name and phone number for callback
Ambulance	**911**	
Federal Interagency Communication Center (BLM)	909-383-5651	
Imperial County Office of Emergency Services	(442) 265-6000	
ICFD Operations	(442) 265-3000	

5.3. Suppression and Response

If a fire is identified, the following steps shall be implemented:

- If it is safe to do so, extinguish a fire using on-site fire extinguishers and appropriate tools.
- Notify emergency services immediately, even if the fire appears out.
- Initiate emergency procedures, as appropriate, including electrical isolation.
- If an off-site wildfire threatens the facility while personnel are on site, evacuate the site if it is safe to do so, meet at a predetermined location to ensure that all personnel have safely evacuated.

6. EMERGENCY, SAFETY AND WORKER ENVIRONMENTAL AWARENESS PROGRAM

A written Emergency Response Plan (ERP) will be developed in accordance with Occupational Safety and Health Administration (OSHA) standards and other applicable federal, state, and local occupational safety and health laws, regulations, and standards governing such emergencies. Contractor(s) will include the ERP in the contractor's Project Safety Plan (PSP) and train all contractor representatives on the provisions of the ERP.

The safety of personnel is the top priority during the construction, operations, maintenance, and decommissioning of the Project. Required staff training would include fire prevention procedures, environmental, cultural, and health and safety training, in part through the Project's Worker

Environmental Awareness Program (WEAP). Annual familiarity training would be conducted with the local authorities, including police, BLM, and ICFD, as appropriate including annual First Aid and CPR training. The construction, operations, and contractor management staff will work to implement safety recommendations and assist in conducting site inspections.

In the event of an emergency response, the individual that discovered the emergency would conduct the following measures:

1. Personnel would assess the situation to determine potential safety concerns and hazards posed to personnel and the environment. Protective actions for life safety are the first priority.
2. All personnel will be moved or evacuated to a safe location. Access to the affected area would be prohibited. (The final ERP will include a site-specific evacuation plan and a shelter-in-place plan.)
3. Stabilization of the incident is the second priority. Anyone who witnesses an unusual situation that cannot be corrected routinely must notify their supervisor immediately and, while respecting the jurisdiction and ability, he/she must take the necessary measures to control the situation until the arrival of the Emergency Coordinator or supervisor.
4. The construction contractor would immediately notify the Project operator’s construction supervisor and environmental monitor of any emergencies and Project operator would notify federal, state, and local authorities, as appropriate. If an emergency threatens public or worker health, the contractor would make appropriate notification(s) to emergency personnel by calling 911.

7. REFERENCES

CAL FIRE (California Department of Forestry and Fire Protection). 2023. Fire Hazard Severity Zone (FHSZ) Viewer. [Online]: https://egis.fire.ca.gov/FHSZ/.

_____. 2007. FHSZ GIS Data for California.

Imperial County Planning & Development Services. 2023. Imperial County General Plan. [Online]: General Plan | Imperial County Planning & Development Services (icpds.com)

Attachment A

Fire Plan Training Log

Fire Plan Training Log

Appropriate training for all employees and regular site contractors will be implemented annually to ensure all personnel are adequately prepared to reduce fire risk at the facility and are aware of actions to be taken in the event of a fire emergency.

Instructor Only – This training event included the following subject matters (check box beside those that apply):	
☐	Preventing risks of fire
☐	Requirements for informing visitors/contractors of fire risks and ignition control
☐	Functionality of fire protection systems and installations as well as how to handle them
☐	Correct response in case of fire, e.g., reporting processes
☐	Correct use of fire suppression equipment, e.g., fire extinguishers
☐	Understanding of safe evacuation processes

Instructor Name: ______________________ Signature: __________________________

Date: ______________________________

Trainee Printed Name	Trainee Signature	Company	Date

Appendix I.3 Hazardous Materials Management And Oil Spill Response Plan

HAZARDOUS MATERIALS MANAGEMENT AND OIL SPILL RESPONSE PLAN

Perkins Renewable Energy Project

Prepared for

Intersect Power

IP Perkins, LLC and
IP Perkins BAAH, LLC
subsidiaries of Intersect Power, LLC

January 2024

CONTENTS

TABLES

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FIGURES

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ATTACHMENTS

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1. INTRODUCTION

IP Perkins, LLC and IP Perkins BAAH, LLC (Applicants or Proponents), subsidiaries of Intersect Power, LLC, proposes to construct, operate, and decommission the Perkins Renewable Energy Project (Project), a utility-scale solar photovoltaic (PV) electrical generating and storage facility, and associated infrastructure to generate and deliver renewable electricity to the statewide electricity transmission grid. The proposed Project site is located on a combination of Bureau of Land Management (BLM)-managed lands, Bureau of Reclamation (BOR)-managed lands, and private lands located in Imperial County east of El Centro, California (see POD [Plan of Development] Appendix A, Figure 1). The Project 500kV loop-in transmission lines will traverse Bureau of Reclamation (BOR) lands.

This framework Hazardous Material Management and Oil Spill Response Plan (Plan) identifies project-specific mitigation measures and other specific stipulations and methods to be taken by IP Perkins, LLC and IP Perkins BAAH, LLC, or the project operator at the time, and its Construction Contractor(s) to address hazardous materials spill prevention, response, and cleanup procedures for the Perkins Renewable Energy Project (project).

The term “hazardous material,” as presented in this framework Plan, refers to hazardous substances, hazardous wastes, marine pollutants, elevated temperature materials, and materials designated as hazardous for transportation as defined in 49 Code of Federal Regulations (CFR) 171.8.

2. OBJECTIVE

The purpose of this Plan is to reduce the risks associated with the use, storage, transportation, and disposal of hazardous materials. IP Perkins, LLC and IP Perkins BAAH, LLC (Proponent), has developed this plan as part of the Plan of Development (POD) that accompanies its application to the Bureau of Land Management (BLM) seeking a right-of-way (ROW) grant. This Plan provides guidance to construction, operations, contractors, and field personnel on measures to minimize effects during construction and operations and decommissioning activities associated with the project. The engineering, procurement and construction (EPC) contractor would supply, have on site, and follow this Hazardous Material Management and Oil Spill Response Plan specifically designed for the Perkins Renewable Energy Project.

This Plan identifies the expected waste and describes the hazardous waste management procedures to be used to maximize diversion and reduce the quantity of waste requiring disposal. In addition, this Plan specifically addresses the generation and characterization of hazardous waste, on-site storage and handling, hazardous waste discharge, and disposal of hazardous wastes generated at the project site and summarizes the responsibilities of all contractors and construction personnel. The Plan also serves as a tool to provide for accountability of hazardous material used throughout the project’s construction phase and describes the roles of the supervisor and the Emergency Coordinator (EC). The on-site supervisor/EC would help enforce and document adherence to this Plan during all construction activities, facility operation, and project decommission.

3. EMERGENCY PROCEDURE GUIDE

Should an emergency occur, all on-site personnel would have specific roles to follow to ensure the emergency is addressed immediately in a safe manner as described. All personnel will be trained in their roles.

3.1. Role of the Construction Personnel

The primary role of construction personnel is to notify the supervisor and EC and provide support where appropriate as follows:

- Obtain data concerning the nature of the emergency.
- Notify the supervisor and/or the EC of an emergency by any communication means available.
- Aid the supervisor and the EC in obtaining additional information necessary for completing the emergency information report form.
- At the direction of the supervisor and/or the EC, initiate control measures to manage and eliminate the release of hazardous materials, fire, or explosion or complete the required emergency shutdown procedures and evacuate the area.

3.2. Role of the Supervisor

The role of the supervisor is as follows:

- Evaluate the information provided by on-site personnel and obtain additional emergency information as requested by the coordinator or outside agencies.
- Initiate and manage facility control or cleanup counter measures.
- Provide continuous updates on the progress of the emergency and its control to the site EC.
- Carry out evacuation procedures at the request of the site EC.

3.3. Role of the Emergency Coordinator

The role of the EC is as follows:

- Whenever there is an actual emergency situation:
  - Activate internal facility alarms or communication systems if their help is needed.
  - Notify appropriate state or local response agencies if their help is needed.
- Whenever there is a release of hazardous materials, fire, or explosion, immediately identify the nature of the problem, source, amount, and extent of any released materials. This can be done by direct observation or use of records, manifests, material safety data sheets, or chemical analysis, if necessary.
- Assess possible hazards to human health and the environment, resulting from the release of hazardous materials, fire, or explosion. Examples include toxic gases or hazardous materials running off site when control measures are used.
- If the project site may need to be evacuated, notify local authorities and be available to provide technical information and to assist officials in the decision to evacuate.
- Notify the appropriate agencies if the emergency extends outside the facility.
- During an emergency, take all reasonable steps to ensure that fires, explosions, or releases of hazardous materials do not spread to other hazardous materials or wastes stored at the facility. Control measures must include stopping processes, collecting and containing released hazardous materials or wastes, and removing or isolating collected

hazardous materials.

- Immediately after an emergency, provide direction for treating, storing, or disposing the recovered waste, contaminated soils or surface water, or any other hazardous material that results from a release of hazardous materials, fire, or explosion.
- Ensure that all required written reports are filed with the appropriate regulatory agencies within the required reporting periods.

4. HAZARDOUS MATERIALS MANAGEMENT

Hazardous materials used during construction may include petroleum products such as gasoline, diesel fuel, and hydraulic fluid; lubricating oils and solvents; cleansers; explosives; and other substances. Some of these materials would be used at material yards and on the ROW to operate and maintain equipment during construction. Small quantities of other materials such as pesticides, herbicides, fertilizers, paints, and chemicals may be used during project operation and maintenance activities. Pesticides and herbicides are hazardous materials and would be used according to manufacturer labeling. Human waste and chemicals used in portable toilets may also be present.

Consistent with the requirements of Imperial County Department of Public Health and the Imperial Certified Unified Program Agency (CUPA), a Hazardous Materials Inventory and a Hazardous Materials Business Plan will be developed to plan and prepare for a chemical emergency. A Business Emergency Response Plan and Inventory is required for sites that handle quantities equal to or greater than 500 pounds of solids, 55 gallons of liquids, or 200 cubic feet of gas. Fuel storage and refueling operations would be conducted in accordance with federal, State, and local regulations, as specified in the project Environmental Assessment and Environmental Impact Report. An HMBP will been prepared and uploaded to the California Environmental Reporting System (CERS). A specific Spill Prevention, Control, and Countermeasures (SPCC) Plan will also been developed consistent with County, State, and Federal requirements.

Table 1. Fuel Storage Tank Specifications

Tank Capacity	Fuel Storage	Length	Widt h	Heigh t
# gallons	Diesel/unleaded			

The project may use a variety of PV technologies including, but not limited to cadmium telluride panels, crystalline silicon panels, or copper indium gallium selenide panels. None of the panels being considered contain materials that are classified as hazardous wastes because the chemicals within PV modules are highly stable and would not be available for release to and interaction with the environment. If a panel is broken, the pieces would be cleaned up completely and returned to the manufacturer for recycling.

Some vehicle fluids are hazardous to humans, wildlife, water resources, and other sensitive environments. Toxicity can be transported as vapor or liquid and can affect skin, eyes, respiratory system, and internal organs. Some of these materials can be flammable and combustible and must be handled carefully when spills are cleaned up. Sources of spills include mobile construction vehicles and machinery. Refueling could also result in spills. Spills can occur from ruptures in fuel tanks, overflow during fueling, during storage, hose ruptures, equipment servicing and repairs, vehicle accidents, and natural disasters.

All weed and insect control on BLM lands would be in accordance with a BLM-approved Integrated Weed Management Plan and Pesticide Use Proposal, which would reduce the potential for exposure of people to pesticides or herbicides. In addition, herbicides may be used for weed control as part of an integrated pest management strategy on BLM-administered lands for the Project. Therefore, herbicides may be present on BLM-administered lands in the Project area and can be in concentrated liquid form. Spills can occur from handling errors, improper storage, and container ruptures. Herbicides would be stored in proper containers and handled by trained personnel. The contractor would minimize the risk of spills during construction and operation by training personnel in best management practices for handling and transporting liquids, requiring spill clean-up equipment on site, and monitoring and inspecting vehicles and liquids handling.

All waste generated would be properly disposed. Any hazardous spills would be properly reported.

5. HAZARDOUS WASTE DISPOSAL FACILITIES

Hazardous waste would be collected regularly and disposed of in accordance with all applicable laws and regulations. The construction contractor(s) will determine details on the proper handling and disposal of hazardous waste and will assign responsibility to specific individuals prior to construction.

Every effort would be made to minimize the production of hazardous waste during the project, including minimizing the number and/or amount of hazardous materials needed for the project; using alternative nonhazardous substances when available; recycling usable material, such as oils, paints, and batteries to the maximum extent; and filtering and reusing solvents and thinners whenever possible.

Any generator of hazardous waste must apply for an Environmental Protection Agency Identification Number. The identification number is needed to complete the Uniform Hazardous Waste Manifest to ship waste off site. A generator can accumulate hazardous waste on site for a period of up to 90 days without having to obtain a permit as a storage facility.

Currently, California permits three hazardous waste landfills actively accepting waste: 1) The Clean Harbors Westmorland Landfill facility located at 5295 South Garvey Road in Imperial County, 2) Chemical Waste Management's Kettleman Hills Facility located at 35251 Old Skyline Road in Kettleman City, Kings County, California, and 3) Clean Harbors' Buttonwillow Facility located at 2500 West Lokern Road in Buttonwillow, Kern County, California.

In addition to hazardous waste landfills, there are numerous commercial hazardous wastes and used oil facilities in California that accept off-site waste for a fee, as well as perform storage, treatment, and/or disposal. These facilities include those that would accept and/or recycle hazardous wastes such as batteries, electronic waste/Polycarbonates/plastics, fluorescent lighting, metal, solvent, and used oil/antifreeze.

Properly locating, cleaning, and maintaining portable toilets and properly disposing of waste would minimize the risk of spills of human waste, which contain possible pathogens, and chemicals used to treat waste. Toilets would be routinely inspected and pumped to avoid overflowing.

6. HAZARDOUS MATERIAL STORAGE AND HANDLING

The construction contractor(s) would use designated material yards for storing hazardous materials. Regulated materials would not be stored in areas subject to flooding or within 100 feet of a jurisdictional waterway. Staging yards, refueling areas, and chemical storage areas, if needed, in upland areas that do not slope to sensitive resources. Liquids would be stored in secured areas (fenced or locked building on the solar site). Storage containers would be properly labeled to indicate the contents of the container. Safety Data Sheets for all materials would be available on site and to construction personnel. Hazardous materials would be stored only in designated areas on impervious surfaces, on plastic ground- covers, or with secondary containment, to prevent spills or leaks from infiltrating the ground. A list of the hazardous materials on site during construction, including information regarding their storage, use, and transportation would be maintained and would be available to project personnel.

At the material yards on the solar sites, the Construction Contractor(s) would:

- Limit the quantity and the amount of time that hazardous materials are stored near water bodies.
- Ensure that the project operator provides secondary containment for all on-site hazardous materials and waste storage tanks. Secondary containment structures must be sized to contain 110 percent of the volume of the largest single container, with sufficient freeboard to capture precipitation, where applicable. Areas that require secondary containment structures include liquid and hazardous waste drum storage areas, aboveground storage tanks, and tanker trucks that are parked at one location for more than two days. Secondary containment structures may include, but are not limited to:
  - Spill containment pallets in which 55-gallon or similar-sized drums can be placed;
  - Earthen berms or trenches lined with plastic sheeting;
  - Concrete containment pits or other impervious basins; and
  - Double-walled aboveground storage tanks.
- Maintain adequate amounts of absorbent materials and containment booms to enable the rapid cleanup of a minor spill.
- Provide adequate lighting for locations where hazardous materials are used and stored.
- Ensure that personnel trained in hazardous materials management are utilized to monitor activities at the material yards.

Construction and storage areas would be monitored for any leaks or spills, including hydraulic leaks from equipment. If any leaks or spills occur, the activity would be immediately stopped, and containment and cleanup activities would immediately begin in accordance with local, state, and federal regulations. In addition, the project operator’s construction or operations personnel would be immediately contacted.

7. VEHICLE AND EQUIPMENT INSPECTION, FUELING, AND MAINTENANCE

The EPC contractor would inspect all equipment before leaving the staging area for the construction site to ensure vehicles and equipment are safe and are not leaking. The EPC contractor would be responsible for promptly repairing or replacing faulty equipment and reporting and mitigating any leaks or spills from equipment. Fuel trucks, if used, would be inspected for leaks and valves tightened, adjusted, or replaced to prevent leakage during transit. All fuel nozzles would have functioning, automatic shut-off valves.

To the greatest extent practical, routine fueling, oil transfers, and maintenance would be done at staging areas. Refueling would occur with the Project laydown yard. Fueling locations would have spill kit and fire suppression equipment available. On-site vehicle repair or maintenance would not occur within 100 feet of a jurisdictional waterway. Drip trays and absorbent pads would be used during on-site fueling or oil changes. All drained oil and clean-up material would be removed from the site for recycling or proper disposal. An appropriately trained person would be in attendance while filling petroleum product and hazardous chemical primary containers, fueling trucks, equipment, etc., during all construction activities.

The washing of construction vehicles, such as concrete trucks, would be allowed only in designated areas more than 100 feet from streams and wetlands. Washing areas would be contained with barriers to pre- vent migration of wastewater and/or sediments into water bodies. Waste concrete material would be removed and properly disposed of once it has hardened. In addition, all preventive measures would be followed as they relate to vehicle washing procedures.

8. EMPLOYEE SPILL PREVENTION/RESPONSE TRAINING

The project operator would require all personnel involved in transporting and handling liquid waste to participate in spill prevention/response training before working on the project. The EPC contractor, the project operator's construction staff, and the environmental monitor would attend the spill training. Training would include:

- An overview of pertinent laws, regulations, and project authorization stipulations;
- Methods for the safe handling/storage of hazardous materials and fueling;
- Overview of spill prevention procedures, clean-up and disposal techniques, and spill clean-up equipment;
- Overview of the location of machinery equipped with clean-up kits and Safety Data Sheets for regulated materials;
- Emergency response procedures including coordinating with emergency response teams;
- Roles and responsibilities of personnel;
- Procedures for notifying agencies;
- Procedures for documenting spills;
- Identification of sites/areas requiring special treatment, if any; and
- Provision of a copy of the HMMP to appropriate personnel.

The project operator's construction inspectors and the environmental monitor would monitor the routine handling of regulated materials. Updates on spill prevention and materials handling would be discussed at weekly safety meetings. The Worker Environmental Awareness Program (WEAP) training would cover spill prevention, emergency response, and safe material handling and would be site-specific.

9. SPILL RESPONSE

Following a spill, personnel would assess the situation to determine potential safety concerns and hazards posed to personnel and the environment. If safe, all reasonable efforts would be made to immediately control the source of the discharge and contain the spill. Personnel would stop the source of the spill by turning off machinery, clamping or disabling hoses, and removing any ignition sources. The material spilled and the quantity of the spill would be identified to the degree possible.

Depending on the volume of the spill, the EPC contractor would deploy on-site spill response materials and contact additional support resources. Absorbent materials or granules would be deployed to limit the area of contamination. All reasonable efforts would be made to prevent any spill from reaching wetlands or waterbodies. If a spill should reach surface waters, straw bales, booms, and absorbent materials will be immediately deployed to contain and reduce downstream migration of the spilled material.

Once a spill is contained, cleanup activities would begin immediately. All spilled material, contaminated soil, and absorbent material would be picked up and contained for disposal. Contaminated vegetation and soil will be excavated from the site within 24 hours of the incident, and along with soiled clean-up material, stored on plastic sheets until it can be removed for proper disposal. Clean-up wastes, including absorbent materials, clothing, or contaminated vegetation, and soil, would be stored in 55-gallon drums and moved to the designated storage area. All drums would be labeled with the contents and date the waste was placed in the drum. If the contaminant is unknown, a sample may be taken to determine the material and method of disposal.

Proper disposal of all waste would abide by relevant federal and state statues and would follow the project operator’s policies and procedures for proper waste characterizations, handling, and disposal. In the event of a large spill or a spill that migrates into surface waters, the spill response contractors would be called to assist in cleanup efforts. Any areas affected by clean-up would be assessed for remediation. Rehabilitation plans would be developed in coordination with the environmental monitor.

9.1. Spill Response Equipment and Material

The construction contractor(s) would supply spill kits and materials that can be stored and readily deployed from staging areas. In addition, the EPC contractor would be required to have mobile spill kits for use in any fueling operations. Each construction crew would have sufficient supplies of absorbent and barrier materials on hand to allow the rapid containment and recovery of any spills.

The quantity and location of equipment would be submitted and approved by the project operator during the contract process. Equipment and material would include but is not limited to:

- Storage containers;
- Bags of absorbent;
- Absorbent pads;
- Plastic sheeting;
- Tyvek suit and booties;
- Nitrile gloves;
- Safely googles;
- Medical first-aid supplies;
- Communications equipment; and
- Shovels and pertinent soil removal equipment to be staged next to spill kits along with fire extinguishing equipment.

9.2. Spill Notification and Spill Reporting

Small spills or leaks (less than 5 gallons) would be dealt with within 24 hours of the incident and would be documented in the spill report form. If a spill is between 5 to 50 gallons, the BLM contact would be given a courtesy call within a few hours of the incident. If the spill is larger than 50 gallons, the appropriate authorities would be notified.

The construction contractor would immediately notify the project operator, and the project operator's Construction Supervisor and environmental monitor of any spills and/or clean-ups, regardless of the size. The project operator would notify BLM, state, and local authorities, as appropriate. The project operator would determine environmental reporting requirements and would notify appropriate environmental agencies.

The contractor would complete a spill report form and submit the form to the project operator's, Construction Supervisor and environmental monitor within 24 hours of a spill. An updated spill report log would be kept on site. If a spill is too large to control or threatens the public or worker health, the contractor would make appropriate notification(s) to emergency personnel.

Appendix I.4 Health, Safety, and Noise Plan

HEALTH, SAFETY AND NOISE PLAN

Perkins Renewable Energy Project

Prepared for

IP Perkins, LLC and
IP Perkins BAAH, LLC
subsidiaries of Intersect Power, LLC

January 2024

CONTENTS

1. INTRODUCTION

IP Perkins, LLC and IP Perkins BAAH, LLC (Applicants or Proponents), subsidiaries of Intersect Power, LLC, proposes to construct, operate, and decommission the Perkins Renewable Energy Project (Project), a utility-scale solar photovoltaic (PV) electrical generating and storage facility, and associated infrastructure to generate and deliver renewable electricity to the statewide electricity transmission grid. The proposed Project site is located on a combination of Bureau of Land Management (BLM)-managed lands, Bureau of Reclamation (BOR)-managed lands, and private lands located in Imperial County east of El Centro, California (see POD [Plan of Development] Appendix A, Figure 1). The Project 500kV loop-in transmission lines will traverse Bureau of Reclamation (BOR) lands.

IP Perkins, LLC and IP Perkins BAAH, LLC is committed to the safety and health of all workers, contract personnel, and visitors to the Perkins Renewable Energy Project site and work locations. All managers, supervisors, and contractors would be held accountable for the health and safety of all workers under their supervision and would consistently work to correct or eliminate workplace hazards that could cause accidents or injuries. Managers, supervisors, and contractors are responsible for ensuring that Project sites, work and office locations, machinery, and equipment are safe and that all workers work in compliance with established safe work practices and procedures.

All workers and contract personnel would be responsible and expected to protect their own health and safety by working in compliance with appropriate Occupational Health and Safety legislation and applicable regulations and standards, as well as the provisions of the health and safety program described herein and following safe work procedures. All personnel and associates would exercise responsibility and care in the prevention of illness and injury to themselves and to others. All personnel and associates are encouraged to establish and maintain high standards of health and safety and to demonstrate that commitment by personal example.

The Health and Safety Plan, described in more detail in Section 4, is comprised of the:

- Project Safety Plan,
- Emergency Response Plan,
- Worker Education and Awareness Program, and
- Monthly Safety and Health Reports.

The Noise Plan is addressed in Section 5.

2. OBJECTIVE

The Construction Contractor(s) would be responsible for preparing and implementing a Health and Safety Plan in compliance with all local, state, and federal regulations pertaining to health and safety. The purpose of the Plan is to provide a description of measures that would be implemented to minimize safety-related situations that could occur and provide procedures to assist in the protection of workers and the public during the construction and operation of the Perkins Renewable Energy Project (Project). IP Perkins, LLC, and IP Perkins BAAH, LLC (Proponents) have developed this Plan as part of the Plan of Development (POD) that accompanies its application to the Bureau of Land Management (BLM) seeking a right-of-way (ROW) grant for the solar facility, battery energy storage system (BESS), breaker and a half switchyard (BAAH), two 500 kV Transmission loop-in lines, and gen-tie line. The Plan provides guidance to contractors and field personnel on measures to minimize effects during construction and operations activities associated with the Project.

The following text includes standard language regarding health and safety. These measures may be modified in the final POD to include measures specifically designed for the Project. The following is intended to be an overview of the Proponent or its contractors' safety and health requirements and is not intended to be a comprehensive or exhaustive list. It is not intended to supersede or replace the contractors' obligations to comply with (and ensure Contractor Representatives comply with) all applicable laws; all reasonable directions and orders given by the Proponent's representatives; and all other guidelines, rules, and procedures that may be given to contractors from time to time, including without limitation, safety and health standards, policies, and procedures resulting from a pre-job risk assessment, amendments by the Proponent or amendments resulting from changes in applicable laws.

The management practices and activities in the Health and Safety Plan are intended to accomplish the following objectives:

- Educate workers on the hazards associated with the Project and how to identify them; the safety measures that must be taken to prevent injury; how to identify potentially contaminated soils and/or groundwater; and the procedures for ensuring personnel receive necessary training.
- Identify federal and state occupational standards regarding occupational safety and safe work practices.
- Establish fire safety evacuation procedures.
- Explain the appropriate response actions for each safety hazard and develop and describe the procedures and mechanisms for responding to and reporting serious accidents to appropriate agencies and for notifying the appropriate authorities of safety issues.
- Identify requirements for temporary fencing around structure areas, staging areas, storage yards, and excavation areas during construction or decommissioning activities, as well as appropriate measures to be taken during construction of the Project to limit public access to hazardous components.
- Designate environmental field representative(s) to be on site to observe, enforce, and document adherence to this Health and Safety Plan.
- Identify where medical kits are located.

3. HEALTH AND SAFETY PLAN

3.1. Regulatory Compliance

IP Perkins, LLC and IP Perkins BAAH, LLC (or the Project operator at the time) would comply with all applicable federal, state, and local occupational safety and health laws, regulations, and standards. The Project operator using prior judgment, experience, and knowledge would identify such additional health and safety measures as may be required for work to be performed safely.

3.2. Safety and Occupational Health Supervisor

Before on-site services begin, the Project operator would ensure that the contractor(s) assign a designated Safety and Occupational Health Supervisor, qualified by experience and/or education, for all services taking place. The Safety and Occupational Health Supervisor would manage implementation of the practices and activities in the Health and Safety Plan and may have additional functions specific to the Proposed Project. The contact number for the designated Safety and Occupational Health Supervisor would be posted onsite for personnel. The roles, responsibilities, and contact information of the designated Safety and Occupational Health Supervisor would be included in the Worker Education and Awareness Program (WEAP) training.

3.3. Competent and Qualified Persons

The Project operator would ensure contractor(s) employ a “competent person” and/or “qualified person” capable of identifying unsafe hazards. Such person(s) would have the authority to take prompt corrective measures to correct such hazards and carry out the responsibilities of a “competent” and/or “qualified” person as required by applicable Occupational Safety and Health Administration (OSHA) standards. Contractor(s) would provide the Project operator with the name and contact information of the assigned person(s) and/or any changes in the assignment.

3.4. Job Safety Analysis

Before on-site services begin, contractor(s) would complete a job safety analysis to identify occupational safety and health hazards associated with the services to be provided. For each identified hazard, hazard controls must be specified and implemented. A hazard analysis defining the required personal protective equipment for the services would also be completed in accordance with OSHA standards and other applicable federal, state, and local occupational safety and health laws, regulations, and standards. The job safety analysis would be used to establish the scope of the subsequent components of the Health and Safety Plan.

3.5. Project Safety Plan

The Project operator would ensure contractor(s) develop a Project Safety Plan (PSP) once construction specifics are known that describes how the contractor would safely provide the contractor’s services. The content of the plan would address regulatory compliance, OSHA standards, and any additional health and safety measures as may be required for the contractor’s services to be performed safely. The PSP would address site specific health and safety measures, relevant contact information, and reporting.

The PSP would also ensure compliance with the applicable health and safety measures found within any applicable Project mitigation measures.

In addition, the PSP will discuss the Project-specific disease preventative requirements for safe work practices and cleaning that would be consistent with federal, State, and local guidelines to minimize risk of exposure. The PSP will discuss general protocols to follow in the event that Contractor(s) or Operator personnel show symptoms of disease or test positive, including exposure to others.

3.6. Emergency Response Plan

Contractor(s) would develop a written Emergency Response Plan (ERP) in accordance with OSHA standards and other applicable federal, state, and local occupational safety and health laws, regulations, and standards. Contractor(s) would include the ERP within contractor’s PSP.

Contractor(s) would train all contractor representatives on the provisions of the ERP, which would be consistent with applicable laws and regulations governing such emergencies.

The resources and coordination required for response to a specific hazard or emergency is determined by type, severity, location, and duration of the event. Most events require management at the field operations level and would require increasing resource requirements to match the severity and duration of the event. This emergency management organization would be included as part of the ERP and would provide increasing levels of resources and the coordination necessary to support immediate or escalating emergency events.

In the event of an emergency, crews would be dispatched quickly to repair or replace any damaged equipment. Public health and safety and the health and safety of workers would have priority under emergency conditions. Repair of the transmission line and restoration of electric service is a public health and safety concern and would proceed as rapidly as possible under the circumstances. All reasonable efforts would be made to protect plants, wildlife, and other resources. Reclamation procedures following completion of repair work would be similar to those prescribed during construction.

3.7. Worker Education and Awareness Program (WEAP)

As part of the PSP, the designated Safety and Occupational Health Supervisor would coordinate with the Environmental Monitor to ensure the implementation of the health, safety, and WEAP programs to properly communicate the necessity of compliance with the Project’s mitigation measures and general site safety requirements for all personnel. The safety of personnel is a top priority of the construction, operations, and contractor management staff. Required staff training would include environmental, cultural, health, and safety training, in part through the Project’s WEAP. The designated Safety and Occupational Health Supervisor, with input from the Environmental Monitor, would prepare a PowerPoint Presentation that all construction personnel must review prior to the commencement of construction. This format is effective in the field and, once printed in hard copy, serves as the on-site training for personnel that may later join the job site. All employees and or contractors would be required to sign a form stating they have completed environmental training for the Project. Each individual that successfully completes training would be issued an environmental training hardhat sticker and would be required to display this sticker throughout construction activities. As new personnel come on-site throughout the various stages of the Project, the training would be initiated, and the records (signed forms) updated and submitted to the BLM. Annual familiarity training would be conducted with the local authorities, including police and fire departments, as appropriate. Annual First Aid and CPR training would also be conducted.

During both construction and operation, there would be continuing training conducted for all facility personnel on current industry issues as well as new changes to safety equipment and procedures. The construction, operations, and contractor management staff would work to implement safety recommendations and assist in conducting site inspections.

3.8. Monthly Safety and Health Reports

Within five (5) working days of the end of each calendar month or after all services are performed, contractor(s) would provide IP Perkins, LLC and IP Perkins BAAH, LLC with a written report containing the following information:

- Number of first aid injuries, and

- Number of OSHA recordable injuries.

4. NOISE PLAN

During construction, construction vehicles would create some noise, although much of the noise would be limited to the period of time when earthwork and pile driving are taking place. Noise generated by the Project would consist of: (1) short duration sounds resulting from construction activities, and (2) sound during normal facility operations. Received sound levels would fluctuate, depending on the construction activity, equipment type, and distance between the noise source and receiver. Otherwise, the primary noise source of vehicles would be delivery trucks. The Project would be subject to mitigation measures during construction designed to limit noise at sensitive receptors and ensure that construction noise complies with local regulations.

During operations, some of the transmission and gen-tie lines would introduce a long-term source of noise related to the audible corona effect of the 500 kV line, which occurs with normal and routine operation. Corona noise from the Project transmission lines would occur in the same corridor as other existing transmission lines. The Project transmission lines on BOR-administered land would be subject to any noise mitigation measures presented in the NEPA environmental document.

In addition, the following protection measures for noise would be implemented during construction and operations and maintenance:

- Construction vehicles and equipment would be maintained in proper operating condition and would be equipped with manufacturers' standard noise control devices or better (e.g., mufflers, engine enclosures). Improperly functioning equipment would be fixed and or removed from the construction site until the issue is corrected.
- Noise associated with construction and operations activities shall comply with applicable noise restrictions.

Appendix I.5 Security and Emergency Preparedness Plan

SECURITY AND EMERGENCY PREPAREDNESS PLAN

Perkins Renewable Energy Project

Prepared for

IP Perkins, LLC and
IP Perkins BAAH, LLC
subsidiaries of Intersect Power, LLC

January 2024

CONTENTS

1. INTRODUCTION

IP Perkins, LLC and IP Perkins BAAH, LLC (Applicants or Proponents), subsidiaries of Intersect Power, LLC, proposes to construct, operate, and decommission the Perkins Renewable Energy Project (Project), a utility-scale solar photovoltaic (PV) electrical generating and storage facility, and associated infrastructure to generate and deliver renewable electricity to the statewide electricity transmission grid. The proposed Project site is located on a combination of Bureau of Land Management (BLM)-managed lands, Bureau of Reclamation (BOR)-managed lands, and private lands located in Imperial County east of El Centro, California (see POD [Plan of Development] Appendix A, Figure 1). The Project 500kV loop-in transmission lines will traverse Bureau of Reclamation (BOR) lands.

The purpose of this Security and Emergency Preparedness Plan (Plan) is to provide guidelines and requirements that all personnel and laborers shall follow to ensure the Perkins Renewable Energy Project (Project) is secured and completed on schedule, and with zero injuries/accidents. This Plan has been prepared, exclusively, to accommodate all phases of the construction activities, operations, and decommissioning of the Project and will be updated throughout the project life to address key personnel and current regulatory requirements.

2. OBJECTIVE

The purpose of the Plan is to provide a description of measures that would be implemented in order to minimize safety-related situations that could occur and provide procedures to assist in the protection of workers and the public during the construction and operation of the Perkins Renewable Energy Project (Project). IP Perkins, LLC and IP Perkins BAAH, LLC, (Proponents) has developed this Plan as part of the Plan of Development (POD) that accompanies its application to the Bureau of Land Management (BLM) seeking a right-of-way (ROW) grant for the solar facility, battery energy storage system (BESS), breaker and a half (BAAH), two new 500 kV transmission lines, and gen-tie line. The Plan provides guidance to contractors and field personnel on measures to minimize effects during construction and operations activities associated with the Project.

These measures may be modified in the final POD to include measures specifically designed for the Project. The following is intended to be an overview of the Proponent or its contractors' safety and health requirements and is not intended to be a comprehensive or exhaustive list. It is not intended to supersede or replace the contractors' obligations to comply with (and ensure Contractor Representatives comply with) all applicable laws; all reasonable directions and orders given by the Proponent's representatives; and all other guidelines, rules, and procedures that may be given to contractors from time to time, including without limitation, safety and health standards, policies, and procedures resulting from a pre-job risk assessment, amendments by the Proponent or amendments resulting from changes in applicable laws.

The management practices and activities in the Security and Emergency Preparedness Plan are intended to accomplish the following objectives:

- Educate workers on the hazards associated with the Project and how to identify them; the safety measures that must be taken to prevent injury; how to identify potentially contaminated soils and/or groundwater; and the procedures for ensuring personnel receive necessary training.
- Identify site security measures that will be implemented during construction and operation

phases of the Project.
- Establish fire safety evacuation procedures.
- Explain the appropriate response actions for each safety hazard and develop and describe the procedures and mechanisms for responding to and reporting serious accidents to appropriate agencies and for notifying the appropriate authorities of safety issues.

3. SITE SECURITY

3.1. Controlled Access

Project ingress and egress locations would be accessed via locked gates located at up to three points off of Highway 98 (see Site Map, POD Appendix A).

3.2. Fencing

The solar facility would be enclosed with fencing that meets National Electric and Safety Code (NESC) requirements for protective arrangements in electric supply stations. The boundary of the Project site would be secured by up-to 6-foot-high chain-link perimeter fences, topped with one foot of three strand barbed wire, or as dictated by BLM and/or North American Electric Reliability Corporation (NERC) specifications. The fence would typically be set approximately 100 feet from the edge of the array.

3.3. Lighting

Motion sensitive, directional security lights would be installed to provide adequate illumination around the substation areas, each inverter cluster, at gates, and along perimeter fencing. All lighting would be shielded and directed downward to minimize the potential for glare or spillover onto adjacent properties. Security lights would use motion sensor technology that would be triggered by movement at a human's height. Once activity has ceased, the motion sensors would be set to turn off lighting within 10 minutes.

All structures would be lower than the 200-foot height standard that triggers Federal Aviation Administration Part 77 Obstruction Evaluation Consultation, so no aviation lighting is required.

3.4. Other Security Measures

During construction, motion detector activated shielded lighting as described in Section 4.3 would be used during all nighttime activities. Nighttime activities are anticipated to be minimal during both Project construction and operations. During construction, they would be limited to work that must be completed sequentially over a 24-hour period (such as transformer installation) or as required by the interconnecting utility or California Independent System Operator (CAISO). During operations, nighttime activities would be limited to occasional O&M activities at the substation, switchyard, BESS, and panel repair required during de-energization. Additionally, off-site security personnel would be on-call and could be dispatched during nighttime hours or could be on-site, depending on security risks, emergency maintenance requirements, and operating needs. Infrared security cameras, motion detectors, and/or other similar technology would be installed to allow for monitoring of the site through review of live footage 24 hours a day, 7 days a week. Such cameras or other equipment would be placed along the perimeter of the facility and/or at the inverters. Security cameras located at the inverters would be posted on poles approximately 20 feet high.

4. EMERGENCY PREPAREDNESS PLAN

4.1. Site Specific Crossing/Traffic Control Plan

A site-specific Crossing/Traffic Control Plan is included as **Attachment 1**.

[TO BE COMPLETED BY EPC PRIOR TO CONSTRUCTION]

4.2. Crisis Management

Refer to the IP Perkins, LLC and IP Perkins BAAH, LLC, Flow Chart in **Attachment 2** for site specific information regarding who to contact in the event of an emergency.

[TO BE COMPLETED PRIOR TO CONSTRUCTION]

4.3. Emergency Services Authority

The Project's onsite Superintendent will be responsible for overseeing emergency services compliance. Their duties will include ensuring that the measures in this plan are complied with, any and all agencies are properly notified in the event notification is required, and that all required plans and reports are prepared and submitted in a timely manner.

The Project Superintendent will be the emergency point of contact for the Perkins Renewable Energy Project. The superintendent's contact information is as follows:

[Enter Project Superintendent contact information here when known]

Emergency Response Contact(s):

Fire/Paramedics/Police: 9-1-1
BLM Fire Non-Emergency Line
California State Office: (916) 978-4400
Imperial County Sheriff (East County): (442) 265-7051
Local Emergency Medical Facility: El Centro Regional Medical Center
1415 Ross Ave
El Centro, CA 92243
(760) 339-7100
Emergency: 9-1-1

4.4. Communication and Training Procedures

All employees and subcontractors will receive safety training before they begin work onsite. This training will include pertinent information regarding hazardous material management and fire prevention. The Project's superintendent will be responsible for ensuring that all personnel receive this training.

4.5. Site Evacuation Plan / Assembly Area

Site evacuation procedures are required as part of an emergency response plan and will be completed by the contractor prior to construction activities. Every job site should, at the outset, determine a safe corridor for escape and assembly.

Examples of emergencies requiring a site evacuation include:

- Explosion from underground pocket of flammable/combustible gases.
- Equipment fire or explosion.
- Inclement weather.
- Toxic gas/vapor release from subsurface pocket of gases or containers.
- Cave-in from excavated trenching.

Evacuation routes are established upwind and cross from the direction of wind flow as determined by either a windsock or other visual means of determining air movement. In the event of an evacuation signal, every worker is required to cease operations, note the wind pattern and move in a cross and upwind direction to the designated assembly point. The designated assembly point is 200' Ft/ outside of the main project entrance.

4.6. Response to a Release of Hazardous Materials/Wastes, Liquids, Unusual Smell or Odor

If there is a release, i.e., oil, diesel, or other petroleum product, hazardous waste, or the perception of an unusual foul or irritating smell or odor, immediately evacuate the area by moving across and up-wind from the source to the designated assembly point. Remain there until cleared to return. Notify project Management Team prior to resuming operations.

If the identity of the released product/waste or odor is known and does not pose an immediate threat to the safety and/or health of the workers or the environment, notify the site supervisor and implement steps to contain and control the release. All hazardous waste spills will be handled in accordance with the Hazardous Materials Management and Oil Spill Response Plan (see POD Appendix O).

4.7. Fire

Alert and immediately evacuate personnel away from the immediate area. Notify Management Team regarding any size fire that occurs on the Project. If necessary, the Management Team will notify the Fire Department by calling 9-1-1.

For small fires (a fire that can be controlled with one 20 lb., fire extinguisher), contain and extinguish the fire as quickly as possible.

For large fires, immediately evacuate the affected area and report to the designated assembly point. Additional fire procedures are identified in the Fire Management and Prevention Plan (see POD Appendix N).

4.8. Explosions

Following an explosion, immediately survey the affected area for injured workers. If safe to enter, remove the injured to a safe distance. Injured workers will be transported to the nearest emergency medical facility.

Immediately evacuate the affected area and report to the designated assembly point. If a fire develops, follow emergency procedures for fire control and evacuation, as described above.

4.9. Accidents

All accidents/incidents shall be reported to the Site Supervisors immediately for investigation and follow-up. An incident written incident report shall be submitted to the Superintendent within 24 hours.

For accidents involving personal injury, immediately apply appropriate first aid and transport the injured party to the designated medical facility. Never allow the injured employee to transport him/herself. Site Supervisors will summon emergency medical response for injuries requiring emergency assistance.

4.10. Vehicle Accidents

Stop the vehicle as soon and as safely as possible. Assess the damage to the vehicle and collateral damage to equipment and any other objects. If injuries are sustained, follow the accident procedures above. Report all vehicle accidents to your supervisor immediately.

An Incident Report online must be filled out for all accidents/incidents.

4.11. Equipment Failure or Power Outage

Turn off equipment or power. Assess damage and notify your supervisor. Wait for further instructions.

4.12. Natural Disaster/Earthquake

Complete the following:

1. Shut down all operations/equipment in a safe effective manner.
2. Check all personnel for injury and follow appropriate procedures
3. Inspect all fuel/oil/wastewater tankage and/or containment structures for signs of leakage or damage.
4. Inspect all operational units for proper operations made, and manually check to insure all automatic and alarmed features are working properly.
5. Inspect all piping, values, and fixed pumping units for damage.
6. Re-inspect electrical circuits and power supplies for damage.
7. Report to assembly point and wait for further instructions.

4.13. Severe Weather

4.13.1. Flash Floods

It is important to be careful when driving during flash flood conditions. Nearly half of flash flood fatalities are vehicle related. Six inches of standing water is enough to stall some cars, a foot of water can float a vehicle, and two feet of moving water is enough to sweep a car away. If the water level is rising around your vehicle, you should abandon the vehicle. Be wary of unknown road conditions. Do not try to cross flooded roadways if you do not know the depth of the water. A Flash Flood Warning is issued when flash flooding is currently occurring or will occur soon.

Seek higher ground on foot immediately.

4.13.2. Chemical and Biological Hazards

Liquefied Petroleum Gases (LPG) and underground storage tanks, along with other chemical containers, may break away and float downstream during a flash flood, causing hazards from their released contents. Floodwaters may also contain biohazards due to direct contamination by untreated raw sewage, dead animals, rotting food, etc. Avoiding contact, good personal hygiene practices, medical surveillance, and discarding all food that comes in contact with flood waters are all important controls.

4.13.3. Fire Response

Flash floods can damage fire protection systems, delay response times of emergency responders and disrupt water distribution systems. All of these factors lead to increased dangers from fire and decreasing firefighter capabilities. Also see Section 5.7 above.

4.13.4. Drowning

Anytime workers are exposed to moving water, their chances for accidental drowning increase. Even good swimmers are easily overcome by swift-moving water.

4.13.5. Hypothermia and Hyperthermia

Hypothermia is a condition brought on when the body temperature drops to less than 95°F. Standing or working in water that is cooler than 75°F will remove body heat more rapidly than it can be replaced, resulting in hypothermia. Symptoms of hypothermia include uncontrollable shivering, slow speech, memory lapses, frequent stumbling, drowsiness, and exhaustion.

Hyperthermia refers to several conditions that can occur when your body's heat-regulation system cannot handle heat in your environment. Hyperthermia comes in many stages. Heat exhaustion, for example, is a common condition. Symptoms of heat exhaustion include dizziness, weakness, thirst, coordination issues, trouble concentrating, skin that is cool and clammy, rapid pulse. When these signs arise, a person should: try to get in a cool location, preferably one with air conditioning, drink water or electrolyte-filled sports drinks, and/or place ice bags under your arms and around the groin area.

Hyperthermia's most serious stage is heat stroke, which can be fatal. Other heat-related illnesses can lead to heat stroke if they are not treated effectively and quickly. Heat stroke can occur when body temperature reaches above 104°F. Fainting is often the first sign. Other symptoms include confusion, irritability, coordination issues, flushed skin, reduced sweating, weak or rapid pulse.

4.14. Valley Fever

Soils in some areas of California host the microscopic fungus that causes valley fever, known as *Coccidioides immitis*, which lives in the top 2 to 12 inches of soil in many parts of the state. When soil is disturbed by activities such as digging, driving, or high winds, fungal spores can become airborne and can potentially be inhaled. Project construction, operation, and decommissioning activities would be subject to dust control requirements that would avoid exposing construction workers and the off-site population to substantial concentrations of dust.

4.15. Health Risk Assessment

Subcontractors will become familiar with the potential hazards on the job and train, manage and provide appropriate measures to protect their employees.

Each Subcontractor shall conduct a health risk assessment to evaluate potential risks to workers from exposure during construction and operations and provide appropriate tools, i.e., PPE, equipment, environmental exposure monitors, to assure that its own employees are working in a safe area and manner.

4.16. Liaison, Notification Requirement for Incidents, Accidents, and Injuries

Should any of the events listed above occur, the Site Supervisors shall be contacted immediately. The Site Supervisors will assist Subcontractors in resolving the issue and coordinate the preparation of a written report to project management within 24 hours.

The Site Supervisors will determine the appropriate reporting and notification procedures involving notification to local authorities.

4.17. Medical Management Plan

4.17.1. Medical Support Facilities

Emergency medical facilities shall be identified and posted for emergency response. The following medical support personnel have been contacted and informed of this project: .

The contacts and corresponding telephone numbers of local clinics and hospitals are given below:

Local		**Hospital:**	
El Centro Regional Medical Center		Phone:	(760) 339-7100
Address:	1415 Ross Ave.		
	El Centro, CA 92243		

Appendix I.6 Operation and Maintenance Plan

www.intersectpower.com

OPERATION AND MAINTENANCE PLAN

Perkins Renewable Energy Project

Prepared for

IP Perkins, LLC and
IP Perkins BAAH, LLC
subsidiaries of Intersect Power, LLC

January 2024

CONTENTS

1. INTRODUCTION

IP Perkins, LLC and IP Perkins BAAH, LLC (Applicants or Proponents), subsidiaries of Intersect Power, LLC, proposes to construct, operate, and decommission the Perkins Renewable Energy Project (Project), a utility-scale solar photovoltaic (PV) electrical generating and storage facility, and associated infrastructure to generate and deliver renewable electricity to the statewide electricity transmission grid. The proposed Project site is located on a combination of Bureau of Land Management (BLM)-managed lands, Bureau of Reclamation (BOR)-managed lands, and private lands located in Imperial County east of El Centro, California (see POD [Plan of Development] Appendix A, Figure 1). The Project 500kV loop-in transmission lines will traverse Bureau of Reclamation (BOR) lands.

The purpose of the Operation and Maintenance Plan (Plan) is to detail practices designed to address potential impacts from operation and maintenance of the Perkins Renewable Energy Project (Project) on public land administered by the Bureau of Land Management (BLM). This Plan has been developed as part of the Plan of Development (POD) and provides information on the project's operation and maintenance, and environmental mitigation measures that will be used and implemented by construction contractors and personnel. It would be the responsibility of IP Perkins, LLC and IP Perkins BAAH (Applicant or Proponent) or the Project operator at the time and its contractors, working with designated environmental monitors, to comply with measures identified in this document.

2. OPERATION AND MAINTENANCE

2.1. Perkins and Battery Energy Storage Facility

After construction, onsite personnel will operate and maintain the Perkins Renewable Energy Project. Public access is anticipated to be restricted to protect public safety and prevent vandalism.

2.1.1. Monitoring and Maintenance Activities

Routine maintenance of the solar photovoltaic modules (PVM) arrays and battery storage systems will be necessary to optimize performance and to detect potential malfunctions. During operations, monitoring and maintenance procedures will be established that define specific routine PVM array maintenance and inspection activities based on the PVM and battery manufacturers' recommendations.

Transformers and inverter units will be maintained as part of normal monitoring and maintenance activities. Periodic inspection and/or maintenance of underground electrical collection lines may be required during the life of the Project. These activities will be conducted pursuant to prudent utility practices. Switchgear maintenance activities will include routine, scheduled equipment maintenance, grounds keeping, and emergency maintenance in the event of equipment failure. Switchgear maintenance will be performed by Project personnel or approved contractors. Inoperative PVMs will be repaired, replaced, or removed in a timely manner. Project access roads will be reconditioned approximately once per year. Additional reconditioning may be necessary, such as after a heavy storm event that may cause destabilization or erosion.

PVM surfaces also are required to be kept clean to maintain their optimized performance. The Project team will conduct periodic cleaning via means of washing using vehicles equipped with washing equipment. Each PVM array will be cleaned up to twice a year. No chemical cleaners would be used for module washing. This frequency and optimum timing will be determined by monitoring Project performance versus weather throughout each year of operation. Once temporary reclamation is complete and vegetation is stable following construction, noxious weed surveys will continue on an annual basis. Onsite vegetation may be trimmed approximately once every three years, as needed. For the first year, weed management and control in accordance with an approved Restoration and Integrated Weed Management Plan would be performed quarterly.

Throughout the O&M phase, on-site vegetation management will consist of vegetation control (e.g., mowing) to prevent interference with solar panels and minimize fire hazard. The Lead Biologist will inspect vegetation annually throughout the Project area and along the 500 kV loop-in transmission corridor to identify hazardous vegetation or barren areas that may be susceptible to erosion or other damage. All mowed or cut plant material that contains invasive weeds will be collected and transported to a licensed solid waste or composting facility. Mowed or cut native plant material may be used on site as mulch. Weed control during the Project O&M phase will be conducted as described in the Restoration and Integrated Weed Management Plan (see POD Appendix Y).

2.1.2. Operation and Maintenance Equipment

No heavy equipment would be used during normal operation. Operation and maintenance (O&M) vehicles would include trucks (pickup and flatbed), forklifts, and loaders for routine and unscheduled maintenance and water trucks for solar panel washing. Large heavy-haul transport equipment may be brought to the solar facility infrequently for equipment repair or replacement. Drones could be used during operations for inspection purposes in accordance with the Drone and Helicopter Safety Plan (see POD Appendix Q).

A Bird and Bat Conservation Strategy would be prepared and would provide for monitoring of bird and bat injuries and mortalities at the solar facility (see POD Appendix X). Drones with artificial intelligence-enabled computer vision may be used for bird and bat monitoring if approved by the wildlife agencies.

2.1.3. Operation and Maintenance Workforce

During operation of the proposed Project, up to 10 permanent staff could be on the site at any one time for ongoing facility maintenance and repairs. Alternatively, approximately 2 permanent staff and 8 project operators would be located off-site and would be on-call to respond to alerts generated by the monitoring equipment at the project site. Security personnel would be on-call. The staff would be sourced from nearby communities in Imperial County. The O&M building would house the security monitoring equipment, including security camera feeds for monitoring the project 24 hours per day. Drones could be used during operations for inspection purposes in accordance with the Drone and Helicopter Safety Plan.

2.1.4. Products Used for Monitoring and Maintenance

After the Perkins Renewable Energy Project is constructed, commissioned, and deemed operational, no new raw materials will be required for Project operation. The only materials brought onto the site will be those related to maintenance or replacement of elements (for example, replacement PVMs, batteries or electrical equipment).

Potentially hazardous materials used for monitoring and maintenance of the PVMs and associated facilities may include mineral oils (lubricant and transformer coolant), synthetic oils, general lubricants, general cleaners, and herbicides for weed control. These materials will be stored at the O&M building. In addition, the BESS battery technology may include materials classified as hazardous materials, depending on the type of technology utilized (e.g., lithium ion, lead acid, sodium sulfur and sodium, or nickel hydride).

Hazardous materials use, storage, and disposal will be in accordance with the Project's Hazardous Materials Management and Oil Spill Response Plan (see POD Appendix O) and will comply with applicable local, state, and federal environmental laws and regulations. The plan identifies hazardous materials that will be used, stored, or transported and establishes inspection procedures, storage requirements, storage quantity limits, inventory control, non-hazardous product substitutes, and disposal of excess materials. The plan also identifies requirements for notices to federal and local emergency response authorities and includes emergency preparedness and response plans, including spill response. Accidental releases of hazardous materials will be prevented or minimized through proper containment of these substances during transportation to the site, storage onsite, and use. Hazardous waste will be removed and disposed of off-site in an appropriately permitted disposal facility.

Hazardous substances or hazardous wastes that are oils or mixed with oils are subject to Spill Prevention, Control, and Countermeasures (SPCC) Plan requirements and will be managed according to a Project SPCC Plan for Project operation and maintenance (see POD Appendix O). The SPCC Plan will be supplemented by other plans, as necessary, describing control and response procedures for other hazardous materials or wastes regulated by the Resource Conservation and Recovery Act and not included in the SPCC Plan. Disposal of liquid and solid waste produced during operation of the solar energy facility will be done so as not to impact human health and the environment.

2.1.5. Site Security

Project areas requiring security during the operations phase include the substations, O&M facility, BESS, and the PVM arrays. The solar facility would be enclosed with fencing that meets National Electric and Safety Code (NESC) requirements for protective arrangements in electric supply stations. The boundary of the Project site would be secured by up-to 6-foot-high chain-link perimeter fences, topped with one foot of three strand barbed wire, or as dictated by BLM and/or North American Electric Reliability Corporation (NERC) specifications. The fence would typically be set approximately 100 feet from the edge of the array.

The Perkins Renewable Energy Project will also be marked with warning and no trespassing signage on fences, gates, and electrical equipment. All gates, access doors, and ports will be locked at all times.

Lighting. Motion sensitive, directional security lights would be installed to provide adequate illumination around the substation areas, each inverter cluster, at gates, and along perimeter fencing. All lighting would be shielded and directed downward to minimize the potential for glare or spillover onto adjacent properties. Security lights would use motion sensor technology that would be triggered by movement at a human's height. Once activity has ceased, the motion sensors would be set to turn off lighting within 10 minutes.

All structures would be lower than the 200-foot height standard that triggers Federal Aviation Administration Part 77 Obstruction Evaluation Consultation, so no aviation lighting is required.

Other Security Measures. Nighttime activities are anticipated to be minimal during Project operations and would be limited to occasional O&M activities at the substation, switchyard, BESS, and panel repair required during de-energization. Additionally, off-site security personnel could be dispatched during nighttime hours or could be on-site, depending on security risks, emergency maintenance requirements, and operating needs. Infrared security cameras, motion detectors, and/or other similar technology would be installed to allow for monitoring of the site through review of live footage 24 hours a day, 7 days a week. Such cameras or other equipment would be placed along the perimeter of the facility and/or at the inverters. Security cameras located at the inverters would be posted on poles approximately 20 feet high.

2.2. Electrical Connection Line

The electrical connection lines will be inspected approximately once per year for conductor soiling, corrosion or oxidation, operating temperatures, physical damage, etc.

2.3. Operational Water Needs

During the operation and maintenance phase, water would be required for panel washing and maintenance, and for workforce facilities. During operation, the solar array portion of the project would require the use of approximately 50 acre-feet annually for panel washing (up to four times per year) and other uses. No wastewater would be generated during panel washing as water would be absorbed into the surrounding soil or would evaporate. Water for operations would be sourced from one of the up to four on-site groundwater wells.

Limited water would also be used for the O&M facility staff, including restrooms for which a septic system would be installed. If the septic system is not self-contained, an associated leach field would be required. The leach field would be permitted by Imperial County and would not be located within 0.25 mile of any drinking water well. For a 750-gallon septic facility, the leach field would consist of two compartments each 20 feet long, 2 feet high, and 4 feet wide with 10 feet of separation between the compartments.

Groundwater usage, both on and offsite will be metered daily and well testing will occur in accordance with the Groundwater Monitoring, Reporting and Mitigation Plan to be prepared for the project and reviewed and approved by BLM. Testing will be conducted on wells dedicated to Project use, both on and offsite, and selected monitoring wells.

2.4. Environmental Protection

Management of wildlife (including monitoring during construction) and documenting wildlife mortalities will occur as specified by the BLM during Project operation. However, due to the passive nature of solar PV systems, batteries and proposed fencing, these impacts are anticipated to be very nominal, if any. All control and mitigation measures established for the Project in this POD and the resource-specific plans that are part of the POD will be maintained and implemented throughout the construction and operation phases, as appropriate, to help ensure that impacts from Project operation are kept to a minimum.