

October 6, 2000

MEMORANDUM

TO: Doug Howard, Regional Administrator
Twin Falls Regional Office

FROM: Michael DuBois, Air Quality Analyst *MD*
Technical Services Office

SUBJECT: ***PERMIT TO CONSTRUCT TECHNICAL ANALYSIS***
P-000415, Gordon Paving Co. Inc., Portable
(Standard Rock Crusher Permit to Construct No. 777-00271; Including Aggregate,
Asphalt, and Concrete Production when Collocated in Attainment Areas)

PURPOSE

The purpose of this memorandum is to satisfy the requirements of IDAPA 58.01.01.200 (*Rules for the Control of Air Pollution in Idaho*) for issuing Permits to Construct (PTC).

PROJECT DESCRIPTION

Gordon Paving Co. Inc. is proposing to commence construction of a portable rock crushing facility. Gordon Paving Co. Inc. is requesting a PTC be issued to cover the operations of the rock crushing facility in both attainment and nonattainment areas throughout the state of Idaho. Note that the Standard PTC for a portable rock crusher also includes provisions for collocated operations in attainment areas with one (1) other portable source (i.e., rock crusher, hot-mix asphalt, or concrete batch plant). The rock crushing facility's maximum hourly production rate is 180 tons per hour (180 T/hr). Electricity is supplied to the facility by the local utility.

SUMMARY OF EVENTS

On September 11, 2000, the Idaho Department of Environmental Quality (DEQ) received a PTC application.

DISCUSSION

1. Process Description

The majority of rock crushing facilities in Idaho mine rock deposits from pits using front-end loaders. However, rock may also be mined from quarries by drilling and blasting or dredged from stream beds. Rock crushing facilities generally produce three to four sizes of aggregate by employing a series of crushers and screens.

The rock is transferred to a vibrating grizzly to segregate large from small material. The large material is conveyed to the primary crusher (usually a jaw or gyratory crusher) where it is reduced to 3 to 12 inches in diameter. The crushed material is transferred to the primary screen where it is separated into two or three size ranges. The oversized material is conveyed to a secondary crusher, and the smaller material is transferred to a tertiary crusher or is stockpiled. The secondary crusher (usually a gyratory or cone crusher) reduces the material to roughly 1 to 4 inches in diameter. The material is rescreened. The oversized

material is crushed in a tertiary crusher and rescreened, and the small aggregate is stockpiled.

Particulate matter (PM) emissions are generated at all points of crushing, screening, and material transfer. The use of water spray is the most common method used to control particulate emissions. If an electrical generation unit is used, the combustion of fuel also results in PM emissions, as well as, oxides of nitrogen (NO_x), oxides of sulfur (SO_x), carbon monoxide (CO), and volatile organic compounds (VOCs). Fugitive PM emissions are generated by the mining activities, the aggregate storage piles, and front-end loader and truck traffic.

The Standard PTC requested will allow this rock crushing facility to collocate and simultaneously operate with one (1) other portable plant (i.e., rock crusher, hot-mix asphalt, or concrete batch plant) in attainment areas. It is important to note that during collocated operations, this crusher is then part of a single, larger source engaged in the production of either hot-mix asphalt, concrete, and/or aggregate; depending upon which type of portable plant the crusher is collocated with. While collocated, the two portable plants are now considered to be one source, and the emissions of this single source is the sum of the emissions from the two portable plants. This single, larger source must comply with all applicable federal, state, and local requirements. To maintain compliance, specific requirements and limitations have been included in the Standard PTC for this rock crusher for collocated operations. As described in the following sections of this technical memorandum, specific conservative assumptions and calculations were made to determine these Standard PTC collocation requirements. For this reason, the permit for the other portable plant with which this rock crusher will collocate must also contain specific collocation requirements based on the same conservative assumptions and calculations used in this Standard PTC.

2. Equipment Listing

The analysis upon which this permit was based assumed that the following equipment would be used:

2.1 Primary Crusher

Manufacturer/Type:	Rexworks/grinder
Date of Manufacture:	1995
Maximum Capacity:	180 tons/hr

2.2 Secondary Crusher

Manufacturer/Type:	NA
Date of Manufacture:	
Maximum Capacity:	

2.3 Tertiary Crusher

Manufacturer/Type:	NA
Date of Manufacture:	
Maximum Capacity:	

2.4 Additional Crusher(s)

Manufacturer/Type: NA
Date of Manufacture:
Maximum Capacity:

2.5 Generator

Manufacturer: NA
Model:
Serial Number:
Rated Power Output(kW):
Fuel Type (gasoline/diesel):
Fuel Usage (gal/hr):
Stack Diameter(ft):
Stack Height(ft):
Exhaust Flared(acfm):
Exhaust Temperature(°F):

2.6 Generator Emission Factors

Not applicable

3. Area Classification

The rock crushing facility is a portable source and may operate in both attainment and nonattainment areas throughout Idaho.

4. Emission Estimates

Emission estimates to determine the potential to emit (PTE) for aggregate processing and handling are conservatively determined using a spreadsheet specifically developed for rock crushing facilities. The spreadsheet has been developed using emission factors from AP-42, Table 11.19.2-2, 1/95 Edition, to estimate the facility's emissions from crushers, screens, and transfer points. Fugitive emissions from sources that are not affected facilities, pursuant to 40 CFR 60.670, are not included in determining PTE. Likewise for collocated operations; fugitive emissions from hot-mix asphalt plant sources that are not affected facilities, pursuant to 40 CFR 60.90, are not included in determining PTE. PTE is used to determine if prevention of significant deterioration (PSD) or Title V Operating Permit requirements apply to the facility. Emissions from generators are also determined by the spreadsheet using emission factors from AP-42, Tables 3.3-2 and 3.4-2, 1/95 Edition. These emissions are included in the determination of PTE. Crusher, screen, and transfer point emissions are not limited to specific pound-per-hour or ton-per-year emission rates because of the margin of error inherent in the emission estimates, which are not source-specific, but rather are applicable to the broader source category of crushed stone processing. Generator emissions are not limited to specific emission rates either.

For collocated operations, a conservative approach is taken by limiting the emissions of each of the collocated units to half of the levels allowed when operating alone. Then the

combined emissions of the two collocated sources will be within the allowable levels. See the information below for a more detailed description. This approach is designed to result in acceptable throughput limits for most collocation situations. In cases where the throughput limits are too restrictive, a site-specific analysis and permit amendment may be completed.

This facility's uncontrolled and controlled PTE is 54.7 tons per any consecutive 12-month period (T/yr) and 16.4 T/yr, respectively. The emission estimates are included as Appendix A. The following narrative briefly explains the methods and assumptions used in the development of the source-specific spreadsheet.

ATTAINMENT AREA OPERATIONS

The spreadsheet inherently limits emissions below certain triggering levels (i.e., PSD and Title V thresholds) by limiting maximum throughput. If a generator is not used, throughput is solely limited to limit a facility's PTE to 99 T/yr of PM emissions. If a generator is used, throughput is limited based on the most limiting pollutant or pollutants (i.e., the pollutant whose emission rate is closest to 99 T/yr). The spreadsheet calculations incorporate the following to determine the throughput limit: the maximum hourly throughput of the primary crusher, the total number of crushers, the capacity of the generator (if used), the ambient impact from the generator, and the generator's fuel type and fuel consumption rate.

In the standard permit, two throughput limit options are available for attainment area operations. One is for an annual limit (annual is any consecutive 12-month period), and the other is for a daily and annual limit. The annual limit option is chosen only to limit emissions to 99 T/yr or less. The daily and annual limit option is chosen to protect a 24-hour ambient standard, an annual ambient standard, and to limit emissions to 99 T/yr. Depending on the circumstances, one or both options may be required.

NONATTAINMENT AREA OPERATIONS

For facilities that operate in a nonattainment area, throughput is limited to protect the standard(s) for which the area is designated as nonattainment. For example, when these facilities operate in a particulate matter with an aerodynamic diameter of less than or equal to a nominal ten (10) microns (PM-10) nonattainment area, throughput is, or may have to be, limited on a daily basis to protect the 24-hour standard, or annually to protect the annual standard. In either case, the spreadsheet automatically calculates the allowable throughput that protects these standards. When a generator is used, the spreadsheet takes into account its ambient impact and limits throughput accordingly. If the impacts are not significant, the spreadsheet limits throughput to keep emissions at or below 99 T/yr.

In the standard permit, two throughput options are available to choose from for operations in a nonattainment area. The first option states the rock crushing facility cannot operate in any PM-10 nonattainment area or proposed PM-10 nonattainment area without DEQ approval. The choice of this option is obvious. The second option is a daily and annual throughput limit. Imposing this limit not only protects the 24-hour limit and annual limit, but also ensures facility emissions will not exceed 99 T/yr.

COLLOCATED OPERATIONS IN ATTAINMENT AREAS

Standard PTCs will only allow collocation with one (1) other portable source (i.e., rock crusher, hot-mix asphalt, or concrete batch plant) which has also received a Standard PTC that specifically allows collocation. When a combination of one portable crusher unit and one other portable unit are operated at a single location, the emissions of both units must be added together when determining PTE. Consistent with the approach taken for attainment area operations, the spreadsheet inherently limits the combined emissions of the two portable units to below certain triggering levels (i.e., PSD and Title V thresholds) by limiting the maximum throughput of each. For collocated operations, half of the attainment area triggering levels are used as limits for calculating throughput for each source. The crusher throughput is then established based on the most limiting pollutant or pollutants (i.e., the pollutant whose emission rate is closest to 49.5 T/yr). The spreadsheet calculations incorporate the following to determine the throughput limit: the maximum hourly throughput of the primary crusher, the total number of crushers, the capacity of the generator (if used), the ambient impact from the generator, and the generator's fuel type and fuel consumption rate.

In the standard permit, two throughput limit options are available for collocated attainment area operations. One is for an annual limit (annual is any consecutive 12-month period), and the other is for a daily and annual limit. The annual limit option is chosen only to limit the combined emissions to 99 T/yr or less. The daily and annual limit option is chosen to protect a 24-hour ambient standard, an annual ambient standard, and to limit emissions to 99 T/yr. Depending on the circumstances, one or both options may be required.

FUGITIVE EMISSIONS AT THE PROPERTY BOUNDARY

In order to ensure the air quality at and beyond the facility boundary is not further degraded, the standard permit requires that no visible emissions cross the facility boundary. It is assumed if no emissions visibly cross the boundary, the air quality is protected and not further degraded. The permit requirement is offered in lieu of fugitive dust modeling.

5. Modeling

Estimated emissions due to aggregate crushing and handling are expected to vary considerably from the facility's actual emissions. Modeling results would reflect the emission estimates with an added level of conservatism built into the modeling. Because of the degree of uncertainty involved in the emissions estimate, modeling of fugitive dust emissions was not conducted. However, to ensure no ambient air quality standard will be violated due to emissions generated by crushing, screening, aggregate handling, and fugitive sources; the permit requires that emissions from these sources not be seen leaving the property boundary for more than three (3) minutes in any sixty (60) minute period. If visible emissions are not seen crossing the property boundary, no significant impact on ambient air quality nor a violation of National Ambient Air Quality Standards (NAAQS) will occur.

If a generator is used to provide power to the facility, an ambient impact analysis must be performed to ensure its emissions do not cause or contribute to a violation of any applicable ambient air quality standard. Normally, the EPA-approved SCREEN3 modeling program is used to predict the ambient impact from the generator. The spreadsheet then uses the modeling result and calculates a throughput limit based on the proposed operating area (attainment, nonattainment, or collocated attainment). For collocated operations, the

crusher generator operation is limited as needed so that the modeled impacts will be half of the available allowable ambient impact. Likewise for collocated operations; the modeled impacts of the other portable facility will also be limited to half of the available allowable, ambient impact so that the combined emissions of the two collocated sources will remain within the NAAQS. Using the 24-hour NAAQS standard for PM-10 (attainment area) as an example, one-half of the allowable available impact would be equal to $32 \mu\text{g}/\text{m}^3$, as follows:

$$32 \mu\text{g}/\text{m}^3 = 0.5 \times [150 \mu\text{g}/\text{m}^3 - 86 \mu\text{g}/\text{m}^3],$$

where $150 \mu\text{g}/\text{m}^3$ is the 24-hour average standard and $86 \mu\text{g}/\text{m}^3$ is the conservative statewide 24-hour average background value. Then the generator operations would be limited as needed, based on the specific ambient impact modeling for this generator, so that its modeled 24-hour concentration does not exceed $32 \mu\text{g}/\text{m}^3$ at or beyond the facility's property boundary. This approach is designed to result in acceptable operational limits for most collocation situations. In cases where these limits are too restrictive, a site-specific analysis and permit amendment may be completed. If a generator is used, the modeling estimates are included as Appendix B.

6. Facility Classification

Rock crushing plants (including collocated operations producing asphalt, concrete, and aggregate) are not designated facilities, as defined in IDAPA 58.01.01.006.27. This facility is not a major facility as defined in IDAPA 58.01.01.006.55 and IDAPA 58.01.01.008.10. The SIC code for this rock crushing facility is 1442, "Construction Sand and Gravel." The AIRS facility classification for this facility is "B" because the uncontrolled potential to emit is less than (100 T/yr). The spreadsheet included as Appendix A automatically determines the facility classification.

7. Regulatory Review

The following rules and/or regulations have been reviewed in this permit analysis:

<u>IDAPA 58.01.01.201</u>	Permit to Construct;
<u>IDAPA 58.01.01.202</u>	Application Procedures;
<u>IDAPA 58.01.01.203</u>	Permit Requirements for New and Modified Stationary Sources;
<u>IDAPA 58.01.01.209</u>	Procedures for Issuing Permits;
<u>IDAPA 58.01.01.211</u>	Conditions for Permits to Construct;
<u>IDAPA 58.01.01.212</u>	Obligation to Comply;
<u>IDAPA 58.01.01.577</u>	Ambient PM-10 Air Quality Standard;
<u>IDAPA 58.01.01.625</u>	Visible Emissions;

IDAPA 58.01.01.650 Rules for Control of Fugitive Dust; and

IDAPA 58.01.01.728.02 Distillate Fuel Oil.

With regard to 40 CFR 60, Subpart OOO, Standards of Performance for Nonmetallic Mineral Processing Plants, this is an affected facility per the applicant's permit application.

8. Permit Coordination

This facility is not a major facility as defined by IDAPA 58.01.01.006.55 and IDAPA 58.01.01.008.10. However, the applicant has indicated that it is an NSPS-affected facility (40 CFR Part 60, Subpart OOO), and therefore, it is a Tier I source as defined by IDAPA 58.01.01.006.104(b). In accordance with IDAPA 58.01.01.301.02(b), these Tier I sources not located at major facilities do not require a Tier I Operating Permit until June 1, 2001, unless an earlier date is required by an applicable standard or EPA determines that no Tier I Operating Permit is required.

9. AIRS Information

Since each of these facilities is considered a new facility for AIRS purposes, an update to the AIRS data base is required. The information necessary to update the data base is included as Appendix B of this technical analysis.

FEES

The facility is not a major facility as defined in IDAPA 58.01.01.008.10. Therefore, registration and registration fees, according to IDAPA 58.01.01.526, are not applicable.

RECOMMENDATION

Based on review of application materials and all applicable state and federal rules and regulations, staff recommend that Gordon Paving Co. Inc. be issued a PTC for a portable rock crushing facility. No public comment period is recommended, no entity has requested a comment period, and the project does not involve PSD PTC requirements.

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cc: DEQ State Office
Twin Falls Regional Office

APPENDIX A

DATA ENTRY

Company Name: Gordon Paving Co
 Project: Portable Crusher
 PTC #: 777-00271
 Engineer: M. D. Hobb
 Date: 10/02/00
 Filename: g:\shw\duhob\sp\gordem00271.wk4

Crusher Facility Information
 Facility Production Capacity: 180 [-] tons/hr

Applicant's Requested Hours of Operation: 24 [-] hrs/day
 Estimated Throughput: 8,760 [-] tons/yr
 1,576,800 [-] tons/yr
 Maximum Hours of Operation: 8,760 [-] hrs/yr
 Maximum Throughput: 1,576,800 [-] tons/yr

Number of Crushers: 1
 Limitations: (A = <100 Tons/yr; Below Title V Threshold)
 Annual Threshold Emission Lb (B = <250 Tons/yr; PSD Threshold)
 Selected Emission Limitation: 250 Tons/yr

Generator Information
 Generator? (Y/N) n
 375 502 7625 Conversion Factor

A	15
B	
n	
26	

Design Emission Factors
 Mean Wind Speed (E) 10 [-] mph
 Material Moisture Content (M) 2.3 [-] %
 Particle Size Multiplier (R) 0.35 [-] dimensionless
 PM10 (<10 µm) 0.74 [-] dimensionless
 PM2.5 (30 µm) 0.0020 [-] lb/ton
 Embodied Factor 0.0031 [-] lb/ton
 PM10 (<10 µm) 0.0067 [-] lb/ton
 PM1

Notes: PM4 - (R=0.0027)(U/5)^1.3M&E271.4#108

Background Concentrations - Attainment/Non-Attainable Area (µg/m³)	
PM	Annual
PM10	12.7
PM2.5	40.0
SO2	23.5
CO	1.400
NOx	5.130
TOC	144

INPUTS TO PERMIT TO CONSTRUCT (PTC)

Section	Value	Units
Section A.2 Operating Requirements		
Section A.2.1 Number of Generators	1	
Section A.2.1 Number of Generators	NA	
Section A.2.1 Number of Generators	NA	
Section B. Attainment Area When NSL Collocated		
Section B.1.1 Facility Throughput Limits	1,576,800	T/yr
Section B.1.3 Generator Hours of Operation	NA	hrs/yr
Section C. Attainment Area When Collocated		
Section C.1.3 Facility Throughput Limits	788,400	T/yr
Section C.1.4 Generator Hours of Operation	NA	hrs/yr
Section D. Nonattainment Area		
Section D.1.1 Facility Throughput Limits	1,576,800	T/yr
Section D.1.3 Generator Hours of Operation	NA	hrs/yr
Daily Hours of Operation	NA	hrs/day

PERMIT LIMITS TABLE

Attachment Area	Attachment Area			Non Attachment Area			Collocated Attachment Areas		
	T/day	Mkt/yr	T/day	Mkt/yr	T/day	Mkt/yr	CO 1-hr Standard microsec/l hr	SO2 3-hr standard hr/3-hr	CO 3-hr standard hr/3-hr
Crusher	4.130	1.58	4.130	1.58	0	0.79	60.0	3.0	8.0
Operating Requirements Generator	NA	NA	NA	NA	NA	NA	NA	NA	NA
Operating Requirements Generator	Contaminant	NA	Contaminant	NA	Contaminant	NA	NA	NA	NA
AIRIS Facility Classification	NA			B					

OUTPUT

Potential to Emit ... Based on Applicant's Data

Crusher, Screens & Transfer Points	Uncontrolled Emissions	Controlled Emissions
PM ₁₀	55 tons/yr 21 tons/yr	16 tons/yr 6 tons/yr
Generator	0.0 tons/yr	0.0 tons/yr
PM ₄₋₁₀	0.0 tons/yr	0.0 tons/yr
CO	0.0 tons/yr	0.0 tons/yr
NO _x	0.0 tons/yr	0.0 tons/yr
SO ₂	0.0 tons/yr	0.0 tons/yr
TOC	0.0 tons/yr	0.0 tons/yr
Total Crusher + Generator	55 tons/yr	16 tons/yr
PM ₁₀	21 tons/yr	6 tons/yr
PTE Summary	54.7 [-] T/yr of PM	16.4 [-] T/yr of PM
Enforceable Limits ... Based on Requested Operations	24.0	8.760
Crusher - Operation	4.130	1.58
Generator - Production		NA
AIRIS Facility Classification	B	

Potential to Emit ... Emissions Analysis Using Ambient Air Quality Standards

256 Tons/yr

Emissions limited to less than:
Assumptions: Plant operations limited by NAAQS from generator emissions and Crusher emissions back-calculated to yield 99 Tons/yr of emissions.

Attachment/Non-Attachable Area		Non Attachment Area	
Uncontrolled Emissions	Controlled Emissions	Uncontrolled Emissions	Controlled Emissions
Crusher PM ₁₀	55 tons/yr 21 tons/yr	55 tons/yr 21 tons/yr	16 tons/yr 6 tons/yr
Generator	0.0 tons/yr	0.0 tons/yr	0.0 tons/yr
PM ₄₋₁₀	0.0 tons/yr	0.0 tons/yr	0.0 tons/yr
CO	0.0 tons/yr	0.0 tons/yr	0.0 tons/yr
NO _x	0.0 tons/yr	0.0 tons/yr	0.0 tons/yr
SO ₂	0.0 tons/yr	0.0 tons/yr	0.0 tons/yr
TOC	0.0 tons/yr	0.0 tons/yr	0.0 tons/yr
Totals	55 tons/yr	21 tons/yr	16 tons/yr
PM ₁₀	21 tons/yr	6 tons/yr	6 tons/yr
PTE Summary	54.7 [-] T/yr of PM	16.4 [-] T/yr of PM	16.4 [-] T/yr of PM
Enforceable Limits ... Attachment Areas	24.0	8.760	1.58
Crusher	4.130	1.58	NA
Generator		NA	NA
Enforceable Limits ... Non Attachment Areas	24.0	8.760	1.58
Crusher	4.130	1.58	NA

EMISSION ANALYSIS BASED ON PARTICIPANT'S DATA

Pollutant	Generator Emission Factor [-] lb/hr	Generator Emission Rate [-] lb/hr	Applicable Status		Generator Emissions		Hours of Operation - TYR	Calculated 24 hr Impact Annual Impact [-] lb/yr	Modified Air Concentrations Based On Emission Scenario	Calculated Annual Impact	Other	Annual
			[-] lb/hr	[-] lb/yr	TYR	24 hr Impact Annual Impact [-] lb/yr						
PM10	N/A	0.00	24.0	8,760	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CO	N/A	0.00	24.0	8,760	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NOx	N/A	0.00	24.0	8,760	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SO2	N/A	0.00	24.0	8,760	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOC	N/A	0.00	24.0	8,760	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Pollutant	Generator Emission Factor [-] lb/hr	Generator Emission Rate [-] lb/hr	Hours of Operation [-] lb/hr	Significant Contribution Emission Rates	Generator Emissions Regulatory Non Attainment Area Significant Contribution	Annual	Ambient Air Concentrations w/ Background Values (ug/m3)	
							Annual	24 hr
PM10	BRC (2.5 TYR)	BRC (1.5 TYR)	No	(2.5 TYR)	No	5 ug/m3	1.44	8.04
CO	BRC (10 TYR)	BRC (10 TYR)	No	(10 TYR)	No	2000 ug/m3	11.480	5.130
NOx	BRC (4 TYR)	BRC (4 TYR)	No	(40 TYR)	No	543		
SO2	BRC (4 TYR)	BRC (4 TYR)	No	(40 TYR)	No			
TOC	BRC (4 TYR)	BRC (4 TYR)	No	(40 TYR)	No			

Rock Crusher Emissions	No. 1	Crushers		No. 1	Stresses	No. 1	Transfer Points		Total Emissions
		No. 1	No. 1				No. 1	No. 5, 7	
The Units Throughput [-] (T/dm3)	1	180	135	0	180	135	4	3	12.5
Operation schedule [-] (hrs/day)	24	1.58	1.18	1.58	1.58	1.18	1.45	0.54	1.4
Throughput [-] (Mk/Ty/dm3)	8,760	70%	70%	70%	70%	70%	1.15	0.43	1.7
Operation schedule [-] (hrs/y)							6.4	2.4	20.8
Control Efficiency							1.9	0.7	6.2
PM10 Emission Factor	0.0003	0.0024	0.0150	0.0210	0.0020	0.0020	0.0053	0.0053	12.5
Uncontrolled Emissions [-] (lb/hr)	0.05	0.00	2.70	0.00	1.45	0.54	1.44	1.44	1.4
Controlled Emissions [-] (lb/hr)	0.01	0.00	0.81	0.00	0.44	0.16	1.15	0.43	1.7
Uncontrolled Emissions [-] (T/y)	0.2	0.0	11.8	0.0	6.4	2.4	6.3	6.3	54.7
Controlled Emissions [-] (T/y)	0.1	0.0	3.5	0.0	1.9	0.7	5.0	1.9	16.4
PM10 Emission Factor	0.0007	0.0063	0.0199	0.1864	0.0053	0.0053	1.44	1.44	12.5
Uncontrolled Emissions [-] (lb/hr)	0.13	0.00	7.99	0.00	3.84	1.44	1.44	1.44	1.4
Controlled Emissions [-] (lb/hr)	0.04	0.00	2.11	0.00	1.15	0.43	1.15	0.43	1.7
Uncontrolled Emissions [-] (T/y)	0.6	0.0	31.0	0.0	16.8	6.3	6.3	6.3	54.7
Controlled Emissions [-] (T/y)	0.2	0.0	9.3	0.0	5.0	1.9	5.0	1.9	16.4

Crusher Hours of Operation to Yield 99.9 TYR Emissions	w/ Generator		w/ Crusher	
	w/ Generator	w/ Crusher	w/ Generator	w/ Crusher
8760	8760	8760	8760	8760

- 1 Number of Screens = Number of Crushers
- 2 Number of Transfer Points = 7*(Number of Crushers)
- 3 Emission Factors from AP-42, Table 11.9.2.2. Where factors were given for one pollutant, the following conversion factors were used: TSP = PM10*2.1, TSP = PM10*8

Hourly values are based on maximum daily production rates given above. Annual values are based on throughput values given above.

Pollutant	Generator Emissions		Crusher Emissions (Controlled)		Total Emissions	
	Hourly	TYR	Hourly	TYR	Hourly	TYR
PM10	0.00	0.00	89.9	16.4	89.9	16.4
CO	0.00	0.00	34.2	6.2	34.2	6.2
NOx	0.00	0.00	0.0	0.0	0.0	0.0
SO2	0.00	0.00	0.0	0.0	0.0	0.0
TOC	0.00	0.00	0.0	0.0	0.0	0.0

Perforated Limits		Generator - Operation		Crusher - Production	
Hourly	TYR	Hourly	TYR	Hourly	TYR
24.0	8,760	8,760	8,760	4,130	4,130

EMISSION ANALYSIS - BASED ON AMBIENT AIR QUALITY STANDARDS
Emissions limited to less than:
250 Tons/yr

Crude Oil Emission Calculations and Impact Parameters

Pollutant	Generator Emissions		Hours of Operation		AAQS	Calculated Impacts		250 Tpy Hours of Operation	Generator		Allowable Impacts		Maximum Throughput CAR (-) MMT/yr
	Emission Factor (-) lb/hr	Emission Rate (-) lb/yr	1-1/2 hr/day	1-1/2 hr/day		1-1/2 hr/day	1-1/2 hr/day		Hours of Operation	Hours of Operation	Hours of Operation	Hours of Operation	
PM10	N/A	0.00	N/A	N/A	1.0	8,760	8,760	24.0	8,760	8,760	18.42	1.28	
PM2.5	N/A	0.00	N/A	N/A	0.2	8,760	8,760	24.0	8,760	8,760	6.24	0.40	
CO	N/A	0.00	N/A	N/A	8.0	8,760	8,760	24.0	8,760	8,760	0.00	0.00	
NOx	N/A	0.00	N/A	N/A	1.0	8,760	8,760	24.0	8,760	8,760	0.00	0.00	
SOx	N/A	0.00	N/A	N/A	1.0	8,760	8,760	24.0	8,760	8,760	0.00	0.00	
TCC	N/A	0.00	N/A	N/A									

Pollutant	Generator Emissions		Hours of Operation		AAQS	Calculated Impacts		250 Tpy Hours of Operation	Generator		Allowable Impacts		Maximum Throughput CAR (-) MMT/yr
	Emission Factor (-) lb/hr	Emission Rate (-) lb/yr	1-1/2 hr/day	1-1/2 hr/day		1-1/2 hr/day	1-1/2 hr/day		Hours of Operation	Hours of Operation	Hours of Operation	Hours of Operation	
PM10	0.0	0.0	0.2	0.2	11.400	3.1h	8.4h	24.0	24.0	24.0	21.5	40	
PM2.5	0.0	0.0	0.1	0.1			5.110						
CO	0.0	0.0	0.4	0.4			543						
NOx	0.0	0.0	0.4	0.4			543						
SOx	0.0	0.0	0.4	0.4			543						
EC	0.0	0.0	0.4	0.4			543						

Notes:
 1) TTY calculations include crusher, screen and transfer point emissions.
 2) CO 1-hr Averaging Period
 3) CO 3-hr Averaging Period
 4) SOx 3-hr Averaging Period
 5) Daily and annual operation values are based on background data less the modeled generator emissions (i.e., ambient air concentrations).
 6) The generator hours of operation have been back-calculated from AAQS values. The crusher permitable emissions (controlled) are then used to back-calculate crusher operational times, assuming 99 Tons/yr full generator emissions.
 7) Maximum throughput values are based on the minimum number of hours (crusher) that will yield a total of 99 Tons/yr, multiplied by the maximum daily production rate.
 8) Hourly emission values are based on maximum daily production rates, given above.
 9) Annual emission values are based on the maximum throughput values given above.

EMISSION ANALYSIS - BASED ON AMBIENT AIR QUALITY STANDARDS
Emissions limited to less than: 250 Ton/yr

Cinder Plant Emission Calculation and Impact Form

Pollutant	Generator Emission Factor [-] lb/bhp hr	Generator Emission Rate [-] lb/hr	Hours of Operation		AQS	Calculated Impacts		Hours of Operation [-] hr/yr	Hours of Operation [-] hr/yr	Hours of Operation [-] hr/yr	Hours of Operation [-] hr/yr	Hours of Operation [-] hr/yr	Hours of Operation [-] hr/yr	Hours of Operation [-] hr/yr	Maximum Throughput [-] MM T/yr
			[-] hr/day	[-] hr/yr		[-] lb/yr	[-] lb/yr								
PM1	N/A	0.00	N/A	N/A	N/A	8,760	8,760	8,760	8,760	8,760	8,760	8,760	8,760	16.42	1.58
PM10	N/A	0.00	N/A	N/A	1.0	8,760	8,760	8,760	8,760	8,760	8,760	8,760	8,760	6.24	1.58
CO	N/A	0.99	N/A	N/A	8.0	8,760	8,760	8,760	8,760	8,760	8,760	8,760	8,760	0.00	0.00
NOx	N/A	0.00	N/A	N/A	10.4	8,760	8,760	8,760	8,760	8,760	8,760	8,760	8,760	0.00	0.00
SOx	N/A	0.00	N/A	N/A											
TCO	N/A	0.00	N/A	N/A											

Pollutant	Generator Emissions		Stacked Impacts		Based On Ambient Screening Data	Ambient Air Concentrations w/ Background Values (ug/m3)		Total Emissions	Allowable Hours of Operation w/ Emissions <100 T/yr	Generator w/o	Generator w/
	Calculated [-] lb/yr	Annual Impact [-] lb/yr	Calculated [-] lb/yr	Impact [-] lb/yr		1-hr	3-hr				
PM1	N/A	0.00	N/A	0.0	11,400	3.18	8.14	24.1	40		
PM10	N/A	0.0	N/A	0.0		5.130	14.1	21.5			
CO	N/A	0.0	N/A	0.0							
NOx	N/A	0.0	N/A	0.0							
SOx	N/A	0.0	N/A	0.0							
TCO	N/A	0.0	N/A	0.0							

No. Units (Throughput [-] T/yr) Throughput [-] MM T/yr Operation Schedule [-] hrs/yr Control Efficiency	Cinders		Screens		Transfer Points		Total Emissions
	No. 1	No. 4	No. 1	No. 4	No. 1	No. 4	
0.0001	135	180	135	180	3	90	12.5
0.05	1.18	1.58	1.18	1.58	0.29	0.43	3.7
0.01	0.00	0.00	0.00	0.00	2.4	6.3	54.7
0.2	0.00	0.00	0.00	0.00	0.7	1.9	16.4
0.1	0.0024	0.0150	0.0710	0.0033	0.0053	1.44	8760
0.0003	0.00	2.70	0.00	1.45	0.54	1.4	8760
0.0003	0.00	0.81	0.00	0.44	0.16	20.8	8760
0.0003	0.00	11.8	0.00	6.4	2.4	6.2	
0.0003	0.00	3.5	0.00	1.9	0.7	6.2	
0.0007	0.0063	0.0394	0.1864	0.0053	0.0053	1.44	8760
0.13	0.09	7.09	0.00	3.84	0.43	3.7	8760
0.04	0.00	2.13	0.00	1.15	0.43	3.7	8760
0.6	0.0	31.0	0.0	16.8	6.3	54.7	8760
0.2	0.0	9.3	0.0	5.0	1.9	16.4	

Notes:
1- TTY calculations include cinder, screen and transfer point emissions.
2- CO 1-hr Averaging Period
3- CO 8-hr Averaging Period
4- SOx 3-hr Averaging Period

1- Daily and annual operation values are based on background data for the modeled generator emissions (i.e., ambient air concentration). That is, the generator hours of operation have been back-calculated from AQS values. The transfer point values are based on the maximum throughput values are based on the minimum number of hours (conservatively) that will yield a total of 99 Tons/yr multiplied by the maximum daily production rate.
2- Hourly emission values are based on maximum daily production rates given above.
3- Annual emission values are based on the maximum throughput values given above.
4- Non-attainment one hour of operation calculations assume TSP emission rate are non-attainment in PM10 non-attainment areas. Therefore, operation is limited by significant impact limits.

Attainment Area - Collected Units - Calculations

Pollutant	Collected Ambient Air Concentrations - Attainment Area Calculations 1-hr, 3-hr, 8-hr, & 24-hr Samples are all in half for collection)				Annual Hours to Achieve (Max. 5 TYU)
	1-hr	3-hr	8-hr	24-hr	
PM ₁₀	14,300		2,435	32.0	8.7
CO					30.0
NO _x		379		111	56.5
SO ₂					
TOC					

Pollutant	Background Concentrations - Attainment Area Classification Criteria (µg/m ³)				Annual Hours to Achieve
	1-hr	3-hr	8-hr	24-hr	
PM ₁₀				86.0	32.7
CO	11,400		5,130		40.0
NO _x		343		144	23.5
SO ₂					
TOC					

APPENDIX B

ABBREVIATED AIRS DATA ENTRY SHEET - ROCK CRUSHERS

Name of Facility: Gordon Paving Co. Inc.
 AIRS/Permit #: 777-00271
 Permit Issue Date: October 2, 2000

<u>Source/Emissions Unit Name</u> (25 spaces) (Please use name as indicated in permit)	<u>SCC #</u> (8 digit #)	<u>Air Program</u> (SIP/NESHAP/NSPS/PSD)
Rock Crushers	30502510	
Diesel Generator	20200401	
Transfer/Screen/Convey	30502503	
Fugitives	30588801	
Property Boundary	30588801	

RETURN TO PAT RAYNE
 AIRS-PT.LST (9/95)