May 23, 1997

MEMORANDUM

TO: Orville D. Green, Assistant Administrator
Air & Hazardous Waste Division

FROM: Martin Bauer, Chief
Air Quality Permitting Bureau

SUBJECT: Issuance for Tier II Operating Permit #777-00160 to Rock Contractors, Inc., Portable Rock Crushing Plant

PURPOSE

The purpose for this memorandum is to satisfy the requirements of IDAPA 16.01.01 Sections 400 through 406 (Rules for the Control of Air Pollution in Idaho) (Rules) for issuing Operating Permits.

PROJECT DESCRIPTION

Rock Contractors, Inc., operates a portable rock crushing facility. Rock Contractors, Inc., is requesting a Tier II Operating Permit (OP) be issued to cover the operations of the rock crushing facility in both attainment and non-attainment areas throughout the state of Idaho. The facility has a maximum rated capacity of 500 tons per hour (T/hr). The facility includes a 560 kilowatt (kW) electrical generator set. The Permittee requested that the standard permitting methodology be applied to the application.

SUMMARY OF EVENTS

On September 15, 1995, the Idaho Department of Health and Welfare, Division of Environmental Quality (DEQ) received a Tier II Operating Permit (OP) application for a portable rock crusher plant for Rock Contractors, Inc. On December 21, 1995, the application was determined administratively complete.

On March 26, 1997, a proposed Tier II OP was issued for public comment. The public comment period was from April 9, 1997, through May 9, 1997. No comments were received.

FEES

The facility is not major as defined in IDAPA 16.01.01.008.14. Therefore, registration and registration fees in accordance with IDAPA 16.01.01.526 are not applicable upon permit issuance.

The facility is subject to Tier II permit application fees as required by IDAPA 16.01.01.470, for the amount of $500.00. The fee will be requested upon permit issuance.

RECOMMENDATION

Based on the review of the OP application and all applicable state and federal rules and regulations concerning the permitting of air pollution sources, the Bureau recommends that Rock Contractors, Inc., be issued a Tier II OP for this portable rock crushing facility. Staff members also recommend that the facility be notified in writing of the obligation to pay permit application fees for their Tier II OP.

CDG\MS\DAM:jrj...\permit\rockcon\rockc-fMM

cc: Pat Rayne, AFS
S. West, Boise Regional Office
OP File Manual
Source File
COF

March 26, 1997

MEMORANDUM

TO: Martin Bauer, Chief
Air Quality Permitting Bureau
Air & Hazardous Waste

FROM: Darrin Mehr, Air Quality Engineer
Air Quality Permitting Bureau
Operating Permits Section

THROUGH: Susan J. Richards, Air Quality Permits Manager
Air Quality Permitting Bureau

SUBJECT: Technical Analysis for Proposed Tier II Operating Permit #777-00160
Rock Contractors, Inc. (Portable Rock Crusher Plant)

PURPOSE

The purpose of this memorandum is to satisfy the requirements of IDAPA 16.01.01 Sections 400 through 406 (Rules for the Control of Air Pollution in Idaho) (Rules) for issuing Operating Permits.

PROJECT DESCRIPTION

This project involves the issuance of a Tier II Operating Permit (OP) for the following process units and fugitive emission sources.

Rock Contractors, Inc., operates a portable rock crushing facility. Rock Contractors, Inc., is requesting a Tier II OP be issued to cover the operations of the rock crushing facility in both attainment and non-attainment areas throughout the state of Idaho. The facility has a maximum rated capacity of five hundred tons per hour (500 T/hr). The facility includes a five hundred sixty kilowatt (560 KW) electrical generator set.

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 NO_x, SO_x, CO, and VOCs. Fugitive PM emissions are generated by the mining activities, the aggregate storage piles, and front-end loader and truck traffic.

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:	Wedag Impactor
Model:	Not Available
Serial Number:	[illegible]
Maximum Capacity:	150 T/hr
NSPS Affected:	No

2.2 Secondary Crusher

Manufacturer/Type:	Cedar Rapids/Cone
Model:	45" RC45STD
Serial Number:	22KC692
Maximum Capacity:	125 T/hr
NSPS Affected:	No

2.3 Tertiary Crusher

Manufacturer/Type:	Cedar Rapids/Cone
Model:	54" PO54II
Serial Number:	2B11794
Maximum Capacity:	200 T/hr
NSPS Affected:	No

2.4 Second Tertiary Crusher

Manufacturer/Type:	Symons/Cone
Model:	45" 42113
Serial Number:	42113
Maximum Capacity:	75 T/hr
NSPS Affected:	Yes
Installation Date:	1995

2.4 Generator

Manufacturer:	Detroit Diesel
Model:	8163T305
Rated Power Output:	560 kW
Stack Diameter:	0.5 feet
Stack Height:	12 feet
Exhaust Flowrate:	5731 acfm
Exhaust Temperature:	700°F

SUMMARY OF EVENTS

On September 15, 1995, DEQ received a Permit to Construct application for a portable rock crushing facility from Rock Contractors, Inc. The application was determined administratively complete on December 21, 1995. On April 11, 1996, a meeting between Rock Contractors, Inc., the facility's consultant (Spidell and Associates), and DEQ staff was held. On September 27, 1996, processing of the application was halted for nonpayment of registration fees. On February 11, 1997, DEQ received payment of delinquent fees and requested additional information. Additional information and a formal request to apply the standard portable permit to the project was received on March 3, 1997.

DISCUSSION

1. Area Classification

The rock crushing facility covered by this permit is a portable source and may operate in both PM_{10} attainment and non-attainment areas throughout the state of Idaho.

2. Emission Estimates

This facility's uncontrolled and controlled potential to emit PTE of PM is 314 T/yr and 99 T/yr, respectively, in PM_{10} non-attainment areas, and 322 T/yr and 99 T/yr, respectively, in attainment areas. The facility's uncontrolled and controlled PTE of PM_{10} emissions is 125 T/yr and 40 T/yr in PM_{10} non-attainment areas, and 124 T/yr and 42 T/yr in attainment areas. The emission estimates are included in Appendix A.

The emissions are inherently limited below certain triggering levels (i.e., PSD and Title V thresholds) by placing limits on maximum throughput for the crushing equipment and hours of operation for the generator. In this case, 1,330,000 T/yr maximum throughput, and 3,909 hours of operation per year in non-attainment areas, and 1,270,000 T/yr maximum throughput and 8,517 hours per year in attainment areas. The 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.

Emission estimates to determine the PTE for aggregate processing and handling are conservatively determined using a generalized crusher spreadsheet. The spreadsheet has been developed using emission factors from AP-42, Table 11.19.2-2 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. PTE is used to determine if PSD or Title V Operating Permit requirements apply to the facility. The following assumptions have been incorporated into the spreadsheet:

a. <u>Crushers</u>

- 100% of the maximum throughput enters the primary and secondary crushers
- 75% of the maximum throughput enters each subsequent crusher
- the control efficiency at each crusher is 71%

b. <u>Screens</u>

- a corresponding screen exists for each crusher
- 100% of the maximum throughput enters each screen
- the control efficiency at each screen is 70%

c. <u>Transfer Points</u>

- seven transfer points are associated with each crusher
- 100% of the maximum throughput goes through the first half of the transfer points
- 50% of the throughput goes through the second half of the transfer points
- the average wind speed is 10 miles per hour
- the moisture content of the material is 2.5%
- the control efficiency at each transfer point is 70%
- transfer point emissions were estimated using the empirical drop-point equation[1]

d. <u>Other</u>

- Particulate Matter (PM) is equal to 2.265 times PM_{10}.

The control efficiency of 70% was chosen based on the use of water spray to control dust emissions and is considered a conservative estimate. The control efficiency obtained by using water on crushing, screening and aggregate transfer points ranges from 70%-90%[2]. After consultation with the Idaho Soil Conservation Commission, the moisture content of the soil (2.5%) was assumed, based on typical soil moisture content in Idaho. The wind speed of 10 miles per hour was based on the midrange wind speed that is valid for the drop-point equation.

In the introduction to AP-42[3], EPA discusses recommended uses of emission factors. "An emission factor is a <u>representative value</u> that attempts to relate the quantity of a pollutant released to the atmosphere with an activity associated with the release of that pollutant . . . In most cases, these factors are simply averages of all available data of acceptable quality, and are generally assumed to be representative of long-term averages for all facilities in the source category (i.e., a population average) . . . Because emission factors essentially represent an average of a range of emission rates, approximately half of the subject sources will have emission rates greater than the emission factor and the other half will have emission rates less than the factor."

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[1] United States Environmental Protection Agency, *Compilation of Air Pollutant Emission Factors, Fifth Edition* (Research Triangle Park, NC: Office of Air Quality Planning and Standards, January 1995), 13.2.4-3.

[2] Orlemann, et al., *Fugitive Dust Control Technology* (Park Ridge, N.J.: Noyes Data Corporation, 1983), 45, 363.

[3] United States Environmental Protection Agency, 1-11.

The Emission Factor Rating that accompanies each emission factor given in AP-42 is a qualitative measure of how well the factor represents emissions from the emission source. EPA states that the factor ". . . is given a rating A through E, with A being the best . . . A single observation based on questionable methods of testing would be assigned an 'E,' and a factor extrapolated from higher-rated factors for similar processes would be assigned a 'D' or 'E.'"* AP-42 emission factors for sand and gravel processing plants and crushed stone processing have emission factor ratings ranging from C to E. The empirical drop-point equation has a rating of A.

Another consideration that limits the accuracy of the emissions estimates is the assumptions of silt and moisture content of the aggregate. The assumptions used are representative of worst-case conditions, resulting in relatively high emission estimates. Worst-case conditions have been chosen to ensure that emissions will never be underestimated. Though these conservative assumptions are used to estimate emissions, they would not be reliable enough for determination of compliance with any applicable standard. This is particularly true if the emissions were to be used in a dispersion model to estimate ambient impacts to compare with the national ambient air quality standards. Although the emission rate is conservatively calculated, it is still used in determining the facility classification.

The facility is permitted to use a 560 kilowatt (kW) electrical generator to power the facility. Emissions due to the operation of the generator are estimated using the generalized spreadsheet that incorporates emission factors from AP-42, Section 3, "Stationary Internal Combustion Sources." The estimated emissions are included in Appendix A. Table 1, "Generator Emissions," summarizes the estimated emissions from the generator set, assuming 3,909 hours of operation per year in PM_{10} non-attainment areas, and 8,507 hours of operation per year in areas designated as attainment or unclassifiable.

Table 1: Generator Emissions

Source	PM (T/yr)	PM_{10} (T/yr)	NO_x (T/yr)	CO (T/yr)	SO_2 (T/yr)	VOC (T/yr)
Generator (Attainment Areas)	[illegible]	[illegible]	39.0	21.3	6.5	7.9
Generator (Non-attainment Areas)	3.2	3.1	45.5	9.8	3.0	3.6

The facility capacity was evaluated at 500 T/hr as specifically requested by the applicant. The crusher plant configuration in the application included a 500 T/hr initial screening operation followed by the initial crusher, which is rated at 160 T/hr. Because the screening emissions factor is larger than for initial crushing, worst-case emissions are accounted for. Maximum flexibility in crusher and generator was determined by the spreadsheet outputs and is provided in the permit's operating conditions, in accordance with DEQ policy.

3. <u>Facility Classification</u>

Rock crushing plants are not designated facilities, as defined in IDAPA 16.01.01.006.25 (<u>Rules for the Control of Air Pollution in Idaho</u>). The following equipment used at this facility is subject to the New Source Performance Standards (Title 40 Code of Federal Regulations Part 60, Subpart OOO, "Standards of Performance for Non-Metallic Mineral Processing Plants"):

Second Tertiary Crusher	
Manufacturer/Type:	Symons/Cone
Model:	45" 42103
Serial Number:	42103
Maximum Capacity:	75 T/hr

* United States Environmental Protection Agency, 1-10.

This facility is not a major facility as defined in IDAPA 16.01.01.006.54 and IDAPA 16.01.01.008.14. The SIC code for this facility is 1442, "Construction Sand and Gravel." The facility classification for this facility is A2 because the uncontrolled potential to emit is greater than on hundred tons per year (100 T/yr). The spreadsheet included as Appendix A automatically determines the facility classification. The facility's desired classification is A2. Additional operational flexibility was not afforded to the facility, because mandatory annual inspections accompany an A1 designation.

4. Permit Requirements

The permit limits PTE by limiting the maximum aggregate throughput to the crushing facility and the hours of operation of the five hundred sixty kilowatt (560 kW) electrical generator in Sections 2.2 and 2.6, respectively To ensure continuous compliance, the permittee must monitor and record these parameters both daily and annually.

PTE is also limited by requiring that all fugitive and point sources of dust (particulate matter) be reasonably controlled. The permittee must monitor and record the methods used to reasonably control all sources of dust emissions each day during operation.

In addition to requiring reasonable control, opacity limits are placed on all crushers, transfer points and fugitive sources according to 40 CFR Part 60, Subpart OOO. Furthermore, visible emissions from all dust sources are not to be observed leaving the property boundary for more than 3 minutes in any 60 minute period. Compliance with opacity limits and visible emission limits will ensure that the National Ambient Air Quality Standards (NAAQS) will not be violated and will provide assurance that reasonable controls are being employed.

Allowable product throughputs and emissions were established according to current DEQ policy for portable rock crushing facilities desiring to operate in both attainment and non-attainment areas.

Each time the facility relocates, the permittee will be required to notify DEQ of the new site of operations, the startup date, the number and type of crushers, and to submit a plot plan that shows the property boundary.

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 3 minutes in any 60 minute period. If visible emissions are not seen crossing the property boundary, no significant impact on ambient air quality nor a violation of NAAQS will occur. Therefore, regarding emissions from the crushing, screening, and conveying equipment, the crushing facility may operate in both PM_{10} attainment and non-attainment areas.

The facility is permitted to use a five hundred sixty kilowatt (560 kW) electrical generator to power the facility. The SCREEN3 modeling output is included in Appendix B and the subsequent worst-case receptor impact analysis is included as part of Appendix A. Table 2, "Generator Modeled Impacts," summarizes the estimated maximum worst-case receptor impacts from the generator set, assuming 3,909 hours of operation per year and 10.7 hours of operation per day. The impacts from the generator are above the levels of significant contribution[3] of 5.0 $\mu g/m^3$ and 1.0 $\mu g/m^3$, respectively. Therefore, the hours of operation of the generator must be limited in PM_{10} non-attainment and proposed non-attainment areas.

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[3] IDAPA 16.01.01.006.88 Rules for the Control of Air Pollution in Idaho

Table 2: Generator Modeled Impacts

	PM_{10} ($\mu g/m^3$)		NO_x ($\mu g/m^3$)	CO ($\mu g/m^3$)		SO_2 ($\mu g/m^3$)		
Averaging Period	24-hr	Annual	Annual	24-hr	Annual	3-hr	24-hr	Annual
Generator Attainment Areas	11.2	2.2	30.7	34.1	6.6	23	11.4	2.3
Generator Non-attainment Areas	5.0	1.0	14.1	15.1	3.0	23	4.7	0.9

6. Regulatory Review

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

IDAPA 16.01.01.301.02(b)	Requirement to Obtain a Tier I Operating Permit;
IDAPA 16.01.01.401.01	Optional Tier II Operating Permits;
IDAPA 16.01.01.402	Application Procedures;
IDAPA 16.01.01.403	Permit Requirements for Tier II Sources
IDAPA 16.01.01.404	Procedures for Issuing Permits;
IDAPA 16.01.01.405	Conditions for Tier II Operating Permits;
IDAPA 16.01.01.406	Obligation to Comply;
IDAPA 16.01.01.470	Permit Application Fees for Tier II Permits;
IDAPA 16.01.01.577.01.a.ii	Ambient PM_{10} Air Quality Standard;
IDAPA 16.01.01.650	Control of Fugitive Dust;
IDAPA 16.01.01.651	Fugitive Dust Precautions; and
40 CFR 60, Subpart OOO	Standards of Performance for Nonmetallic Mineral Processing Plants.

7. Interbureau Coordination

7.1 Operating Permits Bureau

All equipment affected by 40 CFR 60 Subpart OOO must be permitted under the Title V (Tier I) permitting program by June 1, 1999.

7.2 Compliance Assistance Bureau

Based on consultation with the Compliance Assistance Bureau (CAB), no enforcement actions are pending at this facility. A draft copy of this proposed action was presented to the CAB for review and comment.

8. AIRS Information

An update to the AIRS database is required. The information necessary to update the database is included as Appendix C of this technical analysis.

FEES

The facility is not a major facility as defined in IDAPA 16.01.01.008.14. Therefore, registration and registration fees, according to IDAPA 16.01.01.516, are not applicable upon permit issuance.

The Permittee is subject to a $500.00 permit application fee upon issuance of the final permit, as required by IDAPA 16.01.01.470 (Fees).

RECOMMENDATION

Based on the review of the OP application and all applicable state and federal rules and regulations concerning the permitting of air pollution sources, the Bureau recommends that Rock Contractors, Inc., be issued a Tier II OP for this portable rock crushing facility. An opportunity for public comment shall be provided as required by IDAPA 16.01.01.404.01 (Rules). Staff members also recommend that the facility be notified in writing of the obligation to pay permit application fees for the Tier II OP.

MB\SJR\DAM:jrj...\permit\rockcon\rockconc.TAM

cc: P. Rayne/AFS
S. West, Boise Regional Office
Source File
COF

APPENDIX A

Rock Contractors, Inc.

Portable Rock Crushing Plant

Standardized Spreadsheet

DATA ENTRY

Company Name:	ROCK CONTRACTORS, INC.	Engineer:	DAK
Project:	PORTABLE ROCK CRUSHER	Date:	MARCH 13, 1997
		Filename:	RC CRUSH.WK4
	P-1312-146-3 LATEST REQUIREMENT VERSION		

Crusher Facility Information

Facility Production Capacity:	100 [=] tons/hr	
Applicant's		
Requested Hours of Operation:	8 [=] hrs/day	
	1,500 [=] hrs/yr	
Estimated Throughput:	750,000 [=] tons/yr	
Maximum Hours of Operation:	8,760 [=] hrs/yr	
Maximum Throughput:	4,380,000 [=] tons/yr	
Number of Crushers:	1	

Emissions

Annual Threshold Emission Limit:	A	(A = <100 Tons/yr, Below Title V Threshold)
		(B = <250 Tons/yr, PSD Threshold)
Estimated Emission Limitations:	99 Tons/yr	

Generator Information

Generator? (Y/N)	Y	
Generator Size:	400 [=] kW	336.792 Conversion Factor
Units:	B	(A = Horsepower)
		(B = Kilowatts)
Fuel Type:	A	(A = Diesel Fuel Generator)
		(B = Gasoline Fuel/Dual Fuel Generator)
Fuel Usage:	37.8 [=] gal/hr	
Fuel Heating Value:	3.102433 [=] MMBtu/hr	
Predicted Ambient Concentrations:	10.88 [=] ug/m3, at maximum rate of 1 hr/hr	

Dust Fugitive Factors

Mean Wind Speed (U)	10 [=] mph
Material Moisture Content (M)	2.5 [=] %
Particle Size Multiplier (k)	
PM 10 (<10 µm)	0.35 [=] dimensionless
PM (<30 µm)	0.74 [=] dimensionless
Emission Factors:	
PM 10 (<10 µm)	0.0020 [=] lb/ton
PM	0.0032 [=] lb/ton
	0.0047 [=] lb/ton

Note: (PM = (k*0.0032*(U/5)^1.3/(M/2)^1.4)/0.6

	Background Concentrations -- Attainment/Non Classifiable Areas (ug/m3)				
	1-hr	3-hr	8-hr	24-hr	Annual
PM					
PM-10				86.0	32.7
CO	11,500		3,130		
NO_2					40.0
SO_2		251		151	33.3
HC					

PERMIT TO CONSTRUCT DATA

Limits Based on Applicant's Data

PTE Summary	Uncontrolled Emissions		Controlled Emissions	
	181.7 [=] T/yr of PM		55.4 [=] T/yr of PM	
Enforceable Limits - Based on Requested Operations				
Generator - Operation	8.8	hrs/day	1,500	hr/yr
Crusher - Production	6,000	T/day	9.75	MMT/yr
DEQ Classification:	A2			

Attainment/Non Classifiable Area					Non-Attainment Area				
Uncontrolled Emissions		Controlled Emissions				Uncontrolled Emissions		Controlled Emissions	
313.6 [=] T/yr of PM		99.0 [=] T/yr of PM			PTE Summary	322.5 [=] T/yr of PM		99.0 [=] T/yr of PM	
Enforceable Limits - Attainment Areas						Enforceable Limits -- Non-Attainment Areas			
24.0	hrs/day	8,507	hr/yr		Generator	10.7	hrs/day	3,909	hr/yr
12,000	T/day	1.37	MMT/yr		Crusher	6,155	T/day	1.33	MMT/yr
DEQ Classification:		A2				DEQ Classification:		A2	

SPREADSHEET OUTPUT

Potential to Emit -- Based on Applicant's Data

Crusher, Screen & Transfer Points	Uncontrolled Emissions	Controlled Emissions
PM	180 tons/yr	54 tons/yr
PM-10	82 tons/yr	21 tons/yr
Generator		
PM	1.2 tons/yr	1.2 tons/yr
PM-10	1.2 tons/yr	1.2 tons/yr
CO	3.8 tons/yr	3.8 tons/yr
NO_x	17.5 tons/yr	17.5 tons/yr
SO_2	1.2 tons/yr	1.2 tons/yr
TOC	1.5 tons/yr	1.5 tons/yr
Total Crusher + Generator		
PM	181 tons/yr	55 tons/yr
PM-10	84 tons/yr	23 tons/yr

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

Emissions limited to less than: 100 Tons/yr

Assumption: Plant operation limited by NAAQS for generator emissions, and Crusher emissions back-calculated to yield 99 Tons/yr of emissions.

Attainment/Non Classifiable Area				Non Attainment Area	
Uncontrolled Emissions	Controlled Emissions	Crusher	Uncontrolled Emissions	Controlled Emissions
307 tons/yr	92 tons/yr	PM	319 tons/yr	96 tons/yr
117 tons/yr	35 tons/yr	PM-10	121 tons/yr	36 tons/yr
		Generator		
7.0 tons/yr	7.0 tons/yr	PM	3.2 tons/yr	3.2 tons/yr
7.0 tons/yr	7.0 tons/yr	PM-10	3.2 tons/yr	3.2 tons/yr
21.3 tons/yr	21.3 tons/yr	CO	9.8 tons/yr	9.8 tons/yr
99.0 tons/yr	99.0 tons/yr	NO_x	45.3 tons/yr	45.3 tons/yr
6.5 tons/yr	6.5 tons/yr	SO_2	3.0 tons/yr	3.0 tons/yr
7.9 tons/yr	7.9 tons/yr	TOC	3.6 tons/yr	3.6 tons/yr
		Totals:		
314 tons/yr	99 tons/yr	PM	322 tons/yr	99 tons/yr
124 tons/yr	42 tons/yr	PM-10	125 tons/yr	40 tons/yr

EMISSION ANALYSIS BASED ON APPLICANT'S DATA

Generator Emissions			Applicant's Data		Generator Emissions		Modeled Air Concentrations Based On Entered SCREEN3 Data		
Pollutant	Generator Emission Factor [-] lb/hr hr	Generator Emission Rate [-] lb/hr	Hours of Operation [-] hr/day	[-] hr/year	Hours of Operation hr/day	T/yr	Calculated 24 hr Impact [-] µg/m3	Calculated Annual Impact [-] µg/m3	Calculated Annual Impact [-] ug/m3
PM	0.0023	1.63	8.0	1,500	13.31	1.24	NO	NO	
PM 10	0.0023	1.62	8.0	1,500	13.31	1.24	3.7	0.4	
CO	0.0067	3.03	8.0	1,500	40.12	3.76	11.3	1.3	85.3
									60.3
NOx	0.0110	21.27	8.0	1,500	186.20	17.46		5.4	
SO2	0.0021	1.24	8.0	1,500	12.31	1.15	2.3	0.4	32.5
VOC	0.0023	1.83	8.0	1,500	14.84	1.39			

Generator Emissions	Generator Emissions Regulatory Analysis						Ambient Air Concentrations w/ Background Values (µg/m3)				
	BRC Evaluation		Significant Contribution Emission Rates		Non Attainment Area Significant Contribution Ambient Air Concentration						
Pollutant					24 hr	Annual	1 hr	3 hr	8 hr	24 hr	Annual
PM	BRC	(1.1 T/yr)	No	(15 T/yr)							
PM 10	BRC	(1.1 T/yr)	No	(15 T/yr)	No	5 µg/m3					
CO	BRC	(10 T/yr)	No	(100 T/yr)	No	2000 ug/m3 (1 hour)	500 ug/m3 (8 hour)	11,483		5,196	
NOx	Above BRC	(1 T/yr)	No	(40 T/yr)							
SO2	BRC	(1 T/yr)	No	(40 T/yr)				566		147.3	31.9
VOC											

Rock Crusher Emissions	Crushers Stgs. 1 & 2	Crushers Stgs. 3 - 5	Screens Stgs. 1 & 2	Screens Stgs. 3 - 5	Transfer Points Stgs. 1 - 11	Transfer Points Stgs. 12 - 18	Total Emissions	For information purposes: Crusher Hours of Operation to Yield 99.9 T/yr Emissions w/o Generator	w Generator
Stg. Units	2	2	2	2	14	14			
Throughput [-] (lb/hour)	300	175	300	175	300	250			
Operation Schedule [-] (hr/day)	8								1500
Throughput [-] (MM T/yr/unit)	0.78	0.36	0.73	0.36	0.73	0.38			
Operation Schedule [-] (hr/yr)	1,500								
Control Efficiency	70%	70%	70%	70%	70%	70%			hr/yr
PM 10									
Emission Factor	0.0003	0.0024	0.0136	0.0219	0.0020	0.0028			
Uncontrolled Emissions [-] (lb/hr)	0.27	1.80	13.60	11.37	1.53	7.06	42.3		
Controlled Emissions [-] (lb/hr)	0.08	0.54	4.08	3.41	0.46	2.12	22.5	2115	2134
Uncontrolled Emissions [-] (T/yr)	0.2	1.4	11.3	19.9	10.6	3.1	88.6		
Controlled Emissions [-] (T/yr)	0.1	0.4	3.4	12.9	3.2	1.0	26.6		
TSP									
Emission Factor	0.0007	0.0005	0.0395	0.1064	0.0055	0.0051			
Uncontrolled Emissions [-] (lb/hr)	0.70	0.75	39.50	139.78	37.13	19.66	240.6		
Controlled Emissions [-] (lb/hr)	0.21	0.23	11.85	41.93	11.14	5.90	72.3	2745	2709
Uncontrolled Emissions [-] (T/yr)	0.5	1.5	29.3	181.8	26.0	13.8	180.5		
Controlled Emissions [-] (T/yr)	0.2	0.5	8.8	54.5	8.1	4.1	54.1		

Notes

- Number of Screens = Number of Crushers
- Number of Transfer Points = 2*(Number of Crushers)
- Emission Factors from AP-42, Table 11.19.2-2. Where factors were given for one pollutant, the following conversions factors were used: TSP = PM*0.71, TSP = PM*0.8
- Hourly values are based on maximum daily production rates given above. Annual values are based on throughput values given above.

	Generator Emissions		Crusher Emissions (Controlled)		Total Emissions	
Pollutant	lb/day	T/yr	lb/day	T/yr	lb/day	T/yr
PM	13.31	1.21	377.4	24.1	390.6	25.4
PM 10	13.31	1.24	219.4	20.6	232.8	21.8
CO	40.12	3.76			40.1	3.8
NOx	186.20	17.46			186.2	17.5
SO2	12.31	1.15			12.3	1.1
VOC	14.84	1.39			14.8	1.4

Enforceable Limits				
Generator - Operation	8.0	hr/day	1,500	hr/yr
Crusher - Production	1,800	T/hr	0.75	MMT/yr

EMISSION ANALYSIS BASED ON AMBIENT AIR QUALITY STANDARDS

Emissions Restricted to Less than: 100 Tons/yr

Attainment Area

Pollutant	Generator Emission Factor [-] lb/hr/hr	Generator Emission Rate [-] lb/hr	Calculated Impacts AAQS Hours of Operation [-] hr/day	Calculated Impacts AAQS Hours of Operation [-] hr/year	Calculated Impacts AAQS Hours of Operation [-] (Other)	Calculated Impacts < 100 TPY Hours of Operation [-] hr/year	Allowable Impacts Generator Hours of Operation [-] hr/day	Allowable Impacts Generator Hours of Operation [-] hr/year	Allowable Impacts Crusher Hours of Operation [-] hr/year	Allowable Impacts < 100 TPY Calculated Emissions [-] ton/year	Maximum Throughput [-] MM ft/year
PM	0.0022	1.63	N/A	N/A		8,760	24.0	8,507	2,549	99.00	1.27
PM10	0.0022	1.63	24.0	8,760		8,760				42.01	3.32
CO	0.0067	5.02	N/A	N/A	1.0 1 0.0 1	8,760				21.33	
NOx	0.0319	23.37	N/A	8,760		8,507				99.00	
SO2	0.0021	1.54	24.0	8,760	3.0 1	8,760				6.55	
VOC	0.0023	1.65	N/A	N/A		8,760				7.03	

Pollutant	Generator Emissions Calculated 24 hr Impact [-] µg/m³	Generator Emissions Calculated Annual Impact [-] µg/m³	Generator Emissions Calculated Impact [-] (Other)	Ambient Air Concentrations w/ Background Values (µg/m³) Based On Entered SCREEN3 Data: 1 hr	3 hr	8 hr	24 hr	Annual
PM	N/A	N/A						
PM10	11.1	2.2						
CO	34.0	4.6	85.1 60.1	11,485		3,196		
NOx	137.9	30.1						71
SO2	10.4	2.0	31.4		346		154	25.5
VOC	12.8	3.5						

	Stockpile Max. 1 & 2	Stockpile Max. 3 & 4	Hopper Max. 1 & 2	Hopper Max. 3 & 4	Transfer Point Max. 1 & 2	Transfer Point Max. 3 & 4	Total Emissions	Allowable Hours of Operation w/ Emissions <100 T/yr w/o Generator	Allowable Hours of Operation w/ Emissions <100 T/yr w/ Generator
Site Data									
Throughput ([-] ft/hr/hr)	800	375	300	375	300	230			
Throughput ([-] MM ft/year)	1.27	0.96	1.27	0.96	1.27	0.96			
Operation Schedule ([-] hrs/yr)	8,549								
Control ([-])	70%	70%	70%	70%	70%	70%			
PM10									
Emission Factor	0.0003	0.0031	0.0130	0.0210	0.0020	0.0020			
Uncontrolled Emission ([-] lb/hr)	0.27	1.00	15.00	53.23	1.12	7.06	91.5		
Controlled Emission ([-] lb/hr)	0.08	0.30	4.50	15.96	0.34	2.12	23.5	7213	6701
Uncontrolled Emission ([-] T/yr)	0.1	2.1	19.1	67.9	1.0	9.0	116.6		
Controlled Emission ([-] T/yr)	0.1	0.7	5.7	20.4	0.3	2.7	33.8		
PM									
Emission Factor	0.0001	0.0001	0.0191	0.1001	0.0031	0.0031			
Uncontrolled Emission ([-] lb/hr)	0.10	0.31	19.10	119.76	1.53	10.50	150.6		
Controlled Emission ([-] lb/hr)	0.03	0.09	5.73	35.93	0.46	3.15	45.2	3743	3549
Uncontrolled Emission ([-] T/yr)	0.1	0.3	24.3	156.1	2.0	13.7	196.6		
Controlled Emission ([-] T/yr)	0.1	0.1	7.3	46.8	0.6	4.1	58.9		

Notes

- [illegible] calculation methods, crusher and transfer point emissions
- [illegible] Averaging Period
- [illegible] Averaging Period
- [illegible] Averaging Period

Daily and annual operation values are based on background data for the mobile generator emissions (i.e., ambient air concentrations). Based the generator hours of operation have been back calculated from 8,635 values. The crusher particulate emissions (controlled) are also provided for a 24 hour crusher operational time, assuming 99 Tons/hr for generator emissions.

Maximum throughput values are based on the maximum number of hours a 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 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

Non Attainment Area

Pollutant	Generator Emission Factor [-] lb/hr/hr	Generator Emission Rate [-] lb/hr	Calculated Impacts: AAQS Hours of Operation [-] hr/day	Calculated Impacts: AAQS Hours of Operation [-] hr/year	Calculated Impacts: < 100 TPY Hours of Operation [-] Other	Calculated Impacts: < 100 TPY Hours of Operation [-] hr/year	Allowable Impacts: Generator Hours of Operation [-] hr/day	Allowable Impacts: Generator Hours of Operation [-] hr/year	Allowable Impacts: Crusher Hours of Operation [-] hr/year	Allowable Impacts: < 100 TPY Calculated Emissions [-] lbs/year	Maximum Throughput [-] MM Tons/year
PM	0.0022	1.65	N/A	N/A		8,760				99.00	1.33
PM 10	0.0022	1.65	10.7	3,909		8,760	10.7	3,909	2,634	39.66	3.49
SO2	0.0067	5.02	N/A	N/A	10.2	8,760				9.00	
					8.9						
NOx	0.0310	23.27	N/A	8,760		8,760				42.49	
CO	0.0021	1.54	21.0	8,760	20.1	8,760				3.81	
VOC	0.0022	1.65	N/A	N/A		8,760				3.63	

Pollutant	Generator Emissions: Calculated 24 hr Impact [-] µg/m3	Calculated Annual Impact [-] µg/m3	Calculated Impact [-] Other	Ambient Air Concentrations w/ Background Values (µg/m3) Based On Entered SCREEN3 Data: 1 hr	3 hr	8 hr	24 hr	Annual
PM	N/A	N/A						
PM 10	3.0	1.0						
SO2	13.2	3.0	85.2	11,483		5,190		
			40.1					
NOx	30.5	14.1						34
CO	4.7	0.9	31.1		366		149	31.4
VOC	3.6	1.1						

	Crusher Nos. 1 & 2	Crusher Nos. 3 & 4	Screener Nos. 1 & 2	Screener Nos. 3 & 4	Transfer Points Nos. 1 - 11	Transfer Points Nos. 12 - 28	Total Emissions	Allowable Hours of Operation w/ Emissions < 100 T/yr w/o Generator	w/ Generator
Per Units	2	3	2	3	14	14			
Throughput (-) (Tons/hr)	500	375	500	375	500	250			
Throughput (-) (MM Tons/year)	1.33	1.00	1.33	1.00	1.31	0.66			
Operating Schedule (-) (hrs/yr)	2,634								
Control Efficiency	70%	70%	70%	70%	70%	70%			
PM 10									
Emission Factor	0.0003	0.0024	0.0130	0.0710	0.0030	0.0020			
Uncontrolled Emissions (-) lb/hr	0.27	1.80	15.00	53.25	14.13	7.86	91.3		
Controlled Emissions (-) lb/hr	0.08	0.54	4.50	15.98	4.24	2.12	27.5	8760	6978
Uncontrolled Emissions (-) T/yr	0.4	2.4	19.9	70.7	18.7	9.4	121.4		
Controlled Emissions (-) T/yr	0.1	0.7	6.0	21.2	5.6	2.8	36.4		
PM									
Emission Factor	0.0007	0.0063	0.0394	0.1864	0.0053	0.0053			
Uncontrolled Emissions (-) lb/hr	0.70	4.71	59.10	139.98	17.33	18.66	240.6		
Controlled Emissions (-) lb/hr	0.21	1.41	17.81	41.93	11.20	5.60	72.2	2743	2634
Uncontrolled Emissions (-) T/yr	0.9	6.2	77.2	183.5	45.5	24.6	317.2		
Controlled Emissions (-) T/yr	0.3	1.9	23.2	55.0	14.9	7.4	95.0		

Notes

(TPY) calculations include crusher, screen and transfer point emissions

(AAQS) 1 Hr Averaging Period

(AAQS) 8 Hr Averaging Period

(AAQS) 24 Hr Averaging Period

Daily and annual operation values are based on background data less the modeled generator emissions (i.e., ambient air concentrations). 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 rates.

Hourly emission values are based on maximum daily production rates, given above.

Annual emission values are based on the maximum throughput values given above.

Non Attainment Area hour of operation calculations assume TSP emissions are non attainment for PM10 non attainment areas. Therefore, operation is limited by sig impact limits.

APPENDIX B

Rock Contractors, Inc.

Portable Rock Crushing Plant

Electrical Generator Stack

SCREEN3 Modeling Output

03/04/97
11:12:56

*** SCREEN3 MODEL RUN ***
*** VERSION DATED 95250 ***

ROCK CONTRACTORS CRUSHING PLANT GENERATOR STACK

SIMPLE TERRAIN INPUTS:

SOURCE TYPE	=	POINT
EMISSION RATE (G/S)	=	.126000
STACK HEIGHT (M)	=	3.6600
STK INSIDE DIAM (M)	=	.1524
STK EXIT VELOCITY (M/S)	=	148.2478
STK GAS EXIT TEMP (K)	=	644.0000
AMBIENT AIR TEMP (K)	=	293.0000
RECEPTOR HEIGHT (M)	=	.0000
URBAN/RURAL OPTION	=	RURAL
BUILDING HEIGHT (M)	=	.0000
MIN HORIZ BLDG DIM (M)	=	.0000
MAX HORIZ BLDG DIM (M)	=	.0000

STACK EXIT VELOCITY WAS CALCULATED FROM
VOLUME FLOW RATE = 5730.0000 (ACFM)

BUOY. FLUX = 4.601 M**4/S**3; MOM. FLUX = 58.059 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
10.	.1777E-05	3	10.0	10.0	3200.0	10.44	2.00	1.64	NO
100.	16.91	4	20.0	20.0	6400.0	7.05	8.24	4.72	NO
200.	14.32	4	10.0	10.0	3200.0	10.44	15.68	8.72	NO
300.	11.02	4	8.0	8.0	2560.0	12.13	22.74	12.33	NO
400.	9.433	4	5.0	5.0	1600.0	17.22	29.71	15.75	NO
500.	8.032	4	4.0	4.0	1280.0	20.60	36.47	18.93	NO
600.	6.990	4	3.5	3.5	1120.0	23.03	43.07	21.92	NO
700.	6.208	4	3.0	3.0	960.0	26.25	49.61	24.89	NO
800.	5.577	4	2.5	2.5	800.0	30.77	56.11	27.88	NO
900.	5.070	4	2.5	2.5	800.0	30.77	62.37	30.47	NO
1000.	4.642	4	2.0	2.0	640.0	37.55	68.81	33.52	NO

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 10. M:

104.	16.96	4	20.0	20.0	6400.0	7.05	8.62	4.93	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	16.96	104.	0.

****
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
****

APPENDIX C

Rock Contractors, Inc.

Portable Rock Crushing Plant

AIRS Data Entry

ABBREVIATED AIRS DATA ENTRY SHEET

Name of Facility: Rock Contractors, Inc. 500 T/hr Crushing Facility

AIRS/Permit #: 777 - 00160

Permit Issue Date:

*Source/Emissions Unit Name (25 spcs) (Please use name as indicated in permit)	SCC # (8 digit #)	Air Program (SIP/NESHAP/ NSPS/PSD)
*Impact Crusher - Wedag Impactor	30502510	NSPS
Cone Crusher - Cedar Rapids	30502510	NSPS
Cone Crusher - Cedar Rapids	30502510	NSPS
Cone Crusher - Symons	30502510	NSPS*
Generator - 560 kW Detroit Diesel	20100107	SIP

* Comment: Symons Cone Crusher is a 40 CFR60 - Subpart OOO - affected emissions unit.

RETURN TO PAT RAYNE

AIRS-PT.LST (9/95)

March 26, 1997

MEMORANDUM

TO: Orville D. Green, Assistant Administrator
Air & Hazardous Waste Division

FROM: Martin Bauer, Chief
Air Quality Permitting Bureau

SUBJECT: Issuance for Proposed Tier II Operating Permit #777-00160 to Rock Contractors, Inc., Portable Rock Crushing Plant

PURPOSE

The purpose for this memorandum is to satisfy the requirements of IDAPA 16.01.01 Sections 400 through 406 (Rules for the Control of Air Pollution in Idaho) (Rules) for issuing Operating Permits.

PROJECT DESCRIPTION

Rock Contractors, Inc., operates a portable rock crushing facility. Rock Contractors, Inc., is requesting a Tier II Operating Permit (OP) be issued to cover the operations of the rock crushing facility in both attainment and non-attainment areas throughout the state of Idaho. The facility has a maximum rated capacity of 500 tons per hour (T/hr). The facility includes a 560 kilowatt (kW) electrical generator set. The Permittee requested that the standard permitting methodology be applied to the application.

SUMMARY OF EVENTS

On September 15, 1995, DEQ received a Permit to Construct application for a portable rock crushing facility from Rock Contractors, Inc. The application was determined administratively complete on December 21, 1995. The final required information was received on March 3, 1997.

FEES

The facility is not major as defined in IDAPA 16.01.01.008.14. Therefore, registration and registration fees in accordance with IDAPA 16.01.01.526 are not applicable upon permit issuance.

The facility is subject to Tier II permit application fees as required by IDAPA 16.01.01.470, for the amount of $500.00. The fee will be requested upon permit issuance.

RECOMMENDATION

Based on the review of the OP application and all applicable state and federal rules and regulations concerning the permitting of air pollution sources, the Bureau recommends that Rock Contractors, Inc., be issued a Tier II OP for this portable rock crushing facility. An opportunity for public comment shall be provided as required by IDAPA 16.01.01.404.01 (Rules). Staff members also recommend that the facility be notified in writing of the obligation to pay permit application fees for their Tier II OP.

ODG\MS\DAH:jrj...\permit\rockcon\rockcmr.IMM

cc: Pat Rayne, AFS
S. West, Boise Regional Office
OP File Manual
Source File
COF