

**Vincent Well Stabilization Project
Construction Equipment Emissions**

Operation		Emission Factor	Units	Equation Variables		Emissions				
				1	2	PM-10	ROG	CO	NOX	SOX
Excavation Equipment Exhaust Emissions				Pieces of Equipment	Operating Hours	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day
PMV-10	Excavator	0.018	lbs/hr	1	8	0.0				
	Dozer	0.063	lbs/hr	1	8	0.1				
	Scraper	0.054	lbs/hr	2	8	0.5				
	Loader	0.024	lbs/hr	2	8	0.9				
	Other Construction Equipment	0.014	lbs/hr	5	8	0.4				
Other Material Handling Equipment	Other Construction Equipment	0.014	lbs/hr	5	8	0.6				
	Other Material Handling Equipment	0.025	lbs/hr	1	8	0.2				
		0.000	lbs/hr		8	0.0				
		0.000	lbs/hr		8	0.0				
		0.000	lbs/hr		8	0.0				
ROG	Excavator	0.073	lbs/hr	1	8	0.0	0.0			
	Dozer	0.212	lbs/hr	1	8	0.6	0.6			
	Scraper	0.191	lbs/hr	2	8	1.7	1.7			
	Loader	0.075	lbs/hr	2	8	3.1	3.1			
	Other Construction Equipment	0.056	lbs/hr	5	8	1.2	1.2			
Other Material Handling Equipment	Other Construction Equipment	0.056	lbs/hr	5	8	2.3	2.3			
	Other Material Handling Equipment	0.092	lbs/hr	1	8	0.7	0.7			
		0.000	lbs/hr		8	0.0	0.0			
		0.000	lbs/hr		8	0.0	0.0			
		0.000	lbs/hr		8	0.0	0.0			
CO	Excavator	0.512	lbs/hr	1	8	0.0	0.0	0.0		
	Dozer	0.801	lbs/hr	1	8	4.1	4.1	4.1		
	Scraper	0.794	lbs/hr	2	8	6.4	6.4	12.7		
	Loader	0.441	lbs/hr	2	8	12.7	12.7	7.0		
	Other Construction Equipment	0.351	lbs/hr	5	8	14.0	14.0	3.5		
Other Material Handling Equipment	Other Construction Equipment	0.443	lbs/hr	1	8	3.5	3.5	0.0		
		0.000	lbs/hr		8	0.0	0.0	0.0		
		0.000	lbs/hr		8	0.0	0.0	0.0		
		0.000	lbs/hr		8	0.0	0.0	0.0		
		0.000	lbs/hr		8	0.0	0.0	0.0		
NOX	Excavator	0.404	lbs/hr	1	8			0.0	0.0	
	Dozer	1.577	lbs/hr	1	8			3.2	3.2	
	Scraper	1.334	lbs/hr	2	8			12.6	12.6	
	Loader	0.475	lbs/hr	2	8			21.3	21.3	
	Other Construction Equipment	0.352	lbs/hr	5	8			7.6	7.6	
Other Material Handling Equipment	Other Construction Equipment	0.650	lbs/hr	1	8			14.1	14.1	
		0.000	lbs/hr		8			5.2	5.2	
		0.000	lbs/hr		8			0.0	0.0	
		0.000	lbs/hr		8			0.0	0.0	
		0.000	lbs/hr		8			0.0	0.0	
SOX	Excavator	0.001	lbs/hr	1	8					0.0
	Dozer	0.002	lbs/hr	1	8					0.0
	Scraper	0.003	lbs/hr	2	8					0.0
	Loader	0.000	lbs/hr	2	8					0.0
	Other Construction Equipment	0.001	lbs/hr	5	8					0.1
Other Material Handling Equipment	Other Construction Equipment	0.002	lbs/hr	1	8					0.0
		0.000	lbs/hr		8					0.0
		0.000	lbs/hr		8					0.0
		0.000	lbs/hr		8					0.0
		0.000	lbs/hr		8					0.0
					Total	2.6	9.5	47.8	64.1	0.1

Sources: Off-Road Mobile Source Emission Factors, SCAQMD 2020

**Vincent Well Stabilization Project
Material Export/Import Emissions**

Operation		Emission Factor	Units	Equation Variables		Emissions				
				1	2	PM-10 lbs/day	ROG lbs/day	CO lbs/day	NOX lbs/day	SOX lbs/day
				# of trips per day	vmt					
Delivery Vehicle Emissions Onsite	PM-10 Export Material	0.0010	lbs/mile	8	40	0.33				N/A
	Import Material	0.0010	lbs/mile	10	40	0.42				
ROG	Export Material	0.0010	lbs/mile	8	40		0.3			
	Import Material	0.0010	lbs/mile	10	40		0.4			
CO	Export Material	0.0050	lbs/mile	8	40			1.6		
	Import Material	0.0050	lbs/mile	10	40			2.0		
NOX	Export Material	0.0117	lbs/mile	8	40				3.7	
	Import Material	0.0117	lbs/mile	10	40				4.7	
Total						0.7	0.7	3.6	8.4	----

Source: SCAQMD: Emission Factors for On-Road Heavy Duty Diesel Trucks 2021

Vincent Well Stabilization Project
GHG- Construction Equipment Emissions

Operation		Equation Variables		GHG Emissions		
Emission Factor	Units	1	2	CO2 lbs/day	CH4 lbs/day	N2O g/day
Excavation Equipment Exhaust Emissions						
CO2		Pieces of Equipment	Operating Hours			
Excavator	120.0	1	8	0.0		
Dozer	239.0	1	8	960.0		
Scraper	262.0	2	8	1912.0		
Loader	109.0	2	8	4192.0		
Other Construction Equipment	122.0	5	8	1744.0		
Other Material Handling Equipment	141.0	1	8	4880.0		
				1128.0		
				0.0		
				0.0		
				0.0		
CH4						
Excavator	0.007	1	8		0.0	
Dozer	0.019	1	8		0.1	
Scraper	0.073	2	8		0.2	
Loader	0.007	2	8		1.2	
Other Construction Equipment	0.005	5	8		0.1	
Other Material Handling Equipment	0.008	1	8		0.2	
					0.1	
					0.0	
					0.0	
					0.0	
N2O*			Miles Per Day			
Excavator	0.131	1	2			0.0
Dozer	0.520	1	2			0.3
Scraper	0.520	2	2			1.0
Loader	0.100	2	2			2.1
Other Construction Equipment	0.492	5	2			0.4
Other Material Handling Equipment	0.492	1	2			4.9
						1.0
						0.0
						0.0
						0.0
Total lbs/g/day				14816.00	1.75	9.69
Total lbs/day				15551.07		
Total MTCO2e				544.3		

Sources: Off-Road Mobile Source Emission Factors; SCAQMD 2020
Source N2O: California Climate Action Registry General Reporting Protocol, 2009I;
Table A9-8-C SCAQMD Handbook; Climate Leaders EPA, Section 3, Table 2
Duration: 3 Month (70 days) Construction Period

Vincent Well Stabilization Project
GHG- Material Export/Import Emissions

Operation		Emission Factor	Units	Equation Variables		GHG Emissions		
				1	2	CO2 lbs/day	CH4 lbs/day	N2O g/day
Delivery Vehicle Emissions Onsite				# of trips per day	vmt			
CO2	Export Material	4.214	lbs/mile	8	40	1348.48		
	Import Material	4.214	lbs/mile	10	40	1685.60		
CH4	Export Material	0.000	lbs/mile	8	40		0.0	
	Import Material	0.000	lbs/mile	10	40		0.0	
N2O	Export Material	0.000	g/mile	8	40			0.0
	Import Material	0.000	g/mile	10	40			0.0
Total						3034.1	0.0	0.0
Total lbs/day						3034.1		
MTCO2e						34.90		

Source: SCAQMD: Emission Factors for On-Road Heavy Heavy Duty Diesel Trucks 2021

Source N2O: California Climate Action Registry General Reporting Protocol, 2009I;

Table A9-8-C SCAQMD Handbook; Climate Leaders EPA, Section 3, Table 2

Duration: 1 Month (23 days) Construction Period

Vincent Well Stabilization Project

HP: 0 to 100

0.059

HP: Greater than 100

0.0529

Values above are expressed in gallons per horsepower-hour/BSFC.

CONSTRUCTION EQUIPMENT

Construction Equipment	#	Hours per Day	Horsepower	Load Factor	Construction Phase	Fuel Used (gallons)
Excavator/Graders	1	8	187	0.410	Site Prep	2271.27
Other Material Handling Eqp.	0	0	168	0.400	Site Prep	0.00
Rubber Tired Dozer	2	8	247	0.400	Site Prep	2926.85
Tractors/Loaders/Backhoes	0	0	97	0.370	Site Prep	0.00
Concrete/Industrial Saws	0	0	81	0.730	Grading	0.00
Scraper	2	8	187	0.410	Grading	2271.27
Other Material Handling Eqp.	0	0	168	0.400	Grading	0.00
Rubber Tired Loader	2	8	247	0.400	Grading	2926.85
Tractors/Loaders/Backhoes	0	0	97	0.370	Grading	0.00
Bore/Drill Rig	0	0	221	0.500	Building Con.	0
Cranes	0	0	231	0.290	Building Con.	0.00
Forklifts	0	0	89	0.200	Building Con.	0.00
Generator Sets	0	0	84	0.740	Building Con.	0.00
Other Construction Eqp.	5	8	172	0.420	Building Con.	2140.04
Rubber Tired Dozer	0	0	247	0.400	Building Con.	0.00
Tractors/Loaders/Backhoes	0	0	97	0.370	Building Con.	0.00
Welders	0	0	46	0.450	Building Con.	0.00
Cement and Motor Mixers	0	0	9	0.560	Paving	0.00
Concrete/Industrial Saws	0	0	81	0.730	Paving	0.00
Dumpers/Tenders	0	0	16	0.380	Paving	0.00
Graders	0	0	187	0.410	Paving	0.00
Pavers	0	0	130	0.420	Paving	0.00
Paving Equipment	0	0	172	0.420	Paving	0.00
Rollers	0	0	80	0.380	Paving	0.00
Tractors/Loaders/Backhoes	0	0	97	0.370	Paving	0.00
Air Compressors	0	0	78	0.480	Architectual Coat.	0.00
Total Fuel Used						12536.28
						(Gallons)

Construction Phase	Days of Operation
Site Preparation	70
Grading	70
Building Construction	70
Paving	0
Architectual Coating	0

WORKER TRIPS

Construction Phase	MPG [2]	Trips	Trip Length (miles)	Fuel Used (gallons)
Entire Project	24.0	70	40.0	1166.67
Grading	24.0	0	15.0	0.00
Building Construction Phase	24.0	0	15.0	0.00
Paving Phase	24.0	0	15.0	0.00
Architectural Coating	24.0	0	15.0	0.00
Total				1166.67

Material Export/Import Trips

Construction Phase	MPG [2]	Trips	Trip Length (miles)	Fuel Used (gallons)
Site Preparation Phase	7.4	8	40.0	994.59
Grading	7.4	0	40.0	0.00
Building Construction Phase	7.4	10	40.0	124.32
Paving Phase	7.4	0	0.0	0.00
Total				1118.92

Total Gasoline Consumption (gallons)	1166.67
Total Diesel Consumption (gallons)	13655.20

Sources:

[1] United States Environmental Protection Agency. 2018. *Exhaust and Crankcase Emission Factors for Nonroad Compression-Ignition Engines in MOVES2014b*. July 2018. Available at: <https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100UXEN.pdf>.

[2] United States Department of Transportation, Bureau of Transportation Statistics. 2018. *National Transportation Statistics 2018*. Available at: <https://www.bts.gov/sites/bts.dot.gov/files/docs/browse-statistical-products-and-data/national-transportation-statistics/223001/ntentire2018q4.pdf>.