

ENGINEERING EVALUATION

Andreini Brothers, Inc.
151 Main Street, Half Moon Bay, CA 94019
Plant No. 11468
Application No. 692505

BACKGROUND

Andreini Brothers, Inc. has applied for a Permit to Operate for the following:

**S-9 Portable Crusher with Chassis Hopper and Discharge Conveyor, Maximum 150 tons/hr, 48,000 tons/year of concrete, abated by A-4 Water Spray Bar
Make: Trakpactor; Model: XH320**

**S-10 Portable Prime Diesel Engine, Powering S-9 Portable Crusher with Chassis Hopper and Discharge Conveyor
Make: Scania; Model: DC09085A, 345 HP
Exempt Via CARB DOORS Registration #168248 and Regulation 2-1-113.1.3**

Abated by

A-4 3 Integral Water Spray Bars for S-9 Chassis Hopper, Crush Box, and Discharge Conveyor

The Andreini Brothers facility includes an administrative/sales office, portable concrete crushing operations, and miscellaneous maintenance, storage, and parking areas. The facility's portable concrete crushing operations (S-9) occur on the same legal lot as a garden material screening operation associated with the adjacent Half Moon Bay Building and Garden, Inc. facility (HMBBG, Facility #1999). The shared lot where concrete crushing and soil screening activities take place has historically been referred to as the "Resource Recovery Center".

Concrete and asphalt rubble materials are loaded from the existing S-1 Rubble Concrete Stockpile into S-9's chassis hopper, using a front end loader. Upon reaching S-9's chassis hopper, the concrete rubble is wetted by built-in A-4 Spray Bars. Once inside S-9's crush box, four hammers crush the material into aggregate while also wetting the material using two additional integral spray bars. The crushed concrete exits S-9 via an integral discharge conveyor belt where the crushed material is wetted by two built-in spray bars while being transferred to a standalone hopper, portable screener, and the discharge conveyor belt that are owned by HMBBG. The crushed concrete is sprayed once again while being transferred to the existing S-2 Crushed Concrete Stockpile. Once the product stored in S-2 has been purchased, it is loaded into a truck using a loader and hauled off-site.

Andreini Brothers registered S-9 Portable Crusher through California Air Resources Board's (CARB) Portable Equipment Registration Program (PERP) Permit #168248. Andreini Bros requested to operate at multiple locations within the Air District. Andreini

Bros will maintain a valid PERP registration to operate at other sites not owned and/or operated by Andreini Bros, for less than 12 consecutive months, within the Air District. Otherwise, S-9 crusher will be permitted as a stationary source at the shared Resources Recovery Center with HMBBG. As a new stationary source, S-9 operates within 1000 feet of a K-12 school site and requires a public notice per Regulation 2-1-412.

S-9 Portable Crusher is powered by S-10 Portable Prime Diesel Engine. S-10 Portable Prime Diesel Engine is registered with CARB’s In-Use Off-Road Diesel-Fueled Fleets (DOORS) program under Registration #168248. S-10 is exempt from permitting pursuant to Regulation 2-1-113.1.3, which states that vehicles or equipment temporarily or permanently attached to a vehicle are not considered to be a part of that vehicle unless the combination is a vehicle as defined in the Vehicle Code. Since S-10 is registered with CARB’s DOORS program, it is considered a part of a vehicle and is therefore exempt from the requirements of Regulation 2-1-302. S-9 Portable Crusher’s crushing operation is not exempt from permitting requirements of Regulation 2-1-302.

EMISSIONS

Tables 1 and 2 summarize the project emissions from particulate matter 10 microns in size (PM₁₀) and particulate matter 2.5 microns in size (PM_{2.5}).

S-9 Portable Crusher with Chassis Hopper and Discharge Conveyor

Emission factors for controlled Fines Crushing and Tertiary Crushing were obtained from AP-42 Chapter 11.19.2 “Crushed Stone Processing and Pulverized Mineral Processing”. Emission factors from drop operations into storage piles are derived from Chapter 13.2.4 “Aggregate Handling and Storage Piles” of AP-42. Emissions are assumed to be 70% controlled due to the use of water spray bars that suppress dust from the crushing operation and drop points. The following table shows the emission factors used to calculate emissions for S-9.

Basis:

- Operating Schedule: 8 hours/day, 5 days/week, and 52 weeks/year.
- Max throughputs of 150 tons/hour, 1,200 tons/day, and 48,000 tons/year.
- Assume rock is processed several times during a closed circuit operation that performs tertiary crushing and recirculates the tertiary crushed concrete back to the crusher. The tertiary crushed concrete is then re-crushed into fine concrete.
- Includes two drop operations from the loader to the crusher’s chassis hopper and from the crusher to a stockpile when operating without the portable screening skid.

Table 1. S-9 PM₁₀ Emissions Controlled by A-4 Water Spray

Source	Controlled Emission Factor (lb/ton)	Hourly PM ₁₀ Emissions (lbs/hour)	Daily PM ₁₀ Emissions (lbs/day)	Annual PM ₁₀ Emissions (lbs/year)	Annual PM ₁₀ Emissions (tons/year)
S-9 Tertiary Crushing Emissions	0.00054	0.08	0.6	26	0.013

S-9 Fines Crushing Emissions	0.0012	0.18	1.4	58	0.029
S-9 Drop Operation	0.0049/per drop	1.5	12.0	563	0.240
S-9 Total		1.8	14.1	563	0.281

Table 2. S-9 PM_{2.5} Emissions Controlled by A-4 Water Spray

Source	Controlled Emission Factor (lb/ton)	Hourly PM ₁₀ Emissions (lbs/hour)	Daily PM _{2.5} Emissions (lbs/day)	Annual PM _{2.5} Emissions (lbs/year)	Annual PM _{2.5} Emissions (tons/year)
S-9 Tertiary Crushing Emissions	0.00010	0.015	0.1	5	0.002
S-9 Fines Crushing Emissions	0.00007	0.011	0.1	3	0.002
S-9 Drop Operation	0.00076	0.227	1.8	73	0.036
S-9 Total		0.252	2.0	81	0.040

S-9 Vehicle Road Dust Emissions

For vehicles traveling on unpaved surfaces at industrial sites, emissions are estimated from the following equation from AP-42 Chapter 13.2.2 **Unpaved Roads**:

$$E = k(s/12)^a(W/3)^b$$

Where:

E = size specific emission factor (lb/VMT)

k = 1.5 for PM₁₀; 0.15 for PM_{2.5}

a = 0.9

b = 0.45

s = surface material silt content % for stone quarrying and processing; 8.3

W = 40 tons for max weight vehicles - 15 tons for empty vehicles = 25 tons of material per truck

Emissions for vehicles traveling on paved roads were estimated using the following equation from AP-42 Chapter 13.2.1 **Paved Roads**:

$$E = k(sL)^{0.91}(W)^{1.02}$$

Where:

E = size specific emission factor (lb/VMT)

k = 0.0022 for PM₁₀; 0.00054 for PM_{2.5}

sL = surface material silt content % for stone quarrying and processing; 8.3

W = 40 tons for max weight vehicles - 15 tons for empty vehicles = 25 tons of material per truck

Table 3 below shows the emission rates summary for PM₁₀ and PM_{2.5} dust generated by vehicle traffic.

Basis:

- 40 tons of fully loaded truck – 15 tons empty weight = 25 tons of material per truck
- Vehicle miles traveled per day (VMT/day) = 1,200 ton/day / 25 tons of material per truck = 48 trucks/day * 0.076 miles from plant entrance to S-9 (round trip)
- Vehicle miles traveled per year (VMT/year) = 48,000 ton/year / 25 tons of material per truck = 1,920 trucks/year * 0.076 miles (round trip) from plant entrance to S-9
- Front end loaders round trip of 0.076 miles of unpaved portions of the site
- Loadout trucks round trip of 0.068 miles of unpaved roads and 0.38 miles of paved roads
- Vehicle fugitive road dust emissions are abated by water sprays which provides 70% control efficiency

Table 3. Vehicle Traffic Emissions

Vehicle	Road Type	Round Trip Distance (mi/truck trip)	# of Truck Trips/Day	# Truck Trips/Year	VMT /day	VMT/ year	Emission Factor (lb/VMT)	Hourly Emission Rate (lb/hour)	Daily Emission Rate (lb/day)	Annual Emission Rate (lb/year)	Annual Emission Rate (ton/year)
Front End Loaders	Unpaved	0.076	48	1,920	3.64	145.92	2.795	0.38	3.1	121.9	0.061
Loadout Trucks	Unpaved	0.068	48	1,920	3.27	130.91	2.795	0.34	2.7	109.8	0.055
Loadout Trucks	Paved	0.3788	48	1,920	18.18	727.27	0.402	0.27	2.2	87.8	0.044
PM₁₀ Total Emissions								0.99	8.0	319.5	0.160
Front End Loaders	Unpaved	0.076	48	1,920	3.64	145.92	0.279	0.04	0.3	12.2	0.006
Loadout Trucks	Unpaved	0.068	48	1,920	3.27	130.91	0.279	0.03	0.3	10.9	0.005
Loadout Trucks	Paved	0.3788	48	1,920	18.18	727.27	0.099	0.07	0.5	21.6	0.011
PM_{2.5} Total Emissions								0.14	1.1	44.7	0.022

S-10 Portable Prime Diesel Engine, Powering S-9 Portable Crusher with Chassis Hopper and Discharge Conveyor

Basis:

- Since S-10 is exempt, emissions from S-10 are not included in the facility's cumulative increase but are included in the facility's potential to emit (PTE).
- ¹Conservative Assumption: All PM emissions are PM₁₀=PM_{2.5}.
- POC emission factors are from the EPA engine family EY9XL09.3DAA.
- PM₁₀, PM_{2.5}, and CO emission factors were not available from the EPA engine family. Therefore, the Air District's BACT limit will be used to evaluate PM and CO emissions for tier 4 engines.

- ²SO₂ emission factor from AP-42 Table 3.4-1, SO₂ (15 ppm) = 0.00809*0.0015 lb SO₂/bhp-hour = 0.000012 lb/bhp-hr * 454 g = 0.006 g/bhp-hr
- Operating hours for S-10 are 8 hours/day, 5 days/week, 52 weeks/year = 2,080 hours/year

Table 4. Total Combustion Emissions for S-10, 350 BHP

Pollutant	Emission Factor (g/bhp-hour)	Max Daily Emissions (lbs/day)	Annual Emissions (lbs/year)	Annual Emissions (tons/year)
NO _x	0.23	1.4	371	0.185
POC	0.01	0.04	11	0.006
CO	2.60	16.0	4,173	2.087
¹ PM ₁₀	0.01	0.1	16	0.008
¹ PM _{2.5}	0.01	0.1	16	0.008
SO ₂	0.006	0.04	9.6	0.005

CUMULATIVE INCREASE

Table 8 summarizes the cumulative increase in criteria pollutant emissions that will result from this application. The previous S-5 Crusher and S-7 Diesel Engine, permitted under Application #17583, were shut down. Only S-1 Rubble Concrete Stockpile and S-2 Crushed Concrete Stockpile remain as permitted sources at the facility.

Table 5. Cumulative Emissions Increase, Post 4/5/91

Pollutant	Existing Cumulative Increase (tons/year)	Application Emissions (tons/year)	Total Cumulative Increase (tons/year)
POC	0.000	0.000	0.000
NO _x	0.000	0.000	0.000
SO ₂	0.000	0.000	0.000
CO	0.000	0.000	0.000
PM ₁₀	0.254	0.441	0.695
PM _{2.5}	0.000	0.063	0.063

HEALTH RISK ASSESSMENT (HRA)

Pursuant to Regulation 2-5-110, a project shall not be subject to this rule if, for each toxic air contaminant (TAC), the total project emissions are below the acute and chronic trigger levels listed in Table 2-5-1 of this regulation. A project includes all new or modified sources of TACs within a 5-year period. HMBBG’s portable screener, standalone hopper, and standalone conveyors are permitted under Application #703018. The portable screener and portable hopper/conveyor operate with Andreini Brothers’ portable crusher. Therefore, both applications are considered one project.

Table 6. Source Specific Toxic Air Contaminant Emissions

Application #	Source #	Pollutants TAC		Toxic Emissions		Toxics Trigger Level (TL) in Table 2-5-1			
		Name	CAS #	Hourly (lb/hour)	Annual (lb/year)	Acute TL (lb/hour)	Exceeds TL (Yes/No)	Chronic TL (lb/year)	Exceeds TL (Yes/No)
692505	9 - Crusher	Arsenic	7440-38-2	1.12E-05	3.57E-03	8.80E-05	No	1.6E-03	Yes
		Beryllium	7440-41-7	6.07E-07	1.94E-04	--	No	3.4E-02	No
		Cadmium	7440-43-9	5.31E-07	1.70E-04	--	No	1.9E-02	No
		Total Chromium	18540-29-9	2.84E-05	9.09E-03	--	No	--	--
		Chromium Hexavalent	--	2.51E-06	8.02E-04	--	No	5.1E-04	Yes
		Copper	7440-50-8	1.54E-05	4.93E-03	4.4E-02	No	--	No
		Lead	7439-92-1	6.61E-06	2.11E-03	--	No	2.9E-01	No
		Manganese	7439-96-5	1.88E-04	6.03E-02	--	No	3.5E+00	No
		Nickel	7440-02-0	1.23E-05	3.94E-03	8.80E-05	No	3.1E-01	No
		Selenium	7782-49-2	5.31E-07	1.70E-04	--	No	8.0E+00	No
	Crystalline Silica (respirable)	7631-86-9	--	5.12E+01	--	No	1.20E+02	No	
	9 – Vehicle Road Dust	Crystalline Silica (respirable)	7631-86-9	--	1.09E+01	--	No	1.20E+02	No
703018	14 – Portable Screening Skid	Arsenic	7440-38-2	2.0E-06	6.3E-04	8.80E-05	No	1.6E-03	No
		Beryllium	7440-41-7	1.3E-07	4.1E-05	--	No	3.4E-02	No
		Cadmium	7440-43-9	5.9E-08	1.9E-05	--	No	1.9E-02	No
		Total Chromium	18540-29-9	4.0E-06	1.3E-03	--	No	--	No
		Chromium Hexavalent	--	4.0E-07	1.3E-04	--	No	5.1E-04	No
		Copper	7440-50-8	1.7E-06	5.5E-04	4.4E-02	No	--	No
		Lead	7439-92-1	3.2E-06	6.9E-04	--	No	2.9E-01	No
		Manganese	7439-96-5	2.1E-05	6.7E-03	--	No	3.5E+00	No
		Nickel	7440-02-0	4.1E-06	1.3E-03	8.80E-05	No	3.1E-01	No
		Selenium	7782-49-2	1.1E-07	3.6E-05	--	No	8.0E+00	No
		Mercury	7439-97-6	7.2E-10	2.3E-07	2.7E-04	No	2.1E-01	No
	Crystalline Silica (respirable)	7631-86-9	--	1.36E+01	--	No	1.20E+02	No	
	15 – Soil Stockpiles	Lead - Fugitive	7439-92-1	5.7E-06	5.8E-03	--	No	2.9E-01	No
		Crystalline Silica (respirable) - Fugitive	7631-86-9	2.3E-02	2.3E+01	--	No	1.20E+02	No
		Lead – Road Dust	7439-92-1	5.2E-05	1.7E-02	--	No	2.9E-01	No
		Crystalline Silica (respirable) – Road Dust	7631-86-9	6.6E-02	2.1E+01	--	No	1.20E+02	No
			Arsenic	7440-38-2	1.2E-07	3.9E-05	8.80E-05	No	1.6E-03
		Beryllium	7440-41-7	7.8E-09	2.5E-06	--	No	3.4E-02	No

16 – Portable Hopper/Conveyer or	Cadmium	7440-43-9	3.6E-09	1.1E-06	--	No	1.9E-02	No
	Total Chromium	18540-29-9	2.4E-07	7.8E-05	--	No	--	No
	Chromium Hexavalent	--	2.5E-08	7.9E-06		No	5.1E-04	No
	Copper	7440-50-8	1.0E-07	3.3E-05	4.4E-02	No	--	No
	Lead	7439-92-1	2.0E-07	4.2E-05	--	No	2.9E-01	No
	Manganese	7439-96-5	1.3E-06	4.1E-04	--	No	3.5E+00	No
	Nickel	7440-02-0	2.5E-07	8.0E-05	8.80E-05	No	3.1E-01	No
	Selenium	7782-49-2	6.9E-09	2.2E-06	--	No	8.0E+00	No
	Mercury	7439-97-6	4.4E-11	1.4E-08	2.7E-04	No	2.1E-01	No
	Crystalline Silica (respirable)	7631-86-9	1.9E-03	5.7E-01	--	No	1.20E+02	No

Table 7. Total Project Toxic Air Contaminant Emissions

TAC	CAS #	Hourly Emissions (lbs/hour)	Acute Trigger Level (lbs/hour)	Trigger?	Annual Emissions (lbs/year)	Chronic Trigger Level (lbs/year)	Trigger?
Arsenic	7440-38-2	1.3E-05	8.80E-05	No	4.2E-03	1.6E-03	Yes
Beryllium	7440-41-7	7.4E-07	--	No	2.4E-04	3.4E-02	No
Cadmium	7440-43-9	5.9E-07	--	No	1.9E-04	1.9E-02	No
Total Chromium	18540-29-9	6.8E-06	--	No	1.0E-02	--	No
Chromium Hexavalent	--	2.9E-06	--	No	9.4E-04	5.1E-04	Yes
Copper	7439-92-1	1.7E-05	4.4E-02	No	5.5E-03	--	No
Lead	7439-96-5	6.8E-05	--	No	2.5E-02	2.9E-01	No
Manganese	7440-02-0	2.1E-04	--	No	6.7E-02	3.5E+00	No
Nickel	7782-49-2	1.7E-05	8.80E-05	No	5.3E-03	3.1E-01	No
Selenium	7631-86-9	6.5E-07	--	No	2.1E-04	8.0E+00	No
Mercury	7439-97-6	7.6E-10	2.7E-04	No	2.4E-07	2.1E-01	No
Respirable Crystalline Silica	7440-38-2	--	--	No	1.15E+02	1.2E+02	No

A health risk assessment (HRA) was triggered for arsenic and hexavalent chromium emissions.

HRA Results

Results from this HRA indicate that the maximum project cancer risk is estimated at 1.2 in a million, the maximum project chronic hazard index (HI) is estimated at 0.085, and the project acute HI is estimated at 0.36. Since the estimated project cancer risk does not exceed 10 in a million and hazard indices do not exceed 1.0, this proposed project complies with the Air District’s Regulation 2-5-302 project risk requirements, for projects not located in an Overburdened Community, as defined in Regulation 2-1-243. See HRA Report for more details.

Toxics Best Available Control Technology (TBACT)

In accordance with the Air District’s Regulation 2-5-301, each individual sources do not require TBACT because the estimated source risk does not exceed a cancer risk of 1.0 in a million and a chronic HI of 0.20.

Table 8. Individual Source Risks

Source ID	Resident Cancer Risk (chances in a million)
S-9 Crusher	1.0
S-14 Portable Screening Skid	0.15
S-15 Stockpiles (soil/waste byproduct)	0.0050
S-16 Portable Hopper/Conveyor	0.015

Table 9. HRA Results

Maximally Exposed Receptor	Maximum Cancer Risk	Maximum Chronic Hazard Index	Maximum Acute Hazard Index
Resident	1.2 chances in a million	0.085	--
Off-site worker	0.078 chances in a million	0.035	--
Student (Half Moon Bay High School)	0.064 chances in a million	0.015	--
Point Max Impact	--	--	0.36

BEST AVAILABLE CONTROL TECHNOLOGY (BACT)

Per Regulation 2-2-301, BACT is triggered for any new or modified source with the potential to emit (PTE) 10 pounds or more per highest day of precursor organic compounds (POC), non-precursor organic compounds (NPOC), nitrogen oxides (NOx), carbon monoxide (CO), sulfur dioxide (SO₂), PM₁₀, or PM_{2.5} emissions.

Table 1 shows abated PM emissions. Unabated PTE PM₁₀ emissions from S-9’s crushing operation and is subject to BACT. Table 6 shows that CO emissions from S-10 trigger BACT. However, S-10 is not subject to BACT because it is an exempt source.

A BACT analysis was conducted to determine what is currently considered BACT for portable aggregate processing and concrete/asphalt crushing recycling operations.

See attached *Appendix A – “BACT Determination for Portable Aggregate Processing and Concrete/Asphalt Crushing Recycling Operations”* for the discussion of findings and determination.

Requiring more stringent emission limits than what has been deemed achieved in practice is not considered cost effective. BACT achieved in practice for this project has been determined to be the use of a water spray system (A-4) and meeting the opacity requirements of Regulation 6-1-301 and the Air District’s Permit Handbook template

permit conditions for water spray systems. Regulation 6-1-301 require S-9 not to emit visible emissions exceeding Ringelmann 1 and 20% opacity for more than 3 minutes in any one hour period. Since water sprays are used to control 70% of PM emissions, S-9 is expected to be capable of meeting the visible emissions limits of Ringelmann 0.5, or 10% opacity as required in the permit conditions for water spray systems in the Permit Handbook.

OFFSETS

Offset must be provided for any new or modified source at a facility that will have the potential to emit more than 10 tons per year of NOx or POC, as specified in Regulation 2-2-302; 100 tons per year or more of PM_{2.5}, PM₁₀ or sulfur dioxide, as specified in Regulation 2-2-303.

Table 10. Potential to Emit for Facility 11468

Pollutant	Existing Annual Emissions (TPY)	Application Annual Emissions* (TPY)	Facility Annual Emissions* (TPY)	Offset Requirement (TPY)	Offset Required
NOx	0.000	0.185	0.185	>10	N
POC	0.000	0.006	0.006	>10	N
CO	0.000	2.086	2.086	-	N
PM ₁₀	0.254	0.449	0.703	≥100	N
PM _{2.5}	0.000	0.071	0.071	≥100	N
SO ₂	0.000	0.005	0.005	≥100	N

Since the facility Potential to Emit (PTE) levels of NOx, POC, PM₁₀, PM_{2.5}, and SO₂ are below the offsets trigger levels specified in Regulation 2-2, offsets are not required.

STATEMENT OF COMPLIANCE

S-9 Portable Crusher with Chassis Hopper and Discharge Conveyor

Regulation 1

The facility will be subject to the public nuisance requirements of Regulation 1-301, which states the following:

“No person shall discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance or annoyance to any considerable number of persons or the public; or which endangers the comfort, repose, health or safety of any such persons or the public, or which causes, or has a natural tendency to cause, injury or damage to business or property. For purposes of this section, three or more violation notices validly issued in a 30-day period to a facility for public nuisance shall give rise to a rebuttable presumption that the violations resulted from negligent conduct.”

The facility is expected to meet the requirements of Regulation 1-301.

Regulation 2, Rule 5

Pursuant to Regulation 2-5-110, the provisions of this rule are not subject to projects with an increase in emissions less than the trigger levels listed in Table 2-5-1.

The project exceeded the chronic trigger levels for arsenic and hexavalent chromium emissions. Therefore, the provisions of this rule apply to the project. An HRA was conducted, and the project passed the project risk requirements of Regulation 2-5-302.

Regulation 2, Rule 6

The facility is not expected to exceed 100 tons per year of any regulated air pollutant, nor is the facility expected to exceed 10 tons per year of a single hazardous air pollutant (HAP) or 25 tons per year of a combination of HAPs. Therefore, the facility is not a major facility and is not subject to the requirements of Regulation 2-6.

Regulation 6, Rule 1

Pursuant to Regulation 6-1-301 – *Ringelmann No. 1 Limitation* and 6-1-302 – *Opacity Limitation*, a person shall not emit from any source exceeding Ringelmann 1 and 20% opacity for more than 3 minutes in any one hour period.

Furthermore, pursuant to Regulation 6-1-305 – *Visible Particles*, a person shall not emit particles from any operation in sufficient number to cause annoyance to any other person, which particles are large enough to be visible as individual particles at the emission point or of such size and nature as to be visible individually as incandescent particles. Section 6-1-305 shall only apply if such particles fall on real property other than that of the person responsible for the emission.

Regulation 6-1-311.1 – *Total Suspended Particulate (TSP) Weight Limits* states that a person shall not discharge more than 22.6 lb/hour of TSP particulate matter from sources with a process rate of greater than 220,462 lb/hr and less than 330,693 lb/hr. S-9 processes 150 tons/hr, or 300,000 lb/hr, of material and emits an abated emission rate of 3.8 lb/hr of TSP emissions.

Section 6-1-311.2 does not apply to S-9 because the PTE of S-9 TSP emissions is less than 1,000 kg/year.

The operation of S-9 meets the requirements of all the applicable sections of Regulation 6-1, since the operation will be controlled by water spray devices.

Lastly, S-9 will be subject to the monitoring and recordkeeping requirements of Regulation 6-1-503 and 6-1-506.

National Emissions Standards for Hazardous Air Pollutants (NESHAP)

NESHAP is not applicable.

New Source Performance Standards (NSPS)

40 CFR Part 60 Subpart OOO – *Standards of Performance for Nonmetallic Mineral Processing Plants*

40 CFR 60.670(c)(2) states that Subpart OOO is not applicable to S-9 because S-9 is a portable concrete crushing operation.

S-10 Portable Prime Diesel Engine

S-10 Portable Prime Diesel Engine is registered with CARB's In-Use Off-Road Diesel-Fueled Fleets (DOORS) program under Registration #168248. S-10 is exempt from permitting pursuant to Regulation 2-1-113.1.3, which states that vehicles or equipment temporarily or permanently attached to a vehicle are not considered to be a part of that vehicle unless the combination is a vehicle as defined in the Vehicle Code. Since S-10 is registered with CARB's DOORS program, it is considered a part of a vehicle and is therefore exempt from the requirements of Regulation 2-1-302.

California Environmental Quality Act (CEQA)

In 2008, Andreini Brothers and Half Moon Bay Building and Garden Supply submitted an amendment to their existing Coastal Development Permit/Conditional Use Permit (#08-00) to the CEQA Lead Agency the City of Half Moon Bay (City), to include a crushing and recycling of concrete, asphalt, and rock operation at the existing Resource Recycling Center in Half Moon Bay under application APN 056-230-240 (Concrete and Asphalt Recycling Facility Project, State Clearinghouse #2007112007). The project site is jointly owned by the Half Moon Bay Building and Garden Supply and Andreini Brothers Construction (Applicant). The 8.84-acre project site is currently permitted to have a 36-space parking lot to serve the Bel Moon Industrial Park and operate a Resource Recovery Center (soil screening operation) that creates a topsoil product. The soil screening operation occupies approximately 2.7 acres of the 8.84-acre project site.

The proposed project (Project) would allow the operation of a concrete and asphalt recycling unit on an industrially zoned parcel. This parcel currently contains a Resource Recovery Center (soils screening operation) that was initially granted by the Planning Commission on January 25, 2001, and has been operating continuously without incident or impact since 2002. The Applicant could load the concrete crusher onto a truck and take it to larger coast-side demolition projects and crush used concrete and asphalt on-site for reuse. When the concrete crusher is not in use, it is stored on the project site in the soil processing area.

The City reviewed the Initial Study and Mitigated Negative Declaration (IS/MND) for the proposed project and determined that based on the environmental evaluation presented in the IS/MND, the Project would not cause significant adverse effects related to aesthetics, air quality, agricultural resources, hazards and hazardous materials, hydrology/water quality, land use/planning, mineral resources, noise, population/housing, public services, recreation, transportation/traffic, and utilities/service systems. In addition, substantial adverse effects on humans, either direct or indirect, would not occur.

On January 15, 2008, the City of Half Moon Bay City Council approved the Project and determined that: the project will not have a significant impact on the environment; a Mitigated Negative Declaration was prepared for this project pursuant to the provisions of CEQA; and mitigation measures were made a condition of the approval of the project. On January 17, 2008, the Project's Notice of Determination was posted on the State Clearinghouse (<https://ceqanet.lci.ca.gov/2007112007/2>). The Air District has independently reviewed and considered the City's environmental analysis. The Air District has determined that the Project will not have a significant effect on the environment. As the project will not have a significant effect, CEQA does not require the Air District to consider alternatives or mitigation measures to avoid or minimize any such impacts. Since the Air District is not imposing any mitigation measures under CEQA, CEQA does not require the adoption of a mitigation monitoring or reporting plan. With the implementation of the permit conditions outlined in this engineering evaluation and the operational requirements in the IS/MND, no further CEQA review is required for this project.

Prevention of Significant Deterioration (PSD)

This application is not part of a PSD project as defined in Regulation 2-2.

Public Notification (Regulation 2-1-412)

This project is within 1,000 feet of Half Moon Bay High School. Therefore, this project (Applications 692505 Andreini Bros and 703018 Half Moon Bay Building and Garden Supply) is subject to the school public notification requirements of Regulation 2-1-412. Both applications will undergo one combined public notice together.

A public notice will be sent to all parents or guardians of students enrolled at the schools listed above within ¼ mile of the source and all businesses and residents within 1000' of the facility. There will be a 30-day public comment period.

PERMIT CONDITIONS

Permit Condition #100588 for S-9

S-9 Portable Crusher with Chassis Hopper and Discharge Conveyor

This permit authorizes operation of Source S-9 Portable Crusher at Facility #11468 only. S-9 Portable Crusher may be operated at another location only in accordance with some other valid legal authorization, such as a valid PERP registration.

1. The owner/operator of S-9 shall not exceed the following throughput limits of material processed at this portable concrete/asphalt crushing plant:

Concrete/Asphalt Rubble	150 tons/hour and/or
	1,200 tons/calendar day and/or
	48,000 tons/consecutive twelve month period

[Basis: Cumulative Increase]

2. The owner/operator of S-9 shall ensure visible particulate emissions from S-9 Portable Crusher, Chassis Hopper, and Discharge Conveyor do not exceed Ringelmann 0.5 or equivalent to 10% opacity for a period or aggregate periods of more than 3 minutes in any 60 minute period, or result in fallout on adjacent property in such quantities as to cause a public nuisance per Regulation 1-301.
[Basis: Regulation 1-301, Regulation 2-1-403, 6-1-301, BACT]
3. The owner/operator of S-9 shall abate fugitive vehicle road dust emissions, the crush box, chassis hopper, and discharge conveyors with A-4 Water Sprays at all times of operation to maintain compliance with Part 2 of this condition.
[Basis: Cumulative Increase, Regulation 2-1-403, BACT]
4. The owner/operator of S-9 shall maintain an Air District approved log on a daily basis with the following information:
 - a. Daily throughput of concrete/asphalt rubble.
 - b. The daily throughput of material shall be totaled on a monthly and consecutive 12-month basis.

The owner/operator of S-9 shall keep all records in an Air District-approved log on site for at least two years from the date of entry and make it available to Air District staff upon request.

[Basis: Cumulative Increase, Recordkeeping]

RECOMMENDATION

The Air District has reviewed the material contained in the permit application for the proposed project and has made a preliminary determination that the project is expected to comply with all applicable requirements of Air District, state, and federal air quality-related regulations. The preliminary recommendation is to issue a Permit to Operate for the equipment listed below. However, the proposed source is within 1000' of Half Moon Bay High School, which triggers the public notification requirements of Air District Regulation 2-1-412. After the comments are received and reviewed, the Air District will make a final determination on the permit.

I recommend that the Air District initiate a public notice and consider any comments received prior to taking any final action on issuance of a Permit to Operate for the following sources:

- S-9 Portable Crusher with Chassis Hopper and Discharge Conveyor, Maximum 150 tons/hr, 48,000 tons/year of concrete, abated by A-4 Water Spray Bar
Make: Trakpactor; Model: XH320**
- S-10 Portable Prime Diesel Engine, Powering S-9 Portable Crusher with Chassis Hopper and Discharge Conveyor
Make: Scania; Model: DC09085A, 345 HP
Exempt Via CARB DOORS Registration #168248 and Regulation 2-1-113.1.3**

Abated by

A-4 3 Integral Water Spray Bars for S-9 Chassis Hopper, Crush Box, and Discharge Conveyor

Prepared by: Bao Trinh, Senior Air Quality Engineer

Date: 08/04/2025

Appendix A

BACT Determination for Portable Aggregate Processing and Concrete/Asphalt Crushing Recycling Operations

Definition of Best Available Control Technology

Per Section 2-2-202, BACT is defined as an emission limitation, control device, or control technique applied at a source that is the most stringent of:

- the most effective device or technique successfully utilized,
- the most stringent emission limitation achieved by an emission control device or technique for the type of equipment comprising such a source,
- the most effective emission control limitation for the type of equipment comprising such a source that is contained in an approved implementation plan of any state, or
- the most effective control device or technique or most stringent emission limitation that is technologically feasible, taking into consideration cost-effectiveness, any ancillary health and environmental impacts, and energy requirements.

These requirements are generally categorized as either technologically feasible and cost-effective (termed “BACT 1”) or achieved-in-practice (termed “BACT 2”).

BACT 2 is either equal to or less stringent than BACT 1. Because achieved-in-practice is required regardless of cost and BACT 1 is more stringent than BACT 2, an evaluation for what has been achieved-in-practice is first conducted.

Achieved-in-Practice (BACT 2)

To understand what has been achieved in practice specifically for controlling PM emissions from portable aggregate processing and concrete/asphalt crushing recycling operations, the following sources of information were reviewed:

- Regulations (Air District, Other California Air Districts);
- California Air Resources Board (CARB) BACT Clearinghouse; and,
- United States Environmental Protection Agency (EPA) Reasonably Available Control Technology (RACT)/Lowest Achievable Emission Rate (LAER)/BACT Clearinghouse (RBLC).

Air District BACT Workbook

The most applicable Air District achieved-in-practice BACT is presented in the current BAAQMD BACT/TBACT Workbook for Rock and Aggregate Processing, Document #144.1, Revision 1, dated 09/25/91.

For PM₁₀, Air District achieved-in-practice BACT has been determined to be a BAAQMD approved design and operation of an enclosure for jaw/cone crushers, screens, and associated material transfer points and vent to baghouse(s) with <0.01 gr/dscf or water spray of other transfer points, conveyors, storage piles, and site road surfaces. If a facility has implemented what is listed under BACT 1, it would be considered as achieved-in-practice and therefore BACT 2.

Table A-1 lists the current values in the BACT Workbook.

Table A-1. *Air District BACT Workbook for Rock and Aggregate Processing*

Pollutant	BACT	
	1. Technologically Feasible / Cost Effective	Typical Technology
	2. Achieved-in-Practice	
POC	1. n/a 2. n/a	1. n/a 2. n/a
NO _x	1. n/d 2. n/a	1. n/a 2. n/a
CO	1. n/d 2. n/a	1. n/d 2. n/a
PM ₁₀	1. Enclosure of jaw/cone crushers, screens, conveyors, and all material transfer points and vent to baghouse(s) w/ <0.01 gr/dscf; Water spray w/ chemical suppressants of storage piles and site road surfaces ^a 2. Enclosure of jaw/cone crushers, screens, and associated material transfer points and vent to baghouse(s) w/ <0.01 gr/dscf; Water spray of other transfer points, conveyors, storage piles, and site road surfaces ^a	1. BAAQMD Approved Design and Operation ^a 2. BAAQMD Approved Design and Operation ^a
PM _{2.5}	1. n/d 2. n/a	1. n/d 2. n/a
NPOC	1. n/d 2. n/a	1. n/d 2. n/a

References

a. BAAQMD

California Air District Regulations

A review of California air district regulations was conducted to identify those districts that have adopted rules addressing PM emissions from portable concrete/asphalt recycling operations. Table 11 includes the rules within those air districts that are relevant to portable concrete/asphalt recycling operations. The equipment in this operation include, but are not limited to: feeders, crushers, screeners, transfer operations, and material storage. **Table A-2** includes the rules within those air districts that are relevant to portable concrete/asphalt recycling operations.

Table A-2. California Air District Regulations Applicable to Portable Concrete/Asphalt Recycling Operations

Agency	Document	Typical Control Technology	Basis	Comments
Sacramento Metropolitan Air Quality Management District (SMAQMD)	Material Handling - Portable Aggregate Processing & Concrete/Asphalt Recycling with >150 tons/hour Capacity	Equipment/Process: Feeder, Crusher, Screen, Transfer & Storage BACT: Use of water sprays on crushers, screens, conveyors and transfer points as necessary to show compliance with the most stringent 40 CFR Subpart OOO opacity limitations. The emissions from the entry feed hopper loading, stockpile loading and storage piles will be subject to an opacity limitation of 20%.	Achieved in Practice	Covers SCAQMD, ARB, and SDAPCD; BACT is a water spray system with opacity limit of 20%
South Coast Air Quality Management District (SCAQMD)	Rule 1157 - PM10 Emissions Reductions from Aggregate and Related Operations	<p>The operator of a facility/operation shall not cause or allow: (i) a discharge into the atmosphere of, fugitive dust emissions exceeding 20 percent opacity from any activity, equipment, storage pile, or disturbed surface area, based on an average of 12 consecutive readings.</p> <p>The operator of a facility/operation conducting crushing activities of materials shall use baghouses to control PM₁₀ emissions. Alternatively, the operator may apply dust suppressants or other dust control methods at the crusher including all discharge points as necessary to meet the performance standards in subparagraph (d)(1)(A).</p>	Prohibitory Rule	<p>This rule applies to stationary and portable equipment. Baghouses are listed as a control option, but it is not feasible for portable equipment because</p> <ol style="list-style-type: none"> 1) Use of a baghouse requires electrical power. The engine powers the grinder and would not have enough load for the baghouse. 2) The portable crusher is on tracks and can be easily moved from one location to another. Addition of a baghouse would limit mobility of equipment. A concrete pad needs to be constructed for the baghouse each time it's moved. 3) Variation in HP rating of equipment would require specific baghouse to be used with specific equipment (case by case determination). 4) Imposing this as BACT/TBACT would require other facilities to follow suit; the cost burden is not effective for each facility.

California Air Resources Board (CARB)	California Code of Regulations § 2457. Requirements for Registered Equipment Units	Crushers shall be ducted through a fabric dust collector or be equipped with a wet suppression system that maintains minimum moisture content to ensure no visible emissions. Compliance with 40 CFR Subpart 000.	Visible Emissions Limit	None.
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A review of federal regulations was conducted to identify standards addressing PM emissions from portable concrete/asphalt recycling operations. **Table A-3** includes the rules within those air districts that are relevant to portable concrete/asphalt recycling operations.

Table A-3. EPA Regulations Applicable to Portable Concrete/Asphalt Recycling Operations

Agency	Document	Typical Control Technology	Basis	Comments
United States Environmental Protection Agency (EPA)	40 CFR Part 60 Subpart OOO - Standards of Performance for Nonmetallic Mineral Processing Plants	Equipment installed after 4/22/2008 at portable sand and gravel plants and crushed stone plants with capacity of 150 tph or more are subject to an opacity limit of 7% for screening and conveyor transfer points and 12% for crushers. Water sprays were used. According to 40 CFR 60.670(c), portable sand and gravel plants and crushed stone plants with capacities, as defined in § 60.671, of 136 megagrams per hour (150 tons per hour) or less are not subject to Subpart OOO.	Visible Emissions Limit	Subpart OOO is not applicable because S-9 is a portable concrete crushing operation.

CARB BACT Clearinghouse

A review of the CARB BACT Clearinghouse did not yield any results for portable concrete/asphalt recycling operations.

U.S. EPA RACT/ BACT LAER Clearinghouse (RBLC)

The RBLC yielded two results for portable concrete/asphalt recycling operations. The contents of the table below consist of the most stringent limits found from the Clearinghouse results with the search history starting from 01/01/1970. No determinations were made from the two results.

Table A-4. EPA RACT/LAER/BACT Determinations for PM₁₀ Emissions from Portable Concrete/Asphalt Recycling Operations

RBLC ID	Date	Company/Facility	Permit No.	Equipment	Technology/Measure
<u>CA-0389</u>	10/29/1990	Blue Diamond Materials, Div. Sully-Miller	229973	Plant, Portable Crushing & Screening, Aggregate Processing	None
<u>CO-0048</u>	09/22/1998	Holnam, Laporte Co.	11LR338-1	Portable Crusher and Stacker/Calciner Dome	Throughput limited to 50,000 tons/year sandstone or limestone

Technologically Feasible and Cost-Effective

Although Regulation 2, Rule 2 does not include a definition for cost-effectiveness, Section 2-2-414 requires the Air District to publish and periodically update a BACT Workbook and that BACT will be determined using the workbook as a guidance document. The following control technologies and mitigation measures have been found technically feasible for abating PM emissions from portable concrete/asphalt recycling operations:

- Enclosure of jaw/cone crushers, screens, conveyors, and all material transfer points and vent to baghouse(s) w/ <0.01 gr/dscf, and
- Water spray w/ chemical suppressants of storage piles and site road surfaces

Section 1 of the BACT Workbook includes a maximum cost guideline for PM₁₀ emissions of \$5,300 per ton of emissions reduced. Unabated emissions were estimated by using uncontrolled emission factors from AP-42 and removing the abatement efficiency provided by use of water sprays. Using these maximum cost effectiveness values and assuming that 99 percent of the 1.216 tpy unabated S-9 emissions could be abated by enclosing the portable crusher and venting emissions to a baghouse, maximum annualized costs for PM₁₀ controls could not exceed \$6,440 to be deemed cost-effective for S-9. This cost does not account for the technologically feasible aspect of enclosing the portable crusher and costs associated with operating the baghouse.

The enclosure of the portable crusher and routing emissions to a baghouse is not technologically feasible for the following reasons:

- 1) Use of a baghouse requires electrical power. The engine powers the grinder and would not have enough load to support operation of a baghouse.
- 2) The portable crusher is on tracks and can be easily moved from one location to another. Addition of a baghouse would limit mobility of equipment. While portable baghouses exist, drawbacks include high initial cost, additional power requirements to run fans (diesel engines or electricity) which are issues with remote sites, and transport issues depending on the size of the portable baghouse.
- 3) Variation in horsepower rating of equipment would require specific baghouse to be used with specific equipment (case-by-case determination).
- 4) Imposing an enclosure with emissions routed to a baghouse as BACT/TBACT would require other facilities to follow suit; the cost burden is not effective for each facility and is determined on a case-by-case basis.

BACT Determination

Requiring more stringent emission limits than what has been deemed achieved in practice is not considered cost effective nor technologically feasible. BACT for this project has been determined to be the use of a water spray system and meeting the opacity requirements of Regulation 6-1-301 and the Air District's Permit Handbook template conditions for water spray systems. Regulation 6-1-301 and the Air District's Permit Handbook template conditions requires S-9 to not emit from visible emissions exceeding

Ringelmann 1 and 20% opacity for more than 3 minutes in any one hour period. Since water sprays are used to control PM emissions, S-9 is expected to be capable of meeting the visible emissions limits of Ringelmann 0.5, or 10% opacity as required per the Air District's Permit Handbook template conditions for water spray systems.