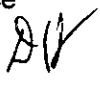


May 14, 2000

MEMORANDUM

TO: Stephen West, Administrator
Boise Regional Office

FROM: Daniel Heiser, P.E. 
State Technical Services Office

SUBJECT: **PERMIT TO CONSTRUCT TECHNICAL ANALYSIS**
P-000004, Idaho Sand and Gravel, Portable
(Standard Hot-Mix Asphalt Plant Permit to Construct No. 777-00256; 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

Idaho Sand and Gravel is proposing to commence construction of a portable hot-mix asphalt (HMA) plant to be operated in both attainment and nonattainment areas within the State of Idaho. Note that the Standard PTC for a portable hot-mix asphalt plant also includes provisions for collocated operations in attainment areas with one other portable source (i.e., rock crusher, hot-mix asphalt, or concrete batch plant). The HMA's maximum hourly throughput is 350 tons per hour (350 T/hr). The HMA facility will be initially located near Nampa, Idaho.

SUMMARY OF EVENTS

On January 31, 2000, the Idaho Department of Health and Welfare, Division of Environmental Quality (DEQ) received a PTC application. On March 15, 2000, the application was determined complete.

DISCUSSION

1. **Process Description**

The facility is a portable drum-mix hot-mix asphalt plant used for the production of asphaltic concrete. The dryer burner is permitted to be fired on fuel oil, natural gas, or waste oil.

The Standard PTC requested will allow this hot-mix asphalt facility to collocate and simultaneously operate with one other portable plant (i.e., rock crusher, hot-mix asphalt plant, and/or concrete batch plant) in attainment areas. It is important to note that during collocated operations, this hot-mix asphalt plant is then part of a single, larger source engaged in the production of either asphalt, concrete and/or aggregate, depending upon which type of portable plant the hot-mix plant 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 hot-mix asphalt plant 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 hot-mix asphalt plant will collocate must also contain specific collocation requirements based on the same conservative assumptions and calculations used in this Standard PTC.

2. Equipment Listing

This standard permit analysis includes the following equipment as submitted in the application:

2.1 Portable Hot-Mix Asphalt Plant

Manufacturer/Model:	Cedar Rapids / 7230 ADM
Type:	Drum Mix
Throughput Capacity (T/hr):	350 T/hr
Burner Fuel Type:	No. 2 fuel oil, waste oil, and natural gas
Dryer heat Input (MMBtu/hr):	90.8 MMBtu/hr

2.2 Air Pollution Control Device

Type:	Baghouse
Manufacturer:	Cedar Rapids

2.3 HMA Stack Information

Stack Height (ft):	30 ft
Stack Diameter (ft):	2.8 ft
Exhaust Gas Flowrate (acfm):	40,000 acfm
Stack Exhaust Temp (°F):	300 °F

When collocated, this hot-mix asphalt plant 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 hot-mix plant is collocated with. The equipment used by this single, larger source would include the hot-mix asphalt plant 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 HMA facility is a portable source and may operate in both attainment and nonattainment areas throughout the State of Idaho.

4. Emission Estimates

Emission estimates for this HMA facility were calculated using a Lotus spreadsheet and emission factors obtained from AP-42, Section 11.1, 1/95 edition and, for waste oil, emission factors for toxic emissions were obtained from AP-42 DRAFT section 11.1, dated 8/15/97. For purposes of maximum flexibility, the spreadsheet calculates the potential to emit (PTE) based on the worst-case emission factor of all possible fuels to be used at the hot-mix plant (diesel fuel oils, propane, and natural gas). The following air pollutant emissions are calculated by the spreadsheet: PM (particulate matter), PM-10 (particulate matter with an aerodynamic diameter of less than or equal to ten [10] microns), NO_x (oxides of nitrogen), SO₂ (sulfur dioxide), and CO (carbon monoxide). In calculating the PTE for each pollutant, the spreadsheet solves for the most limiting pollutant which will give the facility a PTE of less than 100 tons per any consecutive 12-month period (T/yr) (i.e., 99 T/yr). In addition, allowable operational limits for the facility, which corresponds to the PTE <100 T/yr, are given as part of the spreadsheet output. A copy of the spreadsheet showing all calculations and results is presented as Appendix A of this memo.

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.

Toxic emissions for waste oil were analyzed. As shown in Appendix A, nickel, formaldehyde, and benzene emissions are estimated to exceed the acceptable ambient concentrations for carcinogens (AACC) at full capacity (350 T/hr, 8760 hr/yr). Only benzene and nickel emissions were further considered in this analysis because these had emission factors (EFs) that were at least 10 times higher than that already analyzed for the Standard PTC. In comparison, the formaldehyde EF is only 1.3 times that already analyzed for the Standard PTC. No further analysis for formaldehyde was deemed necessary. When limited to 1,755 hours per year or 614,378 tons per year of asphalt using waste oil as the burner fuel, the AACCs are not exceeded. Therefore, the permit will limit the amount of waste oil that can be burned based on this analysis.

In summary, the emission estimates for this facility assume 350 T/hr throughput to a drum-mix HMA plant, one natural gas-fired/#2 diesel-fired/waste oil-fired dryer, and fugitive dust emissions from specified sources (see the spreadsheet). The most limiting pollutant, which gives the facility a PTE of 99 T/hr, is CO.

4.1 Collocated Operations in Attainment Areas

Standard PTCs will only allow collocation with one other portable source (i.e., rock crushing plant, hot-mix asphalt plant, or concrete batch plant) which also has received a Standard PTC that specifically allows collocation. When a combination of one portable hot-mix asphalt 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 hot-mix asphalt plant 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). For collocated attainment area operations, the most limiting pollutant which gives the hot-mix asphalt facility a PTE of 49.5 T/yr is CO.

5. Modeling

Modeling of the asphalt plant stack emissions was conducted using EPA-approved SCREEN 3 computer-run model. The maximum one (1) hour impact from the dryer stack was calculated to be 2.36 $\mu\text{g}/\text{m}^3$ using a 1 lb/hr unity emission rate input to the model. The spreadsheet calculates the ambient impact for each air pollutant (PM, PM-10, NO_x, SO₂, and CO) based on the calculated lb/hr emission rate, averaging periods and background concentrations. The spreadsheet solves for the most limiting pollutant in attainment areas and gives appropriate operational limits which protects the applicable National Ambient Air Quality Standard (NAAQS) as defined in IDAPA 16.01.01.577. In addition, the spreadsheet also calculates the most limiting pollutant in nonattainment areas and gives operational limits to protect applicable significant contribution requirements as defined in IDAPA 16.01.01.006.89. All SCREEN modeling output files are presented as Appendix B of this memo. Spreadsheet impact calculations and results are presented as Appendix A.

For collocated operations in attainment areas, operation of the hot-mix asphalt plant and its generator (if used) are 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 operation of the HMA plant and its generator (if used) would be limited as needed, based on the specific ambient impact modeling, so that the 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

Hot-mix asphalt 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 hot-mix asphalt facility is 2951. The AIRS facility classification for this facility is "A2" because the uncontrolled potential to emit is greater than 100 T/yr.

7. Regulatory Review

The following rules and regulations were reviewed for this permit analysis:

IDAPA 16.01.01.201	Permit to Construct
IDAPA 16.01.01.202	Application Procedures
IDAPA 16.01.01.203	Permit Requirements for New and Modified Stationary Sources
IDAPA 16.01.01.209	Procedures for Issuing Permits
IDAPA 16.01.01.210	Demonstration of Preconstruction Compliance with Toxic Standards
IDAPA 16.01.01.211	Conditions for Permits to Construct
IDAPA 16.01.01.212	Obligation to Comply
IDAPA 16.01.01.577	Ambient Air Quality Standards
IDAPA 16.01.01.585 & 586	Toxic Air Pollutants Non-Carcinogenic and Carcinogenic Increments
IDAPA 16.01.01.625	Visible Emissions
IDAPA 16.01.01.650	Rules for Control of Fugitive Dust
IDAPA 16.01.01.725	Rules for Sulfur Content of Fuels
IDAPA 16.01.01.805	Rules for the Control of Hot-Mix Asphalt Plants

This facility is an affected facility and is subject to regulation in accordance with 40 CFR Part 60, Subpart 1, "Standards of Performance for Hot-Mix Asphalt Facilities."

8. Permit Coordination

This hot-mix asphalt 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 as such, 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), 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

The AIRS data base will be updated to include this new permit. AIRS forms are included as

Appendix C of this technical analysis.

FEES

This facility is not a major facility as defined in IDAPA 16.01.01.008.10. Therefore, registration and registration fees in accordance with IDAPA 16.01.01.526 are not applicable.

RECOMMENDATION

Based on review of application materials and state and federal rules and regulations, staff recommend that Idaho Sand and Gravel be issued a PTC for a portable HMA facility. No public comment period is recommended, no entity has requested a comment period, and the project does not involve PSD PTC requirements.

DH/hs

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cc: State Technical Services
Boise RO
EPA Region 10

Appendix A

Emission Estimate Calculations

P-000004

Idaho Sand and Gravel, Portable

INPUT SECTION - enter info in highlighted areas only

Company: Idaho Sand and Gravel—Oil Fuel
Permit Engineer: DH
Date: 4/20/00
Filename: E/Idaho Sand & Gravel

Enter the HMA Plant Type:
 B (A = Batch Mix Hot Mix Asphalt Plant)
 (B = Drum Mix Hot Mix Asphalt Plant)

Dryer Fuel Type:
 B (A = Natural Gas-Fired Dryer)
 (B = Oil-Fired Dryer)

Enter Dryer Stack Flow Rate: 40,000 [] actual cubic feet per minute (acfm)
Enter Dryer Stack Temperature: 300 [] temperature (°F)
Enter Dryer Stack Moisture: 18.00 [] moisture wt % (Default 18 wt%)
Enter Dryer Stack Pressure: 29.92 [] stack pressure (Default 29.92 "Hg)
Calculated Corrected Flow Rate: 22,783 [] dry standard cubic feet per minute (dscfm)

Enter HMA Maximum Capacity: 350 [] Ton/hr (Asphalt Throughput)

Enter HMA Modeled Concentration: 2.36 [] µg/m³, (1-hr concentration @ 1 lb/hr)

Is a PM performance test required for this HMA plant? Y or N (based on 40 CFR 60.90 Requirements)

Does Plant Require a Generator? n Y or N

1500
 65
 10.90

SPREADSHEET DATA - information used by spreadsheet

State Wide Background Concentrations for Criteria Air Pollutants				
	1-hr	3-hr	8-hr	Annual
PM-10				31.7
CO	11400		5130	40
NOx				23.5
SOx		543	144	

Parameters used in the Emissions Calculations:
 Mean Wind Speed (U) 10 [] mph
 Material Moisture Content (M) 2.5 [] %
 Particle Size Multiplier (k) 0.35 [] dimensionless
 Emission Factor
 PM-10 (<10 µm) 0.0070 [] lb/T
 PM-10 (<10 µm) 0.0053 [] lb/T
 PM2.5 0.0053 [] lb/T
Notes: 1. EF = k*0.0032*(U/5)^1.3*(M/2)^1.4
 Drop-Point Equation, Rating "A," AP-42, 5th Ed., p.13.2.4-3
 Assumptions: Wind Speed = 10 mph; Moisture = 2.5%; and
 Aggregate = 94% of product.

FACILITY CLASSIFICATION INPUT

Enter Annual Emission Limit: 100 [] T/yr
Note: Use 100 T/yr for Title V Limitation
 Use 250 T/yr for PSD Limitation
 For the standard HMA permit, use 100 T/yr.

PERMIT REQUIREMENTS SECTION - enforceable permit limits
 AIRS Facility Classification: A2

Non-attainment Area		Attainment Area	
	Allowable Emission Limits		Allowable Emission Limits
HIMA Dryer Stack:	7.8 lb/hr of PM 99.0 T/yr of CO	HIMA Dryer Stack:	7.8 lb/hr of PM 99.0 T/yr of CO
Generator:	NA hr/day NA hr/year	Generator:	NA hr/day NA hr/year
HIMA Plant Throughput Limits:	5,696 T/day 1,320,000 T/yr	HIMA Plant Throughput Limits:	NA T/day 1,320,000 T/yr
Collocated Attainment Areas			
HIMA Dryer Stack:	7.8 lb/hr of PM 49.5 T/yr of CO	CO 1-hr Standard minutes/1-hr	SO2 3-hr standard hr/3-hr
Generator:	NA hr/day NA hr/year	60.0	3.0
HIMA Plant Throughput Limits:	NA T/day 660,000 T/yr		CO 8-hr Standard hr/8-hr 8.0
INPUTS TO PERMIT TO CONSTRUCT (PTC)			
Section B "Attainment Area When Not Collocated"			
Section B.1.1 Facility Throughput Limits:	Annual Throughput Limit <<OR>> Daily Throughput Limit Annual Throughput Limit Annual Hours of Operation <<AND/OR>> Daily Hours of Operation	Value	Units
		1,320,000	T/yr
		NA	T/day
		1,320,000	T/yr
		NA	hr/year
		NA	hr/day
Section B.1.3 Generator Hours of Operation:	Annual Throughput Limit <<OR>> Daily Throughput Limit Annual Throughput Limit Annual Hours of Operation <<AND/OR>> Daily Hours of Operation	660,000	T/yr
		NA	T/day
		660,000	T/yr
		NA	hr/year
		NA	hr/day
Section C "Attainment Area When Collocated"			
Section C.1.3 Facility Throughput Limits:	Annual Throughput Limit <<OR>> Daily Throughput Limit Annual Throughput Limit Annual Hours of Operation <<AND/OR>> Daily Hours of Operation	Value	Units
		1,320,000	T/yr
		NA	T/day
		660,000	T/yr
		NA	hr/year
		NA	hr/day
Section C.1.4 Generator Hours of Operation:	Annual Throughput Limit <<OR>> Daily Throughput Limit Annual Throughput Limit Annual Hours of Operation <<AND/OR>> Daily Hours of Operation	660,000	T/yr
		NA	T/day
		660,000	T/yr
		NA	hr/year
		NA	hr/day
Section D "Nonattainment Area"			
Section D.1.1 Facility Throughput Limits:	Annual Throughput Limit <<OR>> Daily Throughput Limit Annual Throughput Limit Annual Hours of Operation <<AND/OR>> Daily Hours of Operation	Value	Units
		1,320,000	T/yr
		5,696	T/day
		1,320,000	T/yr
		NA	hr/year
		NA	hr/day
Section D.1.3 Generator Hours of Operation:	Annual Throughput Limit <<OR>> Daily Throughput Limit Annual Throughput Limit Annual Hours of Operation <<AND/OR>> Daily Hours of Operation	660,000	T/yr
		NA	T/day
		660,000	T/yr
		NA	hr/year
		NA	hr/day

DRYER EMISSION RATE CALCULATIONS

Pollutant	DRYER STACK		Emission Rate (Controlled) [t]/hr/d
	Emission Factor [t]/hr/d	Emission Rate (Uncontrolled) [t]/hr/d	
Total PM	0.04	12.25	7.81
Total PM-10	0.04	1,505.00	7.81
CO	0.150	52.50	52.50
NO _x	0.051	17.85	17.85
SO ₂	0.091	31.85	31.85

HMA emission factors for CO, NO_x, SO₂ and uncontrolled PM & PM-10 are from AP-42 Section 11.1. Controlled PM & PM-10 is from the NSPS 0.04 gr/dwt.

GENERATOR EMISSION RATE CALCULATIONS

Pollutant	GENERATOR STACK		Emission Rate (Controlled) [t]/hr/d
	Emission Factor [t]/hr/hr	Emission Rate (Uncontrolled) [t]/hr/d	
Total PM	N/A	0.00	0.00
Total PM-10	N/A	0.00	0.00
CO	N/A	0.00	0.00
NO _x	N/A	0.00	0.00
SO ₂	N/A	0.00	0.00

Generator emission factors are from AP-42 Section 3.3 and 3.4.

MODELING ANALYSIS CALCULATIONS FOR ATTAINMENT AREAS

Pollutant	Allowable Impacts			Permitted Impacts			Calculated Emissions [t]/year
	Hours of Operation [t]/hr/day	Hours of Operation [t]/hr/year	Calculated 24-hr Impact [t]/hr/m ³	Hours of Operation [t]/hr/day	Hours of Operation [t]/hr/year	Calculated Annual Impact [t]/hr/m ³	
PM-10	24.0	8,760	7.37	24.0	3,771	0.63	18.49
CO	N/S	N/S	49.56	24.0	3,771	4.27	99.00
CO ^a	N/S	N/S	1.0	Based on: CO	Based on: CO	1.45	33.66
CO ^b	N/S	N/S	8.0	Limited to 99.0 T/yr.	Limited to 99.0 T/yr.	2.59	60.06
NO _x	24.0	8,760	30.07				
SO ₂	24.0	8,760					
SO ₂ ^c							

MODELING ANALYSIS CALCULATIONS FOR NONATTAINMENT AREAS

Pollutant	Allowable Impacts			Permitted Impacts			Calculated Emissions [t]/year
	Hours of Operation [t]/hr/day	Hours of Operation [t]/hr/year	Calculated 24-hr Impact [t]/hr/m ³	Hours of Operation [t]/hr/day	Hours of Operation [t]/hr/year	Calculated Annual Impact [t]/hr/m ³	
PM-10	16.3	5,940	5.00	16.3	3,771	0.63	18.49
CO	N/S	N/S	33.61	16.3	3,771	4.27	99.00
CO ^a	N/S	N/S	1.0	Based on: PM-10	Based on: CO	1.45	33.66
CO ^b	N/S	N/S	8.0	Limited to 99.0 T/yr.	Limited to 99.0 T/yr.	2.59	60.06
NO _x	24.0	8,760	23.10				
SO ₂	24.0	8,760					
SO ₂ ^c							

FUGITIVE EMISSION CALCULATIONS FOR ATTAINMENT AREAS

	PM	PM-10
Pre-Dryer Source Emissions (l=) lb/hr)		0.66
Leader -> Cold Aggregate Bin	1.75	0.66
Cold Aggregate Bin -> Conveyor	1.75	0.66
Conveyor -> Drum Dryer	1.75	0.66
Total Pre-Dryer Source Emissions	5.26	1.99
Post-Dryer Source Emissions		
Screening Process	NA	NA
Screen -> Hot Bins	NA	NA
Hot Bins -> Weigh Hopper	NA	NA
Weigh Hopper -> Pug Mill	NA	NA
Total Post-Dryer Source Emissions	NA	NA
Scavenger Control Efficiency	NA	NA
Total Uncontrolled Emissions (l=) lb/hr)	5.26	1.99
Total Uncontrolled Emissions (l=) T/yr)	9.93	3.76
Total Controlled Emissions (l=) lb/hr)	5.26	1.99
Total Controlled Emissions (l=) T/yr)	9.93	3.76

Source: National Asphalt Pavement Association
 a: CO 1-hr Averaging Period
 b: CO 8-hr Averaging Period
 c: SO₂ 3-hr Averaging Period

FUGITIVE EMISSION CALCULATIONS FOR NONATTAINMENT AREAS

	PM	PM-10
Pre-Dryer Source Emissions (l=) lb/hr)		0.66
Leader -> Cold Aggregate Bin	1.75	0.66
Cold Aggregate Bin -> Conveyor	1.75	0.66
Conveyor -> Drum Dryer	1.75	0.66
Total Pre-Dryer Source Emissions	5.26	1.99
Post-Dryer Source Emissions		
Screening Process	NA	NA
Screen -> Hot Bins	NA	NA
Hot Bins -> Weigh Hopper	NA	NA
Weigh Hopper -> Pug Mill	NA	NA
Total Post-Dryer Source Emissions	NA	NA
Scavenger Control Efficiency	NA	NA
Total Uncontrolled Emissions (l=) lb/hr)	5.26	1.99
Total Uncontrolled Emissions (l=) T/yr)	9.93	3.76
Total Controlled Emissions (l=) lb/hr)	5.26	1.99
Total Controlled Emissions (l=) T/yr)	9.93	3.76

SPREADSHEET SUMMARY - results of emission and modeling calcs for all pollutants

ATTAINMENT & UNCLASSIFIABLE AREAS		NONATTAINMENT AREAS	
Uncontrolled	Controlled	Dryer	Controlled
23.1 T/yr	14.7 T/yr	PM-10	23.1 T/yr
2838.0 T/yr	14.7 T/yr	CO	2838.0 T/yr
33.7 T/yr	99.0 T/yr	NOx	33.7 T/yr
60.1 T/yr	33.7 T/yr	SO ₂	60.1 T/yr
0.0 T/yr	60.1 T/yr	Generator	0.0 T/yr
0.0 T/yr	0.0 T/yr	PM-10	0.0 T/yr
0.0 T/yr	0.0 T/yr	CO	0.0 T/yr
0.0 T/yr	0.0 T/yr	NOx	0.0 T/yr
0.0 T/yr	0.0 T/yr	SO ₂	0.0 T/yr
9.9 T/yr	9.9 T/yr	Fugitives	9.9 T/yr
3.8 T/yr	3.8 T/yr	PM-10	3.8 T/yr
33.0 T/yr	24.7 T/yr	Total 1	33.0 T/yr
2841.8 T/yr	18.5 T/yr	PM-10	2841.8 T/yr
33.7 T/yr	99.0 T/yr	CO	33.7 T/yr
60.1 T/yr	33.7 T/yr	NOx	60.1 T/yr
2841.8 T/yr	99.0 T/yr	SO ₂	2841.8 T/yr
24.0 hr/day	3.771 hr/day	Title V PTE Summary 1	24.0 hr/day
7.8 lb/hr	14.7 T/yr	Facility PTE Summary	7.8 lb/hr
52.5 lb/hr	99.0 T/yr	Enforceable Limits - Attainment Areas	52.5 lb/hr
17.9 lb/hr	33.7 T/yr	Enforceable Limits - Non-Attainment Areas	17.9 lb/hr
31.9 lb/hr	60.1 T/yr	Dryer Controlled Emission Rates	31.9 lb/hr
0.0 lb/hr	0.0 T/yr	Generator Controlled Emission Rates	0.0 lb/hr
0.0 lb/hr	0.0 T/yr	PM/PM-10	0.0 lb/hr
0.0 lb/hr	0.0 T/yr	CO	0.0 lb/hr
0.0 lb/hr	0.0 T/yr	NOx	0.0 lb/hr
0.0 lb/hr	0.0 T/yr	SO ₂	0.0 lb/hr

1 Total is the dryer, generator and fugitives added together for total PTE.

2 Title V PTE summary does not account for PM, only PM-10.

Attainment Area - Collocated Units - Calculations		Collocation Ambient Air Quality Standards - Calculations				
		(1-hr, 3-hr, 8-hr, & 24-hr standards are out in half for collocation)				
Pollutant		1-hr	3-hr	8-hr	24-hr	Annual (50% Attainment Hours)
PM						
PM-10		14176.1		2348.27	24626113183	8332532486
CO						
NO _x				310.8506		29274542466
SO ₂					80.4336	76955556164
TOC						
Background Concentrations - Attainment/Non-Classifiable Areas (ug/m ³)						
Pollutant		1-hr	3-hr	8-hr	24-hr	Annual
PM						
PM-10			11400		5130	86
CO						
NO _x				543		40
SO ₂						23.5
TOC						

INPUT SECTION - enter info in highlighted areas only

Company: Idaho Sand and Gravel—Gas Fuel
 Permit Engineer: DH
 Date: 4/20/00
 Filename: E/Idaho Sand & Gravel

Enter the HMA Plant Type:
 B (A = Batch Mix Hot Mix Asphalt Plant)
 (B = Drum Mix Hot Mix Asphalt Plant)

Dryer Fuel Type:
 A (A = Natural Gas-Fired Dryer)
 (B = Oil-Fired Dryer)

Enter Dryer Stack Flow Rate: 40,000 [] actual cubic feet per minute (acfm)
 Enter Dryer Stack Temperature: 300 [] temperature (°F)
 Enter Dryer Stack Moisture: 18.00 [] moisture wt % (Default 18 wt%)
 Enter Dryer Stack Pressure: 29.92 [] stack pressure (Default 29.92 "Hg)
 Calculated Corrected Flow Rate: 22,783 [] dry standard cubic feet per minute (dscfm)

Enter HMA Maximum Capacity: 350 [] Ton/hr (Asphalt Throughput)
 Enter HMA Modded Concentration: 2.36 [] µg/m³, (1-hr concentration @ 1 lb/hr)

Is a PM performance test required for this HMA plant? Y
 Does Plant Require a Generator? n

1500
 65
 10,00

SPREADSHEET DATA - information used by spreadsheet

State Wide Background Concentrations for Criteria Air Pollutants

	1-hr	3-hr	8-hr	24-hr	Annual
PM ₁₀				86	32.7
CO	11400		5130		40
NO _x				144	23.5
SO _x					

Parameters used in the Fugitive Emission Calculations:
 Mean Wind Speed (U) 10 [] mph
 Material Moisture Content (M) 2.5 [] %
 Particle Size Multiplier (k) 0.35 [] dimensionless
 Emission Factor₁ 0.0020 [] lb/T
 PM₁₀ (<10 µm) 0.0053 [] lb/T
 PM_{2.5} 0.0053 [] lb/T

Notes: 1 EF = k*(U/5)²*L*(M/2)*1.4
 Drop-Point Equation, Rating "A," AP-42, 5th Ed. p.13.2.4-3.
 Assumptions: Wind Speed = 10 mph; Moisture = 2.5%; and
 Aggregate = 54% of product.

FACILITY CLASSIFICATION INPUT

Enter Annual Emission Limit:
 Note: Use 100 T/yr for Title V Limitation
 Use 250 T/yr for PSD Limitation
 For the standard HMA permit, use 100 T/yr.

100 [] T/yr

PERMIT REQUIREMENTS SECTION - enforceable permit limits
 AIRS Facility Classification: A2

Non-attainment Area		Attainment Area	
	Allowable Emission Limits 7.8 lb/hr of PM	NA T/yr	Allowable Emission Limits 7.8 lb/hr of PM
HMA Dryer Stack:	NA hr/day NA hr/year	NA T/yr	NA T/yr
Generator:	5,696 T/day	2,078,958 T/yr	NA T/yr
HMA Plant Throughput Limits:			3,066,000 T/yr

Collocated Attainment Areas	
	CO 1-hr Standard minutes/1-hr
HMA Dryer Stack:	60.0
Generator:	3.0
HMA Plant Throughput Limits:	8.0

	Allowable Emission Limits 7.8 lb/hr of PM	NA T/yr
HMA Dryer Stack:	NA hr/day NA hr/year	NA T/yr
Generator:	NA T/day	1,533,000 T/yr

INPUTS TO PERMIT TO CONSTRUCT (PTC)	Value	Units
Section B "Attainment Area When Not Collocated"		
Section B.1.1 Facility Throughput Limits:	3,066,000	T/yr
Section B.1.3 Generator Hours of Operation:	NA	T/day
	3,066,000	T/yr
	NA	hr/year
	NA	hr/day
Section C "Attainment Area When Collocated"		
Section C.1.3 Facility Throughput Limits:	1,533,000	T/yr
Section C.1.4 Generator Hours of Operation:	NA	T/day
	1,533,000	T/yr
	NA	hr/year
	NA	hr/day
Section D "Nonattainment Area"		
Section D.1.1 Facility Throughput Limits:	2,078,958	T/yr
Section D.1.3 Generator Hours of Operation:	5,696	T/day
	2,078,958	T/yr
	NA	hr/year
	NA	hr/day

DRYER EMISSION RATE CALCULATIONS

Pollutant	DRYER STACK		Emission Rate (Controlled) [=] lb/hr
	Emission Factor [=] lb/ton	Emission Rate (Uncontrolled) [=] lb/hr	
Total PM	19.00	6,650.00	7.81
Total PM-10	0.04	1,505.00	7.81
CO	[=] lb/ton	19.60	19.60
NO _x	0.030	10.50	10.50
SO ₂	0.003	1.16	1.16

HMA emission factors for CO, NO_x, SO₂ and uncontrolled PM & PM-10 are from AP-42 Section 11.1. Controlled PM & PM-10 is from the NSFS 0.04 gr/dscf.

GENERATOR EMISSION RATE CALCULATIONS

Pollutant	GENERATOR STACK		Emission Rate (Controlled) [=] lb/hr
	Emission Factor [=] lb/tpg-hr	Emission Rate (Uncontrolled) [=] lb/hr	
Total PM	N/A	0.00	0.00
Total PM-10	N/A	0.00	0.00
CO	N/A	0.00	0.00
NO _x	N/A	0.00	0.00
SO ₂	N/A	0.00	0.00

Generator emission factors are from AP-42 Section 3.3 and 3.4.

MODELING ANALYSIS CALCULATIONS FOR ATTAINMENT AREAS

Pollutant	Allowable Impacts			Permitted Impacts			Calculated Emissions [=] lb/yr
	Hours of Operation [=] hr/day	Hours of Operation [=] hr/yr	NAAQS	Calculated 24-hr Impact [=] ug/m ³	Calculated Annual Impact [=] ug/m ³	Other, s.b.	
PM-10	N/S	8,760	8,760	7.37	1.47	42.94	42.94
CO	24.0	N/S	8,760	18.50	3.70	85.85	85.85
NO _x	N/S	8,760	8,760	1.09	1.98	45.99	45.99
SO ₂	24.0	8,760	8,760	0.22	0.22	5.06	5.06

MODELING ANALYSIS CALCULATIONS FOR NONATTAINMENT AREAS

Pollutant	Allowable Impacts			Permitted Impacts			Calculated Emissions [=] lb/yr
	Hours of Operation [=] hr/day	Hours of Operation [=] hr/yr	NAAQS	Calculated 24-hr Impact [=] ug/m ³	Calculated Annual Impact [=] ug/m ³	Other, s.b.	
PM-10	16.3	5,940	8,760	5.00	1.00	29.11	29.11
CO	N/S	N/S	8,760	12.55	2.51	58.21	58.21
NO _x	N/S	8,760	8,760	3.45	1.34	31.18	31.18
SO ₂	24.0	8,760	8,760	0.15	0.15	3.43	3.43

FUGITIVE EMISSION CALCULATIONS FOR ATTAINMENT AREAS

	PM	PM-10
Pre-Dryer Source Emissions ([-] lb/hr)		
Loader -> Cold Aggregate Bin	1.75	0.66
Cold Aggregate Bin -> Conveyor	1.75	0.66
Conveyor -> Drum Dryer	1.75	0.66
Total Pre-Dryer Source Emissions	5.26	1.99
Post-Dryer Source Emissions		
Screening Process	NA	NA
Screen -> Hot Bins	NA	NA
Hot Bins -> Weigh Hopper	NA	NA
Weigh Hopper -> Pug Mill	NA	NA
Total Post-Dryer Source Emissions	NA	NA
Scavenger Control Efficiency	NA	NA
Total Uncontrolled Emissions ([-] lb/hr)	5.26	1.99
Total Uncontrolled Emissions ([-] T/yr)	23.05	8.72
Total Controlled Emissions ([-] lb/hr)	5.26	1.99
Total Controlled Emissions ([-] T/yr)	23.05	8.72

Source: National Asphalt Pavement Association
 a. CO 1-hr Averaging Period
 b. CO 8-hr Averaging Period
 c. SO₂ 3-hr Averaging Period

FUGITIVE EMISSION CALCULATIONS FOR NONATTAINMENT AREAS

	PM	PM-10
Pre-Dryer Source Emissions ([-] lb/hr)		
Loader -> Cold Aggregate Bin	1.75	0.66
Cold Aggregate Bin -> Conveyor	1.75	0.66
Conveyor -> Drum Dryer	1.75	0.66
Total Pre-Dryer Source Emissions	5.26	1.99
Post-Dryer Source Emissions		
Screening Process	NA	NA
Screen -> Hot Bins	NA	NA
Hot Bins -> Weigh Hopper	NA	NA
Weigh Hopper -> Pug Mill	NA	NA
Total Post-Dryer Source Emissions	NA	NA
Scavenger Control Efficiency	NA	NA
Total Uncontrolled Emissions ([-] lb/hr)	5.26	1.99
Total Uncontrolled Emissions ([-] T/yr)	23.05	8.72
Total Controlled Emissions ([-] lb/hr)	5.26	1.99
Total Controlled Emissions ([-] T/yr)	23.05	8.72

SPREADSHEET SUMMARY - results of emission and modeling calcs for all pollutants

ATTAINMENT & UNCLASSIFIABLE AREAS		NON-ATTAINMENT AREAS	
Uncontrolled	Controlled	Dryer	Controlled
29127.0 T/yr	34.2 T/yr	PM	19750.1 T/yr
6591.9 T/yr	34.2 T/yr	PM-10	23.2 T/yr
85.8 T/yr	85.8 T/yr	CO	23.2 T/yr
46.0 T/yr	46.0 T/yr	NOx	58.2 T/yr
5.1 T/yr	5.1 T/yr	SO ₂	31.2 T/yr
		SO ₂	3.4 T/yr
		Generator	
0.0 T/yr	0.0 T/yr	PM	0.0 T/yr
0.0 T/yr	0.0 T/yr	PM-10	0.0 T/yr
0.0 T/yr	0.0 T/yr	CO	0.0 T/yr
0.0 T/yr	0.0 T/yr	NOx	0.0 T/yr
0.0 T/yr	0.0 T/yr	SO ₂	0.0 T/yr
		Fugitives	
23.1 T/yr	23.1 T/yr	PM	15.6 T/yr
8.7 T/yr	8.7 T/yr	PM-10	5.9 T/yr
		Total ¹	
29150.1 T/yr	57.3 T/yr	PM	19765.7 T/yr
6600.6 T/yr	42.9 T/yr	PM-10	4475.7 T/yr
85.8 T/yr	85.8 T/yr	CO	29.1 T/yr
46.0 T/yr	46.0 T/yr	NOx	58.2 T/yr
5.1 T/yr	5.1 T/yr	SO ₂	31.2 T/yr
		SO ₂	3.4 T/yr
6600.6 [-] T/yr of PM-10	85.8 [-] T/yr of CO	Title V PTE Summary ²	4475.7 [-] T/yr of PM-10
29150.1 [-] T/yr of PM	85.8 [-] T/yr of CO	Facility PTE Summary	19765.7 [-] T/yr of PM
Enforceable Limits - Attainment Areas		Enforceable Limits - Non-Attainment Areas	
24.0 hr/day	8,760 hr/yr		16.3 hr/day
Dryer Controlled Emission Rates		Dryer Controlled Emission Rates	
7.8 lb/hr	34.2 T/yr	PM/PM-10	23.2 T/yr
19.6 lb/hr	85.8 T/yr	CO	58.2 T/yr
10.5 lb/hr	46.0 T/yr	NOx	31.2 T/yr
1.2 lb/hr	5.1 T/yr	SO ₂	3.4 T/yr
Generator Controlled Emission Rates		Generator Controlled Emission Rates	
0.0 lb/hr	0.0 T/yr	PM-10	0.0 T/yr
0.0 lb/hr	0.0 T/yr	CO	0.0 T/yr
0.0 lb/hr	0.0 T/yr	NOx	0.0 T/yr
0.0 lb/hr	0.0 T/yr	SO ₂	0.0 T/yr

¹ Total is the dryer, generator and fugitives added together for total PTE.

² Title V PTE summary does not account for PM, only PM-10.

Attainment Area - Collocated Units - Calculations		Collocation Ambient Air Quality Standards - Calculations				
		(1-hr, 3-hr, 8-hr, & 24-hr standards are cut in half for collocation)				
Pollutant		1-hr	3-hr	8-hr	24-hr	Annual (50% Attainment Hg/yr)
PM-10		14253.744		2402.6208	24.626113183	7.9126113183
CO						
NOx				376.04678	109.40968	29.0088
SO2						28.140968
TOC						
Background Concentrations -- Attainment/Non-Classifiable Areas (ug/m3)						
Pollutant		1-hr	3-hr	8-hr	24-hr	Annual
PM-10						86
CO		11400			5130	
NOx						40
SO2				543	144	23.5
TOC						

Non-carcinogenic Pollutant	Emission Factor, lb/ton	Emissions Analysis for Non-Carcinogenic Pollutants			
		Actual, lb/hr	EL Standard, lb/hr	Actual 24 hr. Ambient Conc., ug/m3 AAC, ug/m3 (24 Hour average)	
Phosphorous	5.50E-05	0.02	0.007	0.018095	5
Silver	1.40E-06	0.00049	0.007	0.0004606	5
Zinc	1.20E-04	0.042	0.667	0.03948	500
Chromium	7.40E-06	2.59E-03	0.033	0.0024346	25
Copper	4.30E-06	1.51E-03	0.013	0.0014147	10
Manganese	1.9E-05	6.65E-03	0.067	0.006251	50
Mercury	2.4E-07	8.40E-05	0.0001	0.00007896	0.5
Acrolein	2.6E-05	9.10E-03	0.017	0.008554	12.5
Methyl Ethyl Keton	2E-05	7.00E-03	0.007	0.00658	5.5
Propionaldehyde	0.00013	4.55E-02	0.0287	0.042952	21.5
Quinone	0.00016	5.60E-02	0.027	0.052864	20
Toluene	0.00075	2.63E-01	25	0.2478	18750
Acetone	0.00083	2.91E-01	1.33	0.274232	1000
Crotonaldehyde	8.6E-05	3.01E-02	0.38	0.0284144	285
Valeraldehyde	6.7E-05	2.35E-02	11.7	0.0221368	8750
Ethylbenzene	0.00024	8.40E-02	29	0.079296	21750
Methyl chloroform	4.8E-05	1.68E-02	127	0.0158592	95500

Toluene	0.00018	6.30E-02	25	0.059472	18750
Xylene	0.0002	7.00E-02	29	0.06608	21750
Naphthalene	0.00065	2.28E-01	3.33	0.21476	2500

Emissions Analysis for Carcinogenic Pollutants

Pollutant	Emission Factor, lb/ton	Actual, lb/hr	EL Standard, lb/hr	Actual Annual Ambient Conc., ug/m3	AACC, ug/m3 (annual average)	Annual Hours of Operation to Meet AACC	Annual Tonnage Limit to Meet AACC
Arsenic	1.90E-06	6.65E-04	1.56E-06	1.96E-04	2.30E-04		
Nickel	1.50E-04	5.25E-02	2.70E-05	1.55E-02	4.20E-03	2,376	831,458
Cadmium	5.8E-07	2.03E-04	3.7E-06	5.99E-05	5.6E-04		
Hexavalent Chromium	4.5E-07	1.58E-04	5.6E-07	4.65E-05	8.30E-05		
Acetaldehyde	0.0013	4.55E-01	3E-03	1.34E-01	9.5E-01		
Benzene	0.0058	2.03E+00	8.0E-04	5.99E-01	1.2E-01	1,755	614,378
Formaldehyde*	3.1E-03	1.09E+00	5.1E-04	3.20E-01	7.7E-02	2,107	737,583
Benzo(a)pyr	9.8E-09	3.43E-06	2E-06	1.01E-06	3E-04		

* Note: Formaldehyde emission rate is only 29% higher than that analyzed for #2 fuel oil in standard PTC review.

Lead Emissions

Emission Factor, lb/ton	Actual Emission Rate, tons/year	Significant Level	Actual Ambient Concentration, hourly, ug/m3	Actual Ambient Concentration, quarterly, ug/m3	Ambient Concentration Standard, Quarterly
2.40E-05 lb/ton	0.04 tons/yr	0.6 ton/yr	0.01974 ug/m3	0.0044415 ug/m3	1.5 ug/m3

Appendix B

Modeling Results

P-000004

Idaho Sand and Gravel, Portable

04/20/00
11:12:41

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

Idaho Sand and Gravel HMA

SIMPLE TERRAIN INPUTS:

SOURCE TYPE	=	POINT
EMISSION RATE (G/S)	=	.126000
STACK HEIGHT (M)	=	9.1000
STK INSIDE DIAM (M)	=	.8500
STK EXIT VELOCITY (M/S)	=	33.2679
STK GAS EXIT TEMP (K)	=	421.0000
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 = 40000.000 (ACFM)

BUOY. FLUX = 17.916 M**4/S**3; MOM. FLUX = 139.128 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	195.67	4.21	4.20	NO
100.	.8779E-01	3	10.0	10.0	3200.0	27.76	12.73	7.88	NO
200.	1.896	3	10.0	10.0	3200.0	27.76	23.97	14.61	NO
300.	2.360	4	20.0	20.0	6400.0	18.43	22.77	12.38	NO
400.	2.241	4	15.0	15.0	4800.0	21.54	29.67	15.68	NO
500.	2.027	4	15.0	15.0	4800.0	21.54	36.32	18.64	NO
600.	1.905	4	10.0	10.0	3200.0	27.76	43.05	21.87	NO
700.	1.744	4	10.0	10.0	3200.0	27.76	49.48	24.62	NO
800.	1.628	4	8.0	8.0	2560.0	32.42	55.97	27.60	NO
900.	1.499	4	8.0	8.0	2560.0	32.42	62.24	30.21	NO
1000.	1.370	4	8.0	8.0	2560.0	32.42	68.45	32.78	NO

Screen~1

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 1. M:
302. 2.360 4 20.0 20.0 6400.0 18.43 22.97 12.48 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	----- 2.360	----- 302.	----- 0.

** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **

Appendix C

AIRS Information

P-000004

Idaho Sand and Gravel, Portable

ABBREVIATED AIRS DATA ENTRY SHEET - HOT MIX ASPHALT PLANTS

Name of Facility: Idaho Sand and Gravel

AIRS/Permit #: 777-00256

Permit Issue Date: May 14, 2000

<u>*Source/Emissions Unit Name (25 spcs)</u> (Please use name as indicated in permit)	<u>SCC #</u> (8 digit #)	<u>Air Program</u> (SIP/NESHAP/NSPS/PSD)
<u>* HMA Drum Dryer</u>	<u>30500201</u>	<u>SIP</u>
<u>Agg Handling/Piles</u>	<u>30500204</u>	<u>SIP</u>
<u>Haul Roads</u>	<u>30500290</u>	<u>SIP</u>
<u>Property Boundary</u>	<u>30588801</u>	<u>SIP</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

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