

Appendix O

Greenhouse Gas Emissions

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Equipment	Fuel	Quantity	HP	Hours/day	Typical Days/week
Bulldozer	Diesel	2	190	10	5
Grader	Diesel	2	148	10	5
Backhoe	Diesel	2	84	10	5
Vibratory compactor	Diesel	4	93	10	5
Tractors	Diesel	5	100	10	5
Dump Trucks	Diesel	2	376	10	5
Excavator	Diesel	4	400	10	5
Concrete truck and boom	Diesel	6	376	10	5
Tracked Loader	Diesel	3	300	10	5
Skid Steer	Diesel	4	71	10	5
Forklift	Diesel	8	82	10	5
Piledriver	Diesel	7	83	10	5
Medium duty crane	Diesel	2	367	10	5
Water truck	Diesel	4	376	10	5
Generator	Gasoline	10	11	10	5
ATVs - on-site	Gasoline	30	90	10	5
On Road					
Light duty truck	Gasoline	20		10	
Contractor vehicles	Gasoline	70			
Hauling semitruck/trailer	Diesel	10		10	

Days by Year

2025	2026
10	30
20	40
15	50
10	30
40	80
20	40
10	30
10	30
40	80
20	40
15	50
0	40
0	40
40	80
40	80
40	80

40	80
40	80
0	50

Construction schedule
from October 1, 2025 to
September 30, 2026

10/1/2025 1/1/2026
12/31/2025 9/30/2026
66 195

VTM Assumption	MOVES Lookup	MOVES Item	Notes
Worker Roundtrip distance	250 miles		125 mi one way to Fergus Falls
Light Duty Truck Distance Round Trip 2025 total	480000 miles	32 Veh Class	
Light Duty Truck Distance Round Trip 2026 total	960000 miles	32 Veh Class	
Worker Vehicle Commute Distance Round Trip 2025 total	700000 miles	21 Veh Class	
Worker Vehicle Commute Distance Round Trip 2026 total	1400000 miles	21 Veh Class	
Material Hauling Distance Round Trip 2025 total	0 miles	62 Veh Class	
Material Hauling Distance Round Trip 2026 total	300000 miles	62 Veh Class	
Assumed Highway Speed	60 mph	13 Speed Bin	
Highway VMT Percentage	100%		
Average Speed	60 mph		
Affected Area	487.00	ac	

Equipment	MOVES Lookup ID	SCAB Lookup ID	Fuel	HP	Typical Hours per day	Typical Days/Year	Count	Total Hours Used	Load Factor ^c
Equipment									
Bulldozer	Crawler Tractor/Dozers	Rubber Tired Dozers	Diesel	190	10	10	2	200	0.59
Grader	Graders	Graders	Diesel	148	10	20	2	400	0.59
Backhoe	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes	Diesel	84	10	15	2	300	0.21
Vibratory compactor	Surfacing Equipment	Surfacing Equipment	Diesel	93	10	10	4	400	0.59
Tractors	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes	Diesel	100	10	40	5	2000	0.21
Dump Trucks	Off-Highway Trucks	Off-Highway Trucks	Diesel	376	10	20	2	400	0.59
Excavator	Excavators	Excavators	Diesel	400	10	10	4	400	0.59
Concrete truck and boom	Off-Highway Trucks	Off-Highway Trucks	Diesel	376	10	10	6	600	0.59
Tracked Loader	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes	Diesel	300	10	40	3	1200	0.21
Skid Steer	Skid Steer Loaders	Skid Steer Loaders	Diesel	71	10	20	4	800	0.21
Forklift	Forklifts	Forklifts	Diesel	82	10	15	8	1200	0.59
Piledriver	Bore/Drill Rigs	Bore/Drill Rigs	Diesel	83	10	0	7	0	0.43
Medium duty crane	Cranes	Cranes	Diesel	367	10	0	2	0	0.43
Water truck	Off-Highway Trucks	Off-Highway Trucks	Diesel	376	10	40	4	1600	0.59
Generator	Generator Sets	Generator Sets	Gasoline	11	10	40	10	4000	0.43
ATVs - on-site	All Terrain Vehicles	4-str all terrain vehicles	Gasoline	1	10	40	30	12000	1

Fugitive Dust									
Dust from On Site Activities									
Onroad	MOVES Vehicle Class		Fuel Type	VMT	Onroad Fuel ID	Year			
Resuspended Road Dust									
Light Duty Truck	32		Gasoline	480,000	1	2025			
Contractor vehicle	21		Gasoline	700,000	1	2025			
Material Hauling (Single Unit Truck)	62		Diesel	0	2	2025			

^a EPA Tier II Emissions

^b South Coast AQMD Off Road- Model Mobile Source Emission Factors
(<https://www.aqmd.gov/home/rules-compliance/ceqa/air-quality-analysis-handbook/off-road-mobile-source-emission-factors>)

^c Load Factors from MOVES4

^d EPA Exhaust and Crankcase Emission Factors for Nonroad Compression-Ignition Engines in MOVES3.0.2, September 2021. Equation 10 - Assume ultra low sulfur diesel with 15ppm.

^e Assume breakdown of 5% for NMHC and 95% for Nox emissions. NMHC used as VOC.
https://www.baaqmd.gov/~media/Files/Engineering/policy_and_procedures/Engines/EmissionFactorsforDieselEngines.ashx

^f Global Warming Potentials from EPA's GHG Emissions Hub (June 5, 2024)

^g N2O emissions estimated based on the ratio of g N2O per gallon of construction diesel to gallons of diesel per g CO2, obtained from Tables 2.7 and 2.1, respectively, of the 2023 Climate Registry Default Emission Factors. Retrieved from <https://theclimateregistry.org/wp-content/uploads/2023/06/2023-Default-Emission-Factors-Final.pdf>, June 2023.

^h Calculated from MOVES for Beltrami County, MN

Assumption:

1 kWh = 1.34 hp-hr

Equipment	MOVES Lookup ID	Emission Factors (g/hp-hr) ^{a,b}						Emission Factors (g/hr) ^b			
		CO	NO _x	SO ₂ ^d	VOC ^e	PM ₁₀	PM _{2.5}	CO ₂	CH ₄	N ₂ O ^f	CO ₂ e ^f
Equipment											
Bulldozer	Crawler Tractor/Dozers	2.6119	4.6791	0.0049	0.2463	0.1493	0.1493	83228.2832	4.7607	7.6625	85392.1568
Grader	Graders	3.7313	4.6791	0.0049	0.2463	0.2239	0.2239	56209.8310	1.5632	5.1750	57624.9889
Backhoe	Tractors/Loaders/Backhoes	3.7313	5.3172	0.0054	0.2799	0.2985	0.2985	23463.4126	0.7832	2.1602	24057.7949
Vibratory compactor	Surfacing Equipment	3.7313	5.3172	0.0054	0.2799	0.2985	0.2985	28923.9917	0.6998	2.6629	29649.2622
Tractors	Tractors/Loaders/Backhoes	3.7313	5.3172	0.0054	0.2799	0.2985	0.2985	23463.4126	0.7832	2.1602	24057.7949
Dump Trucks	Off-Highway Trucks	2.6119	4.5373	0.0049	0.2388	0.1493	0.1493	123528.4545	2.5437	11.3728	126613.4819
Excavator	Excavators	2.6119	4.5373	0.0049	0.2388	0.1493	0.1493	106020.4719	0.8117	9.7609	108629.8500
Concrete truck and boom	Off-Highway Trucks	2.6119	4.5373	0.0049	0.2388	0.1493	0.1493	123528.4545	2.5437	11.3728	126613.4819
Tracked Loader	Tractors/Loaders/Backhoes	2.6119	4.6791	0.0049	0.2463	0.1493	0.1493	156422.8023	0.7832	14.4013	160261.0813
Skid Steer	Skid Steer Loaders	3.7313	5.3172	0.0054	0.2799	0.2985	0.2985	19396.4227	0.6820	1.7858	19888.7461
Forklift	Forklifts	3.7313	5.3172	0.0054	0.2799	0.2985	0.2985	14163.3679	0.6148	1.3040	14526.1351
Piledriver	Bore/Drill Rigs	3.7313	5.3172	0.0054	0.2799	0.2985	0.2985	34981.8245	0.4929	3.2207	35849.0993
Medium duty crane	Cranes	2.6119	4.5373	0.0049	0.2388	0.1493	0.1493	81692.4933	1.4314	7.5212	83725.6762
Water truck	Off-Highway Trucks	2.6119	4.5373	0.0049	0.2388	0.1493	0.1493	123528.4545	2.5437	11.3728	126613.4819
Generator	Generator Sets	263.6646	1.8293	0.0046	3.8582	0.1128	0.1038	11516.3396	7.1795	1.9281	12228.3214
ATVs - on-site	All Terrain Vehicles	37.1568	0.3897	0.0010	1.5328	0.0735	0.0676	21107.6608	20.8173	3.5340	22627.0486

Fugitive Dust											
Dust from On Site Activities											
		Emission Factors (g/mi) ^h									
Onroad	MOVES Vehicle Class	CO	NO_x	SO₂	VOC	PM₁₀	PM_{2.5}	CO₂	CH₄	N₂O	CO₂e^f
Resuspended Road Dust											
Light Duty Truck	32	2.57950	0.14206	0.00200	0.04358	0.00419	0.00371	424.20029	0.01050	0.00281	425.2387533
Contractor vehicle	21	2.98595	0.09639	0.00142	0.02803	0.00252	0.00223	301.60282	0.00893	0.00151	302.2530148
Material Hauling (Single Unit Truck)	62	1.85085	3.26416	0.00543	0.08191	0.04915	0.04522	1616.80349	0.01685	0.20734	1672.220027

^a EPA Tier II Emissions

^b South Coast AQMD Off Road- Model Mobile Source Emission Factors
(<https://www.aqmd.gov/home/rules-compliance/ceqa/air-quality-analysis-handbook/off-road-mobile-source-emission-factors>)

^c Load Factors from MOVES4

^d EPA Exhaust and Crankcase Emission Factors for Nonroad Compression-Ignition Engines in MOVES3.0.2, September 2021. Equation 10 - Assume ultra low sulfur diesel with 15ppm.

^e Assume breakdown of 5% for NMHC and 95% for Nox emissions. NMHC used as VOC.
https://www.baaqmd.gov/~media/Files/Engineering/policy_and_procedures/Engines/EmissionFactorsforDieselEngines.ashx

^f Global Warming Potentials from EPA's GHG Emissions Hub (June 5, 2024)

^g N2O emissions estimated based on the ratio of g N2O per gallon of construction diesel to gallons of diesel per g CO2, obtained from Tables 2.7 and 2.1, respectively, of the 2023 Climate Registry Default Emission Factors. Retrieved from <https://theclimateregistry.org/wp-content/uploads/2023/06/2023-Default-Emission-Factors-Final.pdf>, June 2023.

^h Calculated from MOVES for Beltrami County, MN
Assumption:

1 kWh = 1.34 hp-hr

Equipment	MOVES Lookup ID	Criteria Air Pollutant Emissions (ton / year)						GHG Emissions (metric ton/year)			
		CO	NO _x	SO ₂	VOC	PM ₁₀	PM _{2.5}	CO ₂	CH ₄	N ₂ O	CO ₂ e
Equipment											
Bulldozer	Crawler Tractor/Dozers	6.46E-02	1.16E-01	1.20E-04	6.09E-03	3.69E-03	3.69E-03	1.66E+01	9.52E-04	1.53E-03	1.71E+01
Grader	Graders	1.44E-01	1.80E-01	1.87E-04	9.48E-03	8.62E-03	8.62E-03	2.25E+01	6.25E-04	2.07E-03	2.31E+01
Backhoe	Tractors/Loaders/Backhoes	2.18E-02	3.10E-02	3.16E-05	1.63E-03	1.74E-03	1.74E-03	7.04E+00	2.35E-04	6.48E-04	7.22E+00
Vibratory compactor	Surfacing Equipment	9.03E-02	1.29E-01	1.31E-04	6.77E-03	7.22E-03	7.22E-03	1.16E+01	2.80E-04	1.07E-03	1.19E+01
Tractors	Tractors/Loaders/Backhoes	1.73E-01	2.46E-01	2.51E-04	1.30E-02	1.38E-02	1.38E-02	4.69E+01	1.57E-03	4.32E-03	4.81E+01
Dump Trucks	Off-Highway Trucks	2.55E-01	4.44E-01	4.77E-04	2.34E-02	1.46E-02	1.46E-02	4.94E+01	1.02E-03	4.55E-03	5.06E+01
Excavator	Excavators	2.72E-01	4.72E-01	5.07E-04	2.48E-02	1.55E-02	1.55E-02	4.24E+01	3.25E-04	3.90E-03	4.35E+01
Concrete truck and boom	Off-Highway Trucks	3.83E-01	6.66E-01	7.15E-04	3.50E-02	2.19E-02	2.19E-02	7.41E+01	1.53E-03	6.82E-03	7.60E+01
Tracked Loader	Tractors/Loaders/Backhoes	2.18E-01	3.90E-01	4.06E-04	2.05E-02	1.24E-02	1.24E-02	1.88E+02	9.40E-04	1.73E-02	1.92E+02
Skid Steer	Skid Steer Loaders	4.91E-02	6.99E-02	7.12E-05	3.68E-03	3.92E-03	3.92E-03	1.55E+01	5.46E-04	1.43E-03	1.59E+01
Forklift	Forklifts	2.39E-01	3.40E-01	3.47E-04	1.79E-02	1.91E-02	1.91E-02	1.70E+01	7.38E-04	1.56E-03	1.74E+01
Piledriver	Bore/Drill Rigs	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
Medium duty crane	Cranes	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
Water truck	Off-Highway Trucks	1.02E+00	1.78E+00	1.91E-03	9.34E-02	5.84E-02	5.84E-02	1.98E+02	4.07E-03	1.82E-02	2.03E+02
Generator	Generator Sets	5.50E+00	3.82E+00	9.49E-05	8.05E-02	2.35E-03	2.16E-03	4.61E+01	2.87E-02	7.71E-03	4.89E+01
ATVs - on-site	All Terrain Vehicles	4.92E-01	5.15E-03	1.35E-05	2.03E-02	9.72E-04	8.94E-04	2.53E+02	2.50E-01	4.24E-02	2.72E+02

		CO	NO _x	SO ₂	VOC	PM ₁₀	PM _{2.5}	CO ₂	CH ₄	N ₂ O	CO ₂ e
Fugitive Dust											
Dust from On Site Activities		0	0	0	0	2.41E+02	2.45E+01	0	0	0	0
		Criteria Air Pollutant Emissions (ton / year)						GHG Emissions (metric ton/year)			
Onroad	MOVES Vehicle Class	CO	NO_x	SO₂	VOC	PM₁₀	PM_{2.5}	CO₂	CH₄	N₂O	CO₂e
Resuspended Road Dust		0	0	0	0	1.57E-01	3.91E-02	0	0	0	0
Light Duty Truck	32	1.36E+00	7.52E-02	1.06E-03	2.31E-02	2.22E-03	1.96E-03	2.04E+02	5.04E-03	1.35E-03	2.04E+02
Contractor vehicle	21	2.30E+00	7.44E-02	1.09E-03	2.16E-02	1.95E-03	1.72E-03	2.11E+02	6.25E-03	1.06E-03	2.12E+02
Material Hauling (Single Unit Truck)	62	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

^a EPA Tier II Emissions

^b South Coast AQMD Off Road- Model Mobile Source Emission Factors
(<https://www.aqmd.gov/home/rules-compliance/ceqa/air-quality-analysis-handbook/off-road-mobile-source-emission-factors>)

^c Load Factors from MOVES4

^d EPA Exhaust and Crankcase Emission Factors for Nonroad Compression-Ignition Engines in MOVES3.0.2, September 2021. Equation 10 - Assume ultra low sulfur diesel with 15ppm.

^e Assume breakdown of 5% for NMHC and 95% for Nox emissions. NMHC used as VOC.
https://www.baaqmd.gov/~media/Files/Engineering/policy_and_procedures/Engines/EmissionFactorsforDieselEngines.ashx

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^g N2O emissions estimated based on the ratio of g N2O per gallon of construction diesel to gallons of diesel per g CO2, obtained from Tables 2.7 and 2.1, respectively, of the 2023 Climate Registry Default Emission Factors. Retrieved from <https://theclimateregistry.org/wp-content/uploads/2023/06/2023-Default-Emission-Factors-Final.pdf>, June 2023.

^h Calculated from MOVES for Beltrami County, MN
Assumption:

1 kWh = 1.34 hp-hr

lb/metric ton

2204.62

CO	NO _x	SO ₂	VOC	PM ₁₀	PM _{2.5}	CO ₂	CH ₄	N ₂ O	CO ₂ e
8.92	4.90	0.01	0.36	0.18	0.18	987.83	0.29	0.11	1026.06
0.00	0.00	0.00	0.00	241.16	24.50	0.00	0.00	0.00	0.00
3.67	0.15	0.00	0.04	0.16	0.04	414.74	0.01	0.00	415.69
12.59	5.05	0.01	0.40	241.51	24.73	1,402.57	0.30	0.12	1,441.76

Equipment

Fugitive Dust

Onroad

Total

Equipment	MOVES Lookup ID	SCAB Lookup ID	Fuel	HP	Typical Hours per day	Typical Days/Year	Count	Total Hours Used	Load Factor ^c
Equipment									
Bulldozer	Crawler Tractor/Dozers	Rubber Tired Dozers	Diesel	190	10	30	2	600	0.59
Grader	Graders	Graders	Diesel	148	10	40	2	800	0.59
Backhoe	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes	Diesel	84	10	50	2	1000	0.21
Vibratory compactor	Surfacing Equipment	Surfacing Equipment	Diesel	93	10	30	4	1200	0.59
Tractors	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes	Diesel	100	10	80	5	4000	0.21
Dump Trucks	Off-Highway Trucks	Off-Highway Trucks	Diesel	376	10	40	2	800	0.59
Excavator	Excavators	Excavators	Diesel	400	10	30	4	1200	0.59
Concrete truck and boom	Off-Highway Trucks	Off-Highway Trucks	Diesel	376	10	30	6	1800	0.59
Tracked Loader	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes	Diesel	300	10	80	3	2400	0.21
Skid Steer	Skid Steer Loaders	Skid Steer Loaders	Diesel	71	10	40	4	1600	0.21
Forklift	Forklifts	Forklifts	Diesel	82	10	50	8	4000	0.59
Piledriver	Bore/Drill Rigs	Bore/Drill Rigs	Diesel	83	10	40	7	2800	0.43
Medium duty crane	Cranes	Cranes	Diesel	367	10	40	2	800	0.43
Water truck	Off-Highway Trucks	Off-Highway Trucks	Diesel	376	10	80	4	3200	0.59
Generator	Generator Sets	Generator Sets	Gasoline	11	10	80	10	8000	0.43
ATVs - on-site	All Terrain Vehicles	4-str all terrain vehicles	Gasoline	1	10	80	30	24000	1

Fugitive Dust									
Dust from On Site Activities									
Onroad	MOVES Vehicle Class		Fuel Type	VMT	Onroad Fuel ID	Year			
Resuspended Road Dust									
Light Duty Truck	32		Gasoline	960,000	1	2026			
Contractor vehicle	21		Gasoline	1,400,000	1	2026			
Material Hauling (Single Unit Truck)	62		Diesel	300,000	2	2026			

^a EPA Tier II Emissions

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Assumption:

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Equipment	MOVES Lookup ID	Emission Factors (g/hp-hr) ^{a,b}						Emission Factors (g/hr) ^b			
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Equipment											
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Backhoe	Tractors/Loaders/Backhoes	3.7313	5.3172	0.0054	0.2799	0.2985	0.2985	23463.4126	0.7832	2.1602	24057.7949
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Dump Trucks	Off-Highway Trucks	2.6119	4.5373	0.0049	0.2388	0.1493	0.1493	123528.4545	2.5437	11.3728	126613.4819
Excavator	Excavators	2.6119	4.5373	0.0049	0.2388	0.1493	0.1493	106020.4719	0.8117	9.7609	108629.8500
Concrete truck and boom	Off-Highway Trucks	2.6119	4.5373	0.0049	0.2388	0.1493	0.1493	123528.4545	2.5437	11.3728	126613.4819
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Skid Steer	Skid Steer Loaders	3.7313	5.3172	0.0054	0.2799	0.2985	0.2985	19396.4227	0.6820	1.7858	19888.7461
Forklift	Forklifts	3.7313	5.3172	0.0054	0.2799	0.2985	0.2985	14163.3679	0.6148	1.3040	14526.1351
Piledriver	Bore/Drill Rigs	3.7313	5.3172	0.0054	0.2799	0.2985	0.2985	34981.8245	0.4929	3.2207	35849.0993
Medium duty crane	Cranes	2.6119	4.5373	0.0049	0.2388	0.1493	0.1493	81692.4933	1.4314	7.5212	83725.6762
Water truck	Off-Highway Trucks	2.6119	4.5373	0.0049	0.2388	0.1493	0.1493	123528.4545	2.5437	11.3728	126613.4819
Generator	Generator Sets	263.6646	1.8293	0.0046	3.8582	0.1128	0.1038	11516.3396	7.1795	1.9281	12228.3214
ATVs - on-site	All Terrain Vehicles	37.1568	0.3897	0.0010	1.5328	0.0735	0.0676	21107.6608	20.8173	3.5340	22627.0486

Fugitive Dust											
Dust from On Site Activities											
		Emission Factors (g/m) ^h									
Onroad	MOVES Vehicle Class	CO	NO_x	SO₂	VOC	PM₁₀	PM_{2.5}	CO₂	CH₄	N₂O	CO₂e^f
Resuspended Road Dust											
Light Duty Truck	32	2.57950	0.14206	0.00200	0.04358	0.00419	0.00371	424.20029	0.01050	0.00281	425.2387533
Contractor vehicle	21	2.98595	0.09639	0.00142	0.02803	0.00252	0.00223	301.60282	0.00893	0.00151	302.2530148
Material Hauling (Single Unit Truck)	62	1.85085	3.26416	0.00543	0.08191	0.04915	0.04522	1616.80349	0.01685	0.20734	1672.220027

^a EPA Tier II Emissions

^b South Coast AQMD Off Road- Model Mobile Source Emission Factors
(<https://www.aqmd.gov/home/rules-compliance/ceqa/air-quality-analysis-handbook/off-road-mobile-source-emission-factors>)

^c Load Factors from MOVES4

^d EPA Exhaust and Crankcase Emission Factors for Nonroad Compression-Ignition Engines in MOVES3.0.2, September 2021. Equation 10 - Assume ultra low sulfur diesel with 15ppm.

^e Assume breakdown of 5% for NMHC and 95% for Nox emissions. NMHC used as VOC.
https://www.baaqmd.gov/~/_media/Files/Engineering/policy_and_procedures/Engines/EmissionFactorsForDieselEngines.aspx

^f Global Warming Potentials from EPA's GHG Emissions Hub (June 5, 2024)

^h N2O emissions estimated based on the ratio of g N2O per gallon of construction diesel to gallons of diesel per g CO2, obtained from Tables 2.7 and 2.1, respectively, of the 2023 Climate Registry Default Emission Factors. Retrieved from <https://theclimateregistry.org/wp-content/uploads/2023/06/2023-Default-Emission-Factors-Final.pdf>, June 2023.

^b Calculated from MOVES for Beltrami County, MN
Assumption:

1 kWh = 1.34 hp-hr

lb/metric ton

2204.62

		Criteria Air Pollutant Emissions (ton / year)						GHG Emissions (metric ton/year)			
Equipment	MOVES Lookup ID	CO	NO _x	SO ₂	VOC	PM ₁₀	PM _{2.5}	CO ₂	CH ₄	N ₂ O	CO ₂ e
Equipment											
Bulldozer	Crawler Tractor/Dozers	1.94E-01	3.47E-01	3.61E-04	1.83E-02	1.11E-02	1.11E-02	4.99E+01	2.86E-03	4.60E-03	5.12E+01
Grader	Graders	2.87E-01	3.60E-01	3.75E-04	1.90E-02	1.72E-02	1.72E-02	4.50E+01	1.25E-03	4.14E-03	4.61E+01
Backhoe	Tractors/Loaders/Backhoes	7.26E-02	1.03E-01	1.05E-04	5.44E-03	5.80E-03	5.80E-03	2.35E+01	7.83E-04	2.16E-03	2.41E+01
Vibratory compactor	Surfacing Equipment	2.71E-01	3.86E-01	3.93E-04	2.03E-02	2.17E-02	2.17E-02	3.47E+01	8.40E-04	3.20E-03	3.56E+01
Tractors	Tractors/Loaders/Backhoes	3.46E-01	4.92E-01	5.01E-04	2.59E-02	2.76E-02	2.76E-02	9.39E+01	3.13E-03	8.64E-03	9.62E+01
Dump Trucks	Off-Highway Trucks	5.11E-01	8.88E-01	9.53E-04	4.67E-02	2.92E-02	2.92E-02	9.88E+01	2.03E-03	9.10E-03	1.01E+02
Excavator	Excavators	8.15E-01	1.42E+00	1.52E-03	7.45E-02	4.66E-02	4.66E-02	1.27E+02	9.74E-04	1.17E-02	1.30E+02
Concrete truck and boom	Off-Highway Trucks	1.15E+00	2.00E+00	2.14E-03	1.05E-01	6.57E-02	6.57E-02	2.22E+02	4.58E-03	2.05E-02	2.28E+02
Tracked Loader	Tractors/Loaders/Backhoes	4.35E-01	7.80E-01	8.12E-04	4.10E-02	2.49E-02	2.49E-02	3.75E+02	1.88E-03	3.46E-02	3.85E+02
Skid Steer	Skid Steer Loaders	9.81E-02	1.40E-01	1.42E-04	7.36E-03	7.85E-03	7.85E-03	3.10E+01	1.09E-03	2.86E-03	3.18E+01
Forklift	Forklifts	7.96E-01	1.13E+00	1.16E-03	5.97E-02	6.37E-02	6.37E-02	5.67E+01	2.46E-03	5.22E-03	5.81E+01
Piledriver	Bore/Drill Rigs	4.11E-01	5.86E-01	5.96E-04	3.08E-02	3.29E-02	3.29E-02	9.79E+01	1.38E-03	9.02E-03	1.00E+02
Medium duty crane	Cranes	3.63E-01	6.31E-01	6.78E-04	3.32E-02	2.08E-02	2.08E-02	6.54E+01	1.15E-03	6.02E-03	6.70E+01
Water truck	Off-Highway Trucks	2.04E+00	3.55E+00	3.81E-03	1.87E-01	1.17E-01	1.17E-01	3.95E+02	8.14E-03	3.64E-02	4.05E+02
Generator	Generator Sets	1.10E+01	7.63E-02	1.90E-04	1.61E-01	4.71E-03	4.33E-03	9.21E+01	5.74E-02	1.54E-02	9.78E+01
ATVs - on-site	All Terrain Vehicles	9.83E-01	1.03E-02	2.70E-05	4.06E-02	1.94E-03	1.79E-03	5.07E+02	5.00E-01	8.48E-02	5.43E+02

Fugitive Dust		CO	NO _x	SO ₂	VOC	PM ₁₀	PM _{2.5}	CO ₂	CH ₄	N ₂ O	CO ₂ e
Dust from On Site Activities		0	0	0	0	2.42E+02	2.46E+01	0	0	0	0
		Criteria Air Pollutant Emissions (ton / year)						GHG Emissions (metric ton/year)			
Onroad	MOVES Vehicle Class	CO	NO _x	SO ₂	VOC	PM ₁₀	PM _{2.5}	CO ₂	CH ₄	N ₂ O	CO ₂ e
Resuspended Road Dust		0	0	0	0	4.77E-01	1.19E-01	0	0	0	0
	Light Duty Truck	2.73E+00	1.50E-01	2.11E-03	4.61E-02	4.44E-03	3.93E-03	4.07E+02	1.01E-02	2.70E-03	4.08E+02
	Contractor vehicle	4.61E+00	1.49E-01	2.19E-03	4.33E-02	3.89E-03	3.44E-03	4.22E+02	1.25E-02	2.11E-03	4.23E+02
	Material Hauling (Single Unit Truck)	6.12E-01	1.08E+00	1.79E-03	2.71E-02	1.63E-02	1.50E-02	4.85E+02	5.05E-03	6.22E-02	5.02E+02

^a EPA Tier II Emissions

^b South Coast AQMD Off Road- Model Mobile Source Emission Factors
(<https://www.aqmd.gov/home/rules-compliance/ceqa/air-quality-analysis-handbook/off-road-mobile-source-emission-factors>)

^c Load Factors from MOVES4

^d EPA Exhaust and Crankcase Emission Factors for Nonroad Compression-Ignition Engines in MOVES3.0.2, September 2021. Equation 10 - Assume ultra low sulfur diesel with 15ppm.

* Assume breakdown of 5% for NMHC and 95% for Nox emissions. NMHC used as VOC.
https://www.baaqmd.gov/~media/Files/Engineering/policy_and_procedures/Engines/EmissionFactorsforDieselEngines.ashx

^f Global Warming Potentials from EPA's GHG Emissions Hub (June 5, 2024)

^a N2O emissions estimated based on the ratio of g N2O per gallon of construction diesel to gallons of diesel per g CO2, obtained from Tables 2.7 and 2.1, respectively, of the 2023 Climate Registry Default Emission Factors. Retrieved from <https://thelimitregistry.org/wp-content/uploads/2023/06/2023-Default-Emission-Factors-Final.pdf>, June 2023.

^h Calculated from MOVES for Beltrami County, MN

Assumption:

$$1 \text{ kWh} = 1.34 \text{ hp-hr}$$

lb/metric ton

2204.62

CO	NO _x	SO ₂	VOC	PM ₁₀	PM _{2.5}	CO ₂	CH ₄	N ₂ O	CO ₂ e
19.77	12.90	0.01	0.88	0.50	0.50	2315.75	0.59	0.26	2400.71
0.00	0.00	0.00	0.00	242.11	24.60	0.00	0.00	0.00	0.00
7.95	1.38	0.01	0.12	0.50	0.14	1314.52	0.03	0.07	1333.05
27.72	14.28	0.02	0.99	243.11	25.24	3,630.27	0.62	0.33	3,733.76

Equipment

Fugitive Dust

Onroad

Total

5,032.83

0.92

0.44

5,175.52

Resuspended Road Dust
Year: 2025

SpeedBin	MOVES ID	Weight tons	Total Vehicle Miles Traveled (VMT) per Speed Bin					
			Low ADT Road			High ADT Road		
			5	6	7	12	13	16
Light Duty Truck	32	5	0	0	0	480000	0	0
Worker Vehicle	21	5	0	0	0	700000	0	0
Combination Long Haul Truck	62	20	0	0	0	0	0	0

Vehicle Type	Pollutant	Road Type	k (g/VMT)	sL	W	P	VMT	Emissions (tons)
Light Duty Truck	PM _{2.5}	High ADT Road	0.25	0.12	5	110	480000	0.0159
Light Duty Truck	PM ₁₀	High ADT Road	1	0.12	5	110	480000	0.0637
Light Duty Truck	PM _{2.5}	Low ADT Road	0.25	0.6	5	110	0	0.0000
Light Duty Truck	PM ₁₀	Low ADT Road	1	0.6	5	110	0	0.0000
Worker Vehicle	PM _{2.5}	High ADT Road	0.25	0.12	5	110	700000	0.0232
Worker Vehicle	PM ₁₀	High ADT Road	1	0.12	5	110	700000	0.0929
Worker Vehicle	PM _{2.5}	Low ADT Road	0.25	0.6	5	110	0	0.0000
Worker Vehicle	PM ₁₀	Low ADT Road	1	0.6	5	110	0	0.0000
Combination Long Haul Truck	PM _{2.5}	High ADT Road	0.25	0.12	20	110	0	0.0000
Combination Long Haul Truck	PM ₁₀	High ADT Road	1	0.12	20	110	0	0.0000
Combination Long Haul Truck	PM _{2.5}	Low ADT Road	0.25	0.6	20	110	0	0.0000
Combination Long Haul Truck	PM ₁₀	Low ADT Road	1	0.6	20	110	0	0.0000

Silt Loading	AP-42 Roadway Category	sL (Winter)
High ADT Road	5000-10000 ADT	0.12
Low ADT Road	500-5000 ADT	0.6

Total	
PM _{2.5}	0.039130268 tons
PM ₁₀	0.156521073 tons

Formula used from AP-42 Section 13.2.1 "Paved Roads"

$$E = k (sL/2)^{0.91} (W/3)^{1.02} (1-P/4N)$$

E = particulate emission factor (having units matching the units of k)

k = particle size multiplier for particle size range and units of interest, From AP-42 Table 13.2-1.1

sL = road surface silt loading (grams per square meter) (g/m²), Assume winter time condition

W = average weight (tons) of the vehicles traveling the road

Figure 13.2.2-1 AP-42 Section 13.2.2 Unpaved Roads estimates that days of precipitation >0.01 inch per year (P) is approximately 110; N is 365 days.

Resuspended Road Dust
Year: 2026

SpeedBin	MOVES ID	Weight tons	Total Vehicle Miles Traveled (VMT) per Speed Bin					
			Low ADT Road			High ADT Road		16
			5	6	7	12	13	
Light Duty Truck	32	5	0	0	0	960000	0	0
Worker Vehicle	21	5	0	0	0	1400000	0	0
Combination Long Haul Truck	62	20	0	0	0	300000	0	0

Vehicle Type	Pollutant	Road Type	k (g/VMT)	sL	W	P	VMT	Emissions (tons)
Light Duty Truck	PM _{2.5}	High ADT Road	0.25	0.12	5	110	960000	0.0318
Light Duty Truck	PM ₁₀	High ADT Road	1	0.12	5	110	960000	0.1273
Light Duty Truck	PM _{2.5}	Low ADT Road	0.25	0.6	5	110	0	0.0000
Light Duty Truck	PM ₁₀	Low ADT Road	1	0.6	5	110	0	0.0000
Worker Vehicle	PM _{2.5}	High ADT Road	0.25	0.12	5	110	1400000	0.0464
Worker Vehicle	PM ₁₀	High ADT Road	1	0.12	5	110	1400000	0.1857
Worker Vehicle	PM _{2.5}	Low ADT Road	0.25	0.6	5	110	0	0.0000
Worker Vehicle	PM ₁₀	Low ADT Road	1	0.6	5	110	0	0.0000
Combination Long Haul Truck	PM _{2.5}	High ADT Road	0.25	0.12	20	110	300000	0.0409
Combination Long Haul Truck	PM ₁₀	High ADT Road	1	0.12	20	110	300000	0.1636
Combination Long Haul Truck	PM _{2.5}	Low ADT Road	0.25	0.6	20	110	0	0.0000
Combination Long Haul Truck	PM ₁₀	Low ADT Road	1	0.6	20	110	0	0.0000

Silt Loading	AP-42 Roadway Category	sL (Winter)
High ADT Road	5000-10000 ADT	0.12
Low ADT Road	500-5000 ADT	0.6

Total		
PM _{2.5}	0.119172777	tons
PM ₁₀	0.476691107	tons

Formula used from AP-42 Section 13.2.1 "Paved Roads"

$$E = k (sL/2)^{0.91} (W/3)^{1.02} (1-P/4N)$$

E = particulate emission factor (having units matching the units of k)

k = particle size multiplier for particle size range and units of interest, From AP-42 Table 13.2-1.1

sL = road surface silt loading (grams per square meter) (g/m²), Assume winter time condition

W = average weight (tons) of the vehicles traveling the road

Figure 13.2.2-1 AP-42 Section 13.2.2 Unpaved Roads estimates that days of precipitation >0.01 inch per year (P) is approximately 110; N is 365 days.

Fugitive Dust
Year: 2025

Activities	Construction Duration (Days)	Area Affected (ac) or <i>Mileage</i> ⁶	WRAP Level ¹	Duration or <i>Tonnage</i> ⁵	Emission Factor ^{2,3}			Control Efficiency ⁴	Emission (tons/year)	
					Emission Factor Unit	PM ₁₀	PM _{2.5}		PM ₁₀	PM _{2.5}
ROW (Soil Disturbance)	261	487.0	1	8.7	ton/ac-month	0.11	0.011	50%	233.030	23.303
<i>Light Duty Truck Onsite Mileage</i>	261	<i>1600</i>	<i>4</i>	<i>5</i>	<i>lb/ton-mile</i>	<i>0.21</i>	<i>0.021</i>	<i>50%</i>	<i>0.420</i>	<i>0.042</i>
<i>Combination Truck Onsite Mileage</i>	261	<i>0</i>	<i>4</i>	<i>20</i>	<i>lb/ton-mile</i>	<i>0.21</i>	<i>0.021</i>	<i>50%</i>	<i>0.000</i>	<i>0.000</i>
Wind Erosion	261	487.0		1.00	ton/ac-year	0.38	0.057	50%	7.711	1.157
Fugitive Dust Total									241.160	24.502

¹ WRAP Level from Table 3-2 Ch 3 of WRAP Fugitive Dust Handbook Sep/2006: https://www.wrapair.org/forums/dejff/fdh/content/FDHandbook_Rev_06.pdf

² PM2.5/PM10 is set at 0.1 per guideline listed on section 3.31 of WRAP handbook, 0.15 for Wind Erosion per Section 9.2 of WRAP handbook

³ Wind Erosion Emission Factor extracted from WRAP handbook Table 11-6, assumed 100% of TSP is PM10

⁴ 50% of Wet Suppression per WRAP handbook Page 8

⁵ The unit for Duration is either month or year depending on the Emission Factor Unit. 20 tons was assume for Heavy Truck, 5 tons for passenger trucks

⁶ Assume no on-site mileage from worker vehicles. On average, 1 mile is assumed for on-site travel for combination truck and 2 miles is assumed for on-site travel for light duty trucks.

Fugitive Dust
Year: 2026

Activities	Construction Duration (Days)	Area Affected (ac) or <i>Mileage</i> ⁶	WRAP Level ¹	Duration or <i>Tonnage</i> ⁵	Emission Factor ^{2,3}			Control Efficiency ⁴	Emission (tons/year)	
					Emission Factor Unit	PM ₁₀	PM _{2.5}		PM ₁₀	PM _{2.5}
ROW (Soil Disturbance)	261	487.0	1	8.7	ton/ac-month	0.11	0.011	50%	233.030	23.303
<i>Light Duty Truck Onsite Mileage</i>	261	<i>3200</i>	<i>4</i>	<i>5</i>	<i>lb/ton-mile</i>	<i>0.21</i>	<i>0.021</i>	<i>50%</i>	<i>0.840</i>	<i>0.084</i>
<i>Combination Truck Onsite Mileage</i>	261	<i>500</i>	<i>4</i>	<i>20</i>	<i>lb/ton-mile</i>	<i>0.21</i>	<i>0.021</i>	<i>50%</i>	<i>0.525</i>	<i>0.053</i>
Wind Erosion	261	487.0		1.00	ton/ac-year	0.38	0.057	50%	7.711	1.157
Fugitive Dust Total									242.105	24.596

¹ WRAP Level from Table 3-2 Ch 3 of WRAP Fugitive Dust Handbook Sep/2006: https://www.wrapair.org/forums/dejff/fdh/content/FDHandbook_Rev_06.pdf

² PM2.5/PM10 is set at 0.1 per guideline listed on section 3.31 of WRAP handbook, 0.15 for Wind Erosion per Section 9.2 of WRAP handbook

³ Wind Erosion Emission Factor extracted from WRAP handbook Table 11-6, assumed 100% of TSP is PM10

⁴ 50% of Wet Suppression per WRAP handbook Page 8

⁵ The unit for Duration is either month or year depending on the Emission Factor Unit. 20 tons was assume for Heavy Truck, 5 tons for passenger trucks

⁶ Assume no on-site mileage from worker vehicles. On average, 1 mile is assumed for on-site travel for combination truck and 2 miles is assumed for on-site travel for light duty trucks.

Nonroad Compression-Ignition Engines: Exhaust Emission Standards (kW-hr)													
						NMHC	NMHC + NOx	NOx	PM	CO			
	Rated Power (kW)	Rated Power (kW) Lower Bound	Rate Power (kW) Upper Bound	Tier	Model Year	NMHC (g/kW-hr)	NMHC + NOx (g/kW-hr)	NOx (g/kW-hr)	PM (g/kW-hr)	CO (g/kW-hr)	Smoke ^a (Percentage)	Useful Life (hours /years) ^b	Warranty Period (hours /years) ^b
Federal	kW < 8	0	8	1	2000-2004	-	10.5	-	1.0	8.0	20/15/50	3,000/5	1,500/2
		0	8	2	2005-2007	-	7.5	-	0.80	8.0			
		0	8	4	2008+	-	7.5	-	0.4	8.0			
	8 ≤ kW < 19	9	19	1	2000-2004	-	9.5	-	0.80	6.6		3,000/5	1,500/2
		9	19	2	2005-2007	-	7.5	-	0.80	6.6			
		9	19	4	2008+	-	7.5	-	0.40	6.6			
	19 ≤ kW < 37	19	37	1	1999-2003	-	9.5	-	0.80	5.5		5,000/7 ^d	3,000/5 ^e
		19	37	2	2004-2007	-	7.5	-	0.60	5.5			
		19	37	4	2008-2012	-	7.5	-	0.30	5.5			
		19	37	4	2013+	-	4.7	-	0.03	5.5			
	37 ≤ kW < 56	37	56	1	1998-2003	-	-	9.2	-	-	20/15/50	8,000/10	3,000/5
		37	56	2	2004-2007	-	7.5	-	0.40	5.0			
		37	56	3 ^f	2008-2011	-	4.7	-	0.40	5.0			
		37	56	4	2008-2012 (Option 1) ^g	-	4.7	-	0.30	5.0			
		37	56	4	2012 (Option 2) ^g	-	4.7	-	0.03	5.0			
	56 ≤ kW < 75	56	75	1	1998-2003	-	-	9.2	-	-			
		56	75	2	2004-2007	-	7.5	-	0.40	5.0			
		56	75	3	2008-2011	-	4.7	-	0.40	5.0			
		56	75	4	2012-2013 ^h	-	4.7	-	0.02	5.0			
		56	75	4	2014+ ⁱ	0.19	-	0.40	0.02	5.0			
	75 ≤ kW < 130	75	130	1	1997-2002	-	-	9.2	-	-			
		75	130	2	2003-2006	-	6.6	-	0.30	5.0			
		75	130	3	2007-2011	-	4.0	-	0.30	5.0			
		75	130	4	2012-2013 ^h	-	4.0	-	0.02	5.0			
		75	130	4	2014+ ⁱ	0.19	-	0.40	0.02	5.0			
	130 ≤ kW < 225	130	225	1	1996-2002	1.3	-	9.2	0.54	11.4	20/15/50	8,000/10	3,000/5
		130	225	2	2003-2005	-	6.6	-	0.20	3.5			
		130	225	3	2006-2010	-	4.0	-	0.20	3.5			
		130	225	4	2011-2013 ^h	-	4.0	-	0.02	3.5			
		130	225	4	2014+ ⁱ	0.19	-	0.40	0.02	3.5			
	225 ≤ kW < 450	225	450	1	1996-2000	1.3	-	9.2	0.54	11.4			
		225	450	2	2001-2005	-	6.4	-	0.20	3.5			
		225	450	3	2006-2010	-	4.0	-	0.20	3.5			
		225	450	4	2011-2013 ^h	-	4.0	-	0.02	3.5			
		225	450	4	2014+ ⁱ	0.19	-	0.40	0.02	3.5			
	450 ≤ kW < 560	450	560	1	1996-2001	1.3	-	9.2	0.54	11.4			
		450	560	2	2002-2005	-	6.4	-	0.20	3.5			
		450	560	3	2006-2010	-	4.0	-	0.20	3.5			
		450	560	4	2011-2013 ^h	-	4.0	-	0.02	3.5			
		450	560	4	2014+ ⁱ	0.19	-	0.40	0.02	3.5			
	560 ≤ kW < 900	560	900	1	2000-2005	1.3	-	9.2	0.54	11.4			
		560	900	2	2006-2010	-	6.4	-	0.20	3.5			
		560	900	4	2011-2014	0.40	-	3.5	0.10	3.5			
		560	900	4	2015+ ⁱ	0.19	-	3.5	0.04	3.5			
		560	900	4	2015+ ⁱ	0.19	-	3.5	0.04	3.5			
	kW > 900	900	1000	1	2000-2005	1.3	-	9.2	0.54	11.4			
		900	1000	2	2006-2010	-	6.4	-	0.20	3.5			
		900	1000	4	2011-2014	0.40	-	3.5	0.10	3.5			
		900	1000	4	2015+ ⁱ	0.19	-	3.5	0.04	3.5			
		900	1000	4	2015+ ⁱ	0.19	-	3.5	0.04	3.5			

Notes:

^a For Tier 1, 2, and 3 standards, exhaust emissions of nitrogen oxides (NOx), carbon monoxide (CO), hydrocarbons (HC), and non-methane hydrocarbons (NMHC) are measured using the procedures in 40 Code of Federal Regulations (CFR) Part 89 Subpart E. For Tier 1,

^e Warranty period for constant speed engines with rated speed 3,000 rpm or higher is 2 years or 1,500 hours, whichever comes first.

^f These Tier 3 standards apply only to manufacturers selecting Tier 4 Option 2. Manufacturers selecting Tier 4 Option 1 will be meeting those standards in

1 kw-hr = 1.34 hp-hr

Nonroad Compression-Ignition Engines: Exhaust Emission Standards (hp-hr)								
Rated Power (hp) Lower Bound	Rate Power (hp) Upper Bound	Tier	Model Year	NMHC	NMHC + NOx	NOx	PM	CO
				g/hp-hr	g/hp-hr	g/hp-hr	g/hp-hr	g/hp-hr
0	10.72	1	2000-2004	0.0	7.8	0.0	0.7	6.0
0	10.72	2	2005-2007	0.0	5.6	0.0	0.6	6.0
0	10.72	4	2008+	0.0	5.6	0.0	0.3	6.0
12.06	25.46	1	2000-2004	0.0	7.1	0.0	0.6	4.9
12.06	25.46	2	2005-2007	0.0	5.6	0.0	0.6	4.9
12.06	25.46	4	2008+	0.0	5.6	0.0	0.3	4.9
25.46	49.58	1	1999-2003	0.0	7.1	0.0	0.6	4.1
25.46	49.58	2	2004-2007	0.0	5.6	0.0	0.4	4.1
25.46	49.58	4	2008-2012	0.0	5.6	0.0	0.2	4.1
25.46	49.58	0	2013+	0.0	3.5	0.0	0.0	4.1
49.58	75.04	1	1998-2003	0.0	0.0	6.9	0.0	0.0
49.58	75.04	2	2004-2007	0.0	5.6	0.0	0.3	3.7
49.58	75.04	3 f	2008-2011	0.0	3.5	0.0	0.3	3.7
49.58	75.04	4(Option 1) g	2008-2012	0.0	3.5	0.0	0.2	3.7
49.58	75.04	4(Option 2) g	2012	0.0	3.5	0.0	0.0	3.7
49.58	75.04	4	2013+	0.0	3.5	0.0	0.0	3.7
75.04	100.5	1	1998-2003	0.0	0.0	6.9	0.0	0.0
75.04	100.5	2	2004-2007	0.0	5.6	0.0	0.3	3.7
75.04	100.5	3	2008-2011	0.0	3.5	0.0	0.3	3.7
75.04	100.5	4	2012-2013 h	0.0	3.5	0.0	0.0	3.7
75.04	100.5	0	2014+ i	0.1	0.0	0.3	0.0	3.7
100.5	174.2	1	1997-2002	0.0	0.0	6.9	0.0	0.0
100.5	174.2	2	2003-2006	0.0	4.9	0.0	0.2	3.7
100.5	174.2	3	2007-2011	0.0	3.0	0.0	0.2	3.7
100.5	174.2	4	2012-2013 h	0.0	3.0	0.0	0.0	3.7
100.5	174.2	0	2014+	0.1	0.0	0.3	0.0	3.7
174.2	301.5	1	1996-2002	1.0	0.0	6.9	0.4	8.5
174.2	301.5	2	2003-2005	0.0	4.9	0.0	0.1	2.6
174.2	301.5	3	2006-2010	0.0	3.0	0.0	0.1	2.6
174.2	301.5	4	2011-2013 h	0.0	3.0	0.0	0.0	2.6
174.2	301.5	0	2014+ i	0.1	0.0	0.3	0.0	2.6
301.5	603	1	1996-2000	1.0	0.0	6.9	0.4	8.5
301.5	603	2	2001-2005	0.0	4.8	0.0	0.1	2.6
301.5	603	3	2006-2010	0.0	3.0	0.0	0.1	2.6
301.5	603	4	2011-2013 h	0.0	3.0	0.0	0.0	2.6
301.5	603	0	2014+ i	0.1	0.0	0.3	0.0	2.6
603	750.4	1	1996-2001	1.0	0.0	6.9	0.4	8.5
603	750.4	2	2002-2005	0.0	4.8	0.0	0.1	2.6
603	750.4	3	2006-2010	0.0	3.0	0.0	0.1	2.6
603	750.4	4	2011-2013 h	0.0	3.0	0.0	0.0	2.6
603	750.4	0	2014+ i	0.1	0.0	0.3	0.0	2.6
750.4	1206	1	2000-2005	1.0	0.0	6.9	0.4	8.5
750.4	1206	2	2006-2010	0.0	4.8	0.0	0.1	2.6
750.4	1206	4	2011-2014	0.3	0.0	2.6	0.1	2.6
750.4	1206	0	2015+ i	0.1	0.0	2.6	0.0	2.6
1206	1340	1	2000-2005	1.0	0.0	6.9	0.4	8.5
1206	1340	2	2006-2010	0.0	4.8	0.0	0.1	2.6
1206	1340	4	2011-2014	0.3	0.0	2.6	0.1	2.6
1206	1340	0	2015+ i	0.1	0.0	2.6	0.0	2.6

SCAB Fleet Average Emission Factors (Diesel)

SCAB_EF_2025

Air Basin	SC
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		(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)
Equipment	MaxHP	ROG	CO	NOX	SOX	PM	CO2	CH4
Aerial Lifts	15	0.0101	0.0528	0.0631	0.0001	0.0025	8.7	0.0009
Aerial Lifts	25	0.0132	0.0451	0.0838	0.0001	0.0032	11.0	0.0012
Aerial Lifts	50	0.0168	0.1351	0.1218	0.0003	0.0035	19.6	0.0015
Aerial Lifts	120	0.0176	0.2265	0.1496	0.0004	0.0063	38.1	0.0016
Aerial Lifts	500	0.0580	0.3710	0.3660	0.0021	0.0109	213	0.0052
Aerial Lifts	750	0.1054	0.6706	0.6753	0.0039	0.0199	385	0.0095
Aerial Lifts Composite		0.0184	0.1646	0.1366	0.0004	0.0048	34.7	0.0017
Air Compressors	15	0.0087	0.0444	0.0545	0.0001	0.0023	7.2	0.0008
Air Compressors	25	0.0181	0.0605	0.1121	0.0002	0.0045	14.4	0.0016
Air Compressors	50	0.0263	0.1911	0.1476	0.0003	0.0047	22.3	0.0024
Air Compressors	120	0.0289	0.3023	0.1928	0.0006	0.0088	47.0	0.0026
Air Compressors	175	0.0424	0.4998	0.2187	0.0010	0.0104	88.5	0.0038
Air Compressors	250	0.0514	0.2531	0.2553	0.0015	0.0078	131	0.0046
Air Compressors	500	0.0894	0.4292	0.4150	0.0023	0.0134	232	0.0081
Air Compressors	750	0.1385	0.6633	0.6545	0.0036	0.0210	358	0.0125
Air Compressors	1000	0.1999	0.9265	2.5439	0.0049	0.0483	486	0.0180
Air Compressors Composite		0.0349	0.3027	0.2104	0.0007	0.0088	63.6	0.0031
Bore/Drill Rigs	15	0.0120	0.0632	0.0754	0.0002	0.0029	10.3	0.0011
Bore/Drill Rigs	25	0.0193	0.0658	0.1219	0.0002	0.0046	16.0	0.0017
Bore/Drill Rigs	50	0.0190	0.2200	0.1662	0.0004	0.0009	31.0	0.0017
Bore/Drill Rigs	120	0.0252	0.4660	0.1955	0.0009	0.0020	77.1	0.0023
Bore/Drill Rigs	175	0.0324	0.7542	0.0787	0.0016	0.0030	141	0.0029
Bore/Drill Rigs	250	0.0427	0.3426	0.0981	0.0021	0.0035	188	0.0039
Bore/Drill Rigs	500	0.0706	0.5512	0.1622	0.0031	0.0058	311	0.0064
Bore/Drill Rigs	750	0.1396	1.0891	0.3204	0.0062	0.0115	615	0.0126
Bore/Drill Rigs	1000	0.2115	1.6437	3.8912	0.0093	0.0364	928	0.0191
Bore/Drill Rigs Composite		0.0428	0.5007	0.2864	0.0017	0.0042	165	0.0039
Cement and Mortar Mixers	15	0.0074	0.0386	0.0461	0.0001	0.0018	6.3	0.0007
Cement and Mortar Mixers	25	0.0213	0.0724	0.1346	0.0002	0.0052	17.6	0.0019
Cement and Mortar Mixers Composite		0.0085	0.0414	0.0534	0.0001	0.0021	7.2	0.0008
Concrete/Industrial Saws	25	0.0199	0.0678	0.1256	0.0002	0.0047	16.5	0.0018
Concrete/Industrial Saws	50	0.0279	0.2284	0.1910	0.0004	0.0053	30.2	0.0025
Concrete/Industrial Saws	120	0.0370	0.4561	0.2840	0.0009	0.0117	74.1	0.0033
Concrete/Industrial Saws	175	0.0623	0.8663	0.3523	0.0018	0.0160	160	0.0056
Concrete/Industrial Saws Composite		0.0337	0.3706	0.2471	0.0007	0.0093	58.5	0.0030
Cranes	50	0.0350	0.2256	0.1644	0.0003	0.0062	23.2	0.0032
Cranes	120	0.0376	0.3384	0.2298	0.0006	0.0120	50.1	0.0034
Cranes	175	0.0462	0.4744	0.2300	0.0009	0.0120	80.3	0.0042
Cranes	250	0.0544	0.2316	0.2705	0.0013	0.0094	112	0.0049
Cranes	500	0.0858	0.3535	0.3977	0.0018	0.0146	180	0.0077
Cranes	750	0.1446	0.5947	0.6821	0.0030	0.0248	303	0.0130
Cranes	9999	0.5219	1.9715	5.5760	0.0098	0.1146	971	0.0471
Cranes Composite		0.0681	0.3738	0.4223	0.0014	0.0143	129	0.0061
Crawler Tractors	50	0.0487	0.2566	0.1842	0.0003	0.0090	24.9	0.0044
Crawler Tractors	120	0.0609	0.4537	0.3562	0.0008	0.0221	65.8	0.0055
Crawler Tractors	175	0.0823	0.7265	0.4447	0.0014	0.0241	121	0.0074
Crawler Tractors	250	0.0924	0.3662	0.5348	0.0019	0.0192	166	0.0083
Crawler Tractors	500	0.1392	0.5877	0.7527	0.0025	0.0280	259	0.0126
Crawler Tractors	750	0.2506	1.0528	1.3878	0.0047	0.0510	465	0.0226
Crawler Tractors	1000	0.3749	1.5618	4.2168	0.0066	0.0958	658	0.0338
Crawler Tractors Composite		0.0789	0.5065	0.4492	0.0013	0.0227	114	0.0071
Crushing/Proc. Equipment	50	0.0508	0.3859	0.2899	0.0006	0.0083	44.0	0.0046
Crushing/Proc. Equipment	120	0.0506	0.5406	0.3289	0.0010	0.0140	83.1	0.0046
Crushing/Proc. Equipment	175	0.0795	0.9556	0.3830	0.0019	0.0177	167	0.0072
Crushing/Proc. Equipment	250	0.0967	0.4768	0.4357	0.0028	0.0134	245	0.0087
Crushing/Proc. Equipment	500	0.1459	0.6977	0.6163	0.0037	0.0200	374	0.0132
Crushing/Proc. Equipment	750	0.2307	1.1003	0.9907	0.0059	0.0316	589	0.0208
Crushing/Proc. Equipment	9999	0.6019	2.5014	6.6977	0.0131	0.1238	1,308	0.0543

Crushing/Proc. Equipment Composite		0.0693	0.6187	0.3763	0.0015	0.0146	132	0.0062
Dumpers/Tenders	25	0.0092	0.0314	0.0581	0.0001	0.0022	7.6	0.0008
Dumpers/Tenders Composite		0.0092	0.0314	0.0581	0.0001	0.0022	7.6	0.0008
Excavators	25	0.0198	0.0677	0.1253	0.0002	0.0047	16.4	0.0018
Excavators	50	0.0297	0.2365	0.1616	0.0003	0.0035	25.0	0.0027
Excavators	120	0.0448	0.4942	0.2638	0.0009	0.0092	73.6	0.0040
Excavators	175	0.0518	0.6636	0.1982	0.0013	0.0091	112	0.0047
Excavators	250	0.0647	0.3210	0.2222	0.0018	0.0074	159	0.0058
Excavators	500	0.0946	0.4495	0.3091	0.0023	0.0107	234	0.0085
Excavators	750	0.1569	0.7451	0.5194	0.0039	0.0178	387	0.0142
Excavators Composite		0.0559	0.5086	0.2269	0.0013	0.0086	120	0.0050
Forklifts	50	0.0150	0.1361	0.0904	0.0002	0.0013	14.7	0.0014
Forklifts	120	0.0168	0.2086	0.0997	0.0004	0.0023	31.2	0.0015
Forklifts	175	0.0228	0.3310	0.0732	0.0006	0.0029	56.1	0.0021
Forklifts	250	0.0289	0.1551	0.0746	0.0009	0.0027	77.1	0.0026
Forklifts	500	0.0416	0.2123	0.1038	0.0011	0.0038	111	0.0038
Forklifts Composite		0.0236	0.2148	0.0860	0.0006	0.0025	54.4	0.0021
Generator Sets	15	0.0109	0.0627	0.0768	0.0002	0.0032	10.2	0.0010
Generator Sets	25	0.0216	0.0738	0.1368	0.0002	0.0055	17.6	0.0019
Generator Sets	50	0.0242	0.2034	0.1881	0.0004	0.0051	30.6	0.0022
Generator Sets	120	0.0340	0.4585	0.3022	0.0009	0.0122	77.9	0.0031
Generator Sets	175	0.0469	0.7328	0.3291	0.0016	0.0136	142	0.0042
Generator Sets	250	0.0558	0.3746	0.3885	0.0024	0.0108	213	0.0050
Generator Sets	500	0.0862	0.5820	0.5697	0.0033	0.0167	337	0.0078
Generator Sets	750	0.1401	0.9395	0.9382	0.0055	0.0272	544	0.0126
Generator Sets	9999	0.3235	1.8648	5.2188	0.0105	0.0888	1,049	0.0292
Generator Sets Composite		0.0288	0.2667	0.2329	0.0007	0.0081	61.0	0.0026
Graders	50	0.0382	0.2599	0.1877	0.0004	0.0063	27.5	0.0034
Graders	120	0.0521	0.5009	0.3219	0.0009	0.0153	75.0	0.0047
Graders	175	0.0652	0.7261	0.3117	0.0014	0.0157	124	0.0059
Graders	250	0.0781	0.3549	0.3652	0.0019	0.0129	172	0.0071
Graders	500	0.1023	0.4610	0.4468	0.0023	0.0165	229	0.0092
Graders	750	0.2167	0.9755	0.9628	0.0049	0.0353	486	0.0196
Graders Composite		0.0676	0.5696	0.3314	0.0015	0.0147	133	0.0061
Off-Highway Tractors	120	0.1108	0.6619	0.6362	0.0011	0.0455	93.7	0.0100
Off-Highway Tractors	175	0.1110	0.7932	0.6639	0.0015	0.0370	130	0.0100
Off-Highway Tractors	250	0.0890	0.3179	0.5983	0.0015	0.0227	130	0.0080
Off-Highway Tractors	750	0.3692	1.5358	2.4157	0.0057	0.0918	568	0.0333
Off-Highway Tractors	1000	0.5623	2.3619	6.0896	0.0082	0.1577	814	0.0507
Off-Highway Tractors Composite		0.1134	0.6101	0.7291	0.0017	0.0331	151	0.0102
Off-Highway Trucks	175	0.0622	0.7536	0.2376	0.0014	0.0112	125	0.0056
Off-Highway Trucks	250	0.0730	0.3435	0.2521	0.0019	0.0085	167	0.0066
Off-Highway Trucks	500	0.1183	0.5319	0.3878	0.0027	0.0135	272	0.0107
Off-Highway Trucks	750	0.1921	0.8627	0.6384	0.0044	0.0221	442	0.0173
Off-Highway Trucks	1000	0.2823	1.2403	3.1782	0.0063	0.0546	625	0.0255
Off-Highway Trucks Composite		0.1140	0.5385	0.4769	0.0027	0.0142	260	0.0103
Other Construction Equipment	15	0.0118	0.0617	0.0737	0.0002	0.0029	10.1	0.0011
Other Construction Equipment	25	0.0159	0.0544	0.1008	0.0002	0.0038	13.2	0.0014
Other Construction Equipment	50	0.0244	0.2188	0.1693	0.0004	0.0034	28.0	0.0022
Other Construction Equipment	120	0.0379	0.5045	0.2730	0.0009	0.0087	80.9	0.0034
Other Construction Equipment	175	0.0384	0.5858	0.1729	0.0012	0.0075	107	0.0035
Other Construction Equipment	500	0.0792	0.4606	0.3034	0.0025	0.0099	254	0.0071
Other Construction Equipment Composite		0.0442	0.3474	0.2021	0.0013	0.0069	123	0.0040
Other General Industrial Equipmen	15	0.0066	0.0391	0.0466	0.0001	0.0018	6.4	0.0006
Other General Industrial Equipmen	25	0.0185	0.0632	0.1170	0.0002	0.0044	15.3	0.0017
Other General Industrial Equipmen	50	0.0298	0.2099	0.1491	0.0003	0.0047	21.7	0.0027
Other General Industrial Equipmen	120	0.0436	0.4189	0.2603	0.0007	0.0120	62.0	0.0039
Other General Industrial Equipmen	175	0.0519	0.5684	0.2412	0.0011	0.0115	95.9	0.0047
Other General Industrial Equipmen	250	0.0608	0.2743	0.2679	0.0015	0.0083	136	0.0055
Other General Industrial Equipmen	500	0.1174	0.5103	0.4826	0.0026	0.0157	265	0.0106
Other General Industrial Equipmen	750	0.1939	0.8411	0.8117	0.0044	0.0262	437	0.0175
Other General Industrial Equipmen	1000	0.2627	1.1060	2.9924	0.0056	0.0579	560	0.0237
Other General Industrial Equipmen Composite		0.0747	0.4438	0.3947	0.0016	0.0130	152	0.0067
Other Material Handling Equipment	50	0.0410	0.2893	0.2073	0.0004	0.0065	30.3	0.0037
Other Material Handling Equipment	120	0.0421	0.4076	0.2541	0.0007	0.0117	60.7	0.0038
Other Material Handling Equipment	175	0.0653	0.7197	0.3067	0.0014	0.0146	122	0.0059

Other Material Handling Equipment	250	0.0642	0.2920	0.2863	0.0016	0.0088	145	0.0058
Other Material Handling Equipment	500	0.0837	0.3670	0.3482	0.0019	0.0113	192	0.0075
Other Material Handling Equipment	9999	0.3781	1.4596	3.9555	0.0073	0.0764	741	0.0341
Other Material Handling Equipment Composite		0.0696	0.4355	0.3844	0.0015	0.0124	141	0.0063
Pavers	25	0.0225	0.0768	0.1422	0.0002	0.0053	18.7	0.0020
Pavers	50	0.0574	0.2803	0.2102	0.0004	0.0114	28.0	0.0052
Pavers	120	0.0662	0.4696	0.4003	0.0008	0.0263	69.2	0.0060
Pavers	175	0.0899	0.7543	0.5238	0.0014	0.0286	128	0.0081
Pavers	250	0.1097	0.4287	0.7020	0.0022	0.0254	194	0.0099
Pavers	500	0.1263	0.5374	0.7572	0.0023	0.0284	233	0.0114
Pavers Composite		0.0717	0.4745	0.3858	0.0009	0.0220	77.9	0.0065
Paving Equipment	25	0.0152	0.0520	0.0963	0.0002	0.0036	12.6	0.0014
Paving Equipment	50	0.0469	0.2355	0.1789	0.0003	0.0095	23.9	0.0042
Paving Equipment	120	0.0503	0.3671	0.3092	0.0006	0.0200	54.5	0.0045
Paving Equipment	175	0.0687	0.5900	0.4021	0.0011	0.0219	101	0.0062
Paving Equipment	250	0.0672	0.2648	0.4289	0.0014	0.0154	122	0.0061
Paving Equipment Composite		0.0548	0.3993	0.3281	0.0008	0.0190	68.9	0.0049
Plate Compactors	15	0.0050	0.0263	0.0314	0.0001	0.0012	4.3	0.0005
Plate Compactors Composite		0.0050	0.0263	0.0314	0.0001	0.0012	4.3	0.0005
Pressure Washers	15	0.0052	0.0301	0.0368	0.0001	0.0015	4.9	0.0005
Pressure Washers	25	0.0087	0.0299	0.0555	0.0001	0.0022	7.1	0.0008
Pressure Washers	50	0.0079	0.0810	0.0843	0.0002	0.0019	14.3	0.0007
Pressure Washers	120	0.0082	0.1351	0.0897	0.0003	0.0031	24.1	0.0007
Pressure Washers Composite		0.0066	0.0531	0.0561	0.0001	0.0019	9.4	0.0006
Pumps	15	0.0089	0.0456	0.0560	0.0001	0.0024	7.4	0.0008
Pumps	25	0.0244	0.0816	0.1512	0.0002	0.0061	19.5	0.0022
Pumps	50	0.0299	0.2394	0.2138	0.0004	0.0061	34.3	0.0027
Pumps	120	0.0365	0.4656	0.3062	0.0009	0.0129	77.9	0.0033
Pumps	175	0.0499	0.7342	0.3301	0.0016	0.0142	140	0.0045
Pumps	250	0.0572	0.3604	0.3745	0.0023	0.0107	201	0.0052
Pumps	500	0.0959	0.6034	0.5922	0.0034	0.0178	345	0.0087
Pumps	750	0.1593	0.9975	0.9991	0.0057	0.0297	571	0.0144
Pumps	9999	0.4488	2.4388	6.8114	0.0136	0.1186	1,355	0.0405
Pumps Composite		0.0270	0.2617	0.2079	0.0006	0.0078	49.6	0.0024
Rollers	15	0.0074	0.0386	0.0461	0.0001	0.0018	6.3	0.0007
Rollers	25	0.0161	0.0549	0.1017	0.0002	0.0038	13.3	0.0015
Rollers	50	0.0345	0.2258	0.1776	0.0003	0.0068	26.0	0.0031
Rollers	120	0.0392	0.3801	0.2647	0.0007	0.0137	59.0	0.0035
Rollers	175	0.0553	0.6096	0.3030	0.0012	0.0156	108	0.0050
Rollers	250	0.0656	0.3037	0.3629	0.0017	0.0127	153	0.0059
Rollers	500	0.0920	0.4189	0.4752	0.0022	0.0174	219	0.0083
Rollers Composite		0.0410	0.3763	0.2501	0.0008	0.0122	67.0	0.0037
Rough Terrain Forklifts	50	0.0381	0.3041	0.2193	0.0004	0.0054	33.9	0.0034
Rough Terrain Forklifts	120	0.0369	0.4106	0.2316	0.0007	0.0087	62.4	0.0033
Rough Terrain Forklifts	175	0.0569	0.7229	0.2450	0.0014	0.0112	125	0.0051
Rough Terrain Forklifts	250	0.0671	0.3372	0.2625	0.0019	0.0084	171	0.0061
Rough Terrain Forklifts	500	0.0999	0.4838	0.3682	0.0025	0.0123	257	0.0090
Rough Terrain Forklifts Composite		0.0396	0.4430	0.2336	0.0008	0.0090	70.3	0.0036
Rubber Tired Dozers	175	0.1163	0.8019	0.6895	0.0015	0.0386	129	0.0105
Rubber Tired Dozers	250	0.1329	0.4624	0.8841	0.0021	0.0340	183	0.0120
Rubber Tired Dozers	500	0.1817	0.7490	1.1543	0.0026	0.0448	265	0.0164
Rubber Tired Dozers	750	0.2747	1.1262	1.7818	0.0040	0.0684	399	0.0248
Rubber Tired Dozers	1000	0.4321	1.7954	4.5523	0.0060	0.1202	592	0.0390
Rubber Tired Dozers Composite		0.1672	0.6620	1.0824	0.0025	0.0419	239	0.0151
Rubber Tired Loaders	25	0.0204	0.0697	0.1291	0.0002	0.0048	16.9	0.0018
Rubber Tired Loaders	50	0.0418	0.2904	0.2109	0.0004	0.0069	31.1	0.0038
Rubber Tired Loaders	120	0.0397	0.3916	0.2476	0.0007	0.0115	58.9	0.0036
Rubber Tired Loaders	175	0.0546	0.6199	0.2592	0.0012	0.0130	106	0.0049
Rubber Tired Loaders	250	0.0661	0.3041	0.3040	0.0017	0.0107	149	0.0060
Rubber Tired Loaders	500	0.1034	0.4654	0.4455	0.0023	0.0164	237	0.0093
Rubber Tired Loaders	750	0.2119	0.9532	0.9273	0.0049	0.0338	486	0.0191
Rubber Tired Loaders	1000	0.2701	1.1927	3.2272	0.0060	0.0615	594	0.0244
Rubber Tired Loaders Composite		0.0559	0.4311	0.2835	0.0012	0.0121	109	0.0050
Scrapers	120	0.0887	0.6472	0.5218	0.0011	0.0330	93.9	0.0080
Scrapers	175	0.1025	0.8864	0.5654	0.0017	0.0307	148	0.0092
Scrapers	250	0.1187	0.4642	0.7040	0.0024	0.0254	209	0.0107

Scrapers	500	0.1755	0.7332	0.9727	0.0032	0.0364	321	0.0158
Scrapers	750	0.3043	1.2657	1.7266	0.0056	0.0638	555	0.0275
Scrapers Composite		0.1495	0.7187	0.8387	0.0027	0.0335	262	0.0135
Signal Boards	15	0.0072	0.0377	0.0450	0.0001	0.0018	6.2	0.0006
Signal Boards	50	0.0332	0.2686	0.2268	0.0005	0.0063	36.2	0.0030
Signal Boards	120	0.0394	0.4898	0.3076	0.0009	0.0127	80.2	0.0036
Signal Boards	175	0.0587	0.8292	0.3433	0.0017	0.0152	155	0.0053
Signal Boards	250	0.0794	0.4676	0.4435	0.0029	0.0132	255	0.0072
Signal Boards Composite		0.0111	0.0909	0.0718	0.0002	0.0029	16.7	0.0010
Skid Steer Loaders	25	0.0167	0.0568	0.1055	0.0002	0.0040	13.8	0.0015
Skid Steer Loaders	50	0.0194	0.1977	0.1446	0.0003	0.0015	25.5	0.0017
Skid Steer Loaders	120	0.0175	0.2665	0.1240	0.0005	0.0022	42.8	0.0016
Skid Steer Loaders Composite		0.0186	0.2104	0.1354	0.0004	0.0019	30.3	0.0017
Surfacing Equipment	50	0.0171	0.1105	0.0934	0.0002	0.0035	14.1	0.0015
Surfacing Equipment	120	0.0385	0.3950	0.2869	0.0007	0.0146	63.8	0.0035
Surfacing Equipment	175	0.0386	0.4642	0.2429	0.0010	0.0119	85.8	0.0035
Surfacing Equipment	250	0.0504	0.2604	0.3275	0.0015	0.0111	135	0.0045
Surfacing Equipment	500	0.0800	0.4236	0.4893	0.0022	0.0174	221	0.0072
Surfacing Equipment	750	0.1260	0.6643	0.7833	0.0035	0.0275	347	0.0114
Surfacing Equipment Composite		0.0638	0.3590	0.3924	0.0017	0.0142	166	0.0058
Sweepers/Scrubbers	15	0.0124	0.0729	0.0870	0.0002	0.0034	11.9	0.0011
Sweepers/Scrubbers	25	0.0237	0.0808	0.1495	0.0002	0.0056	19.6	0.0021
Sweepers/Scrubbers	50	0.0308	0.2762	0.1942	0.0004	0.0033	31.6	0.0028
Sweepers/Scrubbers	120	0.0395	0.4895	0.2530	0.0009	0.0068	75.0	0.0036
Sweepers/Scrubbers	175	0.0565	0.8005	0.2201	0.0016	0.0084	139	0.0051
Sweepers/Scrubbers	250	0.0587	0.3179	0.1898	0.0018	0.0062	162	0.0053
Sweepers/Scrubbers Composite		0.0410	0.4840	0.2255	0.0009	0.0061	78.5	0.0037
Tractors/Loaders/Backhoes	25	0.0191	0.0653	0.1209	0.0002	0.0045	15.9	0.0017
Tractors/Loaders/Backhoes	50	0.0316	0.2678	0.1895	0.0004	0.0037	30.3	0.0029
Tractors/Loaders/Backhoes	120	0.0281	0.3379	0.1761	0.0006	0.0055	51.7	0.0025
Tractors/Loaders/Backhoes	175	0.0420	0.5839	0.1613	0.0011	0.0072	101	0.0038
Tractors/Loaders/Backhoes	250	0.0633	0.3389	0.2157	0.0019	0.0073	172	0.0057
Tractors/Loaders/Backhoes	500	0.1263	0.6506	0.4127	0.0039	0.0144	345	0.0114
Tractors/Loaders/Backhoes	750	0.1896	0.9760	0.6256	0.0058	0.0216	517	0.0171
Tractors/Loaders/Backhoes Composite		0.0336	0.3586	0.1857	0.0008	0.0059	66.8	0.0030
Trenchers	15	0.0099	0.0517	0.0617	0.0001	0.0024	8.5	0.0009
Trenchers	25	0.0397	0.1355	0.2509	0.0004	0.0094	32.9	0.0036
Trenchers	50	0.0687	0.3197	0.2467	0.0004	0.0140	32.9	0.0062
Trenchers	120	0.0625	0.4341	0.3863	0.0008	0.0259	64.9	0.0056
Trenchers	175	0.1009	0.8327	0.6152	0.0016	0.0338	144	0.0091
Trenchers	250	0.1247	0.4925	0.8480	0.0025	0.0309	223	0.0112
Trenchers	500	0.1661	0.7370	1.0663	0.0031	0.0400	311	0.0150
Trenchers	750	0.3147	1.3882	2.0666	0.0059	0.0766	587	0.0284
Trenchers Composite		0.0674	0.4085	0.3481	0.0007	0.0215	58.7	0.0061
Welders	15	0.0075	0.0381	0.0468	0.0001	0.0020	6.2	0.0007
Welders	25	0.0141	0.0473	0.0876	0.0001	0.0035	11.3	0.0013
Welders	50	0.0280	0.2077	0.1684	0.0003	0.0053	26.0	0.0025
Welders	120	0.0223	0.2476	0.1601	0.0005	0.0073	39.5	0.0020
Welders	175	0.0430	0.5400	0.2396	0.0011	0.0111	98.2	0.0039
Welders	250	0.0423	0.2236	0.2294	0.0013	0.0069	119	0.0038
Welders	500	0.0585	0.3040	0.2969	0.0016	0.0095	168	0.0053
Welders Composite		0.0214	0.1745	0.1373	0.0003	0.0052	25.6	0.0019

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