



Smith Basin Improvement Project

Appendix B

**OCWD Smith Basin Geotechnical Improvements Project Air Quality and
Greenhouse Gas Emissions Technical Memorandum, Vista
Environmental, February 2019**

VISTA ENVIRONMENTAL

February 6, 2019

Greg Woodside
Orange County Water District
18700 Ward Street
Fountain Valley, CA 92708

**Subject: Orange County Water (OCWD) – Smith Basin Geotechnical Improvements Project
Air Quality and Greenhouse Gas Emissions Technical Memorandum.**

Dear Mr. Woodside:

Vista Environmental has conducted an analysis to evaluate whether the proposed Smith Basin Geotechnical Improvements Project (proposed project) would cause significant air quality or greenhouse gas impacts. This assessment was conducted within the context of the California Environmental Quality Act (CEQA, California Public Resources Code Sections 21000, et seq.). The methodology follows the South Coast Air Quality Management District (SCAQMD) recommendations for quantification of emissions and evaluation of potential air quality and greenhouse gas impacts.

Project Description

The proposed project would involve geotechnical improvements to areas in Smith Basin that have experienced substantial erosion on the basin embankment slopes and the removal of overgrown vegetation and debris from this segment of Santiago Creek that is located within the Smith Basin.

Existing Setting

Smith Basin is a former OCWD groundwater recharge basin located on the north side of Villa Park Road and adjacent to the intersection of North Hewes Street. Smith Basin is located in the City of Orange. Smith Basin is part of the Santiago Basin complex, which also includes Santiago Basin, Bond Pit and Blue Diamond Pit. Smith Basin is roughly triangular in shape and is bordered by residential uses to the north and west, by Oak Ridge Private School and Santiago Boulevard to the east, and by Villa Park Road and the Blue Diamond and Bond Pits to the south. Santiago Creek flows into Smith Basin at the northeast corner and out of the Basin from a 21-foot diameter corrugated metal pipe that extends under Villa Park Road and into the Blue Diamond Basin.

The embankment slopes vary in height from 50 feet to 80 feet in height and vary in slope ratio from approximately 1:1 to 2:1, except near the southwest corner of the basin where the embankment slope is approximately 1:1. A portion of the north embankment slope has been improved with concrete v-ditch drainage improvements. A maintenance road is present along the top of the eastern embankment slope and the eastern portion of the southern embankment slope. Portions of the basin interior and lower areas of the southern and eastern embankment slopes are covered with dense vegetation. Erosion has resulted in near-vertical scarps in some areas. The locations where significant erosion has occurred are shown in Figure X. The proposed geotechnical improvements would take place in Areas 1, 2, and 5.

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**Smith Basin Rehabilitation Project
Rehab Areas**

Figure X



Area 1

Area 1 is located on the southern embankment slope adjacent to Villa Park Road. The southern embankment slope was constructed at an approximate slope ratio of 1.7:1 based on the pre-erosion topography. An approximate 450-long area along the toe of the embankment slope has been progressively eroding during high water flow events since approximately 1981. The erosion has created a near vertical scarp that is estimated to be up to 25 feet in height.

Area 2

Area 2 is located on the eastern embankment slope adjacent to Oak Ridge Private School and the northern end of North Santiago Boulevard. The area of erosion is approximately 700 feet in length. Approximately 200 feet of the area is located outside of OCWD property, owned by the County of Orange. The approximate 700-foot long area along the toe of the embankment slope has been progressively eroding during the high water flow events since 1969. The erosion has created a near vertical scarp that ranges in height from approximately 35 feet at the southwest end.

Area 3

Area 3 is located near the northeast corner of the basin. The erosion is within the basin interior and begins at the top of a relatively flat area between the creek flow line and the northern embankment slope. The erosion consists of a relatively narrow erosion gully that has side scarps on the order of 2 to 6 feet deep. Area 3 will be incorporated with the work on Areas 1 and 2.

Area 4

The western portion of the northern embankment slope that does not have drainage improvements has experienced erosion riling. The erosion rills vary in depth, but are generally about a foot deep. The western portion of the slope has more closely spaced rills and less vegetation as a result of the erosion. Area 4 will not be addressed with this project.

Area 5

Area 5 is located near the top of the embankment slope near the west corner of the basin. The embankment slope is relatively steep. The erosion was first observed in the 1970 aerial photographs at the same time that the grading for the residential property to the west and north was being performed. Over the years the erosion gully has widened and retreated to the west toward the adjacent residential property. Access to the slope area is restricted due to steepness and vegetation. The erosion gully has relatively steep side slope that are estimated to be about 6 to 10 feet in height.

Santiago Creek

Proposed Project – Repair Slopes and Re-Establish Santiago Creek to Its Original Alignment

Three areas within Smith Basin would be repaired and/or improved to increase geotechnical stability. As part of the improvements much of the bottom of Smith Basin will be re-graded to repair the existing slope damage and re-establish Santiago Creek to its original alignment.

The project consists of three main repair areas. All of the areas exhibit damage to the slopes of the basin of varying degrees. Repair involves relocating the flow of Santiago Creek to its original location, prior to its southerly migration. Relocating the creek would help to prevent future damage to the slopes from erosion caused by Santiago Creek flowing at the base of the slopes. The project consists of the excavation of soil from the bottom of Smith Basin and placement of fill on the damaged slopes to restore

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them to their original configuration. The repair methods vary by area, and are described in more detail below.

The repair to the failed slopes in Smith Basin will require excavation along the base of the failures and placement of engineered fill. Repairs include using fill excavated from within the bottom of Smith Basin to repair these slopes. During execution of the work, equipment will be staged in the upland areas near the north western quadrant of Smith Basin.

Areas 1 and 2

The primary cause of erosion in Area 1 and Area 2 is undercutting of the toe of the embankment from the southerly migration of Santiago Creek. Existing topography in the Basin indicates that the Santiago Creek bed is well defined and incised as it enters through the northeast corner of Smith Basin. The Basin consists of a long narrow vegetated shelf along the north side of the Basin and a long wide relatively flat lowland area throughout the middle and southern area of the Basin. Over time, the creek flow has moved from the northern side of the Basin towards the south to its current alignment along the toe of the southern and eastern slopes. Flows in Santiago Creek are highly variable throughout the year, with the highest flows typically occurring during the rainy season (December – April) and low flows during the remainder of the year. The Creek currently flows in a shallow incision near the base of the failed slopes at the southern and eastern edges of the Basin.

Re-establishing these embankment slopes will require the current low-flow path of Santiago Creek to be moved northward and westward back towards its original location. Since the soil to repair the slopes will be excavated from the bottom of the Basin, construction in the Basin would be completed in one phase. The repair work would include re-grading the bottom of Smith Basin to restore Santiago Creek in its original alignment towards the middle of the Basin; repairing and reconstructing the slopes in the Basin; and constructing buttress fills and upland planting areas along the southern and eastern slopes. As part of the slope reconstruction, the base of the southern and eastern slopes above the buttress fill will be lined with rip rap and backfilled with soil to allow for vegetation to grow after repairs are completed.

Proposed Construction Activities

Construction of the proposed project would require the use of multiple pieces of equipment over two phases of construction. The overall construction of the project would take approximately two months to complete.

Phase 1 – Basin Site Preparation & Santiago Creek Realignment Rip Rap

Phase 1 is anticipated to take approximately twelve days to complete and would consist of regrading the bottom of Smith Basin, repairing and reconstructing the Basin slopes, and placing and backfilling rip rap. Bulldozers will be used to remove existing vegetation within the bottom of the Basin. The bottom of the Basin will be graded to establish the path of Santiago Creek in a southwesterly direction from the northeast corner of the Basin to the outlet at the culvert under Villa Park Road in the southwest corner of the Basin. A buttress fill featuring a minimum forty foot wide upland planting shelf and rip rap above the planting shelf along the base of the repaired slopes will be constructed along the eastern and southern Basin slopes to prevent erosion. A bulldozer, scrapers, compactor, and motor grader will be used to grade the bottom of the Basin, buttress fill, planting shelf and repaired/reconstructed slopes. The realigned Creek will vary from 100 feet at the inlet, to 550 feet wide at the middle, and back down to 100 feet wide at the outlet. The depth of the Creek will vary through the basin from a depth of 10 – 20 feet deep. Rip rap will be placed along the base of the repaired slopes at the mouth of the Basin. The Creek regrading

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will be completed concurrent with the excavation of the south and east slope repairs. Approximately 150,000 cubic yards of material will be excavated from within the basin to re-grade the creek alignment and repair the slopes. The equipment mix for the site preparation and Santiago Creek realignment rip rap phase is shown below in Table A.

Table A – Phase 1 Site Preparation & Santiago Creek Realignment Rip Rap Equipment Mix

Equipment	Pieces of Equipment	Hours of Operation	Total Days	Total Hours of Operation	Horsepower
Phase 1A – Site Preparation Clearing and Grubbing					
Bulldozer	1	8	8	64	250
Tracked Excavator	1	8	8	64	200
Skidder	1	8	8	64	200
Off-Road Haul Truck	1	8	8	64	350
Dump Truck	1	8	8	64	350
Tub Grinder	1	8	8	64	300
Wheel Loader	1	8	8	64	250
Water Truck	1	8	8	64	350
Work Truck	1	8	8	128	300
Phase 1B – Santiago Creek Realignment Rip Rap					
Tracked Excavator	1	8	4	32	200
Wheel Loader	1	8	4	32	250
Off-Road Haul Truck	1	8	4	32	350
Dump Truck	12	8	2	192	350
Water Truck	1	8	4	32	350
Work Truck	1	8	4	32	300

Source: OCWD.

Phase 2 – Reconstruction of Slopes

Phase 2 is anticipated to take approximately five weeks to complete and would consist of rough grading and excavation to regard the bottom of Smith Basin and reconstruct the slopes in Area 1 and 2. Reconstruction of these slopes would start from the bottom of the slope and proceed upwards to the top. Reconstruction will extend approximately 40 feet beyond both ends of the existing eroded areas. The eroded slump blocks would be removed, and a fill keyway that covers the footprint of the slope and buttress fill would be excavated. Approximately 20,000 cubic yards will be excavated and recompacted in the keyway. After the fill keyway is filled engineered fill will be placed in layers to construct the buttress fill and reconstruct the slope up to the top of the existing slope. Approximately 130,000 cubic yards of fill will be placed to reconstruct the slopes in Areas 1 and 2. After the slope is constructed, rip rap will be placed at the base of the slope and backfilled with soil. The slope would then be trimmed to finished dimensions. The final step of construction would include placement of straw waddle and hydro-seeded with a blend of native seeds. The equipment mix for slope reconstruction is broken up for Area 1 and Area 2 and is shown below in Table B.

Table B – Phase 2 Slope Embankment Repair Equipment Mix

Equipment	Pieces of Equipment	Hours of Operation	Total Days	Total Hours of Operation	Horsepower
Phase 2A – Area 1 Slope Embankment Repair					
Bulldozer	1	8	8	64	250
Motor Grader	1	8	4	32	250
Tracked Excavator	1	8	4	32	200
Scraper	3	8	8	192	490
Compactor	1	8	8	64	200
Water Truck	1	8	8	64	350
Work Truck	1	8	8	128	300
Phase 2B – Area 2 Slope Embankment Repair					
Bulldozer	1	8	16	128	250
Motor Grader	1	8	8	64	250
Tracked Excavator	1	8	8	64	200
Scraper	3	8	16	384	490
Compactor	1	8	16	128	200
Water Truck	1	8	16	128	350
Work Truck	1	8	16	256	300

Source: OCWD.

Phase 3 – Area 5

Phase 3 is anticipated to take two days to complete and would consist of reconstruction of the Area 5 embankment slope. The primary cause of erosion in Area 5 is uncontrolled surface water flow on a relatively steep embankment slope. The primary concern is continued widening of the erosion gully and the possible continued westward retreat of the gulley. Re-construction of the embankment slope in this area would be completed in one phase. The limits of excavation will extend approximately 10 feet beyond the current edge of the gully. The improvements would include rough grading and excavation to fill the deep gullies to match the slopes immediately adjacent to the area. Reconstructing the embankment slope would start from the bottom of the slope and proceed upwards to the top. The gullied area would be over excavated to create a fill keyway at the bottom of the gully. Approximately 1,000 cubic yards will be over excavated and recompacted in the keyway. Engineered fill will then be placed in the fill keyway. After the fill keyway is filled, approximately 4,000 cubic yards of engineered fill will be placed in layers to match the adjacent slopes. After the gullies are filled and trimmed to match adjacent slopes, straw waddle and a native blend of hydro-seed will be placed over the repaired area. The equipment mix for Area 5 slope reconstruction is broken up for Area 1 and Area 2 and is shown below in Table C.

Table C – Phase 3 Area 5 Slope Embankment Repair Equipment Mix

Equipment	Pieces of Equipment	Hours of Operation	Total Days	Total Hours of Operation	Horsepower
Bulldozer	1	8	2	16	250
Tracked Excavator	1	8	2	16	200
Compactor	1	8	2	16	200
Dump Truck	4	8	2	64	350
Water Truck	1	8	2	16	350
Work Truck	2	8	2	32	300

Source: OCWD.

Air Quality Setting

Air quality is a function of both the rate and location of pollutant emissions under the influence of meteorological conditions and topographical features. Atmospheric conditions such as wind speed, wind direction, and air temperature gradients interact with physical features of the landscape to determine their movement and dispersal, and consequently, their effect on air quality. The combination of topography and inversion layers generally prevents dispersion of air pollutants in the South Coast Air Basin (Air Basin).

The climate of the Air Basin lies in the semi-permanent high-pressure zone of the eastern Pacific Ocean, which results in a mild climate, tempered by cool sea breezes. Although the Air Basin has a semiarid climate, the air near the surface is typically moist because of the presence of a shallow marine layer. Except for infrequent periods when dry air is brought into the basin by offshore winds, the ocean effect is dominant. Periods of heavy fog are frequent; and low stratus clouds, often referred to as “high fog” are a characteristic climate feature. Average temperatures for Anaheim, which is the nearest monitoring station to the project site (WRCC 2016), range from an average low of 46.9 degrees Fahrenheit (°F) in December to an average high of 87.1 °F in August. Rainfall averages approximately 14.09 inches a year, with almost all annual rainfall coming from the fringes of mid-latitude storms from late November to early April and summers being almost completely dry.

Winds are an important parameter in characterizing the air quality environment of a project site because they determine the regional pattern of air pollution transport and control the rate of dispersion near a source. Daytime winds in the Air Basin are usually light breezes from off the coast as air moves regionally onshore from the cool Pacific Ocean. These winds are usually the strongest in the dry summer months. Nighttime winds in the Air Basin result mainly from the drainage of cool air off the mountains to the east, and they occur more often during the winter months and are usually lighter than the daytime winds. Between the periods of dominant airflow, periods of air stagnation may occur, both in the morning and evening hours. Whether such a period of stagnation occurs is one of the critical determinants of air quality conditions on any given day.

During the winter and fall months, surface high-pressure systems north of the Air Basin, combined with other meteorological conditions, can result in very strong winds from the northeast called “Santa Ana Winds.” These winds normally have durations of a few days before predominant meteorological conditions are reestablished. The highest wind speed typically occurs during the afternoon due to daytime thermal convection caused by surface heating. This convection brings about a downward transfer of momentum from stronger winds aloft. It is not uncommon to have sustained winds of 60 miles per hour with higher gusts during a Santa Ana Wind.

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Monitored Air Quality

The air quality at any site is dependent on the regional air quality and local pollutant sources. Regional air quality is determined by the release of pollutants throughout the air basin. Estimates of the existing emissions in the Air Basin provided in the Final 2012 AQMP, December 2012, indicate that, collectively, mobile sources account for 59 percent of the volatile organic compounds (VOC), 88 percent of the NOx emissions, and 40 percent of directly emitted PM2.5, with another 10 percent of PM2.5 from road dust.

SCAQMD has divided the Air Basin into 38 air-monitoring areas. The project site is located in Air Monitoring Area 17, which covers Central Orange County. The nearest air monitoring station to the project site is the Anaheim-Pampas Lane Station (Anaheim Station), which is located approximately eight miles northwest of the project site at 1630 West Pampas Lane, Anaheim. However, it should be noted that due to the air monitoring station's distance from the project site, recorded air pollution levels at the Anaheim Station reflect with varying degrees of accuracy, local air quality conditions at the project site. Table D presents the composite of gaseous pollutants monitored from 2015 through 2017.

Table D – Local Area Air Quality Monitoring Summary

Pollutant (Standard)	Year¹		
	2015	2016	2017
Ozone:			
Maximum 1-Hour Concentration (ppm)	0.100	0.103	0.090
Days > CAAQS (0.09 ppm)	1	2	0
Maximum 8-Hour Concentration (ppm)	0.081	0.075	0.076
Days > NAAQS (0.070 ppm)	1	4	4
Days > CAAQs (0.070 ppm)	1	4	4
Nitrogen Dioxide:			
Maximum 1-Hour Concentration (ppb)	59.1	64.3	81.2
Days > NAAQS (100 ppb)	0	0	0
Inhalable Particulates (PM10):			
Maximum 24-Hour California Measurement (ug/m ³)	59.0	74.0	95.7
Days > NAAQS (150 ug/m ³)	0	0	0
Days > CAAQS (50 ug/m ³)	2	ND	ND
Annual Arithmetic Mean (AAM) (ug/m ³)	25.5	27.5	26.9
Annual > NAAQS (50 ug/m ³)	No	No	No
Annual > CAAQS (20 ug/m ³)	No	No	No
Ultra-Fine Particulates (PM2.5):			
Maximum 24-Hour National Measurement (ug/m ³)	53.8	45.5	56.2
Days > NAAQS (35 ug/m ³)	3	1	7
Annual Arithmetic Mean (AAM) (ug/m ³)	14.7	9.4	ND
Annual > NAAQS and CAAQS (12 ug/m ³)	Yes	No	ND

Notes: Exceedances are listed in **bold**. CAAQS = California Ambient Air Quality Standard; NAAQS = National Ambient Air Quality Standard; ppm = parts per million; ppb = parts per billion; ND = no data available.

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¹ Data obtained from the Anaheim Station.
Source: <http://www.arb.ca.gov/adam/>

Project Impacts

Thresholds of Significance

Regional Air Quality

To estimate if the proposed project may adversely affect the air quality in the region, the SCAQMD has prepared CEQA Air Quality Handbook (SCAQMD 1993) to provide guidance to those who analyze the air quality impacts of proposed projects. The SCAQMD CEQA Handbook states that any project in the Air Basin with daily emissions that exceed any of the identified significance thresholds should be considered as having an individually and cumulatively significant air quality impact. For the purposes of this air quality impact analysis, a regional air quality impact would be considered significant if emissions exceed the SCAQMD significance thresholds identified in Table D.

Table E – SCAQMD Regional Criteria Pollutant Emission Thresholds of Significance

	Pollutant Emissions (pounds/day)					
	VOC	NOx	CO	SOx	PM10	PM2.5
Construction	75	100	550	150	150	55
Operation	55	55	550	150	150	55

Source: <http://www.aqmd.gov/ceqa/handbook/signthres.pdf>

Local Air Quality

Project-related construction and operational air emissions may have the potential to exceed the State and Federal air quality standards in the project vicinity, even though these pollutant emissions may not be significant enough to create a regional impact to the Air Basin. In order to assess local air quality impacts the SCAQMD has developed Localized Significant Thresholds (LSTs) to assess the project-related air emissions in the project vicinity. SCAQMD has also provided Final Localized Significance Threshold Methodology (LST Methodology), July 2008, which details the methodology to analyze local air emission impacts. The LST Methodology found that the primary emissions of concern are NO₂, CO, PM10, and PM2.5.

The Look-Up Tables include site acreage sizes of 1-acre, 2-acres and 5-acres. The *Fact Sheet for Applying CalEEMod to Localized Significance Thresholds*, prepared by SCAQMD, 2015, provides guidance on how to determine the appropriate site acreage size to utilize for a project. The Fact Sheet details the site acreage should be based on the maximum number of acres disturbed on the peak day of construction that is calculated on the construction equipment list utilized in the CalEEMod model, where crawler tractors, graders, and rubber tired dozers are all assumed to disturb 0.5-acre in an 8-hour day and scrapers are assumed to disturb 1.0-acre in an 8-hour day. Table F lists all of the construction equipment modeled in CalEEMod and utilizes the methodology in the Fact Sheet to calculate the acres disturbed per day.

Table F – Construction Equipment Modeled in CalEEMod and Acres Disturbed per Day

Phase	Equipment Type	Equipment Quantity	Acres Disturbed per piece of Equipment per Day ¹	Operating Hours per Day	Acres Disturbed per Day
Phase 1A	Bulldozer	1	0.5	8	0.5
	Excavator	1	0	8	0
	Skidder	1	0	8	0
	Off-Road Haul Truck	1	0	8	0
	Dump Truck	1	0	8	0
	Tub Grinder	1	0	8	0
	Wheel Loader	1	0	8	0
	Water Truck	1	0	8	0
	Work Truck	1	0	8	0
	Total Acres Disturbed per Day During Phase 1A				0.5
Phase 1B	Scraper	2	1.0	8	2.0
	Bulldozer	1	0.5	8	0.5
	Compactor	1	0	8	0
	Water Truck	1	0	8	0
	Work Truck	2	0	8	0
Total Acres Disturbed per Day During Phase 1B					2.5
Phase 2A	Bulldozer	1	0.5	8	0.5
	Grader	1	0.5	8	0.5
	Excavator	1	0	8	0
	Scraper	3	1	8	3.0
	Compactor	1	0	8	0
	Water Truck	1	0	8	0
	Work Truck	1	0	8	0
Total Acres Disturbed per Day During Phase 2A					4.0
Phase 2B	Bulldozer	1	0.5	8	0.5
	Grader	1	0.5	8	0.5
	Excavator	1	0	8	0
	Scraper	3	1	8	3.0
	Compactor	1	0	8	0
	Water Truck	1	0	8	0
	Work Truck	1	0	8	0
Total Acres Disturbed per Day During Phase 2B					4.0
Phase 3	Bulldozer	1	0.5	8	0.5
	Excavator	1	0	8	0
	Compactor	1	0	8	0
	Dump Truck	4	0	8	0
	Water Truck	1	0	8	0
	Work Truck	2	0	8	0
	Total Acres Disturbed per Day During Phase 3				0.5
Maximum Acres Disturbed during All Construction Activities					4.0

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Notes:

¹ Based on the Fact Sheet for Applying CalEEMod to Localized Significance Thresholds where crawler tractors, graders, and rubber tired dozers disturb 0.5-acre in an 8-hour day and scrapers disturb 1.0-acre in an 8-hour day. All other equipment disturb 0 acres per 8-hour day.
Source: SCAQMD, 2015.

As shown in Table F, the maximum disturbed per day would occur during Phases 2A and 2B when 4-acres would be disturbed. The closest size available to the calculated 4-acres disturbed per day in the Look-Up Tables is the 5-acre project site, which has been utilized in this analysis.

As detailed above, the project site is located in Air Monitoring Area 17, which covers Central Orange County. The nearest sensitive receptors are students and employees at Oak Ridge Private School that are located on the east side of the Basin and residents at single-family homes located on the north and west sides of the Basin. According to LST Methodology, any receptor located closer than 25 meters (82 feet) shall be based on the 25 meter thresholds. Table G below shows the NO_x, CO, PM10, and PM2.5 for both construction and operational activities.

Table G – SCAQMD Local Air Quality Thresholds of Significance

Activity	Allowable Emissions ¹ (pounds/day)			
	NOx	CO	PM10	PM2.5
Construction	183	1,253	13	7
Operation	183	1,253	3	2

Notes:

¹ The nearest sensitive receptors are at Oak Ridge Private School, located adjacent to the east side of the Basin and the single-family homes located on the north and west sides of the Basin. According to SCAQMD Methodology, all receptors closer than 25 meters are based on the 25 meter threshold.

Source: Calculated from SCAQMD's Mass Rate Look-up Tables for five acres in Air Monitoring Area 17, Central Orange County.

Greenhouse Gas Emissions

The proposed project is located within the jurisdiction of the SCAQMD. In order to identify significance criteria under CEQA for development projects, SCAQMD initiated a Working Group, which provided detailed methodology for evaluating significance under CEQA. At the September 28, 2010 Working Group meeting, the SCAQMD released its most current version of the draft GHG emissions thresholds, which recommends a tiered approach that provides a quantitative annual threshold of 3,000 MTCO₂e for all land use projects. Although the SCAQMD provided substantial evidence supporting the use of the above threshold, as of March 2018, the SCAQMD Board has not yet considered or approved the Working Group's thresholds. Originally SCAQMD had stated that they were waiting to approve the Working Group's thresholds dependent on the outcome of the State Supreme Court decision of the California Building Industry Association v. Bay Area Air Quality Management District (BAAQMD), which was filed on December 17, 2015. However, since that court decision has been decided for some time now, the most likely time for the SCAQMD Board to consider the Working Group thresholds will be in combination with the consideration of the updated CEQA Air Quality Handbook that is currently being revised by SCAQMD staff. In order to provide a conservative analysis, the Working Group's draft thresholds have been utilized. Therefore, the proposed project would be considered to create a significant cumulative GHG impact if the proposed project would exceed the annual threshold of 3,000 MTCO₂e.

Construction Emissions

The sediment restoration project would require the use of multiple pieces of equipment over two phases of construction. The overall construction of the proposed project would take approximately two months.

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The construction equipment and number of truck trips generated by each phase of construction have been detailed above.

Construction-Related Regional Impacts

The CalEEMod model has been utilized to calculate the construction-related regional emissions from the proposed project. The worst-case summer or winter daily construction-related criteria pollutant emissions from the proposed project for each phase of construction activities are shown below in Table H and the CalEEMod model run printout is attached to this letter.

Table H – Construction-Related Regional Criteria Pollutant Emissions Prior to Mitigation

Activity	Pollutant Emissions (pounds/day) ¹					
	VOC	NOx	CO	SO ₂	PM10	PM2.5
Phase 1A – Site Preparation Clearing and Grubbing						
Onsite ²	5.49	53.76	25.82	0.09	4.41	3.21
Offsite ³	0.09	0.06	0.82	0.00	0.26	0.07
Total	5.58	53.82	26.64	0.09	4.67	3.28
Phase 1B – Santiago Creek Realignment Rip Rap						
Onsite	9.92	101.95	55.28	0.19	3.67	3.38
Offsite	0.18	0.12	1.53	0.00	0.48	0.13
Total	10.10	102.07	56.81	0.19	4.15	3.51
Phase 2A – Area 1 Slope Embankment						
Onsite	7.48	87.53	47.20	0.11	7.22	4.60
Offsite	0.09	0.06	0.82	0.00	0.26	0.07
Total	7.57	87.59	48.02	0.11	7.48	4.67
Phase 2B – Area 2 Slope Embankment						
Onsite	7.48	87.53	47.20	0.11	7.22	4.60
Offsite	0.09	0.06	0.82	0.00	0.26	0.07
Total	7.57	87.59	48.02	0.11	7.48	4.67
Phase 3 – Area 5 Slope Embankment						
Onsite	5.56	57.34	29.28	0.09	4.57	3.33
Offsite	0.10	0.07	0.89	0.00	0.28	0.08
Total	5.66	57.41	30.17	0.09	4.85	3.41
SCAQMD Thresholds	75	100	550	150	150	55
Exceeds Threshold?	No	Yes	No	No	No	No

Notes:

¹ Based on adherence to fugitive dust suppression requirements from SCAQMD Rule 403.

² Onsite emissions from equipment not operated on public roads.

³ Offsite emissions from vehicles operating on public roads.

Source: CalEEMod Version 2016.3.2.

Table H shows that NOx emissions would exceed the SCAQMD's regional emissions thresholds during the Santiago Creek realignment rip rap phase (Phase 1B). This would be considered a significant impact. Table H also shows that none of the other analyzed criteria pollutants would exceed the regional emissions thresholds during any of the other phases of construction.

Mitigation Measure 1 is provided that requires all diesel-powered off-road equipment utilized for the proposed project to meet the Tier 3 or higher emissions standards. Table I below shows that with the

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implementation of Mitigation Measure 1, all analyzed criteria pollutants would be within the regional emissions thresholds during all phases of construction. Therefore, with implementation of Mitigation Measure 1, a less than significant regional air quality impact would occur from construction of the proposed project.

Table I – Mitigated Construction-Related Regional Criteria Pollutant Emissions

Activity	Pollutant Emissions (pounds/day) ¹					
	VOC	NOx	CO	SO ₂	PM10	PM2.5
Phase 1A – Site Preparation Clearing and Grubbing						
Onsite ²	2.14	41.45	46.45	0.09	3.92	2.86
Offsite ³	0.11	0.07	0.82	0.00	0.26	0.07
Total	2.25	41.52	47.27	0.09	4.18	2.93
Phase 1B – Santiago Creek Realignment Rip Rap						
Onsite	4.53	87.65	98.22	0.19	3.32	3.32
Offsite	0.20	0.13	1.53	0.00	0.48	0.13
Total	4.73	87.78	99.75	0.19	3.80	3.45
Phase 2A – Area 1 Slope Embankment						
Onsite	2.61	50.52	56.62	0.11	5.71	3.36
Offsite	0.11	0.07	0.82	0.00	0.26	0.07
Total	2.72	50.59	57.44	0.11	5.97	3.43
Phase 2B – Area 2 Slope Embankment						
Onsite	2.61	50.52	56.62	0.11	5.71	3.36
Offsite	0.11	0.07	0.82	0.00	0.26	0.07
Total	2.72	50.59	57.44	0.11	5.97	3.43
Phase 3 – Area 5 Slope Embankment						
Onsite	2.27	43.89	49.19	0.09	4.01	2.96
Offsite	0.12	0.07	0.89	0.00	0.28	0.08
Total	2.39	43.96	50.08	0.09	4.29	3.04
SCAQMD Thresholds	75	100	550	150	150	55
Exceeds Threshold?	No	No	No	No	No	No

Notes:

¹ Based on adherence to fugitive dust suppression requirements from SCAQMD Rule 403 and Mitigation Measure 1 that requires all diesel-powered equipment to meet the Tier 3 or higher emissions standards.

² Onsite emissions from equipment not operated on public roads.

³ Offsite emissions from vehicles operating on public roads.

Source: CalEEMod Version 2016.3.2.

Construction-Related Local Impacts

Construction-related air emissions may have the potential to exceed the State and Federal air quality standards in the project vicinity, even though these pollutant emissions may not be significant enough to create a regional impact to the Air Basin.

The local air quality emissions from construction were analyzed through utilizing the methodology described in *Localized Significance Threshold Methodology* (LST Methodology), prepared by SCAQMD, revised October 2009. The LST Methodology found the primary criteria pollutant emissions of concern are NOx, CO, PM10, and PM2.5. In order to determine if any of these pollutants require a detailed analysis of the local air quality impacts, each phase of construction was screened using the SCAQMD's

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Mass Rate LST Look-up Tables. The Look-up Tables were developed by the SCAQMD in order to readily determine if the daily onsite emissions of CO, NOx, PM10, and PM2.5 from the proposed project could result in a significant impact to the local air quality. Table J shows the onsite emissions from the CalEEMod model for the different construction phases and the calculated emissions thresholds that have been detailed above.

Table J – Construction-Related Local Criteria Pollutant Emissions

Construction Phase	Pollutant Emissions (pounds/day) ¹			
	NOx	CO	PM10	PM2.5
Phase 1A – Site Preparation Clearing and Grubbing	53.76	25.82	7.10	4.06
Phase 1B – Santiago Creek Realignment Rip Rap	87.65	98.22	3.32	3.32
Phase 2A – Area 1 Slope Embankment Repair	50.52	56.62	5.71	3.36
Phase 2B – Area 2 Slope Embankment Repair	50.52	56.62	5.71	3.36
Phase 3 – Area 5 Slope Embankment Repair	43.89	49.19	4.01	2.96
SCAQMD Thresholds ²	183	1,253	13	7
Exceeds Threshold?	No	No	No	No

Notes:

¹ Based on adherence to fugitive dust suppression requirements from SCAQMD Rule 403 and Mitigation Measure 1 that requires all equipment to meet the Tier 3 or higher emissions standards.

² The nearest sensitive receptors are at Oak Ridge Private School, located adjacent to the east side of the Basin and the single-family homes located on the north and west sides of the Basin. According to SCAQMD Methodology, all receptors closer than 25 meters are based on the 25 meter threshold.

Source: Calculated from SCAQMD's Mass Rate Look-up Tables for five acres in Air Monitoring Area 17, Central Orange County.

The data provided in Table J shows that none of the analyzed criteria pollutants would exceed the local emissions thresholds for any phase of construction. In addition, construction emissions would be short-term, limited only to the period when construction activity is taking place. As such, construction related local air concentrations would be less than significant for the proposed project. Additionally, construction activities would be required to follow SCAQMD regulations that limit fugitive dust emissions, including SCAQMD Rules 401 and 403. These rules require that contractors working on the proposed project to implement measures to reduce fugitive dust emissions that include the following:

- Limit speed of vehicles on dirt areas of the project site to 15 miles per hour or less.
- Apply water and/or other dust suppressants as necessary to prevent or alleviate erosion by the forces of wind.
- Limit all stockpiles that can be blown by wind to 8 feet in height or apply a soil stabilizer.
- Cover all trucks hauling soil or other loose material.
- Sweep daily all paved access roads and any trackout onto public road with water sweepers.
- When winds exceed 25 mph, cease all grading operations other than dust suppression activities.

Operational Emissions

The proposed sediment restoration project would consist of three phases of construction that would be completed over an approximately two month period. Annually, OCWD will remove overgrown vegetation and debris and inspect the slopes within Smith Basin. However, the ongoing operation of Smith Basin would primarily be passive and would not typically require the use of any off-road equipment. As such, no operational emissions are anticipated to be created from the proposed project.

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Generation of Greenhouse Gas Emissions

The proposed project would not generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment. The proposed geotechnical improvement project would require the use of multiple pieces of equipment over three phases of construction. The proposed project is anticipated to generate GHG emissions from construction activities associated with the proposed project, however no generation of GHG emissions is anticipated from the operation of the proposed project.

The project's GHG emissions have been calculated with the CalEEMod model. A summary of the results is shown below in Table K and the CalEEMod model run printout is attached to this letter.

Table K – Construction Related Greenhouse Gas Emissions

Construction Phase	Greenhouse Gas Emissions (Metric Tons)			
	CO ₂	CH ₄	N ₂ O	CO ₂ e
Phase 1A – Site Preparation Clearing and Grubbing	33.57	0.01	0.00	33.77
Phase 1B – Santiago Creek Realignment Rip Rap	34.09	0.01	0.00	34.35
Phase 2A – Area 1 Slope Embankment Repair	39.13	0.01	0.00	39.43
Phase 2B – Area 2 Slope Embankment Repair	78.25	0.02	0.00	78.86
Phase 3 – Area 5 Slope Embankment Repair	8.57	0.00	0.00	8.64
Total Construction Emissions	193.61	0.05	0.00	195.06
Amortized Total Construction Emissions (30 years)¹	6.45	0.00	0.00	6.50
SCAQMD Draft Threshold of Significance				3,000

Notes:

¹ Construction emissions amortized over 30 years as recommended in the SCAQMD GHG Working Group on November 19, 2009.

Source: CalEEMod Version 2016.3.2.

The data provided in Table K above shows that the proposed project would create a total of 195.06 MTCO₂e or 6.50 MTCO₂e per year, when amortized over a 30 year period. According to the SCAQMD draft threshold of significance detailed above, a cumulative global climate change impact would occur if the GHG emissions created from a proposed project would exceed 3,000 MTCO₂e per year. Therefore, a less than significant generation of greenhouse gas emissions would occur from development of the proposed project. Impacts would be less than significant.

Greenhouse Gas Plan Consistency

The proposed project would not conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing GHG emissions. The proposed project would involve geotechnical improvements to areas in Smith Basin that have experienced substantial erosion on the Basin embankment slopes and the removal of overgrown vegetation and debris from segment of Santiago Creek. The ongoing operation of Smith Basin would primarily be passive and would not require the use of any off-road equipment.

As detailed above, the proposed project is anticipated to create an average of 6.5 MTCO₂e per year, which is well below the SCAQMD draft threshold of significance of 3,000 MTCO₂e per year. The SCAQMD developed this threshold through a Working Group, which also developed detailed methodology for evaluating significance under CEQA. At the September 28, 2010 Working Group meeting, the SCAQMD released its most current version of the draft GHG emissions thresholds, which recommends a tiered approach that provides a quantitative annual threshold of 3,000 MTCO₂e for all land use type projects, which was based on substantial evidence supporting the use of the recommended thresholds.

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Therefore, the proposed project would not conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases.

Mitigation Measures Required for the Proposed Project

This analysis found that implementation the applicable State and SCAQMD air quality and GHG emissions reductions regulations and through implementation of the following mitigation, all criteria pollutants, toxic air contaminants, odors, and GHG emissions from the proposed project would be reduced to less than significant levels.

Mitigation Measure 1

The project applicant shall require that all off-road diesel-powered equipment utilized for the proposed project shall be registered with CARB and labelled detailing that the equipment meets or exceeds Tier 3 emissions standards.

Please let me know if you have any questions or need additional information with regard to the above analysis. I can be reached at (949) 510-5355, or email me at ggreg@vistalb.com.

Sincerely,



Greg Tonkovich, AICP
Senior Analyst
Vista Environmental

Encl.: CalEEMod Printouts

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OCWD Smith Basin Geotechnical Improvements Project - Orange County, Summer

OCWD Smith Basin Geotechnical Improvements Project Orange County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	10.00	Acre	10.00	435,600.00	0

1.2 Other Project Characteristics

Urbanization	Urban	Wind Speed (m/s)	2.2	Precipitation Freq (Days)	30
Climate Zone	8			Operational Year	2019
Utility Company	Southern California Edison				
CO2 Intensity	702.44	CH4 Intensity (lb/MMWhr)	0.029	N2O Intensity (lb/MMWhr)	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Opening Year 2019

Land Use - 10 acres Other Non-Asphalt Surfaces

Construction Phase - Construction phases and schedule provided by applicant.

Off-road Equipment - Equipment and HP provided by applicant.

Off-road Equipment - Equipment and HP provided by applicant.

Off-road Equipment - Equipment and HP provided by applicant.

Off-road Equipment - Equipment and HP provided by applicant.

Off-road Equipment - Equipment and HP provided by applicant.

Grading -

Energy Use -

Construction Off-road Equipment Mitigation - Per SCAQMD Rule 403 minimum requirements, water exposure 3x per day selected. All off-road equipment with greater than 50 HP set to Tier 3 standards.

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOffEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOffEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	NumberOffEquipmentMitigated	0.00	30.00
tblConstEquipMitigation	NumberOffEquipmentMitigated	0.00	3.00
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tblConstEquipMitigation	NumberOffEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOffEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOffEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOffEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	10.00	8.00
tblConstructionPhase	NumDays	20.00	8.00
tblConstructionPhase	NumDays	20.00	16.00
tblConstructionPhase	PhaseEndDate	7/17/2019	6/12/2019
tblConstructionPhase	PhaseStartDate	7/4/2019	6/1/2019
tblOffRoadEquipment	HorsePower	247.00	250.00
tblOffRoadEquipment	HorsePower	247.00	250.00

tbOffRoadEquipment	HorsePower	187.00	250.00
tbOffRoadEquipment	HorsePower	158.00	200.00
tbOffRoadEquipment	HorsePower	158.00	200.00
tbOffRoadEquipment	HorsePower	8.00	200.00
tbOffRoadEquipment	HorsePower	367.00	490.00
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tbOffRoadEquipment	HorsePower	8.00	200.00
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tbOffRoadEquipment	HorsePower	247.00	250.00
tbOffRoadEquipment	HorsePower	187.00	250.00
tbOffRoadEquipment	HorsePower	158.00	200.00
tbOffRoadEquipment	HorsePower	367.00	490.00
tbOffRoadEquipment	HorsePower	8.00	200.00
tbOffRoadEquipment	HorsePower	402.00	350.00
tbOffRoadEquipment	HorsePower	402.00	300.00
tbOffRoadEquipment	LoadFactor	0.40	0.40
tbOffRoadEquipment	LoadFactor	0.40	0.40

tbOffRoadEquipment	LoadFactor	0.41	0.41
tbOffRoadEquipment	LoadFactor	0.38	0.38
tbOffRoadEquipment	LoadFactor	0.38	0.38
tbOffRoadEquipment	LoadFactor	0.48	0.48
tbOffRoadEquipment	LoadFactor	0.38	0.38
tbOffRoadEquipment	LoadFactor	0.38	0.38
tbOffRoadEquipment	LoadFactor	0.40	0.40
tbOffRoadEquipment	LoadFactor	0.41	0.41
tbOffRoadEquipment	LoadFactor	0.38	0.38
tbOffRoadEquipment	LoadFactor	0.48	0.48
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tbOffRoadEquipment	LoadFactor	0.38	0.38
tbOffRoadEquipment	LoadFactor	0.48	0.48
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tbOffRoadEquipment	LoadFactor	0.38	0.38
tbOffRoadEquipment	LoadFactor	0.38	0.38
tbOffRoadEquipment	OffRoadEquipmentType	Rubber Tired Dozers	
tbOffRoadEquipment	OffRoadEquipmentType	Rubber Tired Dozers	
tbOffRoadEquipment	OffRoadEquipmentType	Graders	
tbOffRoadEquipment	OffRoadEquipmentType	Excavators	
tbOffRoadEquipment	OffRoadEquipmentType	Excavators	
tbOffRoadEquipment	OffRoadEquipmentType	Plate Compactors	
tbOffRoadEquipment	OffRoadEquipmentType	Scrapers	
tbOffRoadEquipment	OffRoadEquipmentType	Off-Highway Trucks	
tbOffRoadEquipment	OffRoadEquipmentType	Plate Compactors	
tbOffRoadEquipment	OffRoadEquipmentType	Off-Highway Trucks	
tbOffRoadEquipment	OffRoadEquipmentType	Excavators	
tbOffRoadEquipment	OffRoadEquipmentType	Rubber Tired Loaders	
tbOffRoadEquipment	OffRoadEquipmentType	Rubber Tired Dozers	
tbOffRoadEquipment	OffRoadEquipmentType	Excavators	
tbOffRoadEquipment	OffRoadEquipmentType	Skid Steer Loaders	
tbOffRoadEquipment	OffRoadEquipmentType	Off-Highway Trucks	

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Year	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio-CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e	lb/day	
																	Year	lb/day

2019	10.1000	102.0645	56.8114	0.1900	9.9909	3.6755	13.4162	3.7792	3.3815	6.9305	0.0000	18,808.65	18,808.659	5.8096	0.0000	18,953.89
Maximum	10.1000	102.0645	56.8114	0.1900	9.9909	3.6755	13.4162	3.7792	3.3815	6.9305	0.0000	18,808.65	18,808.659	5.8096	0.0000	18,953.89
Maximum	10.1000	102.0645	56.8114	0.1900	9.9909	3.6755	13.4162	3.7792	3.3815	6.9305	0.0000	18,808.65	18,808.659	5.8096	0.0000	18,953.89

Mitigated Construction

Year	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio-CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
2019	4.7106	87.7621	99.7579	0.1900	4.0533	3.3277	5.9714	1.5155	3.3275	3.4549	0.0000	18,808.65	18,808.659	5.8096	0.0000	18,953.89
Maximum	4.7106	87.7621	99.7579	0.1900	4.0533	3.3277	5.9714	1.5155	3.3275	3.4549	0.0000	18,808.65	18,808.659	5.8096	0.0000	18,953.89

Percent Reduction	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio-CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	53.36	14.01	-75.59	0.00	59.43	9.46	55.49	59.90	1.60	50.15	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days	Num Weeks	Phase Description
1	1A. Site Preparation	Site Preparation	6/1/2019	6/12/2019	5	8	
2	1B. Santiago Creek Realignment	Trenching	6/13/2019	6/18/2019	5	4	
3	Rin Ran						
3	2A. Area 1 Slope Embankment	Grading	6/19/2019	6/28/2019	5	8	
4	2B. Area 2 Slope Embankment	Grading	6/29/2019	7/22/2019	5	16	
5	3. Area 5 Slope Embankment	Grading	7/23/2019	7/24/2019	5	2	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 10

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
2B. Area 2 Slope Embankment	Rubber Tired Dozers	1	8.00	250	0.40
3. Area 5 Slope Embankment	Rubber Tired Dozers	1	8.00	250	0.40
2B. Area 2 Slope Embankment	Graders	1	8.00	250	0.41
3. Area 5 Slope Embankment	Excavators	1	8.00	200	0.38
2B. Area 2 Slope Embankment	Excavators	1	8.00	200	0.38
3. Area 5 Slope Embankment	Plate Compactors	1	8.00	200	0.43
2B. Area 2 Slope Embankment	Scrapers	3	8.00	490	0.48
3. Area 5 Slope Embankment	Off-Highway Trucks	5	8.00	350	0.38
2B. Area 2 Slope Embankment	Plate Compactors	1	8.00	200	0.43
3. Area 5 Slope Embankment	Off-Highway Trucks	2	8.00	300	0.38
1B. Santiago Creek Realignment Rip Ran.	Excavators	1	8.00	200	0.38
1B. Santiago Creek Realignment Rip Ran.	Rubber Tired Loaders	1	8.00	250	0.36
1A. Site Preparation	Rubber Tired Dozers	1	8.00	250	0.40
1A. Site Preparation	Excavators	1	8.00	200	0.38
1A. Site Preparation	Skid Steer Loaders	1	8.00	200	0.37
1A. Site Preparation	Off-Highway Trucks	3	8.00	350	0.38
1A. Site Preparation	Crushing/Proc. Equipment	1	8.00	300	0.78
1A. Site Preparation	Rubber Tired Loaders	1	8.00	250	0.36
1A. Site Preparation	Off-Highway Trucks	1	8.00	300	0.38
1B. Santiago Creek Realignment Rip Ran.	Off-Highway Trucks	14	8.00	350	0.38
1B. Santiago Creek Realignment Rip Ran.	Off-Highway Trucks	1	8.00	300	0.38
2A. Area 1 Slope Embankment	Rubber Tired Dozers	1	8.00	250	0.40
2A. Area 1 Slope Embankment	Graders	1	8.00	250	0.41

2A. Area 1 Slope Embankment	Excavators	1	8.00	200	0.38
2A. Area 1 Slope Embankment	Scrapers	3	8.00	490	0.48
2A. Area 1 Slope Embankment	Plate Compactors	1	8.00	200	0.43
2A. Area 1 Slope Embankment	Off-Highway Trucks	1	8.00	350	0.38
2A. Area 1 Slope Embankment	Off-Highway Trucks	1	8.00	300	0.38
2B. Area 2 Slope Embankment	Off-Highway Trucks	1	8.00	350	0.38
2B. Area 2 Slope Embankment	Off-Highway Trucks	1	8.00	300	0.38

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Length	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
2A. Area 1 Slope Embankment	9	23.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
1A. Site Preparation	9	23.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
2B. Area 2 Slope Embankment	9	23.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
3. Area 5 Slope Embankment	10	25.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
1B. Santiago Creek Realignment/Bio Bar	17	43.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

3.2 1A. Site Preparation - 2019 Unmitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	NBio-CO2	Total CO2	CH4	N2O	CO2e
Fugitive Dust					6.0221	0.0000	6.0221	3.3102	0.0000	3.3102		0.0000			0.0000
Off-Road	5.4898	53.7579	25.8220	0.0879		2.0573	2.0573			1.9161	1.9161	9,001.2222	9,001.2222	2.2131	9,056.5506
Total	5.4898	53.7579	25.8220	0.0879	6.0221	2.0573	8.0794	3.3102	0.0000	3.3102	1.9161	9,001.2222	9,001.2222	2.2131	9,056.5506

Unmitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
	lb/day															lb/day
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0948	0.0622	0.8205	0.2571	2.6000e-003	0.2588	0.2588	0.0682	1.5800e-003	0.0698	0.0698	259.0123	6.3700e-003	259.0123	6.3700e-003	259.1715
Total	0.0948	0.0622	0.8205	0.2571	2.6000e-003	0.2588	0.2588	0.0682	1.5800e-003	0.0698	0.0698	259.0123	6.3700e-003	259.0123	6.3700e-003	259.1715

Mitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
	lb/day															lb/day
Fugitive Dust					2.3486	0.0000	2.3486	1.2910	0.0000	1.2910	0.0000	0.0000	0.0000	0.0000	0.0000	
Off-Road	2.1440	41.4497	46.4523	0.0879	1.5722	1.5722	1.5722	1.5722	1.5722	1.5722	0.0000	9.001.2222	9.001.2222	2.2131	9.056.5506	
Total	2.1440	41.4497	46.4523	0.0879	2.3486	1.5722	3.9208	1.2910	1.5722	2.8632	0.0000	9.001.2222	9.001.2222	2.2131	9.056.5506	

Mitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
	lb/day															
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0948	0.0622	0.8205	2.6000e-003	0.2571	1.7200e-003	0.2588	0.0682	1.5800e-003	0.0698	259.0123	259.0123	6.3700e-003	259.0123	259.0123	259.1715
Total	0.0948	0.0622	0.8205	2.6000e-003	0.2571	1.7200e-003	0.2588	0.0682	1.5800e-003	0.0698	259.0123	259.0123	6.3700e-003	259.0123	259.0123	259.1715

3.3 1B. Santiago Creek Realignment Rip Rap - 2019

Unmitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
	lb/day															
Off-Road	9.9227	101.9483	55.2774	0.1851	3.6723	3.6723	3.6723	3.3785	3.3785	3.3785	18,324.41	18,324.41	5.7977	18,469.36	07	
Total	9.9227	101.9483	55.2774	0.1851	3.6723	3.6723	3.6723	3.3785	3.3785	3.3785	18,324.41	18,324.41	5.7977	18,469.36	07	

Unmitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio-CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
	lb/day															
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1772	0.1162	1.5340	4.8600e-003	4.8600e-003	3.2100e-003	0.4839	0.1275	2.9600e-003	0.1304	484.2403	484.2403	0.0119	484.2403	484.2403	484.5380
Total	0.1772	0.1162	1.5340	4.8600e-003	4.8600e-003	3.2100e-003	0.4839	0.1275	2.9600e-003	0.1304	484.2403	484.2403	0.0119	484.2403	484.2403	484.5380

Mitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio-CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
	lb/day															
Off-Road	4.5334	87.6459	98.2239	0.1851	3.3245	3.3245	3.3245	3.3245	3.3245	3.3245	0.0000	18,324.41	18,324.41	5.7977	18,469.36	07
Total	4.5334	87.6459	98.2239	0.1851	3.3245	3.3245	3.3245	3.3245	3.3245	3.3245	0.0000	18,324.41	18,324.41	5.7977	18,469.36	07

Mitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio-CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
	lb/day															
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1772	0.1162	1.5340	4.8600e-003	0.4806	3.2100e-003	0.4839	0.1275	2.9600e-003	0.1304	484.2403	484.2403	0.0119	484.2403	484.2403	484.5380
Total	0.1772	0.1162	1.5340	4.8600e-003	0.4806	3.2100e-003	0.4839	0.1275	2.9600e-003	0.1304	484.2403	484.2403	0.0119	484.2403	484.2403	484.5380

3.4 2A. Area 1 Slope Embankment - 2019

Unmitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio-CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
	lb/day															
Fugitive Dust					9.7338	0.0000	9.7338	3.7110	0.0000	3.7110	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.4754	87.5333	47.1983	0.1064	3.4236	3.4236		3.1497	3.1497		10,534.21	10,534.21	3.3329	3.3329	10,617.53	60
Total	7.4754	87.5333	47.1983	0.1064	9.7338	3.4236	13.1574	3.7110	3.1497	6.8807	10,534.21	10,534.21	3.3329	3.3329	10,617.53	60

Unmitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
	lb/day															lb/day
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0948	0.0622	0.8205	2.6000e-003	0.2571	1.7200e-003	0.2588	0.0682	1.5800e-003	0.0698	259.0123	259.0123	6.3700e-003	259.0123	259.0123	259.1715
Total	0.0948	0.0622	0.8205	2.6000e-003	0.2571	1.7200e-003	0.2588	0.0682	1.5800e-003	0.0698	259.0123	259.0123	6.3700e-003	259.0123	259.0123	259.1715

Mitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e	
	lb/day															lb/day	
Fugitive Dust					3.7962	0.0000	3.7962	1.4473	0.0000	1.4473	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
Off-Road	2.6133	50.5230	56.6206	0.1064	1.9164	1.9164	1.9164	1.9164	1.9164	1.9164	10,534.21	10,534.21	3.3329	2	2	10,617.53	
Total	2.6133	50.5230	56.6206	0.1064	3.7962	1.9164	5.7126	1.4473	1.9164	3.3327	0.0000	10,534.21	10,534.21	3.3329	2	2	10,617.53

Mitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
	lb/day															
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0948	0.0622	0.8205	2.6000e-003	0.2571	1.7200e-003	0.2588	0.0682	1.5800e-003	0.0698	259.0123	259.0123	6.3700e-003	259.1715		
Total	0.0948	0.0622	0.8205	2.6000e-003	0.2571	1.7200e-003	0.2588	0.0682	1.5800e-003	0.0698	259.0123	259.0123	6.3700e-003	259.1715		

3.5 2B. Area 2 Slope Embankment - 2019 Unmitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
	lb/day															
Fugitive Dust					9.7338	0.0000	9.7338	3.7110	0.0000	3.7110	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.4754	87.5333	47.1983	0.1064	3.4236	3.4236		3.1497	3.1497		10.534.21	10.534.21	3.3329	3.3329	10.617.53	60
Total	7.4754	87.5333	47.1983	0.1064	9.7338	3.4236	13.1574	3.7110	3.1497	6.8807	10,534.21	10,534.21	3.3329	3.3329	10,617.53	60

Unmitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
	lb/day															
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0948	0.0622	0.8205	2.600e-003	0.2571	1.720e-003	0.2588	0.0682	0.0698	0.0682	259.0123	259.0123	6.3700e-003	259.0123	259.0123	259.1715
Total	0.0948	0.0622	0.8205	2.600e-003	0.2571	1.720e-003	0.2588	0.0682	0.0698	0.0682	259.0123	259.0123	6.3700e-003	259.0123	259.0123	259.1715

Mitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Fugitive Dust					3.7962	0.0000	3.7962	1.4473	0.0000	1.4473		0.0000				0.0000
Off-Road	2.6133	50.5230	56.6206	0.1064			1.9164		1.9164	1.9164	0.0000	10.534.21	3.3329			10.617.53
Total	2.6133	50.5230	56.6206	0.1064	3.7962	1.9164	5.7126	1.4473	1.9164	3.3637	0.0000	10.534.21	3.3329	2	2	60

Mitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio-CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
	lb/day															
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0948	0.0622	0.8205	2.6000e-003	0.2571	1.7200e-003	0.2588	0.0682	1.5800e-003	0.0698	259.0123	259.0123	6.3700e-003	259.1715		
Total	0.0948	0.0622	0.8205	2.6000e-003	0.2571	1.7200e-003	0.2588	0.0682	1.5800e-003	0.0698	259.0123	259.0123	6.3700e-003	259.1715		

3.6 3. Area 5 Slope Embankment - 2019 Unmitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio-CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
	lb/day															
Fugitive Dust					6.0221	0.0000	6.0221	3.3102	0.0000	3.3102			0.0000			0.0000
Off-Road	5.5556	57.3363	29.2841	29.2841	0.0927	2.2164	2.2164		2.0391	2.0391	9,178.210	9,178.210	2.9039		9,250.807	8
Total	5.5556	57.3363	29.2841	29.2841	0.0927	6.0221	2.2164	8.2385	3.3102	2.0391	5.3494	9,178.210	9,178.210	2.9039	9,250.807	8

Unmitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio-CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
	lb/day															
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1030	0.0676	0.8919	2.8200e-003	0.2794	1.8700e-003	0.2813	0.0741	0.0758	0.0758	281.53351	281.53351	6.9200e-003	281.53351	281.7081	281.7081
Total	0.1030	0.0676	0.8919	2.8200e-003	0.2794	1.8700e-003	0.2813	0.0741	0.0758	0.0758	281.53351	281.53351	6.9200e-003	281.53351	281.7081	281.7081

Mitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio-CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e	
	lb/day																
Fugitive Dust					2.3486	0.0000	2.3486	1.2910	0.0000	1.2910	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
Off-Road	2.2702	43.8913	49.1885	0.0927	1.6648	1.6648	1.6648	1.6648	1.6648	1.6648	9.178.210	9.178.210	2.9039	2.9039	9,250.807	9,250.807	
Total	2.2702	43.8913	49.1885	0.0927	2.3486	1.6648	4.0135	1.2910	1.6648	2.9558	0.0000	9,178.210	9,178.210	2.9039	2.9039	9,250.807	9,250.807

Mitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio-CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
	lb/day															
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1030	0.0676	0.8919	2.8200e-003	0.2794	1.8700e-003	0.2813	0.0741	0.0758	0.0758	281.5351	281.5351	6.9200e-003	281.5351	281.7081	281.7081
Total	0.1030	0.0676	0.8919	2.8200e-003	0.2794	1.8700e-003	0.2813	0.0741	0.0758	0.0758	281.5351	281.5351	6.9200e-003	281.5351	281.7081	281.7081

OCWD Smith Basin Geotechnical Improvements Project - Orange County, Winter

OCWD Smith Basin Geotechnical Improvements Project Orange County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	10.00	Acre	10.00	435,600.00	0

1.2 Other Project Characteristics

Urbanization	Urban	Wind Speed (m/s)	2.2	Precipitation Freq (Days)	30
Climate Zone	8			Operational Year	2019
Utility Company	Southern California Edison				
CO2 Intensity	702.44	CH4 Intensity (lb/MMWhr)	0.029	N2O Intensity (lb/MMWhr)	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Opening Year 2019

Land Use - 10 acres Other Non-Asphalt Surfaces

Construction Phase - Construction phases and schedule provided by applicant.

Off-road Equipment - Equipment and HP provided by applicant.

Off-road Equipment - Equipment and HP provided by applicant.

Off-road Equipment - Equipment and HP provided by applicant.

Off-road Equipment - Equipment and HP provided by applicant.

Off-road Equipment - Equipment and HP provided by applicant.

Grading -

Energy Use -

Construction Off-road Equipment Mitigation - Per SCAQMD Rule 403 minimum requirements, water exposure 3x per day selected. All off-road equipment with greater than 50 HP set to Tier 3 standards.

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	30.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	NumDays	10.00	8.00
tblConstEquipMitigation	NumDays	20.00	8.00
tblConstructionPhase	NumDays	20.00	16.00
tblConstructionPhase	PhaseStartDate	7/4/2019	6/1/2019
tblConstructionPhase	PhaseEndDate	7/17/2019	6/12/2019
tblOffRoadEquipment	HorsePower	247.00	250.00
tblOffRoadEquipment	HorsePower	247.00	250.00

tbOffRoadEquipment	HorsePower	187.00	250.00
tbOffRoadEquipment	HorsePower	158.00	200.00
tbOffRoadEquipment	HorsePower	158.00	200.00
tbOffRoadEquipment	HorsePower	8.00	200.00
tbOffRoadEquipment	HorsePower	367.00	490.00
tbOffRoadEquipment	HorsePower	402.00	350.00
tbOffRoadEquipment	HorsePower	8.00	200.00
tbOffRoadEquipment	HorsePower	402.00	300.00
tbOffRoadEquipment	HorsePower	158.00	200.00
tbOffRoadEquipment	HorsePower	203.00	250.00
tbOffRoadEquipment	HorsePower	247.00	250.00
tbOffRoadEquipment	HorsePower	158.00	200.00
tbOffRoadEquipment	HorsePower	65.00	200.00
tbOffRoadEquipment	HorsePower	402.00	350.00
tbOffRoadEquipment	HorsePower	85.00	300.00
tbOffRoadEquipment	HorsePower	203.00	250.00
tbOffRoadEquipment	HorsePower	402.00	300.00
tbOffRoadEquipment	HorsePower	402.00	350.00
tbOffRoadEquipment	HorsePower	402.00	300.00
tbOffRoadEquipment	HorsePower	247.00	250.00
tbOffRoadEquipment	HorsePower	187.00	250.00
tbOffRoadEquipment	HorsePower	158.00	200.00
tbOffRoadEquipment	HorsePower	367.00	490.00
tbOffRoadEquipment	HorsePower	8.00	200.00
tbOffRoadEquipment	HorsePower	402.00	350.00
tbOffRoadEquipment	HorsePower	402.00	300.00
tbOffRoadEquipment	LoadFactor	0.40	0.40
tbOffRoadEquipment	LoadFactor	0.40	0.40

tbOffRoadEquipment	LoadFactor	0.41	0.41
tbOffRoadEquipment	LoadFactor	0.38	0.38
tbOffRoadEquipment	LoadFactor	0.38	0.38
tbOffRoadEquipment	LoadFactor	0.48	0.48
tbOffRoadEquipment	LoadFactor	0.38	0.38
tbOffRoadEquipment	LoadFactor	0.38	0.38
tbOffRoadEquipment	LoadFactor	0.40	0.40
tbOffRoadEquipment	LoadFactor	0.41	0.41
tbOffRoadEquipment	LoadFactor	0.38	0.38
tbOffRoadEquipment	LoadFactor	0.48	0.48
tbOffRoadEquipment	LoadFactor	0.38	0.38
tbOffRoadEquipment	LoadFactor	0.38	0.38
tbOffRoadEquipment	LoadFactor	0.38	0.38
tbOffRoadEquipment	LoadFactor	0.38	0.38
tbOffRoadEquipment	LoadFactor	0.48	0.48
tbOffRoadEquipment	LoadFactor	0.38	0.38
tbOffRoadEquipment	LoadFactor	0.38	0.38
tbOffRoadEquipment	LoadFactor	0.38	0.38
tbOffRoadEquipment	LoadFactor	0.38	0.38
tbOffRoadEquipment	OffRoadEquipmentType	Rubber Tired Dozers	
tbOffRoadEquipment	OffRoadEquipmentType	Rubber Tired Dozers	
tbOffRoadEquipment	OffRoadEquipmentType	Graders	
tbOffRoadEquipment	OffRoadEquipmentType	Excavators	
tbOffRoadEquipment	OffRoadEquipmentType	Excavators	
tbOffRoadEquipment	OffRoadEquipmentType	Plate Compactors	
tbOffRoadEquipment	OffRoadEquipmentType	Scrapers	
tbOffRoadEquipment	OffRoadEquipmentType	Off-Highway Trucks	
tbOffRoadEquipment	OffRoadEquipmentType	Plate Compactors	
tbOffRoadEquipment	OffRoadEquipmentType	Off-Highway Trucks	
tbOffRoadEquipment	OffRoadEquipmentType	Excavators	
tbOffRoadEquipment	OffRoadEquipmentType	Rubber Tired Loaders	
tbOffRoadEquipment	OffRoadEquipmentType	Rubber Tired Dozers	
tbOffRoadEquipment	OffRoadEquipmentType	Excavators	
tbOffRoadEquipment	OffRoadEquipmentType	Skid Steer Loaders	
tbOffRoadEquipment	OffRoadEquipmentType	Off-Highway Trucks	

tblOffRoadEquipment	OffRoadEquipmentType		Crushing/Proc. Equipment
tblOffRoadEquipment	OffRoadEquipmentType		Rubber Tired Loaders
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Rubber Tired Dozers
tblOffRoadEquipment	OffRoadEquipmentType		Graders
tblOffRoadEquipment	OffRoadEquipmentType		Excavators
tblOffRoadEquipment	OffRoadEquipmentType		Scrapers
tblOffRoadEquipment	OffRoadEquipmentType		Plate Compactors
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

Year	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM2.5 Total	Bio-CO2	Total CO2	CH4	N2O	CO2e
					lb/day				lb/day			
2019	10.1227	102.0760	56.6976	0.1897	9.9909	3.6755	13.4162	3.7792	3.3815	6.9305	0.0000	18,782.70
Maximum	10.1227	102.0760	56.6976	0.1897	9.9909	3.6755	13.4162	3.7792	3.3815	6.9305	0.0000	18,782.70

Mitigated Construction

Year	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio-CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
2019	4.7333	87.7737	99.6441	0.1897	4.0533	3.3277	5.9714	1.5155	3.3275	3.4549	0.0000	18,782.70	18,782.702	5,8089	0.0000	18,927.92
Maximum	4.7333	87.7737	99.6441	0.1897	4.0533	3.3277	5.9714	1.5155	3.3275	3.4549	0.0000	18,782.70	18,782.702	5,8089	0.0000	18,927.92

Percent Reduction	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio-CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
53.24	14.01	-75.75	0.00	59.43	9.46	55.49	59.90	1.60	50.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Phase Description
1	1A. Site Preparation	Site Preparation	6/1/2019	6/12/2019	5	
2	1B. Santiago Creek Realignment Rin Ran	Trenching	6/13/2019	6/18/2019	5	
3	2A. Area 1 Slope Embankment	Grading	6/19/2019	6/28/2019	5	
4	2B. Area 2 Slope Embankment	Grading	6/29/2019	7/22/2019	5	
5	3. Area 5 Slope Embankment	Grading	7/23/2019	7/24/2019	5	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 10**Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0****OffRoad Equipment**

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
2B. Area 2 Slope Embankment	Rubber Tired Dozers	1	8.00	250	0.40
3. Area 5 Slope Embankment	Rubber Tired Dozers	1	8.00	250	0.40
2B. Area 2 Slope Embankment	Graders	1	8.00	250	0.41
3. Area 5 Slope Embankment	Excavators	1	8.00	200	0.38
2B. Area 2 Slope Embankment	Excavators	1	8.00	200	0.38
3. Area 5 Slope Embankment	Plate Compactors	1	8.00	200	0.43
2B. Area 2 Slope Embankment	Scrapers	3	8.00	490	0.48
3. Area 5 Slope Embankment	Off-Highway Trucks	5	8.00	350	0.38
2B. Area 2 Slope Embankment	Plate Compactors	1	8.00	200	0.43
3. Area 5 Slope Embankment	Off-Highway Trucks	2	8.00	300	0.38
1B. Santiago Creek Realignment Rip Ran	Excavators	1	8.00	200	0.38
1B. Santiago Creek Realignment Rip Ran	Rubber Tired Loaders	1	8.00	250	0.36
1A. Site Preparation	Rubber Tired Dozers	1	8.00	250	0.40
1A. Site Preparation	Excavators	1	8.00	200	0.38
1A. Site Preparation	Skid Steer Loaders	1	8.00	200	0.37
1A. Site Preparation	Off-Highway Trucks	3	8.00	350	0.38
1A. Site Preparation	Crushing/Proc. Equipment	1	8.00	300	0.78
1A. Site Preparation	Rubber Tired Loaders	1	8.00	250	0.36
1A. Site Preparation	Off-Highway Trucks	1	8.00	300	0.38
1B. Santiago Creek Realignment Rip Ran	Off-Highway Trucks	14	8.00	350	0.38
1B. Santiago Creek Realignment Rip Ran	Off-Highway Trucks	1	8.00	300	0.38
2A. Area 1 Slope Embankment	Rubber Tired Dozers	1	8.00	250	0.40
2A. Area 1 Slope Embankment	Graders	1	8.00	250	0.41
2A. Area 1 Slope Embankment	Excavators	1	8.00	200	0.38
2A. Area 1 Slope Embankment	Scrapers	3	8.00	490	0.48

2A. Area 1 Slope Embankment	Plate Compactors		1	8.00	200	0.43
2A. Area 1 Slope Embankment	Off-Highway Trucks		1	8.00	350	0.38
2A. Area 1 Slope Embankment	Off-Highway Trucks		1	8.00	300	0.38
2B. Area 2 Slope Embankment	Off-Highway Trucks		1	8.00	350	0.38
2B. Area 2 Slope Embankment	Off-Highway Trucks		1	8.00	300	0.38

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class	HDT_Mix	HHDT
2A. Area 1 Slope Embankment	9	23.00	0.00	0.00	14.70	6.90	20.00	LD_Mix			
1A. Site Preparation	9	23.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix		HHDT
2B. Area 2 Slope Embankment	9	23.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix		HHDT
3. Area 5 Slope Embankment	10	25.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix		HHDT
1B. Santiago Creek Realignment Bio Run	17	43.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix		HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment
Water Exposed Area

3.2 1A. Site Preparation - 2019

Unmitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio-CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e	lb/day
Fugitive Dust					6.0221	0.0000	6.0221	3.3102	0.0000	3.3102			0.0000			0.0000	
Off-Road	5.4898	53.7579	25.8220	0.0879		2.0573	2.0573			1.9161	1.9161		9,001.2222	2,2131		9,036.5506	
Total	5.4898	53.7579	25.8220	0.0879	6.0221	2.0573	8.0794	3.3102	1.9161	5.2264	9,001.2222	2,2131	9,036.5506	2	2	6	6

Unmitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
lb/day																
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1069	0.0683	0.7597	0.2571	1.7200e-003	1.7200e-003	0.2588	0.0682	0.0682	0.0682	0.0698	0.0698	0.0698	245.1280	245.1280	245.2789
Total	0.1069	0.0683	0.7597	0.2571	1.7200e-003	1.7200e-003	0.2588	0.0682	0.0682	0.0682	0.0698	0.0698	0.0698	245.1280	245.1280	245.2789

Mitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
lb/day																
Fugitive Dust					2.3486	0.0000	2.3486	1.2910	0.0000	1.2910	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.1440	41.4497	46.4523	0.0879		1.5722	1.5722		1.5722	1.5722	0.0000	9,001,222 ²	9,001,222 ²	2,2131	2,2131	9,056,550 ⁶
Total	2.1440	41.4497	46.4523	0.0879	2.3486	1.5722	3.9208	1.2910	1.5722	2.8632	0.0000	9,001,222²	9,001,222²	2,2131	2,2131	9,056,550⁶

Mitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
	lb/day															
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1069	0.0683	0.7597	2.4600e-003	0.2571	1.7200e-003	0.2588	0.0682	1.5800e-003	0.0698	245.1280	6.0400e-003	245.1280	245.1280	245.1280	245.2789
Total	0.1069	0.0683	0.7597	2.4600e-003	0.2571	1.7200e-003	0.2588	0.0682	1.5800e-003	0.0698	245.1280	6.0400e-003	245.1280	245.1280	245.1280	245.2789

3.3 1B. Santiago Creek Realignment Rip Rap - 2019

Unmitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
	lb/day															
Off-Road	9.9227	101.9483	55.2774	0.1851	3.6723	3.6723	3.6723	3.3785	3.3785	3.3785	18,324.41	4	18,324.41	5.7977	18,469.36	07
Total	9.9227	101.9483	55.2774	0.1851	3.6723	3.6723	3.6723	3.3785	3.3785	3.3785	18,324.41	4	18,324.41	5.7977	18,469.36	07

Unmitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio-CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
	lb/day															
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1999	0.1277	1.4202	4.6000e-003	0.4806	3.2100e-003	0.4839	0.1275	2.9600e-003	0.1304	458.2827	458.2827	0.0113	458.2827	458.5650	
Total	0.1999	0.1277	1.4202	4.6000e-003	0.4806	3.2100e-003	0.4839	0.1275	2.9600e-003	0.1304	458.2827	458.2827	0.0113	458.2827	458.5650	

Mitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio-CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
	lb/day															
Off-Road	4.5334	87.6459	98.2239	0.1851	3.3245	3.3245	3.3245	3.3245	3.3245	3.3245	0.0000	18,324.41	18,324.41	5.7977	18,469.36	07
Total	4.5334	87.6459	98.2239	0.1851	3.3245	3.3245	3.3245	3.3245	3.3245	3.3245	0.0000	18,324.41	18,324.41	5.7977	18,469.36	07

Mitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio-CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
	lb/day															
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1999	0.1277	1.4202	4.6000e-003	0.4806	3.2100e-003	0.4839	0.1275	2.9600e-003	0.1304	458.2827	458.2827	0.0113	458.2827	458.2827	458.5650
Total	0.1999	0.1277	1.4202	4.6000e-003	0.4806	3.2100e-003	0.4839	0.1275	2.9600e-003	0.1304	458.2827	458.2827	0.0113	458.2827	458.2827	458.5650

3.4 2A. Area 1 Slope Embankment - 2019 Unmitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio-CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
	lb/day															
Fugitive Dust					9.7338	0.0000	9.7338	3.7110	0.0000	3.7110	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.4754	87.5333	47.1983	0.1064	3.4236	3.4236		3.1497	3.1497		10,534.21	10,534.21	3.3329	2	10,617.53	60
Total	7.4754	87.5333	47.1983	0.1064	9.7338	3.4236	13.1574	3.7110	3.1497	6.8807	10,534.21	10,534.21	3.3329	2	10,617.53	60

Unmitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
	lb/day															
	lb/day															
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1069	0.0683	0.7597	2.460e-003	0.2571	1.720e-003	0.2588	0.0682	0.0698	0.0698	245.1280	245.1280	6.0400e-003	245.2789		245.2789
Total	0.1069	0.0683	0.7597	2.460e-003	0.2571	1.720e-003	0.2588	0.0682	0.0698	0.0698	245.1280	245.1280	6.0400e-003		245.2789	

Mitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Fugitive Dust					3.7962	0.0000	3.7962	1.4473	0.0000	1.4473		0.0000				0.0000
Off-Road	2.6133	50.5230	56.6206	0.1064			1.9164		1.9164	1.9164	0.0000	10.534.21	3.3329			10.617.53
Total	2.6133	50.5230	56.6206	0.1064	3.7962	1.9164	5.7126	1.4473	1.9164	3.3637	0.0000	10.534.21	3.3329	2	2	60

Mitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio-CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
	lb/day															
	lb/day															
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1069	0.0683	0.7597	2.4600e-003	0.2571	1.7200e-003	0.2588	0.0682	1.5800e-003	0.0698	245.1280	245.1280	6.0400e-003	245.2789		245.2789
Total	0.1069	0.0683	0.7597	2.4600e-003	0.2571	1.7200e-003	0.2588	0.0682	1.5800e-003	0.0698	245.1280	245.1280	6.0400e-003		245.2789	

3.5 2B. Area 2 Slope Embankment - 2019

Unmitigated Construction On-Site

Category	ROG	NOx	CO	SO ₂	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO ₂	NBio- CO ₂	Total CO ₂	CH ₄	N ₂ O	CO ₂ e
	lb/day														lb/day	
Fugitive Dust					9.7333	0.0000	9.7333	3.7110	0.0000	3.7110			0.0000			0.0000
Off-Road	7.4754	87.5333	47.1983	0.1064		3.4236	3.4236		3.1497	3.1497		10,534.21	10,534.21	3.3329		10,617.53
Total	7.4754	87.5333	47.1983	0.1064	9.7333	3.4236	13.1574	3.7110	3.1497	6.8607	10,534.21	10,534.21	3.3329	2	60	10,617.53

Unmitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
	lb/day															
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1069	0.0683	0.7597	2.4600e-003	0.2571	1.7200e-003	0.2588	0.0682	1.5800e-003	0.0698	245.1280	245.1280	6.0400e-003	245.2789		
Total	0.1069	0.0683	0.7597	2.4600e-003	0.2571	1.7200e-003	0.2588	0.0682	1.5800e-003	0.0698	245.1280	245.1280	6.0400e-003	245.2789		

Mitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e	
	lb/day																
Fugitive Dust					3.7962	0.0000	3.7962	1.4473	0.0000	1.4473	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
Off-Road	2.6133	50.5230	56.6206	0.1064		1.9164	1.9164		1.9164	1.9164	10.534.21	10.534.21	3.3329	3.3329	10.617.53	60	
Total	2.6133	50.5230	56.6206	0.1064	3.7962	1.9164	5.7126	1.4473	1.9164	3.3327	0.0000	10,534.21	10,534.21	3.3329	3.3329	10,617.53	60

Mitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio-CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
	lb/day															
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1069	0.0683	0.7597	2.4600e-003	0.2571	1.7200e-003	0.2588	0.0682	1.5800e-003	0.0698	245.1280	245.1280	6.0400e-003	245.2789		
Total	0.1069	0.0683	0.7597	2.4600e-003	0.2571	1.7200e-003	0.2588	0.0682	1.5800e-003	0.0698	245.1280	245.1280	6.0400e-003	245.2789		

3.6 3. Area 5 Slope Embankment - 2019 Unmitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio-CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
	lb/day															
Fugitive Dust					6.0221	0.0000	6.0221	3.3102	0.0000	3.3102	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.5556	57.3363	29.2841	0.0927	2.2164	2.2164	2.2164	2.0391	2.0391	2.0391	9,178.2106	9,178.2106	2.9039	9,250.8078		
Total	5.5556	57.3363	29.2841	0.0927	6.0221	2.2164	8.2385	3.3102	2.0391	5.3494	9,178.2106	9,178.2106	2.9039	9,250.8078		

Unmitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio-CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
	lb/day															
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1162	0.0743	0.8257	2.6700e-003	0.2794	1.8700e-003	0.2813	0.0741	1.7200e-003	0.0758	266.4434	266.4434	6.5600e-003	266.6075		
Total	0.1162	0.0743	0.8257	2.6700e-003	0.2794	1.8700e-003	0.2813	0.0741	1.7200e-003	0.0758	266.4434	266.4434	6.5600e-003	266.6075		

Mitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio-CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e	
	lb/day																
Fugitive Dust					2.3486	0.0000	2.3486	1.2910	0.0000	1.2910	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
Off-Road	2.2702	43.8913	49.1885	0.0927		1.6648	1.6648		1.6648	1.6648	9,178.2106	9,178.2106	2.9039	9,250.8078			
Total	2.2702	43.8913	49.1885	0.0927	2.3486	1.6648	4.0135	1.2910	1.6648	2.9558	0.0000	9,178.2106	9,178.2106	2.9039	9,250.8078		

Mitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio-CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
	lb/day															
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1162	0.0743	0.8257	2.6700e-003	0.2794	1.8700e-003	0.2813	0.0741	0.0741	0.17200e-003	0.0758	266.4434	266.4434	6.5600e-003	266.6075	
Total	0.1162	0.0743	0.8257	2.6700e-003	0.2794	1.8700e-003	0.2813	0.0741	0.0741	0.17200e-003	0.0758	266.4434	266.4434	6.5600e-003	266.6075	

OCWD Smith Basin Geotechnical Improvements Project - Orange County, Annual

OCWD Smith Basin Geotechnical Improvements Project
Orange County, Annual**1.0 Project Characteristics****1.1 Land Usage**

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	10.00	Acre	10.00	435,600.00	0

1.2 Other Project Characteristics

Urbanization	Urban	Wind Speed (m/s)	2.2	Precipitation Freq (Days)	30
Climate Zone	8			Operational Year	2019
Utility Company	Southern California Edison				
CO2 Intensity	702.44	CH4 Intensity (lb/MMWhr)	0.029	N2O Intensity (lb/MMWhr)	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Opening Year 2019

Land Use - 10 acres Other Non-Asphalt Surfaces

Construction Phase - Construction phases and schedule provided by applicant.

Off-road Equipment - Equipment and HP provided by applicant.

Off-road Equipment - Equipment and HP provided by applicant.

Off-road Equipment - Equipment and HP provided by applicant.

Off-road Equipment - Equipment and HP provided by applicant.

Off-road Equipment - Equipment and HP provided by applicant.

Grading -

Energy Use -

Construction Off-road Equipment Mitigation - Per SCAQMD Rule 403 minimum requirements, water exposure 3x per day selected. All off-road equipment with greater than 50 HP set to Tier 3 standards.

Table Name	Column Name	Default Value	New Value
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tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	30.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
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tblConstEquipMitigation	Tier	No Change	Tier 3
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tblConstConstructionPhase	NumDays	20.00	16.00
tblConstConstructionPhase	NumDays	20.00	2.00
tblConstConstructionPhase	PhaseEndDate	7/17/2019	6/12/2019
tblOffRoadEquipment	HorsePower	247.00	250.00
tblOffRoadEquipment	HorsePower	247.00	250.00

tblOffRoadEquipment	HorsePower	187.00	250.00
tblOffRoadEquipment	HorsePower	158.00	200.00
tblOffRoadEquipment	HorsePower	158.00	200.00
tblOffRoadEquipment	HorsePower	8.00	200.00
tblOffRoadEquipment	HorsePower	367.00	490.00
tblOffRoadEquipment	HorsePower	402.00	350.00
tblOffRoadEquipment	HorsePower	8.00	200.00
tblOffRoadEquipment	HorsePower	402.00	300.00
tblOffRoadEquipment	HorsePower	158.00	200.00
tblOffRoadEquipment	HorsePower	203.00	250.00
tblOffRoadEquipment	HorsePower	247.00	250.00
tblOffRoadEquipment	HorsePower	158.00	200.00
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tblOffRoadEquipment	LoadFactor	0.38	0.38
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tblOffRoadEquipment	LoadFactor	0.38	0.38
tblOffRoadEquipment	LoadFactor	0.38	0.38
tblOffRoadEquipment	LoadFactor	0.38	0.38
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tblOffRoadEquipment	OffRoadEquipmentType	Rubber Tired Dozers	
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tblOffRoadEquipment	OffRoadEquipmentType	Scrapers	
tblOffRoadEquipment	OffRoadEquipmentType	Off-Highway Trucks	
tblOffRoadEquipment	OffRoadEquipmentType	Plate Compactors	
tblOffRoadEquipment	OffRoadEquipmentType	Off-Highway Trucks	
tblOffRoadEquipment	OffRoadEquipmentType	Excavators	
tblOffRoadEquipment	OffRoadEquipmentType	Rubber Tired Loaders	
tblOffRoadEquipment	OffRoadEquipmentType	Rubber Tired Dozers	
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tblOffRoadEquipment	OffRoadEquipmentType	Skid Steer Loaders	
tblOffRoadEquipment	OffRoadEquipmentType	Off-Highway Trucks	

tblOffRoadEquipment	OffRoadEquipmentType		Crushing/Proc. Equipment
tblOffRoadEquipment	OffRoadEquipmentType	Rubber Tired Loaders	
tblOffRoadEquipment	OffRoadEquipmentType	Off-Highway Trucks	
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tblOffRoadEquipment	OffRoadEquipmentType	Rubber Tired Dozers	
tblOffRoadEquipment	OffRoadEquipmentType	Graders	
tblOffRoadEquipment	OffRoadEquipmentType	Excavators	
tblOffRoadEquipment	OffRoadEquipmentType	Scrapers	
tblOffRoadEquipment	OffRoadEquipmentType	Plate Compactors	
tblOffRoadEquipment	OffRoadEquipmentType	Off-Highway Trucks	
tblOffRoadEquipment	OffRoadEquipmentType	Off-Highway Trucks	
tblOffRoadEquipment	OffRoadEquipmentType	Off-Highway Trucks	
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	3.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

Year	ROG	Nox	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
					tons/yr						MT/yr					
2019	0.1391	1.5281	0.8257	2.1400e-003	0.1522	0.0589	0.2111	0.0625	0.0543	0.1168	0.0000	193.6164	193.6164	0.0576	0.0000	195.0559
Maximum	0.1391	1.5281	0.8257	2.1400e-003	0.1522	0.0589	0.2111	0.0625	0.0543	0.1168	0.0000	193.6164	193.6164	0.0576	0.0000	195.0559

Mitigated Construction

Year	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
tons/yr																
2019	0.0533	0.9927	1.1271	2.1400e-003	0.0626	0.0376	0.1002	0.0252	0.0376	0.0629	0.0000	193.6161	193.6161	0.0576	0.0000	195.0557
Maximum	0.0533	0.9927	1.1271	2.1400e-003	0.0626	0.0376	0.1002	0.0252	0.0376	0.0629	0.0000	193.6161	193.6161	0.0576	0.0000	195.0557

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	6-6-2019	9-5-2019	1.5895	0.9878
		Highest	1.5895	0.9878

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days	Num Weeks	Phase Description
1	1A. Site Preparation	Site Preparation	6/1/2019	6/12/2019	5	8	
2	1B. Santiago Creek Realignment	Trenching	6/13/2019	6/18/2019	5	4	
3	2A. Area 1 Slope Embankment	Grading	6/19/2019	6/28/2019	5	8	
4	2B. Area 2 Slope Embankment	Grading	6/29/2019	7/22/2019	5	16	
5	3. Area 5 Slope Embankment	Grading	7/23/2019	7/24/2019	5	2	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 10

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
2B. Area 2 Slope Embankment	Rubber Tired Dozers	1	8.00	250	0.40
3. Area 5 Slope Embankment	Rubber Tired Dozers	1	8.00	250	0.40
2B. Area 2 Slope Embankment	Graders	1	8.00	250	0.41
3. Area 5 Slope Embankment	Excavators	1	8.00	200	0.38
2B. Area 2 Slope Embankment	Excavators	1	8.00	200	0.38
3. Area 5 Slope Embankment	Plate Compactors	1	8.00	200	0.43
2B. Area 2 Slope Embankment	Scrapers	3	8.00	490	0.48
3. Area 5 Slope Embankment	Off-Highway Trucks	5	8.00	350	0.38
2B. Area 2 Slope Embankment	Plate Compactors	1	8.00	200	0.43
3. Area 5 Slope Embankment	Off-Highway Trucks	2	8.00	300	0.38
1B. Santiago Creek Realignment Rip	Excavators	1	8.00	200	0.38
1B. Santiago Creek Realignment Rip	Rubber Tired Loaders	1	8.00	250	0.36
1A. Site Preparation	Rubber Tired Dozers	1	8.00	250	0.40
1A. Site Preparation	Excavators	1	8.00	200	0.38
1A. Site Preparation	Skid Steer Loaders	1	8.00	200	0.37
1A. Site Preparation	Off-Highway Trucks	3	8.00	350	0.38
1A. Site Preparation	Crushing/Proc. Equipment	1	8.00	300	0.78
1A. Site Preparation	Rubber Tired Loaders	1	8.00	250	0.36
1A. Site Preparation	Off-Highway Trucks	1	8.00	300	0.38
1B. Santiago Creek Realignment Rip	Off-Highway Trucks	14	8.00	350	0.38
1B. Santiago Creek Realignment Rip	Off-Highway Trucks	1	8.00	300	0.38
2A. Area 1 Slope Embankment	Rubber Tired Dozers	1	8.00	250	0.40

2A. Area 1 Slope Embankment	Graders		1	8.00	250	0.41
2A. Area 1 Slope Embankment	Excavators		1	8.00	200	0.38
2A. Area 1 Slope Embankment	Scrapers		3	8.00	490	0.48
2A. Area 1 Slope Embankment	Plate Compactors		1	8.00	200	0.43
2A. Area 1 Slope Embankment	Off-Highway Trucks		1	8.00	350	0.38
2A. Area 1 Slope Embankment	Off-Highway Trucks		1	8.00	300	0.38
2B. Area 2 Slope Embankment	Off-Highway Trucks		1	8.00	350	0.38
2B. Area 2 Slope Embankment	Off-Highway Trucks		1	8.00	300	0.38

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Length	Worker Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
2A. Area 1 Slope Embankment	9	23.00	0.00	0.00	14.70	6.90	20.00 LD_Mix	HDT_Mix	HHD ^T
1A. Site Preparation	9	23.00	0.00	0.00	14.70	6.90	20.00 LD_Mix	HDT_Mix	HHD ^T
2B. Area 2 Slope Embankment	9	23.00	0.00	0.00	14.70	6.90	20.00 LD_Mix	HDT_Mix	HHD ^T
3. Area 5 Slope Embankment	10	25.00	0.00	0.00	14.70	6.90	20.00 LD_Mix	HDT_Mix	HHD ^T
1B. Santiago Creek Realignment Bio Ban	17	43.00	0.00	0.00	14.70	6.90	20.00 LD_Mix	HDT_Mix	HHD ^T

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment
Water Exposed Area

3.2 1A. Site Preparation - 2019

Unmitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e	MT/yr	
Fugitive Dust					0.0241	0.0000	0.0241	0.0132	0.0000	0.0132	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		
Off-Road	0.0220	0.2150	0.1033	3.5000e-004		8.2300e-003	0.03		7.6600e-003	0.03	32.6631	32.6631	8.0300e-003	0.03	0.0000	32.8639		
Total	0.0220	0.2150	0.1033	3.5000e-004	0.0241	8.2300e-003	0.0323	0.0132	7.6600e-003	0.0209	0.0000	32.6631	32.6631	8.0300e-003	0.03	0.0000	32.8639	

Unmitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
	tons/yr												MT/yr			
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.8000e-004	2.8000e-004	3.1100e-003	1.0000e-005	1.0100e-003	1.0000e-005	1.0200e-003	2.7000e-004	1.0000e-005	2.7000e-004	0.9031	2.0000e-005	0.9031	0.0000	0.0000	0.9037
Total	3.8000e-004	2.8000e-004	3.1100e-003	1.0000e-005	1.0100e-003	1.0000e-005	1.0200e-003	2.7000e-004	1.0000e-005	2.7000e-004	0.9031	2.0000e-005	0.9031	0.0000	0.0000	0.9037

Mitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
	tons/yr												MT/yr			
Fugitive Dust				9.3900e-003	0.0000	9.3900e-003	0.003	5.1600e-003	0.0000	5.1600e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	8.5600e-003	0.1658	0.1858	3.5000e-004	6.2900e-003	6.2900e-003	0.003	6.2900e-003	0.003	6.2900e-003	0.0000	32.6631	32.6631	8.0300e-003	0.0000	32.8638
Total	8.5600e-003	0.1658	0.1858	3.5000e-004	6.2900e-003	6.2900e-003	0.003	6.2900e-003	0.003	6.2900e-003	0.0000	32.6631	32.6631	8.0300e-003	0.0000	32.8638

Mitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio-CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
	tons/yr												MT/yr			
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.8000e-004	2.8000e-004	3.1100e-003	1.0000e-005	1.0100e-003	1.0000e-005	1.0200e-003	2.7000e-004	1.0000e-005	2.7000e-004	0.0000	0.9031	0.9031	2.0000e-005	0.0000	0.9037
Total	3.8000e-004	2.8000e-004	3.1100e-003	1.0000e-005	1.0100e-003	1.0000e-005	1.0200e-003	2.7000e-004	1.0000e-005	2.7000e-004	0.0000	0.9031	0.9031	2.0000e-005	0.0000	0.9037

3.3 1B. Santiago Creek Realignment Rip Rap - 2019

Unmitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio-CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
	tons/yr												MT/yr			
Off-Road	0.0199	0.2039	0.1106	3.7000e-004	7.3400e-003	7.3400e-003	6.7600e-003	6.7600e-003	6.7600e-003	0.0000	33.2473	33.2473	0.0105	0.0000	33.5102	
Total	0.0199	0.2039	0.1106	3.7000e-004	7.3400e-003	7.3400e-003	6.7600e-003	6.7600e-003	6.7600e-003	0.0000	33.2473	33.2473	0.0105	0.0000	33.5102	

Unmitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio-CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
	tons/yr												MT/yr			
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.6000e-004	2.6000e-004	2.9100e-003	1.0000e-005	9.4000e-004	1.0000e-005	9.5000e-004	2.5000e-004	1.0000e-005	2.6000e-004	0.0000	0.8442	2.0000e-005	0.0000	0.0000	0.8447
Total	3.6000e-004	2.6000e-004	2.9100e-003	1.0000e-005	9.4000e-004	1.0000e-005	9.5000e-004	2.5000e-004	1.0000e-005	2.6000e-004	0.0000	0.8442	2.0000e-005	0.0000	0.8447	

Mitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio-CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
	tons/yr												MT/yr			
Off-Road	9.0700e-003	0.1753	0.1965	3.7000e-004	0.03	0.03	6.6500e-003	0.03	0.03	6.6500e-003	0.0000	33.2472	33.2472	0.0105	0.0000	33.5102
Total	9.0700e-003	0.1753	0.1965	3.7000e-004	0.03	0.03	6.6500e-003	0.03	0.03	6.6500e-003	0.0000	33.2472	33.2472	0.0105	0.0000	33.5102

Mitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio-CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
	tons/yr														MT/yr	
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.6000e-004	2.6000e-004	2.9100e-003	1.0000e-005	9.4000e-004	1.0000e-005	9.5000e-004	2.5000e-004	1.0000e-005	2.6000e-004	0.0000	0.8442	2.0000e-005	0.0000	0.0000	0.8447
Total	3.6000e-004	2.6000e-004	2.9100e-003	1.0000e-005	9.4000e-004	1.0000e-005	9.5000e-004	2.5000e-004	1.0000e-005	2.6000e-004	0.0000	0.8442	2.0000e-005	0.0000	0.8447	

3.4 2A. Area 1 Slope Embankment - 2019

Unmitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio-CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
	tons/yr														MT/yr	
Fugitive Dust					0.0389	0.0000	0.0389	0.0148	0.0148	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
Off-Road	0.0299	0.3501	0.1888	4.3000e-004	0.0137	0.0137	0.0137	0.0126	0.0126	0.0000	38.2259	38.2259	0.0121	0.0000	38.5283	
Total	0.0299	0.3501	0.1888	4.3000e-004	0.0137	0.0137	0.0137	0.0126	0.0126	0.0000	38.2259	38.2259	0.0121	0.0000	38.5283	

Unmitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio-CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
	tons/yr														MT/yr	
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.8000e-004	2.8000e-004	3.1100e-003	1.0000e-005	1.0100e-003	1.0000e-005	1.0200e-003	2.7000e-004	1.0000e-005	2.7000e-004	0.0000	0.9031	0.9031	2.0000e-005	0.0000	0.9037
Total	3.8000e-004	2.8000e-004	3.1100e-003	1.0000e-005	1.0100e-003	1.0000e-005	1.0200e-003	2.7000e-004	1.0000e-005	2.7000e-004	0.0000	0.9031	0.9031	2.0000e-005	0.0000	0.9037

Mitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio-CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e	
	tons/yr														MT/yr		
Fugitive Dust					0.0152	0.0000	0.0152	5.7900e-003	0.0000	5.7900e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
Off-Road	0.0105	0.2201	4.3000e-004	0.2265	4.3000e-004	7.6700e-003	7.6700e-003	0.0029	5.7900e-003	7.6700e-003	0.0000	38.2259	38.2259	0.0121	0.0000	38.5282	
Total	0.0105	0.2201	4.3000e-004	0.2265	4.3000e-004	7.6700e-003	7.6700e-003	0.0029	5.7900e-003	7.6700e-003	0.0135	0.0000	38.2259	38.2259	0.0121	0.0000	38.5282

Mitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio-CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
	tons/yr															MT/yr
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.8000e-004	2.8000e-004	3.1100e-003	1.0000e-005	1.0100e-003	1.0000e-005	1.0200e-003	2.7000e-004	1.0000e-005	2.7000e-004	0.0000	0.9031	0.9031	2.0000e-005	0.0000	0.9037
Total	3.8000e-004	2.8000e-004	3.1100e-003	1.0000e-005	1.0100e-003	1.0000e-005	1.0200e-003	2.7000e-004	1.0000e-005	2.7000e-004	0.0000	0.9031	0.9031	2.0000e-005	0.0000	0.9037

3.5 2B. Area 2 Slope Embankment - 2019

Unmitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio-CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
	tons/yr															MT/yr
Fugitive Dust					0.0779	0.0000	0.0779	0.0000	0.0297	0.0297	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0598	0.7003	0.3776	8.5000e-004	0.0274	0.0274	0.0274	0.0252	0.0252	0.0252	0.0000	76.4518	76.4518	0.0242	0.0000	77.0565
Total	0.0598	0.7003	0.3776	8.5000e-004	0.0279	0.0274	0.1053	0.0297	0.0252	0.0549	0.0000	76.4518	76.4518	0.0242	0.0000	77.0565

Unmitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio-CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
	tons/yr															MT/yr
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.7000e-004	5.6000e-004	6.2200e-003	2.0000e-005	2.0200e-005	1.0000e-005	2.0300e-005	5.4000e-004	1.0000e-005	5.5000e-004	0.0000	1.8062	1.8062	4.0000e-005	0.0000	1.8073
Total	7.7000e-004	5.6000e-004	6.2200e-003	2.0000e-005	2.0200e-005	1.0000e-005	2.0300e-005	5.4000e-004	1.0000e-005	5.5000e-004	0.0000	1.8062	1.8062	4.0000e-005	0.0000	1.8073

Mitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio-CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
	tons/yr															MT/yr
Fugitive Dust					0.0304	0.0000	0.0304	0.0116	0.0116	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
Off-Road	0.0209	0.4042	0.4530	8.5000e-004	8.5000e-004	0.0153	0.0153	0.0153	0.0153	0.0153	0.0000	76.4517	76.4517	0.0242	0.0000	77.0564
Total	0.0209	0.4042	0.4530	8.5000e-004	8.5000e-004	0.0153	0.0153	0.0153	0.0153	0.0153	0.0000	76.4517	76.4517	0.0242	0.0000	77.0564

Mitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio-CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
	tons/yr												MT/yr			
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.7000e-004	5.6000e-004	6.2200e-003	2.0000e-005	2.0200e-005	1.0000e-005	2.0300e-005	5.4000e-004	1.0000e-005	5.5000e-004	0.0000	1.8062	4.0000e-005	0.0000	1.8073	
Total	7.7000e-004	5.6000e-004	6.2200e-003	2.0000e-005	2.0200e-005	1.0000e-005	2.0300e-005	5.4000e-004	1.0000e-005	5.5000e-004	0.0000	1.8062	4.0000e-005	0.0000	1.8073	

3.6 3. Area 5 Slope Embankment - 2019 Unmitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio-CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
	tons/yr												MT/yr			
Fugitive Dust					6.0200e-003	0.0000	6.0200e-003	3.3100e-003	0.0000	3.3100e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.5600e-003	0.0573	0.0293	9.0000e-005	2.2200e-003	2.2200e-003	2.2200e-003	2.0400e-003	2.0400e-003	2.0400e-003	0.0000	8.3263	2.6300e-003	0.0000	8.3922	
Total	5.5600e-003	0.0573	0.0293	9.0000e-005	6.0200e-003	2.2200e-003	2.2200e-003	3.3100e-003	2.0400e-003	5.3500e-003	0.0000	8.3263	2.6300e-003	0.0000	8.3922	

Unmitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio-CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0000e-004	8.0000e-005	8.5000e-004	0.0000	2.7000e-004	0.0000	2.8000e-004	7.0000e-005	0.0000	7.0000e-005	0.0000	0.2454	0.2454	1.0000e-005	0.0000	0.2456
Total	1.0000e-004	8.0000e-005	8.5000e-004	0.0000	2.7000e-004	0.0000	2.8000e-004	7.0000e-005	0.0000	7.0000e-005	0.0000	0.2454	0.2454	1.0000e-005	0.0000	0.2456

Mitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio-CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Fugitive Dust					2.3500e-003	0.0000	2.3500e-003	1.2900e-003	0.0000	1.2900e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.2700e-003	0.0439	9.0000e-005	0.0492	9.0000e-005	1.6600e-003	1.6600e-003	1.6600e-003	1.6600e-003	1.6600e-003	0.0000	8.3263	2.6300e-003	0.0000	8.3922	
Total	2.2700e-003	0.0439	9.0000e-005	0.0492	9.0000e-005	1.6600e-003	1.6600e-003	1.6600e-003	1.6600e-003	1.6600e-003	0.0000	8.3263	2.6300e-003	0.0000	8.3922	

Mitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio-CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0000e-004	8.0000e-005	8.5000e-004	0.0000	2.7000e-004	0.0000	2.8000e-004	7.0000e-005	0.0000	7.0000e-005	0.2454	0.2454	1.0000e-005	0.0000	0.0000	0.2456
Total	1.0000e-004	8.0000e-005	8.5000e-004	0.0000	2.7000e-004	0.0000	2.8000e-004	7.0000e-005	0.0000	7.0000e-005	0.2454	0.2454	1.0000e-005	0.0000	0.0000	0.2456