



Air Quality Permitting Statement of Basis

August 3, 2005

Permit to Construct No. P-050307

**Hess Pumice Products, Inc.
Malad City, ID**

Facility ID No. 071-00003

Prepared by:

**Ken Hanna, Permit Writer
AIR QUALITY DIVISION**

FINAL PERMIT

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Acronyms, Units, and Chemical Nomenclatures

acfm	actual cubic feet per minute
AFS	AIRS Facility Subsystem
AIRS	Aerometric Information Retrieval System
AQCR	Air Quality Control Region
ASTM	American Society for Testing and Materials
Btu	British thermal unit
CFR	Code of Federal Regulations
CO	carbon monoxide
DEQ	Department of Environmental Quality
dscf	dry standard cubic feet
EPA	U.S. Environmental Protection Agency
gr	grain (1 lb = 7,000 grains)
HAPs	Hazardous Air Pollutants
IDAPA	a numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act
lb/hr	pound per hour
MMBtu	million British thermal units
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO ₂	nitrogen dioxide
NO _x	nitrogen oxides
NSPS	New Source Performance Standards
PM	particulate matter
PM ₁₀	particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
PSD	Prevention of Significant Deterioration
PTC	permit to construct
PTE	potential to emit
Rules	Rules for the Control of Air Pollution in Idaho
SIC	Standard Industrial Classification
SM	Synthetic Minor
SO ₂	sulfur dioxide
SO _x	sulfur oxides
T/yr or TPY	tons per year
µg/m ³	micrograms per cubic meter
UTM	Universal Transverse Mercator
VOC	volatile organic compound

1. PURPOSE

The purpose for this memorandum is to satisfy the requirements of IDAPA 58.01.01.200, Rules for the Control of Air Pollution in Idaho, for issuing permits to construct.

2. FACILITY DESCRIPTION

Hess Pumice Products, Inc. (Hess Pumice) produces a wide variety of grades of pumice. The pumice is mined at the Wright's Creek Mine and is trucked to the processing plant in Malad City. The material is loaded directly into the hoppers, which feed the processing plant. This plant feed material has about 18% moisture. There are two mills at Hess Pumice, in addition to the proposed Perlite mill. The original mill processes the raw pumice from the mine. The other mill processes low heavies mineral (LHM) from the original mill. The Perlite facility also consists of two mills; one to refine the coarse perlite product and the other to refine the fine perlite product. The facility utilizes several types of processing equipment, such as scalping screens, gravity tables, rod mills, baghouses (some of which vent inside the buildings), sifters, and air separators which emit PM/PM₁₀. The operation also includes dryers which exhaust through baghouses. The final product is either bagged and trucked off the plant or shipped by truck or rail. All of the processes are enclosed, and except for the baghouses, are contained in the main building.

3. FACILITY / AREA CLASSIFICATION

Hess Pumice is not a major facility under the Title V program, as defined under IDAPA 58.01.01.008.10, because the facility does not emit or have the potential to emit a regulated air pollutant in amounts greater than 100 tons per year. Hess Pumice is also not a major facility under the PSD/NSR program as defined under IDAPA 58.01.01.205.01 (40 CFR 52.21(b)(1)). The AIRS classification for this facility is "SM" and the AIRS data entry table is provided in Appendix A.

The facility is located within AQCR 61 and UTM zone 12. The facility is located in Oneida County which is designated as attainment or unclassifiable for all criteria pollutants (CO, NO_x, SO₂, lead, and ozone). The Hess Pumice standard industrial classification (SIC) is 3291.

4. APPLICATION SCOPE

Hess Pumice has applied for a PTC to add a new perlite production line to the facility. The perlite operations will consist of several types of equipment such as conveyer belts, vibrating screens, and cyclones, which emit PM/PM₁₀, and an expander furnace that emits products of fuel combustion. PM emissions from the new perlite line will be controlled by two baghouses.

4.1 Application Chronology

March 24, 2005	DEQ received the PTC application
April 22, 2005	The application was declared complete
May 26-June 27, 2005	The PTC Opportunity for Comment period was provided

5. PERMIT ANALYSIS

This section of the Statement of Basis describes the regulatory requirements for this PTC action.

5.1 Equipment Listing

This permit addresses the following new sources and emissions control equipment. Refer to Figure 3-1, Process Flow Diagram, from the application which is included in Appendix B. None of the existing equipment at the facility is modified by this permit.

Table 5.1 SUMMARY OF REGULATED SOURCES

Source Description	Emissions Control(s)
Expander Furnace and Preheater Manufacturer/Model: Incon Model H-22 Rated Heat Input: 7 MMBtu/hr Fuels: propane Stack parameters: exhaust exits through Baghouse #17	Baghouse #17
Perlite Baghouse #17 Manufacturer: Mikro-Pulsaire, manufactured by Incon Ratings: 99.8% efficiency or 0.008 grains/dscf, manufacturer guaranteed Rated input capacity: 1.7 tons/hr Air/cloth ratio: 3.1 Pressure drop: listed in application as 7 inches of water Stack ID no.: BH17 Stack height: 65 ft Stack exit diameter: 1.67 ft Stack exit gas flow rate: 7000 acfm Stack exit gas temp: 300° F	-----
Perlite Baghouse #18 (Ore Unloading Baghouse) Manufacturer: Mikro-Pulsaire Efficiency Rating: none Rated input capacity: 1.5 tons/hr Air/cloth ratio: 0.43 Pressure drop: listed in application as 6 inches of water Stack ID no.: BH18 Stack height: 45 ft Stack exit diameter: 0.67 ft Stack exit gas flow rate: 1000 acfm Stack exit gas temp: 70° F	-----
Ore Unloading (truck dumping onto Unloading Conveyor)	Baghouse #18
Ore Unloading Conveyor	Baghouse #18
Bucket Elevator to Ore Storage Bins	Baghouse #18
Ore Storage Bins (openings, vents)	Baghouse #18
Reclaim Conveyor	Baghouse #18
Bucket Elevator to Surge Bin	Baghouse #18
Surge Bin (openings, vents)	Baghouse #18
Vibrating Screen	(unit has no emissions, it is fully enclosed)
Product Collector Cyclone (coarse product)	Baghouse #17
Cooler Separator	Baghouse #17
Coarse Product Packer	Baghouse #17
Product Collector Cyclone (fine product)	Baghouse #17
Fine Product Packer	Baghouse #17
Baghouse #18 Fines Packer	Baghouse #17

5.2 Emissions Inventory

Emissions from the Hess Pumice facility will increase following construction of the proposed perlite production line. As part of the PTC application, emission estimates were provided. These estimates were reviewed and found to be consistent with DEQ methods and procedures. The emissions estimates provided for the expander furnace are based on a propane consumption rate limit of 60 gallons per hour which is less than the maximum propane consumption rate of 77 gal/hr. Since compliance with the applicable standards was demonstrated at a reduced firing rate, an operating limit equal to 60 gal/hr was

required as a permit condition. In the application, it is noted that the primary source of fugitive emissions from this new process is the uncovered unloading conveyer belt, but due to the high moisture content of this material, fugitive emissions will be negligible. Dust from other new processing units is captured by the ventilation system and routed through one of two new baghouses to control PM emissions. A summary of the estimated criteria emissions increases for this project is given in Table 5.2. A summary of the emissions estimates for the entire facility following the project is given in Table 5.3, and details are included in Appendix B.

Table 5.2 SUMMARY OF PERLITE PROCESSING LINE PROJECT EMISSIONS

Potential Emissions – Hourly (lb/hr), and Annual (T/yr)										
Source Description	PM/PM ₁₀		CO		NO _x		SO ₂		VOC	
	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr
Expander Furnace, Baghouse 17	0.48	2.10	0.11	0.50	0.84	3.68	3E-05	1E-04	0.03	0.13
Unloading/Storage, Baghouse 18	0.002	0.01	---	---	---	---	---	---	---	---
Project Stack Emissions Total	---	2.11	---	0.5	---	3.68	---	1E-04	---	0.13

Table 5.3 EMISSION INVENTORY – ENTIRE FACILITY

CO (T/yr)	NO _x (T/yr)	PM (T/yr)	PM ₁₀ (T/yr)	SO ₂ (T/yr)	VOC (T/yr)
3.52	22.6	24.6	24.6	4.01	0.64

Emissions of toxic air pollutants (TAP) have also been estimated for the project to demonstrate compliance with the PTC requirements of IDAPA 58.01.01.210. TAP emissions include perlite as PM and products of combustion from the expander furnace's 7 MMBtu/hr propane burner. It has been demonstrated that each estimated TAP emission rate is less than the corresponding screening emission level (EL); therefore, no other procedures for demonstrating pre-construction compliance are required.

5.3 Modeling

JBR Environmental Consultants, Inc. conducted air quality dispersion modeling for Hess Pumice in support of a permit to construct (PTC) application to expand processing operations at the facility. The modeling documentation was reviewed by DEQ and details of this review are provided in Appendix C.

Based on the results of the analysis, DEQ has determined that the modeling analysis: 1) utilized appropriate methods and models; 2) was conducted using reasonably accurate or conservative model parameters and input data; 3) appropriately adhered to established DEQ guidelines for new source review dispersion modeling; and, 4) showed that predicted pollutant concentrations at all receptor locations, when appropriately combined with background concentrations, were below stated air quality standards.

Table 5.4 FULL IMPACT ANALYSIS RESULTS

Pollutant	Averaging Period	Facility Ambient Impact (µg/m ³)	Background Concentration (µg/m ³)	Total Ambient concentration (µg/m ³)	NAAQS (µg/m ³)	Percent of NAAQS
PM ₁₀	24-hour	48.0	73	121.0	150	80.7%
	Annual	16.0	26	42.0	50	84.0%
SO ₂	3-hour	360.1	34	394.1	1,300	30.3%
	24-hour	87.7	26	113.7	365	31.1%
	Annual	16.5	8	24.5	80	30.6%
NO _x	Annual	16.7	17	33.7	100	33.7%

The results of the analysis presented in Table 5.4 demonstrates, to DEQ's satisfaction, that the project will not cause or significantly contribute to a violation of any ambient air quality standard.

5.4 Regulatory Review

This section describes the regulatory analysis of the applicable air quality rules with respect to this PTC.

IDAPA 58.01.01.201 Permit to Construct Required

A permit to construct is required. This project does not qualify under the PTC exemption requirements. On this basis, Hess Pumice has applied for a PTC for construction of a new source.

IDAPA 58.01.01.203.02 Demonstration of Preconstruction Compliance with NAAQS

Compliance with the NAAQS has been demonstrated to DEQ's satisfaction. Refer to the modeling section above and Appendix C for details.

IDAPA 58.01.01.203.03, 210 Demonstration of Preconstruction Compliance with Toxic Standards

An analysis of increased emissions of toxic air pollutants (TAP) resulting from this permitting action shows that the TAP requirements are met. The uncontrolled emissions rates for all TAP emissions increases were found to be less than the corresponding screening emission level (EL) given by IDAPA 58.01.01.585-586. Therefore, no further analysis is necessary in accordance with 58.01.01.210.05 and preconstruction compliance is demonstrated. Refer to the emissions estimate worksheet in Appendix B for details.

IDAPA 58.01.01.203.675-681 Fuel Burning Equipment, Particulate Matter

Compliance with the fuel burning equipment standards for PM, for propane combustion in the expander furnace, is demonstrated as follows. For this furnace, IDAPA 58.01.01.677 applies since the maximum rated heat input is less than 10 MMBtu/hr. Under IDAPA 58.01.01.677, the following requirements apply: for gas the standard is 0.015 grains per dry standard cubic feet (gr/dscf) and for liquid it is 0.050 gr/dscf, both corrected to an oxygen content of 3%. For gaseous fuel (propane) the maximum PM concentration is estimated below, based on the estimated PM emission rate of 0.02 lb/hr and the estimated exhaust gas flow rate for combustion of 60 gal/hr of propane (920 dscfm @ 3% O₂):

$$[(0.020 \text{ lb/hr})(7000 \text{ grains/lb})(\text{hr}/60 \text{ min})] \div [920 \text{ dscfm}] = 0.0025 \text{ gr/dscf}$$

IDAPA 58.01.01.590, 40 CFR 60 Subpart OOO Standards of Performance for Nonmetallic Mineral Processing Plants

"Affected facilities" for which Subpart OOO applies include the following: crusher, grinding mill, screening operation, bucket elevator, belt conveyor, bagging operation, storage bin, enclosed truck, or rail car loading station. Since the proposed perlite plant includes affected facilities, Subpart OOO applies. In particular, the following requirements apply and corresponding conditions were included in the PTC:

- 60.672, Standards for particulate matter
- 60.674, Monitoring of operations
- 60.675, Test methods and procedures
- 60.676, Reporting and recordkeeping
- Part 60, Subpart A, NSPS General Provisions

IDAPA 58.01.01.591, 40 CFR 61 and 63 National Emission Standards for Hazardous Air Pollutants (NESHAP and MACT)

There are no requirements under 40 CFR Parts 61 and 63 that apply to the facility.

IDAPA 58.01.01.625 Visible Emissions

The visible emissions standards apply to the perlite plant's new point sources.

IDAPA 58.01.01.650-651..... Control of Fugitive Dust

The fugitive dust control rules apply to the perlite plant's new fugitive dust sources.

IDAPA 58.01.01.700-703..... Particulate Matter – Process Weight Limitations

Compliance with the PM process weight limitations of IDAPA 58.01.01.701 has been demonstrated in Table 5-2 of the permit application. The PM emissions rate limit under this rule is the same for baghouse no. 17 and baghouse no. 18 - it is 5.48 lb/hr. The estimated PM emissions rates for each of these sources are 0.48 lb/hr and 0.002 lb/hr, respectively, which are well below the allowable process weight limit.

40 CFR 64 Compliance Assurance Monitoring (CAM)

Since Hess Pumice is not a major facility, there are no requirements under 40 CFR Part 64 that apply.

5.5 Permit Conditions Review

This section describes only those permit conditions that have been revised, modified or deleted as a result of this permit action. All other permit conditions remain unchanged.

Permit Condition 1.1 and PTC Appendix

Emissions limits for the perlite expander baghouse no. 17 were added to this permit condition and to the emission limits table in the PTC Appendix. The emissions limit was established to ensure that emissions remain consistent with the estimates used in the permit application to demonstrate compliance with applicable requirements such as the PM₁₀ NAAQS.

Permit Condition 1.2.1

The permit condition was changed to present the NSPS particulate matter standard more clearly with regard to the NSPS standards as presented in 40 CFR 60.672(a)(1).

Permit Condition 1.2.2

The permit condition was changed to be more consistent with 40 CFR 60.672(a)(2) and to make it clear that it pertains to "stack" emissions. It was also changed to indicate that compliance with the NSPS baghouse opacity standard shall be determined in accordance with 40 CFR 60.675 in addition to IDAPA 58.01.01.625.

Permit Condition 1.2.3

The permit condition was changed to be more consistent with 40 CFR 60.672(b) and to make it clear that it pertains to "fugitive" emissions. It also makes it clear that the requirements of 60.672(c), (d), and (e) apply also.

Permit Condition 1.6

The perlite expander furnace was added to this permit condition which requires compliance with the PM standard for fuel burning equipment.

Permit Conditions 2.1.3 and 3.1.3

A throughput limit for the perlite production process was added to ensure that the facility continues to operate in a manner that is consistent with production levels for which compliance with the rules was demonstrated in the application (e.g., NAAQS, TAPs, and process weight rate limits). Corresponding monitoring and recordkeeping requirements were also added. The throughput limit is based on information presented in Section 5 of the PTC application which indicates the permit analysis is based on a dry product output rate of 3000 lb/hr from the expander furnace. Using this information, and using a “daily” basis for purposes of maintaining compliance with the 24-hour PM₁₀ NAAQS, the throughput limit is:

$$(3000 \text{ lb/hr})(24 \text{ hr/day})(\text{ton } 2000 \text{ lb}) = 36 \text{ tons/day}$$

Permit Condition 2.2.1

A limitation to only combust propane in the perlite expander furnace was added to confirm that the facility continues to operate in a manner that is consistent with the NAAQS compliance demonstration presented in the permit application.

Permit Condition 2.2.2.1

The sentence was changed to read “... shall not exceed 216 gallons per hour and...” so it is clear that this is an hourly limit.

Permit Conditions 2.2.3 and 3.1.5

The propane fuel consumption limit, and monitoring, for the P3 dryer was expressed in terms of “gallons” in addition to “cubic feet” for consistency with other conditions in this permit. The limits were derived as follows:

$$(553 \text{ cubic feet/hr})(2450 \text{ Btu/cubic foot})(\text{gallon}/90,500 \text{ Btu}) = 15 \text{ gallons/hr}$$

$$(4,818,000 \text{ cubic feet/yr})(2450 \text{ Btu/cubic foot})(\text{gallon}/90,500 \text{ Btu}) = 130,432 \text{ gallons/yr}$$

Permit Conditions 2.2.4 and 3.1.6

A limitation on the amount of propane fuel that may be combusted in the perlite expander furnace was added to confirm that the facility continues to operate in a manner that is consistent with the NAAQS compliance demonstration presented in the permit application. This limit was determined as follows, based on information presented in the application: $(60 \text{ gal/hr}) * (8760 \text{ hr/yr}) = 525,600 \text{ gallons/year}$. A corresponding monitoring and recordkeeping requirement was also added to the permit.

Permit Conditions 2.4 and 2.4.1

The permittee is required to revise the O&M manual within 60 days of permit issuance to include provisions for Baghouses no. 17 and 18.

Permit Condition 3.2

Requirements for NSPS initial performance testing in accordance with 40 CFR 60 Subpart OOO were added for the new “affected facilities” which will be constructed as part of the new perlite plant. New affected facilities at the perlite plant include the following: screening operations, bucket elevators, belt conveyors, bagging operations, storage bins, or enclosed truck or rail car loading stations. These conditions were also revised to present the NSPS testing requirements more clearly, including those in 40 CFR 60.8. Existing “affected facilities” that have already completed the Subpart OOO test requirements may not have to be re-tested. Only the new affected facilities may require testing following issuance of this permit.

Permit Condition 4.1

The permit condition which addresses excess emissions events was revised to present the information in IDAPA 58.01.01.130-136 more clearly.

PTC General Provisions

The current version of the PTC General Provisions was used in this permit. In particular, note that the provisions for source testing are changed, and the provision that limits the maximum allowable operating rate to 120% of the average rate attained during a performance test has been removed.

6. PERMIT FEES

Hess Pumice paid a \$1,000 PTC application fee as required by IDAPA 58.01.01.224 on March 25, 2005. A permit to construct processing fee of \$2,500 was received on July 13, 2005; this amount was due in accordance with IDAPA 58.01.01.225 because this project is a new source with an emissions increase of 1-10 tons per year.

Table 5.1 PTC PROCESSING FEE TABLE

Pollutant	Annual Emissions Increase (T/yr)	Annual Emissions Reduction (T/yr)	Annual Emissions Change (T/yr)
NO _x	3.68	0	3.68
SO ₂	1.2E-04	0	1.2E-04
CO	0.5	0	0.5
PM ₁₀	2.11	0	2.11
VOC	0.13	0	0.13
Total:	6.42	0	6.42
Fee Due	\$ 2,500.00		

7. PERMIT REVIEW

7.1 *Regional Review of Draft Permit*

Copies of the facility-draft PTC and Statement of Basis were provided to the Pocatello Regional Office for review on June 17, 2005, and it was indicated that no changes were needed on June 29, 2005.

7.2 *Facility Review of Draft Permit*

Copies of the draft PTC and Statement of Basis were provided to Hess Pumice and JBR Environmental Consultants, Inc. On July 6, 2005 a response was received. It was requested that Permit Condition 3.2 which specifies performance testing for the baghouses be changed so it's clear that only the new baghouses need an initial test and the remaining baghouses have already passed their initial test requirements. This change was made to the final permit.

7.3 *Public Comment*

An opportunity for public comment period on the PTC application was provided from May 26, 2005 to June 27, 2005 in accordance with IDAPA 58.01.01.209.01.c. . No comments on the application and no requests for a public comment period on DEQ's proposed action have been received.

8. RECOMMENDATION

Based on review of application materials, and all applicable state and federal rules and regulations, staff recommend that Hess Pumice be issued final PTC No. P-050307 for the proposed perlite plant. No public comment period is recommended, no entity has requested a comment period, and the project does not involve PSD requirements.

KH/sd

Permit No. P-050307

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Appendix A

AIRS Information

P-050307

AIRS/AFS^a FACILITY-WIDE CLASSIFICATION^b DATA ENTRY FORM

Facility Name: Hess Pumice, Inc.
Facility Location: Malad City, Idaho
AIRS Number: 071-00003

AIR PROGRAM POLLUTANT	SIP	PSD	NSPS (Part 60)	NESHAP (Part 61)	MACT (Part 63)	SM80	TITLE V	AREA CLASSIFICATION A-Attainment U-Unclassified N- Nonattainment
SO ₂	B							U
NO _x	B							U
CO	B							U
PM ₁₀	SM		X			No		U
PT (Particulate)	SM					No		U
VOC	B							U
THAP (Total HAPs)	B							U
			APPLICABLE SUBPART					
			000					

^a Aerometric Information Retrieval System (AIRS) Facility Subsystem (AFS)

^b AIRS/AFS Classification Codes:

- A = Actual or potential emissions of a pollutant are above the applicable major source threshold. For HAPs only, class "A" is applied to each pollutant which is at or above the 10 T/yr threshold, or each pollutant that is below the 10 T/yr threshold, but contributes to a plant total in excess of 25 T/yr of all HAPs.
- SM = Potential emissions fall below applicable major source thresholds if and only if the source complies with federally enforceable regulations or limitations.
- B = Actual and potential emissions below all applicable major source thresholds.
- C = Class is unknown.
- ND = Major source thresholds are not defined (e.g., radionuclides).

Appendix B

Emissions Inventory

P-050307

TAP Emission Estimates: Hess Pumice, Malad City, Propane Combustion

Evaluated by: JBR Environmental Consultants, June 17, 2005
 Propane Fuel Combustion: Based on boiler size < 10 MMBtu
 Fuel usage rate = 60 gal/hr (firing below maximum capacity)
 Annual hours of operation = 8760

Pollutant	Emission Factor ^a (lb/1000 gal)	Uncontrolled Emission Rate (lb/hr)	Uncontrolled Emission Rate (T/yr)	Screening Emissions Level (lb/hr)	Meets EL (Y/N)
Ammonia	3.00E-01	1.80E-02	7.88E-02	1.20E+00	Y
Benzene	7.20E-04	4.32E-05	1.89E-04	8.00E-04	Y
Ethyl benzene	8.50E-04	5.10E-05	2.23E-04	2.90E+01	Y
Formaldehyde	1.53E-03	9.18E-05	4.02E-04	5.10E-04	Y
Naphthalene	3.00E-05	1.80E-06	7.88E-06	3.33E+00	Y
Toluene	3.28E-03	1.97E-04	8.62E-04	2.50E+01	Y
Xylene	2.44E-03	1.46E-04	6.41E-04	2.90E+01	Y
Acetaldehyde	3.90E-04	2.34E-05	1.02E-04	3.00E-03	Y
Acrolein	2.40E-04	1.44E-05	6.31E-05	1.70E-02	Y
Anthracene		0.00E+00	0.00E+00		NA
Benz(a)anthracene ^b		0.00E+00	0.00E+00		NA
Benzo(b,k)fluoranthene		0.00E+00	0.00E+00		NA
Benzo(g,h,i)perylene		0.00E+00	0.00E+00		NA
Chrysene ^b		0.00E+00	0.00E+00		NA
Dibenzo(a,h)anthracene ^b		0.00E+00	0.00E+00		NA
Fluoranthene		0.00E+00	0.00E+00		NA
Fluorene		0.00E+00	0.00E+00		NA
Hexane	5.70E-04	3.42E-05	1.50E-04	1.20E+01	Y
PAH ^c	1.00E-05	6.00E-07	2.63E-06	9.10E-05	Y
Phenanthrene		0.00E+00	0.00E+00		NA
POM		0.00E+00	0.00E+00		NA
Pyrene		0.00E+00	0.00E+00		NA
Antimony		0.00E+00	0.00E+00		NA
Arsenic		0.00E+00	0.00E+00		NA
Barium		0.00E+00	0.00E+00		NA
Beryllium		0.00E+00	0.00E+00		NA
Cadmium		0.00E+00	0.00E+00		NA
Chloride		0.00E+00	0.00E+00		NA
Chromium		0.00E+00	0.00E+00		NA
Chromium VI		0.00E+00	0.00E+00		NA
Cobalt		0.00E+00	0.00E+00		NA
Copper		0.00E+00	0.00E+00		NA
Fluoride		0.00E+00	0.00E+00		NA
Lead		0.00E+00	0.00E+00		NA
Manganese		0.00E+00	0.00E+00		NA
Mercury		0.00E+00	0.00E+00		NA
Molybdenum		0.00E+00	0.00E+00		NA
Nickel		0.00E+00	0.00E+00		NA
Phosphorous		0.00E+00	0.00E+00		NA
Selenium		0.00E+00	0.00E+00		NA
Vanadium		0.00E+00	0.00E+00		NA
Zinc		0.00E+00	0.00E+00		NA
Nitrous Oxide		0.00E+00	0.00E+00		NA

Annual Hours = Annual Fuel Limit / Firing Rate = (no limit gal/yr)/(77 gal/hr) = no limit = 8760 hr

a) TAP emission factors for propane fuel combustion <10 MMBTU/hr, CARB AB2588 Program Factors, Table B-3

b) Compounds which make up PAH

c) Polyaromatic Hydrocarbons

Appendix C

Modeling Review

P-050307

MEMORANDUM

DATE: May 3, 2005

TO: Ken Hanna, Air Quality Division

THROUGH: Kevin Schilling, Stationary Source Modeling Coordinator, Air Quality Division *KSS*

FROM: Dustin Holloway, Modeling Analyst, Air Quality Division *DH*

PROJECT NUMBER: P-050307

SUBJECT: Modeling Review for the Hess Pumice Products, Inc. Facility Near Malad City

1. SUMMARY

JBR Environmental Consultants, Inc. conducted air quality dispersion modeling for Hess Pumice Products, Inc. (Hess Pumice) in support of a permit to construct (PTC) application to expand processing operations at the facility.

Based on the results of the analyses, DEQ has determined that the modeling analysis: 1) utilized appropriate methods and models; 2) was conducted using reasonably accurate or conservative model parameters and input data; 3) appropriately adhered to established DEQ guidelines for new source review dispersion modeling; 4) showed that predicted pollutant concentrations at all receptor locations, when appropriately combined with background concentrations, were below stated air quality standards.

2. BACKGROUND INFORMATION

2.1 *Applicable Air Quality Impact Limits*

The Hess Pumice facility is located near Malad City in Oneida county. Oneida county is designated attainment or unclassifiable for all criteria air pollutants. The following table summarizes the applicable air quality standards for this area.

Table 2.1 APPLICABLE REGULATORY LIMITS

Pollutant	Averaging Period	Significant Contribution Levels ($\mu\text{g}/\text{m}^3$) ^{a, b}	Regulatory Limit ($\mu\text{g}/\text{m}^3$) ^c	Modeled Value Used ^d
PM ₁₀ ^e	Annual	1	50 ^f	Maximum 1 st highest ^g
	24-hour	5	150 ^h	Maximum 6 th highest ⁱ Highest 2 nd highest ^j
SO ₂	Annual	1	80 ^f	Maximum 1 st highest ^g
	24-hour	5	365 ^k	Highest 2 nd highest ^l
	3-hour	25	1,300 ^k	Highest 2 nd highest ^l
NO ₂	Annual	1	100 ^f	Maximum 1 st highest ^g

^a IDAPA 58.01.01.006.93
^b Micrograms per cubic meter
^c IDAPA 58.01.01.577 for criteria pollutants, IDAPA 58.01.01.585 for non-carcinogenic toxic air pollutants IDAPA 58.01.01.586 for carcinogenic toxic air pollutants.
^d The maximum 1st highest modeled value is always used for significant impact analysis and for all toxic air pollutants.
^e Particulate matter with an aerodynamic diameter less than or equal to a nominal ten micrometers
^f Never expected to be exceeded in any calendar year.
^g Concentration at any modeled receptor.
^h Never expected to be exceeded more than once in any calendar year.
ⁱ Concentration at any modeled receptor when using five years of meteorological data.
^j The highest 2nd high is considered to be conservative for five years of meteorological data.
^k Not to be exceeded more than once per year.

2.2 Background Concentrations

DEQ updated the background concentration data for Idaho in the Spring of 2003¹. The background concentrations used in this analysis were default values for rural/agricultural areas in Idaho. The following table summarizes the background concentrations.

Table 2.2 BACKGROUND CONCENTRATIONS

Pollutant	Averaging Period	Background concentrations ($\mu\text{g}/\text{m}^3$) ^a
PM ₁₀	24-hour	73
	Annual	26
SO ₂	3-hour	34
	24-hour	26
	Annual	8
NO ₂	Annual	17

a. Micrograms per cubic meter.

3. ASSESSMENT OF MODELING ANALYSIS

3.1 Modeling Methodology

Hess Pumice submitted air quality dispersion modeling in support of a PTC application to expand processing operations. The analysis, conducted by JBR Environmental Consultants, Inc., included a full impact analysis of facility-wide emissions of PM₁₀, SO₂, and NO₂. All NO_x emissions were conservatively assumed to be NO₂. The applicants submittal states that the analysis used the ISCST3 model. However, the files submitted with the analysis were ISCPrime files. ISCPrime is an appropriate model for this facility.

¹ Hardy, Rick and Schilling, Kevin. *Background Concentrations for Use in New Source Review Dispersion Modeling*. Memorandum to Mary Anderson, March 14, 2003.

The building profile input program for the Prime algorithm (BPIPFRM) used by the applicant is version 95086. DEQ used the updated BPIPFRM, version 04274, for verification modeling. The resulting concentrations were slightly different than those submitted by the applicant. The results shown in this modeling review are the ones calculated by DEQ verification modeling. The following table summarizes the modeling parameters used by the applicant and DEQ's review and determination of those parameters.

Table 3.1 MODELING PARAMETERS

Parameter	What Facility Submitted	DEQ's Review/Determination
Modeling protocol	Submitted and reviewed by DEQ	This analysis was performed in accordance with the submitted protocol and incorporated DEQ's comments on the protocol.
Model Selection	ISCPPrime	This model is appropriate for this analysis.
Meteorological Data	1987-1991 Pocatello surface data coupled with 1987-1991 Boise upper air data	This is the most representative meteorological data available for this area.
Model Options	Regulatory default	This is appropriate for this analysis.
Land Use	Rural	This facility is located in a rural area
Terrain	Terrain effects were accounted for	The analysis included receptor elevations and the model was run to account for the effects of simple and complex terrain.
Building Downwash	Downwash effects of buildings were calculated	The Prime algorithm calculates the effects of building wakes and cavities on pollutant dispersion.
Receptor Network	25 meter spacing along the fenceline and out to 100 meters; 50 meter spacing out to 500 meters	This receptor network is sufficient to reasonably resolve the maximum modeled concentration.
Facility Layout	N/A	The facility layout was compared to the facility plot plans submitted with the analysis to verify accuracy.

3.2 Emission Rates

The following tables summarize the emissions rates used by the applicant in the modeling analysis.

Table 3.2 PM₁₀ EMISSION RATES

Source ID	Source Description	Emission Rate (lb/hr)
BH1DRYER	Baghouse No. 1	0.83
BH2PROCE	Baghouse No. 2	0.42
BH3GT24	Baghouse No. 3	0.42
BH4GT56	Baghouse No. 4	0.29
BH5LHMBV	Baghouse No. 5	0.11
BH6PROCW	Baghouse No. 6	0.42
BH7HUMR	Baghouse No. 7	0.54
BH8GT789	Baghouse No. 8	0.51
BH9LHMDR	Baghouse No. 9	0.30
BH11LHMW	Baghouse No. 11	0.50
BH12LHME	Baghouse No. 12	0.50
BH15BIN	Baghouse No. 15	0.030
PIROTDRY	P1 Dryer	0.45
POINT3	P3 Dryer	0.010
P4CYCLNE	P4 Cyclone	0.076
BH17PRLT	Baghouse No. 17	0.48
BH18PRLT	Baghouse No. 18	0.0020

Table 3.3 NO_x AND SO₂ EMISSION RATES

	NO _x (lb/hr)	SO ₂ (lb/hr)
PIROTDRY	4.10	5.4
POINT3	0.21	0.010
BH17PRLT	0.84	2.77E-05

3.3 Emission Release Parameters

The following table summarizes the emission release parameters used in the modeling analysis.

BH1DRYER	397,503.9	4,669,220.0	1,367.9	20.0	149.8	8.9	3.02	0.83
BH2PROCE	397,503.6	4,669,239.0	1,367.9	15.0	69.7	8.3	2.49	0.42
BH3GT24	397,501.5	4,669,232.5	1,367.9	8.6	69.7	6.3	2.00	0.42
BH4GT56	397,502.7	4,669,236.0	1,367.9	8.0	69.7	9.4	2.49	0.29
BH5LHMBV	397,517.3	4,669,233.5	1,367.9	8.0	69.7	12.5	1.51	0.11
BH6PROCW	397,502.1	4,669,228.5	1,367.9	64.5	69.7	29.6	1.31	0.42
BH7HUMR	397,519.8	4,669,231.0	1,367.9	8.0	69.7	20.3	2.00	0.54
BH8GT789	397,517.3	4,669,231.5	1,367.9	8.0	69.7	20.2	2.00	0.51
BH9LHMDR	397,536.5	4,669,235.0	1,367.9	45.0	69.7	33.0	0.66	0.30
BH11LHMW	397,536.5	4,669,237.5	1,367.9	10.0	69.7	11.6	2.00	0.50
BH12LHME	397,536.5	4,669,228.0	1,367.9	10.0	69.7	8.9	3.02	0.50
BH15BIN	397,448.1	4,669,261.5	1,368.0	10.0	69.7	0.7	3.02	0.030
PIROTDYR	397,505.1	4,669,221.0	1,367.9	20.0	149.8	5.0	3.02	0.45
POINT3	397,536.5	4,669,235.0	1,367.9	45.0	69.7	13.0	0.66	0.010
P4CYCLNE	397,500.6	4,669,217.0	1,367.9	15.0	149.8	4.6	2.65	0.076
BH17PRLT	397,397.0	4,669,541.0	1,371.4	65.0	300.0	16.2	1.67	0.48
BH18PRLT	397,397.0	4,669,547.0	1,371.4	45.0	70.0	14.4	0.67	0.0020

3.4 Results

3.4.1 Full Impact Analysis Results

Table 3.5 FULL IMPACT ANALYSIS RESULTS

Pollutant	Averaging Period	Facility Ambient Impact ($\mu\text{g}/\text{m}^3$)	Background Concentration ($\mu\text{g}/\text{m}^3$)	Total Ambient concentration ($\mu\text{g}/\text{m}^3$)	NAAQS ($\mu\text{g}/\text{m}^3$)	Percent of NAAQS
PM ₁₀	24-hour	48.0	73	121.0	150	80.7%
	Annual	16.0	26	42.0	50	84.0%
SO ₂	3-hour	360.1	34	394.1	1,300	30.3%
	24-hour	87.7	26	113.7	365	31.1%
	Annual	16.5	8	24.5	80	30.6%
NO ₂	Annual	16.7	17	33.7	100	33.7%

This analysis demonstrates, to DEQ's satisfaction, that the project will not cause or significantly contribute to a violation of any ambient air quality standard.