

March 20, 2000

MEMORANDUM

TO: Audrey Cole, Administrator
Pocatello Regional Office

FROM: Daniel Heiser, Air Quality Engineer *DH*
Technical Services Office

SUBJECT: **PERMIT TO CONSTRUCT TECHNICAL ANALYSIS**
P-990155, Smith Paving and Construction Company, Portable
(Standard Rock Crusher Permit to Construct No. 777-00227; Including Aggregate, Asphalt,
and Concrete Production when Collocated in Attainment Areas)

PURPOSE

The purpose of this memorandum is to satisfy the requirements of IDAPA 16.01.01.200 (*Rules for the Control of Air Pollution in Idaho*) for issuing Permits to Construct (PTC).

PROJECT DESCRIPTION

Smith Paving and Construction is proposing to modify the PTC for its portable rock crushing facility. Smith Paving and Construction 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 fifty tons per hour (50 T/hr). The facility includes a 110-kilowatt (110-kW), diesel-fired electrical generator that operates the conveyor and a 218-kilowatt (218-kW), diesel fired generator that runs the roll crusher unit.

SUMMARY OF EVENTS

On November 18, 1999, the Idaho Department of Health and Welfare, Division 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: Universal Engineering Corporation/30" Twin Dual Roll, Right Hand Drive with Hopper
Date of Manufacture: 1956
Maximum Capacity: 50 tons/hour

2.2 Secondary Crusher

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

2.3 Tertiary Crusher

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

2.4 Additional Crusher(s)

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

2.5 Generators

2.5.1 Electrical Generator to Power Conveyor

Manufacturer:	Caterpillar
Model:	D333
Serial Number:	NA
Rated Power Output(kW):	110 kW
Fuel Type (gasoline/diesel):	Diesel
Fuel Usage (gal/hr):	29 gal/hr
Stack Diameter(ft):	0.5 ft
Stack Height(ft):	12 ft
Exhaust Flared(acfm):	3,404 acfm
Exhaust Temperature(°F):	1,063 °F

2.5.2 Generator to Power Rolls Crusher

Manufacturer:	Caterpillar
Model:	D337X, Series F
Serial Number:	NA
Rated Power Output(kW):	292 hp (218 kW)
Fuel Type (gasoline/diesel):	Diesel
Fuel Usage (gal/hr):	22.8 gal/hr
Stack Diameter(ft):	0.5 ft
Stack Height(ft):	8 ft
Exhaust Flared(acfm):	573 acfm
Exhaust Temperature(°F):	1,254 °F

When collocated, this crusher is then part of a single, larger source that produces either hot-mix asphalt, concrete, and/or aggregate, depending upon which type of portable plant the crusher is collocated with. The equipment used by this single, larger source would include the crusher equipment listed above plus the equipment of the other portable plant. To see an equipment description for the other portable plant, see the corresponding permitting files for that plant.

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 PTE is 60.1 tons per any consecutive 12-month period (60.1 T/yr); the controlled PTE is also 60.1 T/yr. 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 16.01.01.006.27. This facility is not a major facility as defined in IDAPA 16.01.01.006.55 and IDAPA 16.01.01.008.10. 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 16.01.01.201</u>	Permit to Construct;
<u>IDAPA 16.01.01.202</u>	Application Procedures;
<u>IDAPA 16.01.01.203</u>	Permit Requirements for New and Modified Stationary Sources;
<u>IDAPA 16.01.01.209</u>	Procedures for Issuing Permits;
<u>IDAPA 16.01.01.211</u>	Conditions for Permits to Construct;
<u>IDAPA 16.01.01.212</u>	Obligation to Comply;
<u>IDAPA 16.01.01.577</u>	Ambient PM-10 Air Quality Standard;
<u>IDAPA 16.01.01.625</u>	Visible Emissions;
<u>IDAPA 16.01.01.650</u>	Rules for Control of Fugitive Dust; and
<u>IDAPA 16.01.01.728.02</u>	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 16.01.01.006.55 and IDAPA 16.01.01.008.10. 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 16.01.01.006.104(b). In accordance with IDAPA 16.01.01.301.02(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 C of this technical analysis.

FEES

The facility is not a major facility as defined in IDAPA 16.01.01.008.10. Therefore, registration and registration fees, according to IDAPA 16.01.01.526, are not applicable.

RECOMMENDATION

Based on review of application materials and all applicable state and federal rules and regulations, staff recommend that Smith Paving and Construction 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
EPA -Region 10
Regional Office

Appendix A

Emission Estimate Calculations

P-990155

Smith Paving and Construction, Soda Springs

DATA ENTRY

Company Name: Smith Paving Engineer: DH
 Project: Portable Crusher Date: 2-21-00
 PTC #: 777-00248 Filename: E-Smith Paving.jaw

Crusher Facility Information

Facility Production Capacity: 50 [] tons/hr
 Applicant's Requested Hours of Operation: 24 [] hrs/day
 Estimated Throughput: 8,760 [] tons/yr
 Maximum Hours of Operation: 8,760 [] hrs/yr
 Maximum Throughput: 438,000 [] tons/yr
 Number of Crushers: 1
 Annual Threshold Emission L.A.: (A = <100 Tons/yr; Below Title V Threshold)
 (B = <250 Tons/yr; PSD Threshold)
 Selected Emission Limitations: 100 Tons/yr

Generator Information

Generator (1/N): Y 312.3831 Conversion Factor
 Generator Size: 233 [] kW Note: Combined capacity of 2 generators
 Units: B (A = Horsepower)
 (B = Kilowatts)
 Fuel Type: A (A = Diesel-Fired Generator)
 (B = Gasoline-Fired/Dual-Fired Generator)
 Modified 1-hr Concentrations: 723 [] ug/m³ at emission rate of 1 lb/yr

Diesel Fuel Exhaust Factors

Airway Wind Speed (U)	1.0 [] mph
Material Moisture Content (M)	2.5 [] %
Particle Size Multiplier (R)	0.35 [] dimensionless
PM-10 (<10 µm)	0.74 [] dimensionless
PM (<30 µm)	0.0020 [] lb/ton
Resuspension Factor:	0.0053 [] lb/ton
PM-10 (<10 µm)	0.0087 [] lb/ton
PM	

Notes: 1. PM = (6*U-0.0032*(U^2)^1.3/(0.02)^1.4)^0.8

INPUTS TO PERMITS TO CONSTRUCT (PTC)

Section	Value	Units
Section A.1.1 Number of Crushers	1	
Section A.2.1 Number of Generators	1	
Section A.2.1 Size of Generators	233	[] kW
Section B.1.1 Facility Throughput Limits	438,000	Tons/yr
Section B.1.1 Annual Hours of Operation	8,760	hrs/yr
Section B.1.1 Daily Hours of Operation	NA	
Section C.1.1 Annual Throughput Limits	219,000	Tons/yr
Section C.1.1 Annual Hours of Operation	8,760	hrs/yr
Section C.1.1 Daily Hours of Operation	22.7	hrs/day
Section D.1.1 Annual Throughput Limits	438,000	Tons/yr
Section D.1.1 Annual Hours of Operation	12,293	hrs/yr
Section D.1.1 Daily Hours of Operation	3.5	hrs/day

Background Concentrations -- Attachment/Non-Constructible Areas (ug/m³)

Area	1-hr	3-hr	8-hr	24-hr	Annual
PM					
PM-10	11,400		86.0		32.7
NO _x			5,130		40.0
SO ₂		543		144	23.5
CO					

PERMIT LIMITS TABLE

Crusher	Attainment Area		Non-Attainment Area		Collocated Attainment Areas		CO ₂ 1-hr Standard minutes/yr	SO ₂ 3-yr standard lb/yr	CO 1-hr Standard lb/yr
	W/Day	MCM/yr	W/Day	MCM/yr	W/Day	MCM/yr			
Operating Requirements	1,200	0.44	377	0.44	1,136	0.72			
Generator	24.0	3.16	3.5	1.25	2.7	3.9			8.0
Operating Requirements	24.0	3.16	3.5	1.25	2.7	3.9			8.0
Generator	24.0	3.16	3.5	1.25	2.7	3.9			8.0
Enforceable Limits	None	None	None	None	None	None			
AURS Facility Classification	B								

OUTPUT

Potential to Exceed -- Based on Applicant's Data

Crusher, Screens & Transfer Points	Uncontrolled Emissions	Controlled Emissions
PM	15 tons/yr	5 tons/yr
PM-10	6 tons/yr	2 tons/yr
Generator		
PM	3.0 tons/yr	3.0 tons/yr
CO	3.0 tons/yr	3.0 tons/yr
NO _x	9.1 tons/yr	9.1 tons/yr
SO _x	42.4 tons/yr	42.4 tons/yr
TOC	2.8 tons/yr	2.8 tons/yr
Total Crusher + Generator	5.4 tons/yr	5.4 tons/yr
PM	18 tons/yr	8 tons/yr
PM-10	9 tons/yr	5 tons/yr
PTES Summary	42.4 (=) T/yr of NO _x	42.4 (=) T/yr of NO _x
Enforceable Limits -- Based on Requested Operations	24.0 lbs/day	8.760 lbs/day
Crusher -- Production	1,200 T/day	0.44 MCM/yr
AURS Facility Classification:	B	

Potential to Exceed -- Emissions Analysis Using Ambient Air Quality Standards

100 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.

Crusher	Uncontrolled Emissions	Controlled Emissions	Uncontrolled Emissions	Controlled Emissions
PM	15 tons/yr	5 tons/yr	15 tons/yr	5 tons/yr
PM-10	6 tons/yr	2 tons/yr	6 tons/yr	2 tons/yr
Generator				
PM	1.9 tons/yr	1.9 tons/yr	0.4 tons/yr	0.4 tons/yr
CO	1.9 tons/yr	1.9 tons/yr	0.4 tons/yr	0.4 tons/yr
NO _x	5.8 tons/yr	5.8 tons/yr	1.4 tons/yr	1.4 tons/yr
SO _x	26.7 tons/yr	26.7 tons/yr	6.3 tons/yr	6.3 tons/yr
TOC	1.8 tons/yr	1.8 tons/yr	0.4 tons/yr	0.4 tons/yr
Total:	2.1 tons/yr	2.1 tons/yr	0.5 tons/yr	0.5 tons/yr
PM	17 tons/yr	6 tons/yr	16 tons/yr	5 tons/yr
PM-10	8 tons/yr	4 tons/yr	6 tons/yr	2 tons/yr
PTES Summary	26.7 (=) T/yr of NO _x	26.7 (=) T/yr of NO _x	15.6 (=) T/yr of PM	6.3 (=) T/yr of NO _x
Enforceable Limits -- Attainment Areas	24.0 lbs/day	5.516 lbs/day	3.5 lbs/day	1.295 lbs/day
Crusher -- Production	1,200 T/day	0.44 MCM/yr	177 T/day	0.44 MCM/yr
AURS Facility Classification:	B			

EMISSION ANALYSIS BASED ON APPLICANT'S DATA

Generator Emissions	Generator Emission Factors		Applicant's Data		Generator Emissions		Modeled Air Concentrations Based On Emission SCREEN Data							
	Generator Emission Factor (-) lb/tp-hr	Generator Emission Rate (-) lb/hr	Hours of Operation (-) hr/day	[-] hr/year	Per Day	TYr	Calculated 24-hr Impact (-) ug/m3	Calculated Annual Impact (-) ug/m3	Calculated Annual Impact (-) Other	1-hr	3-hr	8-hr	24-hr	Average
PM	0.0022	0.69	24.0	8,760	16.49	3.01	N/S	N/S	257.3					
PM-10	0.0022	0.69	24.0	8,760	16.49	3.01	6.8	33.8	180.3					
CO	0.0067	2.09	24.0	8,760	50.08	9.14	107.7	20.5	180.3					
NOx	0.0310	9.68	24.0	8,760	232.41	42.42	95.3	6.3	71.4					
SOx	0.0021	0.64	24.0	8,760	11.11	2.80	31.5							
TOC	0.0023	0.71	24.0	8,760	18.52	3.38								

Generator Emissions	BRC Evaluation		Significant Contribution		Non-Attainment Area Significant Contribution		Ambient Air Concentrations w/ Background Values (ug/m3)				
	No. 1	2, 3, 4, 5, 6, 7	No	Significant	24-hr	Annual	1-hr	3-hr	8-hr	24-hr	Average
PM	56	38	No	Significant	500 ug/m3	11,657					39.5
PM-10	24	0.44	No	No	2000 ug/m3 (1-hour)						119.8
CO	8,740	70%	No	No							175.5
NOx	0.0003	0.0024	No	No							155.3
SOx	0.01	0.00	No	No							29.8
TOC	0.01	0.00	No	No							

Generator Emissions	Crushers		Screens		Transfer Points		Total Emissions
	No. 1	No. 2-7	No. 1-4	No. 5-7	No. 1-4	No. 5-7	
No. Units	1	0	1	0	1	0	3
Throughput ([-] T/hr/amt)	56	38	50	50	50	25	25
Operation Schedule ([-] hr/day)	24	0.33	0.44	0.44	0.44	0.22	0.22
Throughput ([-] MM T/hr/amt)	8,740	70%	70%	70%	70%	70%	70%
Control Efficiency	0.0003	0.0024	0.0150	0.0710	0.0020	0.0020	0.0020
Uncontrolled Emissions ([-] lb/hr)	0.01	0.00	0.00	0.00	0.40	0.15	1.3
Controlled Emissions ([-] lb/hr)	0.00	0.00	0.23	0.00	0.12	0.05	0.4
Uncontrolled Emissions ([-] T/yr)	0.1	0.0	5.3	0.0	1.8	0.7	5.8
Controlled Emissions ([-] T/yr)	0.0	0.0	1.0	0.0	0.5	0.2	1.7
PM Emission Factor	0.0007	0.0063	0.0304	0.1864	0.0053	0.0053	0.0053
Uncontrolled Emissions ([-] lb/hr)	0.04	0.00	1.87	0.00	1.07	0.32	3.5
Controlled Emissions ([-] lb/hr)	0.01	0.00	0.59	0.00	0.32	0.12	1.0
Uncontrolled Emissions ([-] T/yr)	0.2	0.0	8.6	0.0	4.7	1.8	15.2
Controlled Emissions ([-] T/yr)	0.0	0.0	2.0	0.0	1.4	0.5	4.6

For information purposes:
Crusher Hours of Operation to Yield 99.0 T/yr Emissions

Generator	8760
Generator	8760
Generator	8760

Notes:
1 Number of Screens - Number of Crushers
2 Number of Transfer Points - 7 (Number of Crushers)
3 Emission Factors from AP-42, Table 11.19.2-2. Where factors were given for one pollutant, the following conversion factors were used:
TSP = PM10*1.1; TSP = PM2.5*1.8
Hourly values are based on maximum daily production rates given above. Annual values are based on throughput values given above.

Generator Emissions	Generator Emissions		Crusher Emissions (Controlled)		Total Emissions	
	lb/day	TYr	lb/day	TYr	lb/day	TYr
PM	16.49	3.01	25.0	4.6	41.5	7.6
PM-10	16.49	3.01	9.5	1.7	26.0	4.7
CO	50.08	9.14	50.1	50.1	100.2	9.1
NOx	232.41	42.42	232.41	232.41	464.82	42.4
SOx	11.11	2.80	11.11	11.11	22.22	2.8
TOC	18.52	3.38	18.52	18.52	37.04	3.4

Generator - Operation	24.0	hr/day	8,760	hr/yr
Crusher - Production	1,200	T/yr	0.44	MMT/yr

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

Attachment Area	Generator Emissions		Hours of Operation		AAQS		Calculated Impacts		Allowable Impacts		Maximum Throughput
	Generator Emission Factor (-) [lb/HR]	Generator Emission Rate (-) [lb/yr]	Hours of Operation (-) [hr/day]	Hours of Operation (-) [hr/year]	Hours of Operation (-) [hr/year]	Hours of Operation (-) [hr/year]	Generator Hours of Operation (-) [hr/day]	Generator Hours of Operation (-) [hr/year]	Crusher Hours of Operation (-) [hr/year]	Calculated Emissions (-) [lb/yr]	
Rightbank	0.0021	0.29	NS	NS	NS	NS	24.0	8,760	24.0	8,760	0.44
PM10	0.0067	2.09	NS	NS	1.0	NS	8.760	8,760	8.760	5.75	0.44
CO	0.0310	9.68	NS	NS	8.0	NS	8,760	8,760	8,760	26.71	0.44
NOx	0.0021	0.64	NS	NS	3.0	NS	8,760	8,760	8,760	1.77	0.44
TOC	0.0025	0.77	NS	NS	NS	NS	8,760	8,760	8,760	2.13	0.44

Pollutant	Generator Emissions		Calculated Annual Impact		Based On Entered SCREENS Data		Ambient Air Concentrations w/ Background Values (ug/m3)	
	Calculated Annual Impact (-) [lb/yr]	Calculated Annual Impact (-) [lb/yr]	1-hr	3-hr	8-hr	24-hr	Annual	
PM10	35.8	NS						
CO	102.7	NS						
NOx	476.4	60.0	11,657	5310			100	
SOx	31.5	4.0		614		176	27.5	
TOC	38.0	4.8						

No. Units Throughput (-) [T/yr]	Crushers		Screens		Transfer Points		Total Emissions		Allowable Hours of Operation w/ Emissions <100 T/yr	
	No. 1	No. 2	No. 1	No. 2	No. 1-4	No. 5-7	No. 1-4	No. 5-7	Generator	Generator
58	38	0	1	1	0	3	25	25		
8.44	0.33	0.44	0.44	0.44	0.44	0.22	0.44	0.22		
8,760	70%	70%	70%	70%	70%	70%	70%	70%		
0.0003	0.0024	0.0150	0.0150	0.0710	0.0020	0.0020	0.0020	0.0020		
0.01	0.00	0.75	0.75	0.40	0.15	0.15	0.15	0.15		
0.00	0.00	0.23	0.23	0.00	0.12	0.05	0.05	0.05		
0.1	0.0	5.3	5.3	0.0	1.8	0.7	0.7	0.7		
0.0	0.0	1.0	1.0	0.0	0.5	0.2	0.2	0.2		
0.0007	0.0063	0.0394	0.0394	0.1864	0.0053	0.0053	0.0053	0.0053		
0.04	0.00	1.87	1.87	0.00	1.07	0.40	0.40	0.40		
0.01	0.00	0.59	0.59	0.00	0.32	0.12	0.12	0.12		
0.2	0.0	8.6	8.6	0.0	4.7	1.8	1.8	1.8		
0.0	0.0	2.6	2.6	0.0	1.4	0.5	0.5	0.5		
									8760	8760

Notes:
 1. TTY calculations include crusher, screen and transfer point emissions.
 2. CO 1-hr Averaging Period
 3. CO 8-hr Averaging Period
 4. SOx 3-hr Averaging Period
 - Daily and annual operation values are based on background data less the modeled generator emissions (i.e., ambient air concentration).
 - That is, the generator hours of operation have been back-calculated from AAQS values. The crusher particulate emissions (controlled) are then used to back-calculate crusher operational times, assuming 99 Tons/yr less generator emissions.
 - 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.
 - Hourly emission values are based on maximum daily production rates, given above.
 - 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: 100 Tons/yr

Pollutant	Generator Emission Rate		Hours of Operation		Calculated Impacts		Allowable Impacts		Maximum Throughput
	(-) lb/hr	(-) lb/hr	(-) hr/day	(-) hr/year	(-) Other	(-) hr/year	(-) hr/year	(-) lb/year	
PM ₁₀	0.0022	0.69	NS	NS	NS	8,760	1,295	8,760	5.01
CO	0.0067	2.09	NS	NS	1.0 7	8,760	1,295	8,760	2.18
NO _x	0.0310	9.68	NS	NS	3.0 3	8,760	1,295	8,760	1.35
SO ₂	0.0021	0.64	NS	NS	3.0 4	8,760	1,295	8,760	6.27
TOC	0.0023	0.71	NS	NS	3.0 4	8,760	1,295	8,760	0.41

Generator Emissions
Based On Entered SCREEN3 Data

Pollutant	Calculated		Hours of Operation		Calculated Impacts		Allowable Impacts	
	(-) lb/hr	(-) lb/hr	(-) hr/day	(-) hr/year	(-) Other	(-) hr/year	(-) hr/year	(-) lb/year
PM ₁₀	15.2	3.0	257.1	614	11,657	5,130	24-hr	24.4
CO	70.5	14.1	71.4	614	11,657	5,130	24-hr	24.4
NO _x	4.7	0.9	71.4	614	11,657	5,130	24-hr	24.4
TOC	3.6	1.1	71.4	614	11,657	5,130	24-hr	24.4

No. Units	Crushers		Screens		Transfer Points		Total Emissions		w/ Generator
	No. 1	No. 2	No. 1	No. 2	No. 1 - 4	No. 5 - 7	No. 1 - 4	No. 5 - 7	
Throughput (Tons/yr)	1	38	50	38	4	25	3	25	8760
Throughput (MM Tons/yr)	0.44	0.33	0.44	0.33	0.44	0.22	0.22	0.22	8760
Operating Schedule (hrs/yr)	8760	70%	70%	70%	70%	70%	70%	70%	8760
Control Efficiency	0.0003	0.0024	0.0150	0.0210	0.0020	0.0070	0.0070	0.0070	8760
Uncontrolled Emissions (lb/hr)	0.01	0.00	0.25	0.00	0.40	0.15	0.15	0.15	1.3
Controlled Emissions (lb/hr)	0.00	0.00	0.23	0.00	0.32	0.05	0.05	0.05	0.4
Uncontrolled Emissions (lb/yr)	0.1	0.0	3.3	0.0	1.8	0.7	0.7	0.7	5.8
Controlled Emissions (lb/yr)	0.0	0.0	1.0	0.0	0.5	0.2	0.2	0.2	1.7
Emission Factor	0.0007	0.0663	0.0394	0.1864	0.0033	0.0053	0.0053	0.0053	3.5
Uncontrolled Emissions (MM Tons/yr)	0.04	0.00	1.97	0.00	1.07	0.40	0.40	0.40	0.40
Controlled Emissions (MM Tons/yr)	0.01	0.00	0.39	0.00	0.32	0.12	0.12	0.12	0.12
Uncontrolled Emissions (Tons/yr)	0.2	0.0	8.6	0.0	4.7	1.8	1.8	1.8	15.2
Controlled Emissions (Tons/yr)	0.0	0.0	2.6	0.0	1.4	0.5	0.5	0.5	4.6

Notes:
1) TYP calculations include crusher, screen and transfer point emissions.
2) CO 1-hr Averaging Period
3) CO 8-hr Averaging Period
4) SO₂ 3-hr Averaging Period

Daily and annual operation values are based on background data less the modeled generator emissions (i.e., ambient air concentrations). This is the generator hours of operation have been back-calculated from AQIS values. The crusher particulate emissions (controlled) are then used to back-calculate crusher operational times, assuming 99 Tons/yr less generator emissions. 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 rates.
Hourly emission values are based on maximum daily production values (given above).
Annual emission values are based on the maximum throughput values (given above).
New-Attachment Area hour of operation calculations assume TSP emissions are non-attainment in PM₁₀ non-attainment areas. Therefore, operation is limited by significant impact limit.

Attainment Area - Collocated Units - Calculations

Pollutant	Collocated Ambient Air Concentrations - Attainment Area Calculations (1.5, 3.0, 4.5, 6.0 & 7.5 hr standards are cut in half for collocation)			Annual to Achieve (Max. Hours 49.5 T/Yr)
	1-hr	3-hr	24-hr	
PM				
PM ₁₀				
CO	16,043	2,253		
NO _x				
SO _x		208	79	31.6
TSP				

Pollutant	Background Concentrations - Attainment/Non-Attainable Areas (ug/m ³)			Annual to Achieve (Max. Hours 49.5 T/Yr)
	1-hr	3-hr	24-hr	
PM				
PM ₁₀				
CO	11,400	5,130	860	32.7
NO _x				
SO _x		343	144	40.0
TSP				

Appendix B

Modeling Results

P-990155

Smith Paving and Construction, Soda Springs

*** SCREEN3 MODEL RUN ***
*** VERSION DATED 96043 ***

Smith Paving Jaw Crusher

SIMPLE TERRAIN INPUTS:
SOURCE TYPE = POINT
EMISSION RATE (G/S) = .126000
STACK HEIGHT (M) = 1.8200
STK INSIDE DIAM (M) = .1554
STK EXIT VELOCITY (M/S) = 34.0896
STK GAS EXIT TEMP (K) = 655.0000
AMBIENT AIR TEMP (K) = 293.0000
RECEPTOR HEIGHT (M) = 1.0000
URBAN/RURAL OPTION = RURAL
BUILDING HEIGHT (M) = .0000
MIN HORIZ BLDG DIM (M) = .0000
MAX HORIZ BLDG DIM (M) = .0000

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

STACK EXIT VELOCITY WAS CALCULATED FROM
VOLUME FLOW RATE = 1370.0000 (ACFM)

BUOY. FLUX = 1.115 M**4/S**3; MOM. FLUX = 3.138 M**4/S**2.

*** FULL METEOROLOGY ***

*** SCREEN AUTOMATED DISTANCES ***

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

1.	.0000	1	1.0	1.0	320.0	25.07	1.26	1.20	NO
100.	82.93	4	5.0	5.0	1600.0	6.47	8.31	4.84	NO
200.	53.54	4	3.0	3.0	960.0	9.57	15.72	8.78	NO
300.	39.40	4	2.0	2.0	640.0	13.45	22.85	12.54	NO
400.	31.20	4	1.5	1.5	480.0	17.32	29.79	15.90	NO
500.	25.53	4	1.5	1.5	480.0	17.32	36.42	18.83	NO
600.	22.10	4	1.0	1.0	320.0	25.07	43.23	22.23	NO
700.	19.55	4	1.0	1.0	320.0	25.07	49.63	24.94	NO
800.	17.18	4	1.0	1.0	320.0	25.07	55.97	27.59	NO
900.	15.77	6	1.0	1.0	10000.0	27.40	31.63	14.90	NO
1000.	16.25	6	1.0	1.0	10000.0	27.40	34.66	15.75	NO

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 1. M:
 27. 122.9 4 20.0 20.0 6400.0 2.98 2.52 1.55 NO

DWASH= MEANS NO CALC MADE (CONC = 0.0)
 DWASH=NO MEANS NO BUILDING DOWNWASH USED
 DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
 DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
 DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

 *** SUMMARY OF SCREEN MODEL RESULTS ***

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	122.9	27.	0.

 ** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **

Appendix C

AIRS Information

P-990155

Smith Paving and Construction, Soda Springs

ABBREVIATED AIRS DATA ENTRY SHEET - ROCK CRUSHERS

Name of Facility: Smith Paving and Construction

AIRS/Permit #: 777-00227

Permit Issue Date: February 29, 2000

***Source/Emissions Unit Name (25 spcs)**
(Please use name as indicated in permit)

SCC #
(8 digit #)

Air Program
(SIP/NESHAP/NSPS/PSD)

<u>* Rock Crushers</u>	<u>30502510</u>	<u>NSPS</u>
<u>Diesel Generator</u>	<u>20200401</u>	<u>SIP</u>
<u>Transfer/Screen/Convey</u>	<u>30502503</u>	<u>NSPS</u>
<u>Fugitives</u>	<u>30588801</u>	<u>SIP</u>
<u>Property Boundary</u>	<u>30588801</u>	<u>SIP</u>
<u>Diesel Generator</u>	<u>20200401</u>	<u>SIP</u>

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