

ATTACHMENT E
Revised AQ, GHG, Energy Emissions Tables and CalEEMod
Assumptions

Table 5.3-5: Unmitigated Daily Construction Emissions

Source	Daily Emissions (lbs/day)		
	ROG	NO _x	PM ₁₀
Off-road Equipment	12.44	131.37	7.85
Mobile Sources	<u>1.591.04</u>	<u>42.6023.40</u>	<u>3.912.59</u>
Fugitive Dust	0.00	0.00	0.78
Project Total	<u>14.0413.49</u>	<u>173.97154.77</u>	<u>12.5311.22</u>
PCAPCD Threshold	82	82	82
Exceeds Threshold?	No	Yes	No

Notes:

lbs/day = pounds per day

NO_x = nitrogen oxide

PCAPCD = Placer County Air Pollution Control District

PM₁₀ = particulate matter with an aerodynamic diameter of 10 micrometers or less

ROG = reactive organic gas

Table 5.3-6: Mitigated Daily Construction Emissions

Source	Daily Emissions (lbs/day)		
	ROG	NO _x	PM ₁₀
Off-road Equipment	4.86	27.42	3.42
Mobile Sources	<u>1.591.04</u>	<u>42.6023.40</u>	<u>3.912.59</u>
Fugitive Dust	0.00	0.00	0.78
Project Total	<u>6.465.91</u>	<u>70.0250.82</u>	<u>8.106.79</u>
PCAPCD Threshold	82	82	82
Exceeds Threshold?	No	No	No

Notes:

lbs/day = pounds per day

NO_x = nitrogen oxide

PCAPCD = Placer County Air Pollution Control District

PM₁₀ = particulate matter with an aerodynamic diameter of 10 micrometers or less

ROG = reactive organic gas

Table 5.6-1: Project Construction Fuel Consumption

Source	Fuel Consumption (gallons)
Off-road Equipment	159,384
Heavy Duty Trucks	<u>20,257,477.701</u>
Worker Vehicles	14,134
Project Total	<u>193,775,221.219</u>
2018 Diesel Fuel Data for Lassen County ¹	2,083,333
Percentage of County	<u>9.310.6%</u>

1. Diesel is adjusted to account for retail (48 percent) and non-retail (52 percent) diesel sales.

Source: CEC 2020

Table 5.8-2: Project Annual Construction GHG Emissions

Source	MTCO ₂ e/year
Off-road Equipment	1,457.31
Mobile	<u>350.31658.52</u>
Project Total	<u>1,807.622,115.83</u>
30-Year Amortization	<u>60.2570.53</u>
PCAPCD Threshold	10,000
Exceeds Threshold?	No
Source: PCAPCD 2016	

Zayo Construction Assumptions

Duration: 6 months
 Up to 5 workdays per week
 Daily workday: 7AM-7PM

For a daily emissions threshold:

Worst-case day assumption: All crews for each installation method and 1 bridge crew would operate on same day

For an annual emissions threshold:

If annual emissions are required, annual emissions from each installation method will be based on total # of workdays per construction activity.

Start	End	Workdays in 6 months
6/1/2020	12/31/2020	154

*Not acutal schedule, only used to represent 6-month duration

Construction Activity	% of Project Duration	# of Workdays
Plowing In Method	90%	139
Open Trenching	25%	39
Directional Boring	97%	150
Bridge Attachments	97%	150
Blowing/Splicing	66%	102

Installation Method Distribution

Total Miles of Cable		
193		
Method	Miles	% of Total Miles
1) Plowing In Method	154.4	80.0%
2) Open Trenching	19.3	10.0%
3) Directional Boring	19.3	10.0%

1) Plowing In Method**Crew #1**

Construction Equipment	CalEEMod Equipment Type	# of Equipment	Equipment Usage (Hours/Day)
Cable Plow	Crawler Tractors	1	10
Water Truck	Off-Highway Trucks	1	10
Mini Excavators	Excavators	1	10
Mini Excavators	Excavators	1	10
Backhoes	Tractors/Loaders/Backhoes	1	10
Lowboy Tractor Trailer	HHDT	1	10

Mobile

Truck Type	EMFAC Vehicle Category	# of Trucks	Trips/day (In/Out)	One-Way Trip Length (miles)
F-350, F-450	LHDT2	3	6	30
Lowboy Tractor Trailer	HHDT	1	2	30
Water Truck - On-road	HHDT	2	4	30

Crew #2

Construction Equipment	CalEEMod Equipment Type	# of Equipment	Equipment Usage (Hours/Day)
Cable Plow	Crawler Tractors	1	10
Water Truck	Off-Highway Trucks	1	10
Mini Excavators	Excavators	1	10
Mini Excavators	Excavators	1	10
Backhoes	Tractors/Loaders/Backhoes	1	10
Lowboy Tractor Trailer	HHDT	0	10

Mobile

Truck Type	EMFAC Vehicle Category	# of Trucks	Trips/day (In/Out)	One-Way Trip Length (miles)
F-350, F-450	LHDT2	3	6	30
Lowboy Tractor Trailer	HHDT	1	2	30
Water Truck - On-road	HHDT	2	4	30

1) Plowing In Method

Crew #3

Construction Equipment	CalEEMod Equipment Type	# of Equipment	Equipment Usage (Hours/Day)
Cable Plow	Crawler Tractors	1	10
Water Truck	Off-Highway Trucks	1	10
Mini Excavators	Excavators	1	10
Mini Excavators	Excavators	1	10
Backhoes	Tractors/Loaders/Backhoes	1	10
Lowboy Tractor Trailer	HHDT	0	10

Mobile

Truck Type	EMFAC Vehicle Category	# of Trucks	Trips/day (In/Out)	One-Way Trip Length (miles)
F-350, F-450	LHDT2	3	6	30
Lowboy Tractor Trailer	HHDT	1	2	30
Water Truck - On-road	HHDT	2	4	30

2) Open Trench

Crew #1

Construction Equipment	CalEEMod Equipment Type	# of Equipment	Equipment Usage (Hours/Day)
Minis 10K-24K	Excavators	2	10
Dozer/loaders/trenching	Tractors/Loaders/Backhoes	2	10

Mobile

Truck Type	EMFAC Vehicle Category	# of Trucks	Trips/day (In/Out)	One-Way Trip Length (miles)
F-350, F-450	LHDT2	3	6	30
Water Truck - On-road	HHDT	2	4	30

Crew #2

Construction Equipment	CalEEMod Equipment Type	# of Equipment	Equipment Usage (Hours/Day)
Minis 10K-24K	Excavators	2	10
Dozer/loaders/trenching	Tractors/Loaders/Backhoes	2	10

Mobile

Truck Type	EMFAC Vehicle Category	# of Trucks	Trips/day (In/Out)	One-Way Trip Length (miles)
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F-350, F-450	LHDT2	3	6	30
Water Truck - On-road	HHDT	2	4	30

3) Directional Boring

Total # of Boring Locations	Days per boring location	Total Days with 4 Crews
300	2	150

Crew #1

Construction Equipment	CalEEMod Equipment Type	# of Equipment	Equipment Usage (Hours/Day)
Drill Rig	Bore/Drill Rigs	1	10
Support Equipment	Tractors/Loaders/Backhoes	1	10

Mobile

Truck Type	EMFAC Vehicle Category	# of Trucks	Trips/day (In/Out)	One-Way Trip Length (miles)
F-350, F-450	LHDT2	2	4	30
Vac Truck	HHDT	1	2	30
2T Truck	HHDT	1	2	30
Water Truck - On-road	HHDT	3	6	30

Crew #2

Construction Equipment	CalEEMod Equipment Type	# of Equipment	Equipment Usage (Hours/Day)
Drill Rig	Bore/Drill Rigs	1	10
Support Equipment	Tractors/Loaders/Backhoes	1	10

Mobile

Truck Type	EMFAC Vehicle Category	# of Trucks	Trips/day (In/Out)	One-Way Trip Length (miles)
F-350, F-450	LHDT2	2	4	30
Vac Truck	HHDT	1	2	30
2T Truck	HHDT	1	2	30
Water Truck - On-road	HHDT	3	6	30

3) Directional Boring

Crew #3

Construction Equipment	CalEEMod Equipment Type	# of Equipment	Equipment Usage (Hours/Day)
Drill Rig	Bore/Drill Rigs	1	10
Support Equipment	Tractors/Loaders/Backhoes	1	10

Mobile

Truck Type	EMFAC Vehicle Category	# of Trucks	Trips/day (In/Out)	One-Way Trip Length (miles)
F-350, F-450	LHDT2	2	4	30
Vac Truck	HHDT	1	2	30
2T Truck	HHDT	1	2	30
Water Truck - On-road	HHDT	3	6	30

Crew #4

Construction Equipment	CalEEMod Equipment Type	# of Equipment	Equipment Usage (Hours/Day)
Drill Rig	Bore/Drill Rigs	1	10
Support Equipment	Tractors/Loaders/Backhoes	1	10

Mobile

Truck Type	EMFAC Vehicle Category	# of Trucks	Trips/day (In/Out)	One-Way Trip Length (miles)
F-350, F-450	LHDT2	2	4	30
Vac Truck	HHDT	1	2	30
2T Truck	HHDT	1	2	30
Water Truck - On-road	HHDT	3	6	30

Bridge Attachments

Number of Bridges	Days per Bridge	Total Days		
30	5	150		
Construction Equipment			Equipment Usage (Hours/Day)	
CalEEMod Equipment Type	# of Equipment			
Excavators	1	10		
Mobile				
Truck Type	EMFAC Vehicle Category	# of Trucks	Trips/day (In/Out)	One-Way Trip Length (miles)
F-350, F-450	LHDT2	2	4	30
Bridge Truck	HHDT	1	2	30
Lowboy Tractor Trailer	HHDT	1	2	30
Water Truck - On-road	HHDT	2	4	30

Blowing Fiber/Splicing (Occurs after all conduit is installed)

Construction Equipment			Equipment Usage (Hours/Day)	
CalEEMod Equipment Type	# of Equipment			
Air Compressors	6	10		
Mobile				
Truck Type	EMFAC Vehicle Category	# of Trucks	Trips/day (In/Out)	One-Way Trip Length (miles)
F-350, F-450	LHDT2	6	12	30
Water Truck - On-road	HHDT	2	2	30
Blowing/Splicing Installation				
Cable installation (miles)	Cable Installation (feet)	Cable Blowing Rate (ft/day)	Workdays	
193	1019040	10,000	102	

Spoils Hauling

Truck Type	EMFAC Vehicle Category	Total # of Trucks	Trips/day (In/Out)	One-Way Trip Length (miles)
On-road trucks	MHDT	80 trucks x 2 trips = 160	2	20

Emissions Summary

Unmitigated	Daily Emissions (lb/day)		
Source	ROG	NOX	PM10 Total
Offroad	12.44	131.37	7.85
Mobile	1.59	42.60	3.91
Grading Dust	0.00	0.00	0.78
Total	14.04	173.97	12.53
PCAPCD Threshold	82	82	82
Exceeds Threshold?	No	Yes	No

Mitigated	Daily Emissions (lb/day)		
Source	ROG	NOX	PM10 Total
Offroad	4.86	27.42	3.42
Mobile	1.59	42.60	3.91
Grading Dust	0.00	0.00	0.78
Total	6.46	70.02	8.10
PCAPCD Threshold	82	82	82
Exceeds Threshold	No	No	No

Notes:

Placer County Air Pollution Control District (PCAPCD)

<https://www.placer.ca.gov/1804/CEQA-Thresholds>

Global Warming Potentials¹

CO ₂	CH ₄	N ₂ O
1	28	265

GHG Summary

Source Category	CO ₂	CH ₄	N ₂ O	CO ₂ e
Offroad	1445.12	0.44	0.00	1457.31
Mobile	644.29	0.01	0.05	658.52
Totals	2089.41	0.44	0.05	2115.83
30-Year Amortization				70.53
PCAPCD Threshold ²				10,000
Exceeds Threshold?				No

Notes:

1. Global Warming Potentials based on IPCC AR5 Values

https://www.ghgprotocol.org/sites/default/files/ghgp/Global-Warming-Potential-Values%20%28Feb%2016%202016%29_1.pdf

2. Placer County Air Pollution Control District (PCAPCD)

<https://www.placer.ca.gov/1804/CEQA-Thresholds>

Offroad Emissions

Scenario	Daily Emissions (lb/day)									
	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Unmitigated	12.4435	131.3698	110.3447	0.2397	1.9885	5.861	7.8495	0.2147	5.3921	5.6068
Mitigated	4.8626	27.4155	143.0056	0.2397	1.9885	1.4348	3.4233	0.2147	1.4348	1.6495

*Only Summer output file used since offroad construction emissions do not vary with season.

Mobile Emissions					RUNNING Emission Factors (g/mi)												
					ROG	NOX	CO	SOX	PM10 Fugitive	PM10 Exhaust	PM10 Total	PM2.5 Fugitive	PM2.5 Exhaust	PM2.5 Total	CO2	CH4	N2O
Construction Activity	Total Workdays	# of Truck Trips/day	Trip Length (miles)	EMFAC Vehicle Category													
Plowing In Method	139	6	30	HHDT	1.55E-01	6.94E+00	5.75E-01	1.56E-02	3.95E-01	8.06E-02	4.75E-01	1.08E-01	7.71E-02	1.85E-01	1.65E+03	7.20E-03	2.60E-01
Plowing In Method	139	18	30	LHDT2	1.82E-01	2.66E+00	8.70E-01	6.20E-03	4.01E-01	3.20E-02	4.33E-01	1.15E-01	3.06E-02	1.45E-01	6.56E+02	8.46E-03	1.03E-01
Open Trenching	39	12	30	LHDT2	1.82E-01	2.66E+00	8.70E-01	6.20E-03	4.01E-01	3.20E-02	4.33E-01	1.15E-01	3.06E-02	1.45E-01	6.56E+02	8.46E-03	1.03E-01
Directional Boring	150	16	30	HHDT	1.55E-01	6.94E+00	5.75E-01	1.56E-02	3.95E-01	8.06E-02	4.75E-01	1.08E-01	7.71E-02	1.85E-01	1.65E+03	7.20E-03	2.60E-01
Directional Boring	150	16	30	LHDT2	1.82E-01	2.66E+00	8.70E-01	6.20E-03	4.01E-01	3.20E-02	4.33E-01	1.15E-01	3.06E-02	1.45E-01	6.56E+02	8.46E-03	1.03E-01
Bridge Attachments	150	4	30	HHDT	1.55E-01	6.94E+00	5.75E-01	1.56E-02	3.95E-01	8.06E-02	4.75E-01	1.08E-01	7.71E-02	1.85E-01	1.65E+03	7.20E-03	2.60E-01
Bridge Attachments	150	4	30	LHDT2	1.82E-01	2.66E+00	8.70E-01	6.20E-03	4.01E-01	3.20E-02	4.33E-01	1.15E-01	3.06E-02	1.45E-01	6.56E+02	8.46E-03	1.03E-01
Blowing/Splicing	102	12	30	LHDT2	1.82E-01	2.66E+00	8.70E-01	6.20E-03	4.01E-01	3.20E-02	4.33E-01	1.15E-01	3.06E-02	1.45E-01	6.56E+02	8.46E-03	1.03E-01
					RUNNING Emissions (lb/day)												
Construction Activity	Total Workdays	# of Truck Trips/day	Trip Length (miles)	EMFAC Vehicle Category	ROG	NOX	CO	SOX	PM10 Fugitive	PM10 Exhaust	PM10 Total	PM2.5 Fugitive	PM2.5 Exhaust	PM2.5 Total	CO2	CH4	N2O
Plowing In Method	139	6	30	HHDT	6.15E-02	2.75E+00	2.28E-01	6.19E-03	1.57E-01	3.20E-02	1.89E-01	4.29E-02	3.06E-02	7.35E-02	6.56E+02	2.86E-03	1.03E-01
Plowing In Method	139	18	30	LHDT2	2.17E-01	3.16E+00	1.04E+00	7.38E-03	4.77E-01	3.80E-02	5.15E-01	1.37E-01	3.64E-02	1.73E-01	7.81E+02	1.01E-02	1.23E-01
Open Trenching	39	12	30	LHDT2	1.45E-01	2.11E+00	6.90E-01	4.92E-03	3.18E-01	2.54E-02	3.44E-01	9.11E-02	2.43E-02	1.15E-01	5.21E+02	6.71E-03	8.18E-02
Directional Boring	150	16	30	HHDT	1.64E-01	7.34E+00	6.08E-01	1.65E-02	4.18E-01	8.53E-02	5.03E-01	1.14E-01	8.16E-02	1.96E-01	1.75E+03	7.62E-03	2.75E-01
Directional Boring	150	16	30	LHDT2	1.93E-01	2.81E+00	9.21E-01	6.56E-03	4.24E-01	3.38E-02	4.58E-01	1.22E-01	3.23E-02	1.54E-01	6.94E+02	8.95E-03	1.09E-01
Bridge Attachments	150	4	30	HHDT	4.10E-02	1.84E+00	1.52E-01	4.13E-03	1.04E-01	2.13E-02	1.26E-01	2.86E-02	2.04E-02	4.90E-02	4.37E+02	1.91E-03	6.87E-02
Bridge Attachments	150	4	30	LHDT2	4.82E-02	7.03E-01	2.30E-01	1.64E-03	1.06E-01	8.45E-03	1.15E-01	3.04E-02	8.09E-03	3.85E-02	1.74E+02	2.24E-03	2.73E-02
Blowing/Splicing	102	4	30	LHDT2	1.45E-01	2.11E+00	6.90E-01	4.92E-03	3.18E-01	2.54E-02	3.44E-01	9.11E-02	2.43E-02	1.15E-01	5.21E+02	6.71E-03	8.18E-02
					1.01E+00	2.28E+01	4.56E+00	5.23E-02	2.32E+00	2.70E-01	2.59E+00	6.57E-01	2.58E-01	9.15E-01	5.53E+03	4.71E-02	8.69E-01

Notes:

Emission factors from CARB's EMFAC2017, Lassen County, Calendar Year 2020; LHDT2 & HHDT; Diesel

		Daily Emissions (lb/day)												
		ROG	NOX	CO	SOX	PM10 Fugitive	PM10 Exhaust	PM10 Total	PM2.5 Fugitive	PM2.5 Exhaust	PM2.5 Total	CO2	CH4	N2O
		1.04	23.40	4.88	0.05	2.32	0.27	2.59	0.66	0.26	0.92	5600.68	0.05	0.88
Additional Mobile		0.55	19.20	5.18	0.05	1.22	0.09	1.31	0.33	0.09	0.42	Annual Emissions (lb/year)		
Total		1.59	42.60	10.06	0.11	3.54	0.36	3.91	0.99	0.35	1.34	CO2	CH4	N2O
												741255.47	6.05	116.52
												Annual Emissions (MT/year)		
												336.2282	0.002743	0.05285

Mobile Emissions					NON-RUNNING Emission Factor (g/trip)												
					ROG	NOX	CO	SOX	PM10 Fugitive	PM10 Exhaust	PM10 Total	PM2.5 Fugitive	PM2.5 Exhaust	PM2.5 Total	CO2	CH4	N2O
Construction Activity	Total Workdays	# of Truck Trips/day	Trip Length (miles)	EMFAC Vehicle Category													
Plowing In Method	139	6	30	HHDT	0.00E+00	2.06E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Plowing In Method	139	18	30	LHDT2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Open Trenching	39	12	30	LHDT2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Directional Boring	150	16	30	HHDT	0.00E+00	2.06E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Directional Boring	150	16	30	LHDT2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Bridge Attachments	150	4	30	HHDT	0.00E+00	2.06E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Bridge Attachments	150	4	30	LHDT2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Blowing/Splicing	102	12	30	LHDT2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
					NON-RUNNING Emissions (lb/day)												
Construction Activity	Total Workdays	# of Truck Trips/day	Trip Length (miles)	EMFAC Vehicle Category	ROG	NOX	CO	SOX	PM10 Fugitive	PM10 Exhaust	PM10 Total	PM2.5 Fugitive	PM2.5 Exhaust	PM2.5 Total	CO2	CH4	N2O
Plowing In Method	139	6	30	HHDT	0.00E+00	2.72E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Plowing In Method	139	18	30	LHDT2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Open Trenching	39	12	30	LHDT2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Directional Boring	150	16	30	HHDT	0.00E+00	7.27E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Directional Boring	150	16	30	LHDT2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Bridge Attachments	150	4	30	HHDT	0.00E+00	1.82E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Bridge Attachments	150	4	30	LHDT2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Blowing/Splicing	102	4	30	LHDT2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
					0.00E+00	1.18E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Notes:

Emission factors from CARB's EMFAC2017, Lassen County, Calendar Year 2020; LHDT2 & HHDT; Diesel

Additional Mobile
Total

Mobile Emissions					IDLING Emission Factors (g/trip)												
					ROG	NOX	CO	SOX	PM10 Fugitive	PM10 Exhaust	PM10 Total	PM2.5 Fugitive	PM2.5 Exhaust	PM2.5 Total	CO2	CH4	N2O
Construction Activity	Total Workdays	# of Truck Trips/day	Trip Length (miles)	EMFAC Vehicle Category													
Plowing In Method	139	6	30	HHDT	4.87E-01	7.62E+00	5.50E+00	1.11E-02	0.00E+00	2.19E-02	2.19E-02	0.00E+00	2.09E-02	2.09E-02	1.17E+03	2.26E-02	1.85E-01
Plowing In Method	139	18	30	LHDT2	8.73E-03	2.00E-01	7.23E-02	1.70E-04	0.00E+00	2.13E-03	2.13E-03	0.00E+00	2.04E-03	2.04E-03	1.80E+01	4.05E-04	2.83E-03
Open Trenching	39	12	30	LHDT2	8.73E-03	2.00E-01	7.23E-02	1.70E-04	0.00E+00	2.13E-03	2.13E-03	0.00E+00	2.04E-03	2.04E-03	1.80E+01	4.05E-04	2.83E-03
Directional Boring	150	16	30	HHDT	4.87E-01	7.62E+00	5.50E+00	1.11E-02	0.00E+00	2.19E-02	2.19E-02	0.00E+00	2.09E-02	2.09E-02	1.17E+03	2.26E-02	1.85E-01
Directional Boring	150	16	30	LHDT2	8.73E-03	2.00E-01	7.23E-02	1.70E-04	0.00E+00	2.13E-03	2.13E-03	0.00E+00	2.04E-03	2.04E-03	1.80E+01	4.05E-04	2.83E-03
Bridge Attachments	150	4	30	HHDT	4.87E-01	7.62E+00	5.50E+00	1.11E-02	0.00E+00	2.19E-02	2.19E-02	0.00E+00	2.09E-02	2.09E-02	1.17E+03	2.26E-02	1.85E-01
Bridge Attachments	150	4	30	LHDT2	8.73E-03	2.00E-01	7.23E-02	1.70E-04	0.00E+00	2.13E-03	2.13E-03	0.00E+00	2.04E-03	2.04E-03	1.80E+01	4.05E-04	2.83E-03
Blowing/Splicing	102	12	30	LHDT2	8.73E-03	2.00E-01	7.23E-02	1.70E-04	0.00E+00	2.13E-03	2.13E-03	0.00E+00	2.04E-03	2.04E-03	1.80E+01	4.05E-04	2.83E-03
					IDLING Emissions (lb/day)												
Construction Activity	Total Workdays	# of Truck Trips/day	Trip Length (miles)	EMFAC Vehicle Category	ROG	NOX	CO	SOX	PM10 Fugitive	PM10 Exhaust	PM10 Total	PM2.5 Fugitive	PM2.5 Exhaust	PM2.5 Total	CO2	CH4	N2O
Plowing In Method	139	6	30	HHDT	6.44E-03	1.01E-01	7.27E-02	1.47E-04	0.00E+00	2.89E-04	2.89E-04	0.00E+00	2.77E-04	2.77E-04	1.55E+01	2.99E-04	2.44E-03
Plowing In Method	139	18	30	LHDT2	3.46E-04	7.93E-03	2.87E-03	6.76E-06	0.00E+00	8.44E-05	8.44E-05	0.00E+00	8.08E-05	8.08E-05	7.16E-01	1.61E-05	1.12E-04
Open Trenching	39	12	30	LHDT2	2.31E-04	5.28E-03	1.91E-03	4.51E-06	0.00E+00	5.63E-05	5.63E-05	0.00E+00	5.39E-05	5.39E-05	4.77E-01	1.07E-05	7.50E-05
Directional Boring	150	16	30	HHDT	1.72E-02	2.69E-01	1.94E-01	3.91E-04	0.00E+00	7.71E-04	7.71E-04	0.00E+00	7.38E-04	7.38E-04	4.14E+01	7.97E-04	6.51E-03
Directional Boring	150	16	30	LHDT2	3.08E-04	7.05E-03	2.55E-03	6.01E-06	0.00E+00	7.51E-05	7.51E-05	0.00E+00	7.18E-05	7.18E-05	6.36E-01	1.43E-05	1.00E-04
Bridge Attachments	150	4	30	HHDT	4.29E-03	6.72E-02	4.85E-02	9.78E-05	0.00E+00	1.93E-04	1.93E-04	0.00E+00	1.85E-04	1.85E-04	1.04E+01	1.99E-04	1.63E-03
Bridge Attachments	150	4	30	LHDT2	7.69E-05	1.76E-03	6.38E-04	1.50E-06	0.00E+00	1.88E-05	1.88E-05	0.00E+00	1.80E-05	1.80E-05	1.59E-01	3.57E-06	2.50E-05
Blowing/Splicing	102	4	30	LHDT2	2.31E-04	5.28E-03	1.91E-03	4.51E-06	0.00E+00	5.63E-05	5.63E-05	0.00E+00	5.39E-05	5.39E-05	4.77E-01	1.07E-05	7.50E-05
					2.91E-02	4.64E-01	3.25E-01	6.59E-04	0.00E+00	1.54E-03	1.54E-03	0.00E+00	1.48E-03	1.48E-03	6.98E+01	1.35E-03	1.10E-02

Notes:

Emission factors from CARB's EMFAC2017, Lassen County, Calendar Year 2020; LHDT2 & HHDT; Diesel

Additional Mobile
Total

Grading Emissions								Emission Factor (lb/VMT) ²		Emissions (lb/day) ³	
								PM10	PM2.5	PM10	PM2.5
Phase	CalEEMod Equipment Type	Acres/8hr-day per Equipment Type	Quantity ¹	Hours per Day	Scaling Factor	Total Acres/8hr-day	VMT				
Plowing In Method	Crawler Tractors	0.5	3	10	8	1.875	1.289	1.54	0.17	0.78	0.08
Plowing In Method	Excavators	0	6	10	8	0	0	1.54	0.17	0.00	0.00
Plowing In Method	Off-Highway Trucks	0	3	10	8	0	0	1.54	0.17	0.00	0.00
Plowing In Method	Tractors/Loaders/Backhoes	0	3	10	8	0	0	1.54	0.17	0.00	0.00
Open Trenching	Excavators	0	4	10	8	0	0	1.54	0.17	0.00	0.00
Open Trenching	Tractors/Loaders/Backhoes	0	4	10	8	0	0	1.54	0.17	0.00	0.00
Directional Boring	Bore/Drill Rigs	0	4	10	8	0	0	1.54	0.17	0.00	0.00
Directional Boring	Tractors/Loaders/Backhoes	0	4	10	8	0	0	1.54	0.17	0.00	0.00
Bridge Attachments	Excavators	0	1	10	8	0	0	1.54	0.17	0.00	0.00
Blowing/Splicing	Air Compressors	0	6	10	8	0	0	1.54	0.17	0.00	0.00

Equipment Type	Acres/8-hr day
Crawler Tractors	0.5
Graders	0.5
Rubber Tired Dozers	0.5
Scrapers	1

- Notes:**
- 1) Information provided from applicant
 - 2) Emission factor based on CalEEMod Methodology
 - 3) Includes dust reduction measure consistent with CalEEMod methods. Watering 3x per day, 61 percent reduction

Grading Emissions

EF_{PM15}
 EF Emission Factor (lb/VMT)
 S mean vehicle speed (mph), AP-42 Default: 7.1 mph
 F_{PM2.5} PM2.5 scaling factor, AP-42 default: 0.031
 F_{PM10} PM10 scaling factor, AP-42 default: 0.6

S 7.1
 F_{PM2.5} 0.031
 F_{PM10} 0.6
 EF_{PM15} 2.57
 EF_{TSP} 5.37

Emission Factor (lb/VMT)

EF_{PM10} 1.543
 EF_{PM2.5} 0.167

Emissions= EF x VMT

VMT:
 A_{site} acreage of grading site
 W_b Width of blade, default: 12 feet
 Feet/acre conversion 43560
 feet/mile conversion 5280
 Acres per 8-hr day amount of acres graded per day, see calc below

Parameters:	Value
A _{site}	
W _b	12
Feet/acre conversion	43560
feet/mile conversion	5280
Acres per 8-hr day	1.875
VMT	1.2890625

Acres per 8-hr day

Equipment Type	Acres/8-hr day	# of equipment	Equipment Hours per day	Scaling Factor	Acres per day
Crawler Tractors	0.5	3	10	8	1.875
Graders	0.5	0	10	8	0
Rubber Tired Dozers	0.5	0	10	8	0
Scrapers	1	0	10	8	0

1.875

Zayo Prineville to Reno Fiber-Optic Installation - Lassen County APCD Air District, Summer

Zayo Prineville to Reno Fiber-Optic Installation
Lassen County APCD Air District, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	5.00	1000sqft	0.11	5,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	Wind Speed (m/s)	2.2	Precipitation Freq (Days)	56
Climate Zone	14			Operational Year	2021
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	CH4 Intensity (lb/MWhr)	0.029	N2O Intensity (lb/MWhr)	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -
 Land Use -

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	11.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	11.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstructionPhase	NumDays	1.00	139.00
tblConstructionPhase	NumDays	1.00	39.00
tblConstructionPhase	NumDays	1.00	150.00
tblConstructionPhase	NumDays	1.00	150.00
tblConstructionPhase	NumDays	1.00	102.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	UsageHours	8.00	10.00
tblOffRoadEquipment	UsageHours	8.00	10.00
tblOffRoadEquipment	UsageHours	8.00	10.00
tblTripsAndVMT	WorkerTripNumber	38.00	0.00
tblTripsAndVMT	WorkerTripNumber	20.00	0.00
tblTripsAndVMT	WorkerTripNumber	20.00	0.00
tblTripsAndVMT	WorkerTripNumber	3.00	0.00
tblTripsAndVMT	WorkerTripNumber	15.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Plowing In Method	Site Preparation	6/1/2020	12/10/2020	5	139	
2	Open Trenching	Site Preparation	6/1/2020	7/23/2020	5	39	
3	Directional Boring	Site Preparation	6/1/2020	12/27/2020	5	150	
4	Bridge Attachments	Site Preparation	6/1/2020	12/27/2020	5	150	
5	Blowing/Splicing	Site Preparation	8/12/2020	12/31/2020	5	102	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

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

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Plowing In Method	Crawler Tractors	3	10.00	212	0.43
Plowing In Method	Excavators	6	10.00	158	0.38
Plowing In Method	Off-Highway Trucks	3	10.00	402	0.38
Plowing In Method	Tractors/Loaders/Backhoes	3	10.00	97	0.37
Open Trenching	Excavators	4	10.00	158	0.38
Open Trenching	Tractors/Loaders/Backhoes	4	10.00	97	0.37
Directional Boring	Bore/Drill Rigs	4	10.00	221	0.50
Directional Boring	Tractors/Loaders/Backhoes	4	10.00	97	0.37
Bridge Attachments	Excavators	1	10.00	158	0.38
Blowing/Splicing	Air Compressors	6	10.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Plowing In Method	15	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Open Trenching	8	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Directional Boring	8	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Bridge Attachments	1	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Blowing/Splicing	6	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

3.2 Plowing In Method - 2020
Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Category	lb/day										lb/day						
Fugitive Dust					1.9885	0.0000	1.9885	0.2147	0.0000	0.2147			0.0000				0.0000
Off-Road	7.2804	77.6281	56.7202	0.1294		3.2920	3.2920		3.0286	3.0286		12,525.0591	12,525.0591	4.0509			12,626.3305
Total	7.2804	77.6281	56.7202	0.1294	1.9885	3.2920	5.2805	0.2147	3.0286	3.2433		12,525.0591	12,525.0591	4.0509			12,626.3305

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Category	lb/day										lb/day						
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000			0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000			0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000			0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000			0.0000

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Category	lb/day										lb/day						
Fugitive Dust					1.9885	0.0000	1.9885	0.2147	0.0000	0.2147			0.0000				0.0000
Off-Road	1.5869	6.8765	73.6595	0.1294		0.2116	0.2116		0.2116	0.2116	0.0000	12,525.0591	12,525.0591	4.0509			12,626.3305
Total	1.5869	6.8765	73.6595	0.1294	1.9885	0.2116	2.2001	0.2147	0.2116	0.4263	0.0000	12,525.0591	12,525.0591	4.0509			12,626.3305

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Category	lb/day										lb/day						
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000			0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000			0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000			0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000			0.0000

3.3 Open Trenching - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Category	lb/day										lb/day						
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000				0.0000
Off-Road	2.2724	22.5889	27.7375	0.0414		1.2499	1.2499		1.1499	1.1499		4,004.4346	4,004.4346	1.2951			4,036.8125
Total	2.2724	22.5889	27.7375	0.0414	0.0000	1.2499	1.2499	0.0000	1.1499	1.1499		4,004.4346	4,004.4346	1.2951			4,036.8125

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Category	lb/day										lb/day						
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000			0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000			0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000			0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000			0.0000

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Category	lb/day										lb/day						
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000				0.0000
Off-Road	0.5076	2.1995	31.3004	0.0414		0.0677	0.0677		0.0677	0.0677	0.0000	4,004.4346	4,004.4346	1.2951			4,036.8125
Total	0.5076	2.1995	31.3004	0.0414	0.0000	0.0677	0.0677	0.0000	0.0677	0.0677	0.0000	4,004.4346	4,004.4346	1.2951			4,036.8125

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Category	lb/day										lb/day						
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000			0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000			0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000			0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000			0.0000

3.4 Directional Boring - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	2.4351	28.1370	21.8023	0.0625		1.1730	1.1730		1.0792	1.0792		6,052.8769	6,052.8769	1.9576		6,101.8175
Total	2.4351	28.1370	21.8023	0.0625	0.0000	1.1730	1.1730	0.0000	1.0792	1.0792		6,052.8769	6,052.8769	1.9576		6,101.8175

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Category	lb/day										lb/day						
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000				0.0000
Off-Road	0.7746	3.3564	33.1481	0.0625		0.1033	0.1033		0.1033	0.1033	0.0000	6,052.8769	6,052.8769	1.9576			6,101.8175
Total	0.7746	3.3564	33.1481	0.0625	0.0000	0.1033	0.1033	0.0000	0.1033	0.1033	0.0000	6,052.8769	6,052.8769	1.9576			6,101.8175

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Category	lb/day										lb/day						
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000			0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000			0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000			0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000			0.0000

3.5 Bridge Attachments - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.3062	3.0158	4.0848	6.4600e-003		0.1461	0.1461		0.1344	0.1344		625.1480	625.1480	0.2022		630.2027
Total	0.3062	3.0158	4.0848	6.4600e-003	0.0000	0.1461	0.1461	0.0000	0.1344	0.1344		625.1480	625.1480	0.2022		630.2027

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.0794	0.3442	4.8975	6.4600e-003		0.0106	0.0106		0.0106	0.0106	0.0000	625.1480	625.1480	0.2022		630.2027
Total	0.0794	0.3442	4.8975	6.4600e-003	0.0000	0.0106	0.0106	0.0000	0.0106	0.0106	0.0000	625.1480	625.1480	0.2022		630.2027

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

3.6 Blowing/Splicing - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	2.4218	16.8384	18.3142	0.0297		1.1094	1.1094		1.1094	1.1094		2,814.4805	2,814.4805	0.2179		2,819.9282
Total	2.4218	16.8384	18.3142	0.0297	0.0000	1.1094	1.1094	0.0000	1.1094	1.1094		2,814.4805	2,814.4805	0.2179		2,819.9282

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Category	lb/day										lb/day						
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000				0.0000
Off-Road	2.4218	16.8384	18.3142	0.0297		1.1094	1.1094		1.1094	1.1094	0.0000	2,814.4805	2,814.4805	0.2179			2,819.9282
Total	2.4218	16.8384	18.3142	0.0297	0.0000	1.1094	1.1094	0.0000	1.1094	1.1094	0.0000	2,814.4805	2,814.4805	0.2179			2,819.9282

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Category	lb/day										lb/day						
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000			0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000			0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000			0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000			0.0000

Zayo Prineville to Reno Fiber-Optic Installation - Lassen County APCD Air District, Annual

**Zayo Prineville to Reno Fiber-Optic Installation
Lassen County APCD Air District, Annual**

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	5.00	1000sqft	0.11	5,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	Wind Speed (m/s)	2.2	Precipitation Freq (Days)	56
Climate Zone	14			Operational Year	2021
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	CH4 Intensity (lb/MWhr)	0.029	N2O Intensity (lb/MWhr)	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	11.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	11.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstructionPhase	NumDays	1.00	139.00
tblConstructionPhase	NumDays	1.00	39.00
tblConstructionPhase	NumDays	1.00	150.00
tblConstructionPhase	NumDays	1.00	150.00
tblConstructionPhase	NumDays	1.00	102.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	UsageHours	8.00	10.00
tblOffRoadEquipment	UsageHours	8.00	10.00
tblOffRoadEquipment	UsageHours	8.00	10.00
tblTripsAndVMT	WorkerTripNumber	38.00	0.00
tblTripsAndVMT	WorkerTripNumber	20.00	0.00
tblTripsAndVMT	WorkerTripNumber	20.00	0.00
tblTripsAndVMT	WorkerTripNumber	3.00	0.00
tblTripsAndVMT	WorkerTripNumber	15.00	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	0.8794	9.0309	7.3585	0.0165	0.1382	0.4087	0.5469	0.0149	0.3805	0.3954	0.0000	1,445.1167	1,445.1167	0.4354	0.0000	1,456.0004
Maximum	0.8794	9.0309	7.3585	0.0165	0.1382	0.4087	0.5469	0.0149	0.3805	0.3954	0.0000	1,445.1167	1,445.1167	0.4354	0.0000	1,456.0004

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	0.3077	1.6571	9.5171	0.0165	0.1382	0.0811	0.2193	0.0149	0.0811	0.0961	0.0000	1,445.1150	1,445.1150	0.4354	0.0000	1,455.9986
Maximum	0.3077	1.6571	9.5171	0.0165	0.1382	0.0811	0.2193	0.0149	0.0811	0.0961	0.0000	1,445.1150	1,445.1150	0.4354	0.0000	1,455.9986

	ROG	NOx	CO	SO2	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	65.01	81.65	-29.34	0.00	0.00	80.15	59.89	0.00	78.68	75.71	0.00	0.00	0.00	0.00	0.00	0.00

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	6-1-2020	8-31-2020	4.5117	0.6165
2	9-1-2020	9-30-2020	1.4792	0.3458
		Highest	4.5117	0.6165

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Plowing In Method	Site Preparation	6/1/2020	12/10/2020	5	139	
2	Open Trenching	Site Preparation	6/1/2020	7/23/2020	5	39	
3	Directional Boring	Site Preparation	6/1/2020	12/27/2020	5	150	
4	Bridge Attachments	Site Preparation	6/1/2020	12/27/2020	5	150	
5	Blowing/Splicing	Site Preparation	8/12/2020	12/31/2020	5	102	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

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

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Plowing In Method	Crawler Tractors	3	10.00	212	0.43
Plowing In Method	Excavators	6	10.00	158	0.38
Plowing In Method	Off-Highway Trucks	3	10.00	402	0.38
Plowing In Method	Tractors/Loaders/Backhoes	3	10.00	97	0.37
Open Trenching	Excavators	4	10.00	158	0.38
Open Trenching	Tractors/Loaders/Backhoes	4	10.00	97	0.37
Directional Boring	Bore/Drill Rigs	4	10.00	221	0.50
Directional Boring	Tractors/Loaders/Backhoes	4	10.00	97	0.37
Bridge Attachments	Excavators	1	10.00	158	0.38
Blowing/Splicing	Air Compressors	6	10.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Plowing In Method	15	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Open Trenching	8	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Directional Boring	8	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Bridge Attachments	1	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Blowing/Splicing	6	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Zayo Additional Construction Equipment and Vehicles - Lassen County APCD Air District, Summer

Zayo Additional Construction Equipment and Vehicles
Lassen County APCD Air District, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	5.00	1000sqft	0.11	5,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	Wind Speed (m/s)	2.2	Precipitation Freq (Days)	56
Climate Zone	14			Operational Year	2023
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MW hr)	641.35	CH4 Intensity (lb/MW hr)	0.029	N2O Intensity (lb/MW hr)	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase - Project-specific schedule

Off-road Equipment - already accounted for in original modeling

Off-road Equipment - already accounted for in original modeling

Off-road Equipment - already accounted for in original modeling

Off-road Equipment - equipment accounted for in previous modeling.

Off-road Equipment - already accounted for in original modeling

Grading - accounted for in previous modeling

Trips and VMT - Additional water truck trips for boring operations, dust suppression, etc.

30 miles for water trucks

20 miles for spoils disposal

Off-road Equipment - No offroad for spoils hauling

Vehicle Trips - Additional const only

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	1.00	102.00
tblConstructionPhase	NumDays	1.00	150.00
tblConstructionPhase	NumDays	1.00	150.00
tblConstructionPhase	NumDays	1.00	39.00
tblConstructionPhase	NumDays	1.00	150.00
tblConstructionPhase	NumDays	1.00	139.00
tblConstructionPhase	PhaseEndDate	9/21/2022	8/23/2022
tblConstructionPhase	PhaseEndDate	9/7/2022	10/28/2022
tblConstructionPhase	PhaseEndDate	4/20/2022	5/26/2022
tblConstructionPhase	PhaseEndDate	9/14/2022	10/28/2022
tblConstructionPhase	PhaseEndDate	4/18/2022	10/13/2022
tblConstructionPhase	PhaseStartDate	9/15/2022	4/4/2022
tblConstructionPhase	PhaseStartDate	4/21/2022	4/4/2022
tblConstructionPhase	PhaseStartDate	4/19/2022	4/4/2022
tblConstructionPhase	PhaseStartDate	9/8/2022	4/4/2022
tblConstructionPhase	PhaseStartDate	4/16/2022	4/4/2022
tblGrading	AcresOfGrading	51.00	0.00
tblOffRoadEquipment	LoadFactor	0.37	0.38
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	PhaseName		Directonal Boring
tblOffRoadEquipment	PhaseName		Open Trenching

tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	7.00
tblTripsAndVMT	HaulingTripLength	20.00	30.00
tblTripsAndVMT	HaulingTripLength	20.00	30.00
tblTripsAndVMT	HaulingTripLength	20.00	30.00
tblTripsAndVMT	HaulingTripLength	20.00	30.00
tblTripsAndVMT	HaulingTripLength	20.00	30.00
tblTripsAndVMT	HaulingTripNumber	0.00	160.00
tblTripsAndVMT	HaulingTripNumber	0.00	1,668.00
tblTripsAndVMT	HaulingTripNumber	0.00	312.00
tblTripsAndVMT	HaulingTripNumber	0.00	2,700.00
tblTripsAndVMT	HaulingTripNumber	0.00	600.00
tblTripsAndVMT	HaulingTripNumber	0.00	408.00
tblTripsAndVMT	HaulingVehicleClass	HHDT	MHDT
tblTripsAndVMT	WorkerTripNumber	3.00	0.00
tblTripsAndVMT	WorkerTripNumber	3.00	0.00
tblTripsAndVMT	WorkerTripNumber	3.00	0.00
tblVehicleTrips	ST_TR	1.32	0.00
tblVehicleTrips	SU_TR	0.68	0.00
tblVehicleTrips	WD_TR	6.97	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2022	0.5522	19.1995	5.1784	0.0526	1.2211	0.0896	1.3107	0.3348	0.0857	0.4205	0.0000	5,502.2062	5,502.2062	0.0879	0.0000	5,504.4034
Maximum	0.5522	19.1995	5.1784	0.0526	1.2211	0.0896	1.3107	0.3348	0.0857	0.4205	0.0000	5,502.2062	5,502.2062	0.0879	0.0000	5,504.4034

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2022	0.5522	19.1995	5.1784	0.0526	1.2211	0.0896	1.3107	0.3348	0.0857	0.4205	0.0000	5,502.2062	5,502.2062	0.0879	0.0000	5,504.4034
Maximum	0.5522	19.1995	5.1784	0.0526	1.2211	0.0896	1.3107	0.3348	0.0857	0.4205	0.0000	5,502.2062	5,502.2062	0.0879	0.0000	5,504.4034

	ROG	NOx	CO	SO2	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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Plowing in Method	Site Preparation	4/4/2022	10/13/2022	5	139	
2	Open Trenching	Site Preparation	4/4/2022	5/26/2022	5	39	
3	Directonal Boring	Site Preparation	4/4/2022	10/28/2022	5	150	
4	Bridge Attachments	Site Preparation	4/4/2022	10/28/2022	5	150	
5	Blowing/Splicing	Site Preparation	4/4/2022	8/23/2022	5	102	
6	Spoils	Site Preparation	4/4/2022	10/28/2022	5	150	

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Spoils	0	0.00	0.00	160.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	MHDT
Plowing in Method	0	0.00	0.00	1,668.00	10.80	7.30	30.00	LD_Mix	HDT_Mix	HHDT
Open Trenching	1	0.00	0.00	312.00	10.80	7.30	30.00	LD_Mix	HDT_Mix	HHDT
Directonal Boring	1	0.00	0.00	2,700.00	10.80	7.30	30.00	LD_Mix	HDT_Mix	HHDT
Bridge Attachments	0	0.00	0.00	600.00	10.80	7.30	30.00	LD_Mix	HDT_Mix	HHDT
Blowing/Splicing	1	0.00	0.00	408.00	10.80	7.30	30.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Plowing in Method - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1410	4.9708	1.3339	0.0136	0.3131	0.0229	0.3361	0.0857	0.0220	0.1077		1,420.2097	1,420.2097	0.0227		1,420.7766
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	0.1410	4.9708	1.3339	0.0136	0.3131	0.0229	0.3361	0.0857	0.0220	0.1077		1,420.2097	1,420.2097	0.0227		1,420.7766

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1410	4.9708	1.3339	0.0136	0.3131	0.0229	0.3361	0.0857	0.0220	0.1077		1,420.2097	1,420.2097	0.0227		1,420.7766
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

Total	0.1410	4.9708	1.3339	0.0136	0.3131	0.0229	0.3361	0.0857	0.0220	0.1077		1,420.2097	1,420.2097	0.0227		1,420.7766
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3.3 Open Trenching - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0940	3.3139	0.8892	9.0500e-003	0.2087	0.0153	0.2240	0.0571	0.0146	0.0718		946.8064	946.8064	0.0151		947.1844
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	0.0940	3.3139	0.8892	9.0500e-003	0.2087	0.0153	0.2240	0.0571	0.0146	0.0718		946.8064	946.8064	0.0151		947.1844

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0940	3.3139	0.8892	9.0500e-003	0.2087	0.0153	0.2240	0.0571	0.0146	0.0718		946.8064	946.8064	0.0151		947.1844
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	0.0940	3.3139	0.8892	9.0500e-003	0.2087	0.0153	0.2240	0.0571	0.0146	0.0718		946.8064	946.8064	0.0151		947.1844

3.4 Directonal Boring - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.2115	7.4563	2.0008	0.0204	0.4697	0.0344	0.5041	0.1286	0.0329	0.1615		2,130.3145	2,130.3145	0.0340		2,131.1649
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

Total	0.2115	7.4563	2.0008	0.0204	0.4697	0.0344	0.5041	0.1286	0.0329	0.1615		2,130.3145	2,130.3145	0.0340		2,131.1649
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Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.2115	7.4563	2.0008	0.0204	0.4697	0.0344	0.5041	0.1286	0.0329	0.1615		2,130.3145	2,130.3145	0.0340		2,131.1649
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	0.2115	7.4563	2.0008	0.0204	0.4697	0.0344	0.5041	0.1286	0.0329	0.1615		2,130.3145	2,130.3145	0.0340		2,131.1649

3.5 Bridge Attachments - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0470	1.6570	0.4446	4.5300e-003	0.1044	7.6500e-003	0.1120	0.0286	7.3200e-003	0.0359		473.4032	473.4032	7.5600e-003		473.5922
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	0.0470	1.6570	0.4446	4.5300e-003	0.1044	7.6500e-003	0.1120	0.0286	7.3200e-003	0.0359		473.4032	473.4032	7.5600e-003		473.5922

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0470	1.6570	0.4446	4.5300e-003	0.1044	7.6500e-003	0.1120	0.0286	7.3200e-003	0.0359		473.4032	473.4032	7.5600e-003		473.5922
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

Total	0.0470	1.6570	0.4446	4.5300e-003	0.1044	7.6500e-003	0.1120	0.0286	7.3200e-003	0.0359		473.4032	473.4032	7.5600e-003		473.5922
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3.6 Blowing/Splicing - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0470	1.6570	0.4446	4.5300e-003	0.1044	7.6500e-003	0.1120	0.0286	7.3200e-003	0.0359		473.4032	473.4032	7.5600e-003		473.5922
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	0.0470	1.6570	0.4446	4.5300e-003	0.1044	7.6500e-003	0.1120	0.0286	7.3200e-003	0.0359		473.4032	473.4032	7.5600e-003		473.5922

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0470	1.6570	0.4446	4.5300e-003	0.1044	7.6500e-003	0.1120	0.0286	7.3200e-003	0.0359		473.4032	473.4032	7.5600e-003		473.5922
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	0.0470	1.6570	0.4446	4.5300e-003	0.1044	7.6500e-003	0.1120	0.0286	7.3200e-003	0.0359		473.4032	473.4032	7.5600e-003		473.5922

3.7 Spoils - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0118	0.1446	0.0653	5.6000e-004	0.0208	1.6300e-003	0.0225	6.2400e-003	1.5600e-003	7.8100e-003		58.0691	58.0691	9.6000e-004		58.0931
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	0.0118	0.1446	0.0653	5.6000e-004	0.0208	1.6300e-003	0.0225	6.2400e-003	1.5600e-003	7.8100e-003		58.0691	58.0691	9.6000e-004		58.0931

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Category	lb/day										lb/day						
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000
Total	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Category	lb/day										lb/day						
Hauling	0.0118	0.1446	0.0653	5.6000e-004	0.0208	1.6300e-003	0.0225	6.2400e-003	1.5600e-003	7.8100e-003		58.0691	58.0691	9.6000e-004			58.0931
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000			0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000			0.0000
Total	0.0118	0.1446	0.0653	5.6000e-004	0.0208	1.6300e-003	0.0225	6.2400e-003	1.5600e-003	7.8100e-003		58.0691	58.0691	9.6000e-004			58.0931

Zayo Additional Construction Equipment and Vehicles - Lassen County APCD Air District, Annual

**Zayo Additional Construction Vehicles - Mobile Off-site
Lassen County APCD Air District, Annual**

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	5.00	1000sqft	0.11	5,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	Wind Speed (m/s)	2.2	Precipitation Freq (Days)	56
Climate Zone	14			Operational Year	2023
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MW hr)	641.35	CH4 Intensity (lb/MW hr)	0.029	N2O Intensity (lb/MW hr)	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase - Project-specific schedule

Off-road Equipment - already accounted for in original modeling

Off-road Equipment - equipment accounted for in previous modeling.

Off-road Equipment - already accounted for in original modeling

Off-road Equipment - already accounted for in original modeling

Off-road Equipment - already accounted for in original modeling

Off-road Equipment - No offroad for spoils hauling

Trips and VMT - Additional water truck trips for boring operations, dust suppression, etc.

20 miles for water trucks

Grading - accounted for in previous modeling

Vehicle Trips - Additional const only

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	1.00	139.00
tblConstructionPhase	NumDays	1.00	39.00
tblConstructionPhase	NumDays	1.00	150.00
tblConstructionPhase	NumDays	1.00	150.00
tblConstructionPhase	NumDays	1.00	102.00
tblConstructionPhase	NumDays	1.00	150.00
tblOffRoadEquipment	HorsePower	97.00	402.00
tblOffRoadEquipment	LoadFactor	0.37	0.38
tblOffRoadEquipment	LoadFactor	0.37	0.38
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	7.00
tblTripsAndVMT	HaulingTripLength	20.00	30.00
tblTripsAndVMT	HaulingTripLength	20.00	30.00
tblTripsAndVMT	HaulingTripLength	20.00	30.00
tblTripsAndVMT	HaulingTripLength	20.00	30.00
tblTripsAndVMT	HaulingTripLength	20.00	30.00
tblTripsAndVMT	HaulingTripNumber	0.00	1,668.00
tblTripsAndVMT	HaulingTripNumber	0.00	312.00
tblTripsAndVMT	HaulingTripNumber	0.00	2,700.00

tblTripsAndVMT	HaulingTripNumber	0.00	600.00
tblTripsAndVMT	HaulingTripNumber	0.00	408.00
tblTripsAndVMT	HaulingTripNumber	0.00	160.00
tblTripsAndVMT	HaulingVehicleClass	HHDT	MHDT
tblVehicleTrips	ST_TR	1.32	0.00
tblVehicleTrips	SU_TR	0.68	0.00
tblVehicleTrips	WD_TR	6.97	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	0.0348	1.2162	0.3278	3.2500e-003	0.0736	5.6100e-003	0.0792	0.0202	5.3600e-003	0.0256	0.0000	308.0658	308.0658	5.1700e-003	0.0000	308.1951
Maximum	0.0348	1.2162	0.3278	3.2500e-003	0.0736	5.6100e-003	0.0792	0.0202	5.3600e-003	0.0256	0.0000	308.0658	308.0658	5.1700e-003	0.0000	308.1951

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	0.0348	1.2162	0.3278	3.2500e-003	0.0736	5.6100e-003	0.0792	0.0202	5.3600e-003	0.0256	0.0000	308.0658	308.0658	5.1700e-003	0.0000	308.1951
Maximum	0.0348	1.2162	0.3278	3.2500e-003	0.0736	5.6100e-003	0.0792	0.0202	5.3600e-003	0.0256	0.0000	308.0658	308.0658	5.1700e-003	0.0000	308.1951

	ROG	NOx	CO	SO2	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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)

1	4-4-2022	7-3-2022	0.5957	0.5957
2	7-4-2022	9-30-2022	0.4964	0.4964
		Highest	0.5957	0.5957

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Plowing in Method	Site Preparation	4/4/2022	10/13/2022	5	139	
2	Open Trenching	Site Preparation	4/4/2022	5/26/2022	5	39	
3	Directonal Boring	Site Preparation	4/4/2022	10/28/2022	5	150	
4	Bridge Attachments	Site Preparation	4/4/2022	10/28/2022	5	150	
5	Blowing/Splicing	Site Preparation	4/4/2022	8/23/2022	5	102	
6	Spoils	Site Preparation	4/4/2022	10/28/2022	5	150	

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Plowing in Method	0	0.00	0.00	1,668.00	10.80	7.30	30.00	LD_Mix	HDT_Mix	HHDT
Open Trenching	0	0.00	0.00	312.00	10.80	7.30	30.00	LD_Mix	HDT_Mix	HHDT
Directonal Boring	0	0.00	0.00	2,700.00	10.80	7.30	30.00	LD_Mix	HDT_Mix	HHDT
Bridge Attachments	0	0.00	0.00	600.00	10.80	7.30	30.00	LD_Mix	HDT_Mix	HHDT
Blowing/Splicing	0	0.00	0.00	408.00	10.80	7.30	30.00	LD_Mix	HDT_Mix	HHDT
Spoils	0	0.00	0.00	160.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	MHDT

3.1 Mitigation Measures Construction

3.2 Plowing in Method - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	9.9400e-003	0.3534	0.0946	9.4000e-004	0.0211	1.6100e-003	0.0227	5.8000e-003	1.5400e-003	7.3400e-003	0.0000	89.1818	89.1818	1.5000e-003	0.0000	89.2192
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	9.9400e-003	0.3534	0.0946	9.4000e-004	0.0211	1.6100e-003	0.0227	5.8000e-003	1.5400e-003	7.3400e-003	0.0000	89.1818	89.1818	1.5000e-003	0.0000	89.2192

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	9.9400e-003	0.3534	0.0946	9.4000e-004	0.0211	1.6100e-003	0.0227	5.8000e-003	1.5400e-003	7.3400e-003	0.0000	89.1818	89.1818	1.5000e-003	0.0000	89.2192
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	9.9400e-003	0.3534	0.0946	9.4000e-004	0.0211	1.6100e-003	0.0227	5.8000e-003	1.5400e-003	7.3400e-003	0.0000	89.1818	89.1818	1.5000e-003	0.0000	89.2192

3.3 Open Trenching - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.8600e-003	0.0661	0.0177	1.8000e-004	3.9500e-003	3.0000e-004	4.2500e-003	1.0800e-003	2.9000e-004	1.3700e-003	0.0000	16.6815	16.6815	2.8000e-004	0.0000	16.6885
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	1.8600e-003	0.0661	0.0177	1.8000e-004	3.9500e-003	3.0000e-004	4.2500e-003	1.0800e-003	2.9000e-004	1.3700e-003	0.0000	16.6815	16.6815	2.8000e-004	0.0000	16.6885

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.8600e-003	0.0661	0.0177	1.8000e-004	3.9500e-003	3.0000e-004	4.2500e-003	1.0800e-003	2.9000e-004	1.3700e-003	0.0000	16.6815	16.6815	2.8000e-004	0.0000	16.6885
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	1.8600e-003	0.0661	0.0177	1.8000e-004	3.9500e-003	3.0000e-004	4.2500e-003	1.0800e-003	2.9000e-004	1.3700e-003	0.0000	16.6815	16.6815	2.8000e-004	0.0000	16.6885

3.4 Directonal Boring - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0161	0.5720	0.1532	1.5200e-003	0.0342	2.6000e-003	0.0368	9.3900e-003	2.4900e-003	0.0119	0.0000	144.3590	144.3590	2.4200e-003	0.0000	144.4196
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0161	0.5720	0.1532	1.5200e-003	0.0342	2.6000e-003	0.0368	9.3900e-003	2.4900e-003	0.0119	0.0000	144.3590	144.3590	2.4200e-003	0.0000	144.4196

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0161	0.5720	0.1532	1.5200e-003	0.0342	2.6000e-003	0.0368	9.3900e-003	2.4900e-003	0.0119	0.0000	144.3590	144.3590	2.4200e-003	0.0000	144.4196
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0161	0.5720	0.1532	1.5200e-003	0.0342	2.6000e-003	0.0368	9.3900e-003	2.4900e-003	0.0119	0.0000	144.3590	144.3590	2.4200e-003	0.0000	144.4196

3.5 Bridge Attachments - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.5700e-003	0.1271	0.0340	3.4000e-004	7.6000e-003	5.8000e-004	8.1800e-003	2.0900e-003	5.5000e-004	2.6400e-003	0.0000	32.0798	32.0798	5.4000e-004	0.0000	32.0933
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	3.5700e-003	0.1271	0.0340	3.4000e-004	7.6000e-003	5.8000e-004	8.1800e-003	2.0900e-003	5.5000e-004	2.6400e-003	0.0000	32.0798	32.0798	5.4000e-004	0.0000	32.0933

Total	2.4300e-003	0.0864	0.0232	2.3000e-004	5.1700e-003	3.9000e-004	5.5600e-003	1.4200e-003	3.8000e-004	1.8000e-003	0.0000	21.8143	21.8143	3.7000e-004	0.0000	21.8234
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3.7 Spoils - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	9.1000e-004	0.0112	5.1600e-003	4.0000e-005	1.5200e-003	1.2000e-004	1.6400e-003	4.6000e-004	1.2000e-004	5.8000e-004	0.0000	3.9495	3.9495	7.0000e-005	0.0000	3.9511
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	9.1000e-004	0.0112	5.1600e-003	4.0000e-005	1.5200e-003	1.2000e-004	1.6400e-003	4.6000e-004	1.2000e-004	5.8000e-004	0.0000	3.9495	3.9495	7.0000e-005	0.0000	3.9511

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	9.1000e-004	0.0112	5.1600e-003	4.0000e-005	1.5200e-003	1.2000e-004	1.6400e-003	4.6000e-004	1.2000e-004	5.8000e-004	0.0000	3.9495	3.9495	7.0000e-005	0.0000	3.9511
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	9.1000e-004	0.0112	5.1600e-003	4.0000e-005	1.5200e-003	1.2000e-004	1.6400e-003	4.6000e-004	1.2000e-004	5.8000e-004	0.0000	3.9495	3.9495	7.0000e-005	0.0000	3.9511

Fuel Consumption Summary

Source Category	Fuel Consumption (gal)	
	Diesel	Gasoline
Offroad Equipment	159,384	0
Heavy Duty Trucks	47,701	0
Worker Trucks	14,134	0
Total Fuel Consumption	221,219	0

Lassen County Fuel Consumption (2018) ¹

Source	Fuel Type	Gallons (Retail + Non- Retail)		Percent of Project Compared to County
		Retail	Non-Retail	
Off-Road/HHDT/LHDT2	Diesel	2,083,333.33		10.619%

Notes:

- California Energy Commission, California Annual Retail Fuel Outlet Report Results (CEC-A15), 2018
https://ww2.energy.ca.gov/almanac/transportation_data/gasoline/piira_retail_survey.html
https://ww2.energy.ca.gov/almanac/transportation_data/gasoline/2010-2018_A15_Results_ada.xlsx
 Accessed May 2020. Diesel is adjusted to account for retail (48%) and non-retail (52%) diesel sales

Off-Road Equipment

Fuel Consumption: Equipment ≤ 100HP	Value
Brake Specific Fuel Consumption Factor (lb/hp-hr) ¹	0.408
Fuel Density (lb/gal) ¹	7.11
Consumption Factor (gal/hp-hr)	0.0574
Total HP-HR <100	650,123
Total Diesel Fuel (gal)	37,312

Fuel Consumption: Equipment > 100HP	Value
Brake Specific Fuel Consumption Factor (lb/hp-hr) ¹	0.367
Fuel Density (lb/gal) ¹	7.11
Consumption Factor (gal/hp-hr)	0.0516
Total HP-HR >100	2,364,602
Total Diesel Fuel (gal)	122,072

Total diesel gallons (off-road equipment): 159,384

Construction Phase	Equipment	# of Equipment	Hours/Day	HP	Load	Days	Total HP-HR
Plowing In Method	Crawler Tractors	3	10	212	0.43	139	380,137
Plowing In Method	Excavators	6	10	158	0.38	139	500,734
Plowing In Method	Off-Highway Trucks	3	10	402	0.38	139	637,009
Plowing In Method	Tractors/Loaders/Backhoes	3	10	97	0.37	139	149,661
Open Trenching	Excavators	4	10	158	0.38	39	93,662
Open Trenching	Tractors/Loaders/Backhoes	4	10	97	0.37	39	55,988
Directional Boring	Bore/Drill Rigs	4	10	221	0.5	150	663,000
Directional Boring	Tractors/Loaders/Backhoes	4	10	97	0.37	150	215,340
Bridge Attachments	Excavators	1	10	158	0.38	150	90,060
Blowing/Splicing	Air Compressors	6	10	78	0.48	102	229,133
						Total >100HP	2,364,602
						Total <100HP	650,123

Notes:

1. CARB, 2017 Off-road Diesel Emission Factors

https://ww3.arb.ca.gov/msei/ordiesel/ordas_ef_fcf_2017_v7.xlsx

HHDT Trucks

Onroad Travel Consumption	Value
EMFAC2017 Diesel Fuel Consumption Factor (gal/mi): ¹	0.1757
Total VMT (mi):	270,840
Total diesel gallons	47,587
Idling Consumption	Value
Idling Fuel Consumption Factor (gal/hr): ²	0.8400
Total Idle-Hours per Year:	378
Total diesel gallons	114

Total diesel gallons: 47,701

Construction Activity	Total Workdays	# of Truck Trips/day	Trip Length (miles)	EMFAC Vehicle Category	VMT	Idle Hours
Plowing In Method	139	18	30	HHDT	75,060	209
Directional Boring	150	34	30	HHDT	153,000	425
Open Trench	39	8	30	HHDT	9,360	26
Blowing/Fiber/Splicing	102	4	30	HHDT	12,240	34
Spoils Hauling	150	1.06	20	HHDT	3,180	13
Bridge Attachments	150	4	30	HHDT	18,000	50
Total VMT:					270,840	
Total Idle-Hours:						378

1. CARB, EMFAC2017 (Lassen APCD; HHDT; Annual; CY 2020; Aggregate MY; Aggregate Speed,DSL)
2. Department of Energy, Fact #861, 2015 Idle Fuel Consumption for Selected Gasoline and Diesel Vehicles, February 23, 2015.
<https://www.energy.gov/eere/vehicles/fact-861-february-23-2015-idle-fuel-consumption-selected-gasoline-and-diesel-vehicles>

LHDT2 Trucks

Onroad Travel Consumption		Value
EMFAC2017 Diesel Fuel Consumption Factor (gal/mi): ¹		0.0651
Total VMT (mi):		215,820
Total diesel gallons		14,043
Idling Consumption		Value
Idling Fuel Consumption Factor (gal/hr): ²		0.8400
Total Idle-Hours per Year:		300
Total diesel gallons		91

Total diesel gallons: 14,134

Construction Activity	Total Workdays	# of Truck Trips/day	Trip Length (miles)	EMFAC Vehicle Category	VMT	Idle Hours
Plowing In Method	139	18	30	LHDT2	75,060	209
Open Trenching	39	12	30	LHDT2	14,040	39
Directional Boring	150	16	30	LHDT2	72,000	200
Bridge Attachments	150	4	30	LHDT2	18,000	50
Blowing/Splicing	102	12	30	LHDT2	36,720	102
Total VMT:					215,820	
Total Idle-Hours:						300

1. CARB, EMFAC2017 (Lassen APCD; HHDT; Annual; CY 2020; Aggregate MY; Aggregate Speed,DSL)
2. Department of Energy, Fact #861, 2015 Idle Fuel Consumption for Selected Gasoline and Diesel Vehicles, February 23, 2015.
<https://www.energy.gov/eere/vehicles/fact-861-february-23-2015-idle-fuel-consumption-selected-gasoline-and-diesel-vehicles>

Mobile Trip Summary

Construction Activity	Total Workdays	# of Truck Trips/day	Trip Length (miles)	EMFAC Vehicle Category
Plowing In Method	139	6	30	HHDT
Directional Boring	150	16	30	HHDT
Bridge Attachments	150	4	30	HHDT
Plowing In Method	139	18	30	LHDT2
Open Trenching	39	12	30	LHDT2
Directional Boring	150	16	30	LHDT2
Bridge Attachments	150	4	30	LHDT2
Blowing/Splicing	102	12	30	LHDT2

Region	LASSEN COUNTY APCD
Vehicle Category	HHDT
Model Year	Aggregated
Speed	Aggregated
Calendar Year	2020
Fuel	DSL

Sum of VMT	Sum of Fuel Consumption
9120.325442	1.602454098

HHDT Fuel Consumption Factor

VMT (mi/day)	Fuel Consumption (1000gal/day)	Fuel Consumption Rate (gal/mi)	Fuel Economy (mi/gal)
9120.325442	1.6025	0.1757	5.6915

Region	LASSEN COUNTY APCD
Vehicle Category	LHDT2
Model Year	Aggregated
Speed	Aggregated
Calendar Year	2020
Fuel	DSL

Sum of VMT	Sum of Fuel Consumption
17066.05188	1.110468878

LHDT2 Fuel Consumption Factor

VMT (mi/day)	Fuel Consumption (1000gal/day)	Fuel Consumption Rate (gal/mi)	Fuel Economy (mi/gal)
17066.05188	1.1105	0.0651	15.3683