AIR QUALITY EMISSION INVENTORY
FOR
LYNX CAT RAIL LOADOUT FACILITY

CONDITIONAL USE PERMIT
PROJ-2024-00080

Prepared For:

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December 2024

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INTRODUCTION

LCM Development LLC (LCMD) is requesting approval of a Conditional Use Permit (CUP PROJ-2024-00173) and Zone Change to construct a railway track loop and aggregate loading facility located three miles west of Hinkley, San Bernardino County. The property is currently zoned Rural Living – 40 acre minimum (RL-40). LCMD is requesting a Zone Change to Resource Conservation. The proposed BNSF-approved rail loop and aggregate loading facility would occur within the 640-acre Assessor's Parcel Number 0496-011-07-000, approximately 2 miles north of State Route (SR) 58. The proposed "Y" track (on BLM public land) and rail loop alignment and construction of the 115- acre aggregate loading facility encompasses both private and public lands. The Proposed Project would occur on 131 acres of the 640-acre private property. The track alignment would consist of two separate single standard rail tracks converging as a "Y" into a single track across BLM Section 24 property running approximately 1,500 linear feet north into Section 13 and connecting with the 8,660 linear foot rail loop constructed on the adjacent private property in Section 13.

Rock and aggregate materials will be transported to the loadout facility by truck from the Lynx Cat Mountain Quarry, an operating granite rock quarry that is located three miles north of the of the proposed loadout facility and the BNSF main line east/west railroad track. This operation produces a variety of granite rock, construction aggregate, paving stone, and railroad ballast rock products. The quarry provides ballast rock, sub-ballast, and construction aggregates to various customers. The proposed rail loop facility would greatly expand the efficient use of railway transportation for the movement of ballast rock and construction aggregates to various public projects in the high desert and across the southwest region.

This AQ Emissions Inventory estimates the criteria and greenhouse gases (GHGs) that may be produced by proposed project's operations. The potential impacts the air emissions may have on the local and regional air quality in the vicinity are assessed in the Initial Study/Mitigated Negative Declaration.

Proposed Operational Assumptions for Air Quality Assessment

Operational Hours:
Loading of train cars would take place on approximately 200 days/year and 12 hours/day. Loading will be allowed up to 365 days/year and 24 hours/day depending on train scheduling and demand.

Production: 2.0 million tons per year (mtpy)

- 2 mtpy transported to the site and loaded into 100-ton rail cars; 166,667 tons/month; 11,000 tons/day for approximately 200 days/year.

- 50 to 182 trains per year with 110 cars (typical) depending on train scheduling and product demand;
- 103 - 65-ton off-road trucks to transport material from Lynx Cat Mountain Mine to rail loading facility;
- Round trip distance is 4.5 miles; 463.5 miles/day; 92,700 miles/year.

Table 1
Production Information

	Proposed Operations
Loading	
Trains	110 cars with 100-ton capacity each
Number of trains	50 to 182 (used 182 in AQ inventory)
Rock and Aggregate	0.5 to 2 million tons per year (mtpy) (use 2 mtpy in AQ inventory)
Days/year	200 (allowed 365/24 hrs./day to meet rail scheduling and demand
Tons/day	11,000
Hours/day	12 (up to 24 hrs./day)
Tons/hour	1,000
Two – three loaders; total 24 hours/day.	24 hours of loader time per operating day; assume one loader can load 4.5 to 5 rail cars/hour.
TRUCKING (off-road truck travel emissions included in the Lynx Cat Mountain Quarry operations)	
65-ton off-road haul trucks	2 mtpy
Days/year	200 to 300
# of trucks/day	103
Miles/year based on 4.5 miles round trip	463.5 miles/day; 92,700 miles/year

Source: Lynx Cat Rail Loop Operator, 2024

Rail Loadout Facility Equipment

Typical mobile equipment types and numbers were provided by Lynx Cat and are listed in Table 1. These are estimated equipment types, numbers, and usage. All equipment will meet the Tier 4 Final emission standards.

Table 2
Lynx Cat Rail Loadout Facility Mobile Equipment List (Typical)

Number	Equipment Description	Hrs/day (total)	Load Factor	HP	Net HP	Equipment Uses
2 - 3	CAT 988 with 18 cy bucket	24 hrs. total/ operating day	0.36	538	194	2-3 load rail cars at 24 total hrs./operating day.
3	CAT 773 Off-Road Trucks (65-ton capacity typ.)	Up to 24 hrs./day	0.39	727	283.5	Transportation of excavated material to the rail loadout. Exhaust emissions included as part of Lynx Cat Mtn. Quarry operations.
1	CAT 416 loader	12	0.37	78	29	Clean-up at facility and maintenance of roads.
1	CAT 730 6000-gal. Water Pull or Truck-	6	0.38	370	141	Water spray haul roads, stockpiles, and general dust control.
1	Service Truck	---	---	---	---	Servicing and fueling onsite equipment.
1	25kW gen set	24	0.74	15	11	Trailer and lights

Source: Lynx Cat Operations; December 2024

Thresholds of Significance

Air quality analyses for the proposed project have been conducted in accordance with the California Environmental Quality Act (CEQA) and Federal Conformity Guidelines (MDAQMD 2020) and the South Coast Air Quality Management District (SCAQMD) Air Quality Handbook with revisions through 2024. The MDAQMD has established the following significant annual emissions thresholds for determining whether the impacts from a project would be considered significant per CEQA:

Annual Emissions Thresholds of Significance (MDAQMD)

- Greenhouse Gases (CO_2e) - 100,000 tons
- Carbon monoxide (CO) – 100 tons
- Oxides of Nitrogen (NO_x) – 25 tons
- Volatile Organic Compounds (VOC) – 25 tons
- Oxides of Sulfur (SO_X) – 25 tons
- Particulate matter (PM_{10}) – 15 tons
- Particulate matter ($PM_{2.5}$) – 15 tons

Source: CEQA and Federal Conformity Guidelines (MDAQMD 2020)

County of San Bernardino "Greenhouse Gas Emissions Reduction Plan"

In September 2011, San Bernardino County adopted the Emissions Reduction Plan (GHGRP), which outlines a strategy to use energy more efficiently, harness renewable energy to power buildings, enhance access to sustainable transportation modes, and recycle waste. The 2015

update of the GHG Emissions Development Review Process updated the language the performance standard bringing it up to date with current code. In September 2021, the County adopted its GHGRP Update. Since the adoption of the County's GHGRP in 2011 and its update in 2015, the State has enacted new climate change regulations, most notably the Senate Bill (SB) 32, which provides statewide targets to reduce GHG emissions to 40 percent below 1990 levels by 2030. To ensure conformity with the latest State climate change regulations, the County has updated its 2011 and 2015 GHGRP. This 2021 GHGRP Update serves as a comprehensive roadmap to outline strategies that the County will implement to continue achieving its GHG emissions reductions into the year 2030 and beyond, thereby ensuring sustainable and healthy growth.

The 2021 GHGRP Update summarizes the County's historic and future GHG emissions and the reduction targets the County has established; the local reduction strategies that will be implemented and benefit at the community level to meet the reduction targets; and the implementation of the measures, potential funding sources, and how the GHGRP Update will be monitored and updated over time.

The County may also consider the MDAQMD guidance and incorporate all applicable standards. The MDAQMD significance threshold for GHGs (100,000 tons/yr), while higher than the County's GHG Plan of 3,000 metric tons of carbon dioxide equivalent/year (MTCO2e/yr) is more applicable to this type of project. Upon review of the Screening Tables, it was determined that the GHG reduction measures listed are related to typical long-term residential, commercial, and industrial structural development and the project activities do not apply. The MDAQMD states that, in general, emissions less than those listed in their CEQA and Federal Conformity Guidelines (February 2020) will result in less than significant impact on air quality. Thus, regional impacts from a project that adds emissions to the air basin in quantities which are less than those listed above would be less than cumulatively considerable.

OPERATIONS CRITERIA POLLUTANTS EVALUATION

For the proposed project, onsite mobile criteria and dust emissions were screened using CALEEMOD App. G, Version 2022, 1.1.3, Table G-13, Off-Road Equipment Emissions Factors; the MDAQMD Emissions Inventory Guidance; SCAQMD "Air Quality Handbook"; Emission Factors for On-Road Heavy-Heavy Duty Diesel Trucks (EMFAC2021(v1.0.2) CARB website (October 2024); AP-42 Chapters 11.19 and 13.2.2; and SCAQMD Particulate Matter Emission Factors.

Proposed operational emissions were analyzed with the following assumptions:

- All mobile equipment will meet Tier 4 Final diesel emission standards.
- Annual emissions were estimated based on 200 working days per calendar year.
- Equipment would operate approximately as estimated in Tables 1 and 2 subject to change on occasion due to train scheduling and construction demand.

- Off-road 65-ton capacity haul trucks will transport material to the rail loadout 16 hours/day - 103 trips per day. The exhaust emissions of the off-road haul trucks were evaluated in the Lynx Cat Mountain Quarry revision project.
- MDAQMD process plant dust control requirements including Rule 403.1 for fugitive dust control measures are included in the emissions' estimates.

The emissions calculations for the proposed project are provided in Appendices A and B. The estimated air pollutant emissions of the proposed project as compared to the thresholds above are summarized in Table 3. As shown, the air emissions from the proposed project are less than the annual thresholds of significance. With implementation of the MDAQMD rules, CARB's Off-Road diesel Vehicle regulations, and measures to limit emissions listed below, air quality impacts are expected to be less than significant.

Table 3
Lynx Cat Rail Loadout Facility
Estimated Air Pollutant Emissions and Significance (Proposed)
Tons/Year

	ROG	NO_x	CO	PM_{10}	$PM_{2.5}$
Site Equipment	0.09	0.38	3.79	0.10	0.09
Off-Road Haul Trucks road dust	---	---	---	6.67	1.39
Fugitive Dust (loading, un-loading, & stockpiles)	---	---	---	2.49	0.52
Vendors & Employees Exhaust (on and off-site)	0.05	0.09	0.44	0.01	0.01
Emissions Totals	**0.14**	**0.47**	**4.23**	**9.27**	**2.01**
MDAQMD CEQA Thresholds (Tons/year)	25	25	100	15	12
Significant	**No**	**No**	**No**	**No**	**No**

Scenario Year for Emissions: Proposed (2025 and thereafter) depending on train scheduling and demand.
Emission Sources: EMFAC2021(v1.0.2) CARB website (October 2024) for off-road equipment including off-road trucks; SCAQMD Emission Factors for on-road mobile vehicles; Particulate Matter Emission Factors SCAQMD, July 2010); and AP-42 Section 13.2.2 EPA, November 2006)

GREENHOUSE GASES

Per CEQA guidelines, new project emissions are treated as standard emissions, and air quality impacts are evaluated for significance on an air basin. Greenhouse gas emissions are treated differently, in that the perspective is global, not local. Therefore, emissions for certain types of projects might not necessarily be considered as new emissions if the project is primarily

population driven. Many gases make up the group of pollutants that are believed to contribute to global climate change. However, three gases are currently evaluated carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O). Nitrous oxide is not of concern due its very low emissions from this type of operation and methane is included but is also a very minor contributor.

The proposed project's GHG emissions were compared to the MDAQMD threshold of 100,000 tons/year and the screening threshold of 3,000 $MTCO_2e$ per year adopted by the County as potentially significant to global warming. Utilizing the air quality models listed above, the annual operational GHG emissions amount to approximately 483 $MTCO_2e$ per year based on 200 days of operations per year (see Table 4 and Appendix A tables). The project's estimated GHGs would not exceed the MDAQMD's or the County's thresholds and no significant GHG impacts are expected.

In a broader sense, the proposed project is providing the more favorable environmental option of transporting heavy construction material by rail instead of long-distance trucking. Local-sourced material in conjunction with the utilization of the rail load-out facility, will substantially reduce truck trips, miles driven, fuel consumption, air pollutant and GHG emissions, and degradation of public roads. To the extent that a project reduces vehicle miles driven, GHG emissions, particularly CO2, may be reduced. GHG impacts for the operation of the proposed rail loadout facility are deemed to cause a less than significant impact on climate change.

Table 4
Lynx Cat Rail Loadout Facility
Greenhouse Gas Emissions
Operational Annual Emissions ($MTCO_2e$)

Source/Phase	**CO_2**	**CH_4**
	Proposed	**Proposed**
Onsite Equipment & Generator	370	0.4
Vendor Trucks & Employees	112	0.1
Total $MTCO_2e$ per Year	**482**	**0.5**
Total $MTCO_2e$	**482.5**	
MDAQMD Threshold	100,000	
Significant	**No**	
County's GHG Plan	3,000	
Significant	**No**	

Refer to Appendix A for detailed GHG emissions estimates.

MEASURES TO CONTROL AIR EMISSIONS

The following air quality regulations and measures required to be implemented by the Lynx Cat Rail Loadout Facility operations:

1. *To limit dust production, the Project proponent must comply with Rules 402 nuisance and 403 fugitive dust, which require the implementation of Best Available Control Measures for each fugitive dust source. Compliance with Rules 402 and 403 are mandatory requirements and thus not considered mitigation measures.*

2. *Water will be sprayed on unpaved haul and access roads, active operational areas, and material stockpiles.*

3. *Roads will be treated with EPA approved dust suppressants to prevent dust as needed.*

4. *Speed limits on unpaved roads shall be 25 mph.*

5. *Loading activities shall be suspended when winds exceed 25 miles per hour.*

6. *Production shall be scheduled to minimize daily equipment operations;*

7. *Trucks in loading queues will have their engines turned off when not in use for more than 5 minutes to reduce idling and vehicle emissions in compliance with Title 13, California Code of Regulations, Section 2485 (Anti-Idling Policy);*

8. *All equipment used for transporting and loading materials must be tuned and maintained to the manufacturer's specification to maximize efficient burning of vehicle fuel.*

9. *The operator shall comply with all existing and future CARB and MDAQMD regulations related to diesel-fueled trucks, which may include among others: (1) meeting more stringent emission standards; (2) retrofitting existing engines with particulate traps; (3) use of low sulfur fuel; and (4) use of alternative fuels or equipment.*

10. *The operator shall obtain permits to construct and annually renew permits to operate the generator from the MDAQMD as applicable and be in compliance with such permits.*

Note that numerous measures to reduce air pollutant emissions as listed above also reduce GHG emissions. These measures include numbers 6 through 10.

APPENDIX A
LYNX RAIL LOOP AQ TABLES

Table A1
Lynx Cat Rail Loadout Facility (Proposed - 2 MTPY)
Onsite Loading Equipment Emissions (Typical)

Operation	Emission Factor	Units	Equation Variables 1	Equation Variables 2	PM-10 lbs/day	PM-2.5 lbs/day	ROC lbs/day	CO lbs/day	NOX lbs/day	SOX lbs/day	CO2 lbs/day	CH4 lbs/day
Equipment Exhaust Emissions			Equipment #	Operating Hrs								
PM-10 &		lbs/hr										
		lbs/hr										
PM-2.5 Loader CAT 988 (194hp)	0.03880	lbs/hr	2	12	0.931	0.857						
Loader CAT 416 (29 HP)	0.00058	lbs/hr	1	12	0.007	0.006						
Water Truck CAT 730 (142 hp)	0.00283	lbs/hr	1	6	0.017	0.016						
Gen Set 25 kW (33 hp)	0.00007	lbs/hr	1	24	0.002	0.001						
		lbs/hr										
ROG		lbs/hr					0.00					
		lbs/hr					0.00					
Loader CAT 988	0.02522	lbs/hr	2	12			0.61					
Loader CAT 416 (29 HP)	0.00380	lbs/hr	1	12			0.05					
Water Truck	0.01840	lbs/hr	1	6			0.11					
Gen Set 25 kW	0.00429	lbs/hr	1	24			0.10					
		lbs/hr					0.00					
CO		lbs/hr						0.00				
		lbs/hr						0.00				
Loader CAT 988	1.10600	lbs/hr	2	12				26.54				
Loader CAT 416 (29 HP)	0.16500	lbs/hr	1	12				1.98				
Water Truck	0.80660	lbs/hr	1	6				4.84				
Gen Set 25 kW	0.18810	lbs/hr	1	24				4.51				
		lbs/hr										
NOX		lbs/hr							0.00			
		lbs/hr							0.00			
Loader CAT 988	0.11060	lbs/hr	2	12					2.65			
Loader CAT 416 (29 HP)	0.01650	lbs/hr	1	12					0.20			
Water Truck	0.08066	lbs/hr	1	6					0.48			
Gen Set 25 kW	0.01881	lbs/hr	1	24					0.45			
		lbs/hr										
SOX		lbs/hr								0.00		
		lbs/hr								0.00		
Loader CAT 988	0.00140	lbs/hr	2	12						0.03		
Loader CAT 416 (29 HP)	0.00140	lbs/hr	1	12						0.02		
Water Truck	0.00140	lbs/hr	1	6						0.01		
Gen Set 25 kW	0.00020	lbs/hr	1	24						0.00		
		lbs/hr										
CO2		lbs/hr										
		lbs/hr										
Loader CAT 988	118.0	lbs/hr	2	12							2,832.0	
Loader CAT 416 (29 HP)	20.0	lbs/hr	1	12							240.0	
Water Truck	125.0	lbs/hr	1	6							750.0	
Gen Set 25 kW	10.2	lbs/hr	1	24							244.8	
		lbs/hr										
CH4		lbs/hr										
		lbs/hr										
Loader CAT 988	0.00520	lbs/hr	2	12								0.1248
Loader CAT 416 (29 HP)	0.00240	lbs/hr	1	12								0.0288
Water Truck	0.00560	lbs/hr	1	6								0.0336
Gen Set 25 kW	0.00100	lbs/hr	1	24								0.0240
		lbs/hr										
				Total Daily	0.96	0.88	0.86	37.88	3.79	0.06	4,067	0.21
				Total Annual Tons	0.10	0.09	0.09	3.79	0.38	0.01	370	0.40

Based on 2 million tpy loaded onto 100-ton rail cars (11,000 tons/day (one train; 182 trains/year; used 200 days /year)
Proposed 2 mtpy (typical 550,000 tons/year). 200 working days/year.
PM2.5 fraction of PM10 Exhaust is 0.92 (CEIDARS List)
Emission Sources: CALEEMOD App G; Version 2022, 1.1.3: Table G-13 - Offroad Equipment Emission Factors April 2022; all Tier 4 final. SCAQMD Emissions.
Two - three loaders load rail cars 12 hours for two loaders or 8 hours for three loaders; about 24 hours/day total.
HP are with load factors calculated per CALEEMOD.
CAT 988s with 18 cy buckets

Table A2
Lynx Cat Rail Loadout Facility
Off-Road Haul Truck Dust Emissions to Rail Loadout (Proposed Round Trip)

Operation	Emission Factor	Units	Equation Variables		Emissions		
			1		PM-10 lbs/day Unmitigated	PM-10 lbs/day Mitigated	PM-2.5 lbs/day Mitigated
Off-Road Haul Trucks			# of trips per day	vmt			
					0.0	0.0	0.0
Off-Road Haul Trucks	2.88	lbs/vmt	103	4.50	1333.5	66.7	13.9
CAT 773; 65-ton (typ)					0.0	0.0	0.0
				Total	1333.5	66.7	13.9
			Total Tons/year		133.3	6.67	1.39

Note: PM10 mitigation assumed to reduce emissions 95 percent on roads per AP-42 and SCAQMD.
Includes watering, gravel surface, dust suppressants which create hard-pack surfaces, and speed limits.

vmt = vehicle miles driven from proposed mine area to rail loadout and back (round trip approx. 4.5 miles)

Source of Emission Factor: SCAQMD Particulate Matter Emission Factors and AP-42, Chapter 13.2.2

$E=k * (s/12)^{0.9} * (W/3)^{0.45}$

E = PM10 emissions/vmt
k = constant (for PM10 = 1.5) =0.9
S - silt content (for sand & gravel plant road = 4.8%)
W = mean vehicle weight (off-road haul truck is 48.25 tons empty and 113.25 tons loaded) (Mean wt. = 80.75 tons)
Based on 2 mtpy transported from mine to loadout on 65-ton off-road trucks.
Dust related PM2.5 = 0.208 of PM10 (CEIDARS List).

Table A3
Lynx Cat Rail Loadout Facility
Vendor Trucks & Vehicle Exhaust Emissions Off-Site

Operation		Emission Factor	Units	Equation Variables 1	Equation Variables 2	Emissions PM-10 lbs/day	PM-2.5 lbs/day	ROC lbs/day	CO lbs/day	NOX lbs/day	SOX lbs/day	CO2 lbs/day	CH4 lbs/day
Truck Emissions Onsite				# of trips per day	vmt						Negl		
PM-10			lbs/mile										
PM-2.5	Vendor Trucks	0.00007	lbs/hr	2	60	0.009	0.008						
	Employees	0.00010	lbs/mile	12	60	0.072	0.066						
			lbs/mile										
ROG			lbs/mile										
	Vendor Trucks	0.00003	lbs/mile	2	60			0.003					
	Employees	0.00070	lbs/mile	12	60			0.504					
			lbs/mile										
CO			lbs/mile										
	Vendor Trucks	0.00013	lbs/mile	2	60				0.016				
	Employees	0.00610	lbs/mile	12	60				4.392				
			lbs/mile										
NOX			lbs/mile										
	Vendor Trucks	0.00356	lbs/mile	2	60					0.427			
	Employees	0.00060	lbs/mile	12	60					0.432			
			lbs/mile										
CO2			lbs/mile										
	Vendor Trucks	3.63000	lbs/mile	2	60							436	
	Employees	1.10000	lbs/mile	12	60							792	
			lbs/mile										
CH4			lbs/mile										
	Vendor Trucks	0.000001	lbs/mile	2	60								0.0001
	Employees	0.00006	lbs/mile	12	60								0.0432
			lbs/mile										
					Total	0.08	0.07	0.51	4.41	0.86	Negl	1,228	0.0433
				Total Tons/Year (proposed)		0.01	0.01	0.05	0.44	0.09	Negl	112	0.08

Emission Factors Source: SCAQMD On-Road Passenger Vehicles & Delivery Truck (scenario year 2025)

PM2.5 fraction of PM10 Exhaust is 0.92 (CEIDARS List)
vmt = miles driven for deliveries and employees estimated at 60 miles round trip.

APPENDIX B
FUGITIVE DUST EMISSIONS CALCULATIONS

APPENDIX B
LYNX CAT RAIL LOADOUT FACILITY

AIR POLLUTANT FUGITIVE DUST EMISSIONS ASSUMPTIONS AND CALCULATIONS
December 2024

Table B1
Production Information

	Proposed Operations
Loading	
Trains	110 cars with 100-ton capacity each (typical)
Number of trains per year (depending on demand)	50 to 182 (used 182 in AQ inventory)
Rock and Aggregate	0.5 to 2 million tons per year (mtpy) (use 2 mtpy in AQ inventory)
Days/year	200 (allowed 365/24 hrs./day to meet rail scheduling and demand)
Tons/day	11,000
Hours/day	11 (up to 24 hrs./day)
Tons/hour	1,000
Two to three loaders; total 22 hours/day	22 hours of loader time per operating day
TRUCKING (off-road truck travel emissions included in the Lynx Cat Mountain Quarry operations)	
65-ton off-road haul trucks	2 mtpy
Days/year	200 to 300
# of trucks/day	103
Miles/year based on 4.5 miles round trip	463.5 miles/day; 92,700 miles/year

Source: Lynx Cat Rail Loop Operator, 2024

Table B2
Lynx Cat Rail Loadout Facility Mobile Equipment List (Typical)

Number	Equipment Description	Hrs/day (total)	Load Factor	HP	Net HP	Equipment Uses
2 - 3	CAT 988 (loads rail cars)	22 hrs. total/ operating day	0.36	538	194	Loads rail cars at 22 total hrs./operating day.
3	CAT 773 Off-Road Trucks (65-ton capacity typ.)	Up to 24 hrs./day	0.39	727	283.5	Transportation of excavated material to the rail loadout. Exhaust emissions included as part of Lynx Cat Mtn. Quarry operations.

1	CAT 416 loader	8	0.37	78	29	Clean-up at facility and maintenance of roads.
1	CAT 730 6000-gal. Water Pull or Truck	6	0.38	370	141	Water spray haul roads, stockpiles, and general dust control.
1	Service Truck	varies	---	---	---	Servicing and fueling onsite equipment.
1	25kW gen set	24	0.74	15	11	Trailer and lights

Source: Lynx Cat Operations; December 2024

Table B3
Lynx Cat Rail Loadout Facility
Annual Operations
Fugitive Dust Emissions (PM_{10} & $PM_{2.5}$)
Tons/Year (Controlled)

Source	Controlled Emission Factors: (PM_{10}) ($PM_{2.5}$)	Fugitive Dust Emissions (tons/year)
	Lbs./Ton	**2 mtpy Loaded**
Loading[1]	0.0012 lbs/ton (PM_{10}) 0.00025 lbs./ton ($PM_{2.5}$)	2.4 0.5
	Lbs./day/acre	
Active Loadout & Stockpile Areas[2]	0.22 lb/day/ac (PM_{10}) 0.046 lb/day/ac ($PM_{2.5}$)	0.088 0.0184
Unpaved Roads[3] (onsite)	**Lbs./mile**	
Off-Road 65-ton haul trucks (onsite)	0.144 lbs./mi (PM_{10}) 0.03 lbs./mi ($PM_{2.5}$)	6.67 1.39
Totals	---	9.16 (PM_{10}) 1.91 ($PM_{2.5}$)

Source: Lynx Cat & Lilburn Corporation 2024. See Appendix A for Excel tables.

Notes:

1. Loading includes two (2) operations, one drop or unload by trucks into stockpiles and one loading rail cars. Assume 90% control based on water spraying material.
2. Active loadout areas/stockpiles at any one time: 4 acres. Assume 80% control with water spraying; active 200 days/year.
3. Unpaved roads site includes off-road haul truck movement from the mine site to the loadout facility (approx. 4.5 miles round trip). Estimated controls 95% with watering, dust palliatives to create hard-pack surface, and speed limits.

Silt content (s) = 1.5% (MDAQMD for crushed limestone rock)
Moisture Content of ore/overburden = 0.5% (worst case per *MDAQMD*)
PM10 = 0.489 of Total Particulate Matter
PM2.5 = 0.208 of PM 10
Source: CEIDARS List SCAQMD 2006

FUGITIVE DUST EMISSIONS ESTIMATES

Unloading (Dropping Material) from Trucks and Loading Rail Cars

Emissions from the loading/dropping activities at site include unloading trucks and loading rail cars.

EF (PM10) = 0.024 lbs/ton (uncontrolled)
EF (PM10) = 0.0024 lbs./ton (controlled with water spraying, dust suppressants, and speed limits on roads – 90% est.)
EF (PM2.5) with control = 0.0024 * 0.208 = 0.0005 lbs./ton

Source: AP-42 Section 13.2.4 (EPA, November 2006)

EF (PM10) = k * (0.0032)* (U/5)^1.3 / (M/2)^1.4 lbs/ton

U (mean wind speed) = 12 mph (SCAQMD default factor)
Moisture content (M) = 0.5% (Dry; worst case per MDAQMD)
k (PM10) = 0.35

EF (PM10) = 0.35 * (0.0032) * (12/50^1.3 / (0.5/2)^1.4
= 0.00112 * 3.12/0.1436
= 0.024 lbs/ton (uncontrolled)

EF (PM10) with control = 90% (SCAQMD fugitive dust mitigation measures including limiting vehicle and equipment speeds to 15 mph, applying dust suppressants, water spraying active areas and roadways)

PM10 & PM2.5 Emissions:

- Material unloaded from trucks to stockpiles (11,000 tpd; 2 mtpy)
- Material loaded into rail cars (11,000 tpd)
- Approx. 182 days/year (used 200 days/year)

Emissions (PM10) = 22,000 tpd * 0.0024 lbs/ton = 52.8 lbs/day x 200 days/year = 5.28 tons/year (PM10 controlled)
Emissions (PM2.5) = 5.28 tpy x 0.208 = 1.1 tpy (PM2.5 controlled)

Active Loading and Stockpile Areas:

Loading and Active Stockpiles areas - 4 acres

EF Source: MDAQMD Mineral Guidance 2013 Section G
EF= J * 1.7 * sl / 1.5 * (365-P) / 235 * I / 15 lb./day/ac

J = 0.5 for PM_{10}
J = 0.2 for $PM_{2.5}$
Silt loading (sl) = 1.5% for rock material
P = ave. days of precipitation (default = 20 days) MDAQMD
I = windy hours greater than 12 mph = 13.3% (MDAQMD default)

EF(PM10) =0.5 * 1.7 *1.5/1.5 * 1.47 * 0.89 = 1.11 lbs/day/ac (uncontrolled)

EF(PM10) at 80% control with water spraying = 0.22 lbs./day/ac (controlled)

EF(PM2.5) = 0.046 lbs./day/ac (controlled)

Haul Road Dust

Refer to Table A2 for total dust emissions.

Table B4
Lynx Cat Mountain Quarry
Off-Road Haul Trucks Road Dust

Parameters	Planned
CAT 773 (typ); off-road 65-ton haul truck	
Truck Weight (tons): CAT 773 65-ton	Empty: 48.25 tons Full: 113.25 tons Average: 80.75 tons
Production	2 mtpy
Truck Trips/Day	103
Days/Year	200
Vehicle miles traveled (VMT) (round trip)	4.5
Miles/Year	92,700
Control Factor	95%

Emission Factor (PM_{10}) = K * (s/12)^a * (W/3)^b

Source: AP-42, Section 13.2.2, Unpaved Roads (11-2006 & SCAQMD)

K = 1.5 for PM_{10} (lbs/VMT)
s (silt content) = 4.8% (from sand & gravel road; AP-42 and MDAQMD)
W (ave. truck wt.) = 80.75 tons for 65-ton trucks
a = 0.9
b = 0.45

EF (PM_{10}) = 1.5 * $(4.8/12)^{0.9}$ * $(80.75/3)^{0.45}$ lbs/VMT
= 1.5 * 0.438 * 4.39 = **2.88 lbs./VMT (uncontrolled for 65-ton trucks)**

Dust Control Estimates

Water spray – 61% (SCAQMD)
15 mph speed limit – 57% (SCAQMD)
Use of approved dust suppressant on unpaved roads and work areas – 84% (SCAQMD)
Gravel bed on dirt roads.

Used 95% for unpaved roads and areas.