

April 23, 2000

MEMORANDUM

TO: Stephen West, Administrator
Boise Regional Office

FROM: Daniel Heiser, P.E. *DH*
Technical Services Office

SUBJECT: ***PERMIT TO CONSTRUCT TECHNICAL ANALYSIS***
P-000002, Nelson-Deppe, Portable
(Standard Rock Crusher Permit to Construct No. 777-00209; 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

Nelson-Deppe is proposing to modify a portable rock crushing facility. Nelson-Deppe 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 1200 tons per hour (1200 T/hr). The facility includes a 1360-kilowatt (1360-kW), diesel-fired electrical generator.

SUMMARY OF EVENTS

On January 24, 2000, the Idaho Department of Health and Welfare, Division of Environmental Quality (DEQ) received a PTC application. On February 23, 2000, the application was determined complete.

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:	Bohringer Horizontal Impact Crusher/Model RC 14
Date of Manufacture:	1987
Maximum Capacity:	275 tons/hour

2.2 Secondary Crusher

Manufacturer/Type:	Pioneer Twin Roll Crusher/Model 5536
Date of Manufacture:	1979
Maximum Capacity:	277 tons/hour

2.3 Tertiary Crusher

Manufacturer/Type:	Barmac Mark III Duopactor/Model Mk III Duopactor
Date of Manufacture:	1990
Maximum Capacity:	300 tons/hour

2.4 Generator

Manufacturer:	Caterpillar
Model:	3512
Serial Number:	NA
Rated Power Output(kW):	1360 kW
Fuel Type (gasoline/diesel):	Diesel
Fuel Usage (gal/hr):	96.2 gph
Stack Diameter (ft):	1.1 ft
Stack Height (ft):	13 ft
Exhaust Flared (acfm):	10,921 acfm
Exhaust Temperature (°F):	838 °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 and controlled PTE is 1,633 tons per any consecutive 12-month period (1,633T/yr) of PM and 493 T/yr of PM, 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 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 "A2" because the uncontrolled PTE is greater 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 Nelson-Deppe, 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
Boise RO
EPA Region 10

Appendix A

Emission Estimate Calculations

P-00002
Nelson-Deppe

DATA ENTRY

Company Name: Nelson Deppe
 Project: Portable Crusher
 PTC #: 777-00289
 Engineer: DH
 Date: 04/10/00
 Filename: E/Nelson Deppe

Crusher Facility Information
 Facility Production Capacity: 1290 [=] tons/hr

Applicant's Requested Hours of Operatio: 24 [=] hrs/day
 8,760 [=] hrs/yr
 Estimated Throughput: 10,512,000 [=] tons/yr
 Maximum Hours of Operatio: 8,760 [=] hrs/yr
 Maximum Throughput: 10,512,000 [=] tons/yr

Number of Crushers: 3
 Limitations: (A = <100 Tons/yr, Below Title V Threshold)
 (B = <250 Tons/yr, PSD Threshold)
 Annual Threshold Emission LA: 100 Tons/yr

Selected Emission Limitation: Y
 Generator Information: Y
 Generator? (Y/N)
 Generator Size: 1,360 [=] kW 1823.352 Conversion Factor

Units: B (A = Horsepower)
 (B = Kilowatts)

Fuel Type: A (A = Diesel-Fired Generator)
 (B = Gasoline-Fired/Dual-Fired Generator)

Fuel Usage: 96.2 [=] gal/hr

Fuel Heating Value: 13.089453 [=] MMBTU/hr

Modeled 1-hr Concentration: 7.2 [=] µg/m³, at emission rate of 1 lb/hr

Drop Point Emission Factors
 Mean Wind Speed (U): 10 [=] mph
 Material Moisture Content (M): 2.5 [=] %
 Particle Size Multiplier (k): 0.35 [=] dimensionless
 PM₁₀ (<10 µm): 0.74 [=] dimensionless
 PM_{2.5} (<2.5 µm): 0.4020 [=] lb/ton
 Emission Factor: 0.10653 [=] lb/ton
 PM₁₀ (<10 µm): 0.0667 [=] lb/ton
 PM_{2.5} (<2.5 µm): 0.0667 [=] lb/ton

Note: 1 PM = (K*(10032*(US)^1.3/(M2)^1.4)*D) 8

Background Concentrations -- Attainment/Non-Classifiable Areas (µg/m³)

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

INFUTS TO PERMIT TO CONSTRUCT (PTC)

Section	Value	Units
Section A.2 "Operating Requirements"		
Section A.2.1 Number of Crushers	3	
Section A.2.1 Number of Generators	1	
Section A.2.1 Number of Generators	1,360	[=] kW
Section B "Attainment Area When Not Collocated"		
Section B.1.1 Facility Throughput Limits	2,081,289	T/yr
Section B.1.3 Generator Hours of Operation	4,880	hrs/yr
Section C "Attainment Area When Collocated"		
Section C.1.3 Facility Throughput Limits	1,040,644	T/yr
Section C.1.4 Generator Hours of Operation	2,440	hrs/yr
Section D "Nonattainment Area"		
Section D.1.1 Facility Throughput Limits	2,081,289	T/yr
Section D.1.3 Generator Hours of Operation	4,880	hrs/yr

PERMIT LIMITS TABLE

Crusher	Attainment Area		Non-Attainment Area		Collocated Attainment Areas	
	T/day	MMT/yr	T/day	MMT/yr	MMT/yr	MMT/yr
Operating Requirements	28,800	2.08	28,800	2.08	1.04	1.04
Generator	24.0	4,880	24.0	4,880	3.0	3.0
Operating Requirements	24.0	4,880	24.0	4,880	3.0	3.0
Generator	24.0	4,880	24.0	4,880	3.0	3.0
Emission Limits	99	99	99	99	49.5	49.5
AIRS Facility Classification	A2	A2	A2	A2	A2	A2

OUTPUT

Potential to Emit -- Based on Applicant's Data

Crusher, Screens & Transfer Points	Uncontrolled Emissions		Controlled Emissions	
	PM-10	PM-10	PM-10	PM-10
Generator	1,629 tons/yr	620 tons/yr	489 tons/yr	186 tons/yr
PM-10	4.0 tons/yr	3.3 tons/yr	4.0 tons/yr	3.3 tons/yr
CO	46.4 tons/yr	177.7 tons/yr	46.4 tons/yr	177.7 tons/yr
NOx	29.0 tons/yr	29.0 tons/yr	29.0 tons/yr	29.0 tons/yr
SOx	5.7 tons/yr	5.7 tons/yr	5.7 tons/yr	5.7 tons/yr
TOC	1633 tons/yr	623 tons/yr	493 tons/yr	189 tons/yr
Total Crusher + Generator	1633 tons/yr	623 tons/yr	493 tons/yr	189 tons/yr
PTES Summary	1633.3 [-] T/yr	623.3 [-] T/yr	492.8 [-] T/yr	189.0 [-] T/yr
Enforceable Limits -- Based on Requested Operations	24.0	24.0	8.760	8.760
Generator -- Operation	24.0	24.0	8.760	8.760
Crusher -- Production	28,800	28,800	10.51	10.51
AIRS Facility Classification	A2	A2	A2	A2

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

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 Attainment/Non-Classifiable Area

Crusher	Uncontrolled Emissions		Controlled Emissions		Non-Attainment Area		Controlled Emissions	
	PM-10	PM-10	PM-10	PM-10	Crusher	Generator	Crusher	Generator
Generator	323 tons/yr	123 tons/yr	97 tons/yr	37 tons/yr	323 tons/yr	123 tons/yr	97 tons/yr	37 tons/yr
PM-10	2.2 tons/yr	1.8 tons/yr	2.2 tons/yr	1.8 tons/yr	2.2 tons/yr	1.8 tons/yr	2.2 tons/yr	1.8 tons/yr
CO	25.9 tons/yr	25.9 tons/yr	25.9 tons/yr	25.9 tons/yr	25.9 tons/yr	25.9 tons/yr	25.9 tons/yr	25.9 tons/yr
NOx	99.0 tons/yr	99.0 tons/yr	99.0 tons/yr	99.0 tons/yr	99.0 tons/yr	99.0 tons/yr	99.0 tons/yr	99.0 tons/yr
SOx	16.1 tons/yr	16.1 tons/yr	16.1 tons/yr	16.1 tons/yr	16.1 tons/yr	16.1 tons/yr	16.1 tons/yr	16.1 tons/yr
TOC	323 tons/yr	123 tons/yr	97 tons/yr	37 tons/yr	323 tons/yr	123 tons/yr	97 tons/yr	37 tons/yr
Total	325 tons/yr	124 tons/yr	99 tons/yr	39 tons/yr	325 tons/yr	124 tons/yr	99 tons/yr	39 tons/yr
PTES Summary	324.8 [-] T/yr	124.8 [-] T/yr	99.0 [-] T/yr	39.0 [-] T/yr	324.8 [-] T/yr	124.8 [-] T/yr	99.0 [-] T/yr	39.0 [-] T/yr
Enforceable Limits -- Attainment Areas	24.0	24.0	8.760	8.760	24.0	24.0	8.760	8.760
Generator	24.0	24.0	8.760	8.760	24.0	24.0	8.760	8.760
Crusher	28,800	28,800	2.08	2.08	28,800	28,800	2.08	2.08
AIRS Facility Classification	A2	A2	A2	A2	A2	A2	A2	A2

EMISSION ANALYSIS BASED ON APPLICANT'S DATA

Pollutant	Generator Emissions		Applicant's Data		Generator Emissions		Modeled Air Concentrations	
	lb/day	T/yr	Hours of Operation	Generator Emission Rate	Hours of Operation	24-hr Impact	Calculated Annual Impact	Calculated Annual Impact
PM-10	21.90	4.00	21.90	0.91	21.90	4.00	N/S	N/S
PM-10	18.00	3.29	18.00	0.75	18.00	3.29	0.4	0.4
CO	254.46	46.44	254.46	10.60	254.46	46.44	6.1	6.1
NO _x	973.86	177.73	973.86	40.58	973.86	177.73	23.4	23.4
SO _x	158.64	28.95	158.64	6.61	158.64	28.95	3.8	3.8
TOC	8,760	31.41	8,760	1.31	8,760	31.41	43	43

Pollutant	Generator Emissions Regulatory Analysis		Non-Attainment Area Significant Contribution		Ambient Air Concentration	
	24-hr	Annual	24-hr	Annual	1-hr	Annual
PM-10	5 ug/m ³	500 ug/m ³	5 ug/m ³	500 ug/m ³	11.476	33.1
CO	2000 ug/m ³	(8-hour)	2000 ug/m ³	(8-hour)	5.183	63.4

Pollutant	Generator Emissions Regulatory Analysis		Non-Attainment Area Significant Contribution		Ambient Air Concentration	
	24-hr	Annual	24-hr	Annual	1-hr	Annual
PM-10	5 ug/m ³	500 ug/m ³	5 ug/m ³	500 ug/m ³	11.476	33.1
CO	2000 ug/m ³	(8-hour)	2000 ug/m ³	(8-hour)	5.183	63.4

Pollutant	Generator Emissions		Crusher Emissions (Controlled)		Total Emissions	
	lb/day	T/yr	lb/day	T/yr	lb/day	T/yr
PM-10	21.90	4.00	4.00	2700.1	492.8	2700.1
PM-10	18.00	3.29	3.29	1036.4	189.1	1036.4
CO	254.46	46.44	46.44	254.5	46.4	254.5
NO _x	973.86	177.73	177.73	973.9	177.7	973.9
SO _x	158.64	28.95	28.95	158.6	29.0	158.6
TOC	8,760	31.41	31.41	8,760	31.4	8,760

Notes: 1. Number of Screens = Number of Crushers
 2. Number of Transfer Points = # (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 x 1.1; TSP = PM10 x 0.8

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

For information purposes, Crusher Hours of Operation to Yield 99.0 T/yr Emissions w/o Generator = 8760 hrs/yr

Crusher Plant Emission Calculations and Impact Estimates

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		AAQS		Calculated Impacts		Allowable Impacts		Maximum Throughput	
	[=] lb/MMBtu	[=] lb/hr	[=] hr/day	[=] hr/yr	[=] lb/yr	[=] lb/yr	[=] lb/yr	[=] lb/yr	[=] lb/yr	[=] lb/yr	[=] hr/day	[=] hr/yr	[=] ton/year	[=] MMT/year
PM-10	0.0573	0.75	24.0	8,760	N/S	8,760	1.0	8,760	8,760	1,734	4,880	99.00	2.08	
CO	0.8100	10.60	N/S	8,760	N/S	8,760	8.0	8,760	8,760	1,734	4,880	38.63	5.50	
NO _x	5.1000	40.58	N/S	8,760	N/S	8,760	3.0	8,760	8,760	1,734	4,880	99.00	2.08	
SO _x	0.5059	6.61	24.0	8,760	N/S	8,760	3.0	8,760	8,760	1,734	4,880	38.63	5.50	
TOC	0.1000	1.31	N/S	8,760	N/S	8,760	1.0	8,760	8,760	1,734	4,880	99.00	2.08	

Generator Emissions Ambient Air Concentrations w/ Background Values (ug/m³)
Based On Entered SCREEN Data

Pollutant	Calculated		Calculated		Calculated		Calculated		Calculated		Calculated		Calculated		Calculated		Calculated	
	24-hr Impact	Annual Impact	[=] ug/m ³															
PM-10	2.2	2.2	0.2	0.2	11.476	11.476	5.183	5.183	3-hr	3-hr	8-hr	8-hr	24-hr	24-hr	Annual	Annual	Annual	Annual
CO	30.5	30.5	3.4	3.4	76	76	53	53	3-hr	3-hr	8-hr	8-hr	24-hr	24-hr	Annual	Annual	Annual	Annual
NO _x	16.9	16.9	13.0	13.0	43.4	43.4	43.4	43.4	3-hr	3-hr	8-hr	8-hr	24-hr	24-hr	Annual	Annual	Annual	Annual
SO _x	19.0	19.0	2.1	2.1	43.4	43.4	43.4	43.4	3-hr	3-hr	8-hr	8-hr	24-hr	24-hr	Annual	Annual	Annual	Annual
TOC	3.8	3.8	0.4	0.4	11.476	11.476	5.183	5.183	3-hr	3-hr	8-hr	8-hr	24-hr	24-hr	Annual	Annual	Annual	Annual

Notes:
*TPY calculations include crusher, screen and transfer point emissions
*CO 1-hr Averaging Period
*SO_x 3-hr Averaging Period

Throughput (=) T/hr (t/yr)
Throughput (=) MM T/yr (t/yr)
Operation Schedule (=) hrs/yr
Control Efficiency (%)
Emission Factor
Uncontrolled Emissions (=) lb/hr
Controlled Emissions (=) lb/hr
Uncontrolled Emissions (=) T/yr
Controlled Emissions (=) T/yr
Emission Factor
Uncontrolled Emissions (=) lb/hr
Controlled Emissions (=) lb/hr
Uncontrolled Emissions (=) T/yr
Controlled Emissions (=) T/yr

TPY calculations include crusher, screen and transfer point emissions
CO 1-hr Averaging Period
SO_x 3-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.

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		AAQS		Allowable Impacts		Maximum Throughput	
	[=] lb/tp-yr	[=] lb/hr	[=] hr/day	[=] hr/yr	[=] lb/tp-yr	[=] lb/yr	[=] hr/day	[=] hr/yr	[=] lb/tp-yr	[=] lb/yr	[=] lb/tp-yr	[=] lb/yr
PM-10	0.0697	0.91	N/S	8,760	N/S	8,760	1.0	8,760	1,734	4,880	49,000	2,060
PM	0.0573	0.75	N/S	8,760	N/S	8,760	1.0	8,760	1,734	4,880	49,000	2,060
CO	0.8100	10.60	N/S	8,760	N/S	8,760	5.0	8,760	1,734	4,880	49,000	2,060
NO _x	3.1000	40.58	N/S	8,760	N/S	8,760	3.0	8,760	1,734	4,880	49,000	2,060
SO _x	0.9350	6.91	N/S	8,760	N/S	8,760	3.0	8,760	1,734	4,880	49,000	2,060
TOC	0.1000	1.31	N/S	8,760	N/S	8,760	3.0	8,760	1,734	4,880	49,000	2,060

Generator Emissions
Based On Entered SCREEN3 Data

Pollutant	Calculated 24-hr Impact		Calculated Annual Impact		Ambient Air Concentrations w/ Background Values (ug/m ³)	
	[=] ug/m ³	[=] ug/m ³	[=] ug/m ³	[=] ug/m ³	1-hr	Annual
PM-10	2.2	0.2	76	53	11.476	5.183
PM	2.2	0.2	76	53	11.476	5.183
CO	30.5	3.4	1,147.6	586	163	25.6
NO _x	116.9	13.0	4,260	586	163	25.6
SO _x	19.0	2.1	651	586	163	25.6
TOC	3.8	0.4	131	586	163	25.6

No Units	Crushers		Screens		Transfer Points		Total Emissions	Allowable Hours of Operation w/ Emissions <100 T/yr	Generator
	Nos. 1 & 2	Nos. 3	Nos. 1 & 2	Nos. 3	Nos. 1, 2, 3	Nos. 1, 2, 3			
Throughput ([-] T/tp-yr)	1200	900	1200	900	1200	900	10	600	1734
Operation Schedule ([-] hrs/yr)	2,08	1,56	2,08	1,56	2,08	1,56	1,04	600	1734
Control Efficiency	70%	70%	70%	70%	70%	70%	70%	70%	70%
Emission Factor	0.0003	0.0024	0.0150	0.0710	0.0020	0.0020	0.0020	0.0020	0.0020
Uncontrolled Emissions ([-] lb/tp-yr)	0.64	2.16	36.00	63.90	26.64	12.11	141.4	141.4	141.4
Controlled Emissions ([-] lb/tp-yr)	0.19	0.63	10.80	19.17	7.99	3.63	42.4	42.4	42.4
Uncontrolled Emissions ([-] T/yr)	0.6	1.9	31.2	55.4	23.1	10.5	122.7	122.7	122.7
Controlled Emissions ([-] T/yr)	0.2	0.6	9.4	16.6	6.9	3.1	36.8	36.8	36.8
Emission Factor	0.0007	0.0063	0.0394	0.1864	0.0033	0.0033	0.0033	0.0033	0.0033
Uncontrolled Emissions ([-] lb/tp-yr)	1.68	5.67	94.50	167.74	70.39	32.00	372.0	372.0	372.0
Controlled Emissions ([-] lb/tp-yr)	0.50	1.70	28.35	50.32	21.12	9.60	111.6	111.6	111.6
Uncontrolled Emissions ([-] T/yr)	1.5	4.9	82.0	145.5	61.0	27.7	322.6	322.6	322.6
Controlled Emissions ([-] T/yr)	0.4	1.5	24.6	43.6	18.3	8.3	96.8	96.8	96.8

Notes: (TPY) calculations include crusher, screen and transfer point emissions
CO 1-hr Averaging Period
SO_x 3-hr Averaging Period

-- Daily and annual operator 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 in PM-10 non-attainment areas. Therefore, operation is limited by significant impact limits.

Appendix B

Modeling Results

P-00002
Nelson-Deppe

04/10/00
09:57:04

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

Nelson Deppe Crusher

SIMPLE TERRAIN INPUTS:

SOURCE TYPE = POINT
EMISSION RATE (G/S) = .126000
STACK HEIGHT (M) = 3.9600
STK INSIDE DIAM (M) = .2500
STK EXIT VELOCITY (M/S) = 104.9992
STK GAS EXIT TEMP (K) = 1103.0000
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 = 10921.000 (ACFM)

BUOY. FLUX = 11.814 M**4/S**3; MOM. FLUX = 45.760 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	140.49	3.04	3.01	NO
100.	4.343	4	20.0	20.0	6400.0	10.79	8.28	4.78	NO
200.	6.840	4	20.0	20.0	6400.0	10.79	15.66	8.68	NO
300.	5.440	4	15.0	15.0	4800.0	13.06	22.76	12.37	NO
400.	4.589	4	10.0	10.0	3200.0	17.61	29.71	15.76	NO
500.	3.920	4	8.0	8.0	2560.0	21.03	36.47	18.94	NO
600.	3.359	4	8.0	8.0	2560.0	21.03	42.99	21.76	NO
700.	2.966	4	5.0	5.0	1600.0	31.27	49.80	25.27	NO
800.	2.735	4	5.0	5.0	1600.0	31.27	56.12	27.90	NO
900.	2.493	4	5.0	5.0	1600.0	31.27	62.37	30.48	NO
1000.	2.293	4	4.5	4.5	1440.0	34.30	68.68	33.24	NO

SCREEN Nelson Deppe

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 1. M:
 166. 7.166 4 20.0 20.0 6400.0 10.79 13.27 7.44 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	----- 7.166	----- 166.	----- 0.

 ** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **

Appendix C

AIRS Information

P-000002

Nelson-Deppe

ABBREVIATED AIRS DATA ENTRY SHEET - ROCK CRUSHERS

Name of Facility: Nelson-Deppe

AIRS/Permit #: 777-00209

Permit Issue Date: April 23, 2000

<u>*Source/Emissions Unit Name (25 spcs)</u> <i>(Please use name as indicated in permit)</i>	<u>SCC #</u> <i>(8 digit #)</i>	<u>Air Program</u> <i>(SIP/NESHAP/ NSPS/PSD)</i>
<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>SIP</u>
<u>Fugitives</u>	<u>30588801</u>	<u>SIP</u>
<u>Property Boundary</u>	<u>30588801</u>	<u>SIP</u>

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