

May 7, 2001

**MEMORANDUM**

TO: Mark Dietrich, Administrator  
Pocatello Regional Office

FROM: Robert E. Baldwin, Air Quality Engineer   
State Technical Services Office

SUBJECT: TECHNICAL REVIEW OF FACILITY ASSISTED PROPOSED PERMIT,  
Project No. P-000349, Granite Construction, Portable Hot Mix Asphalt  
Plant, Permit to Construct No. 777-00282, updated summary of events.

**PURPOSE**

The purpose of this memorandum is to satisfy the requirements of IDAPA 58.01.01.200 (*Rules for the Control of Air Pollution in Idaho*) for issuing Permit to Construct (PTC). This is the technical analysis of the review engineer.

**PROJECT DESCRIPTION**

Granite Construction is proposing to commence construction of a portable hot mix asphalt plant (HMA) to be operated in both attainment and nonattainment areas within the state of Idaho. The proposed permit includes provisions to operate as a collocated facility in attainment areas with one other portable source. The HMA's maximum hourly throughput is 400 tons. The HMA will be initially located in an attainment areas considerable distance from a highly populated areas.

**SUMMARY OF EVENTS**

On February 9, 2001, the Pocatello Regional office received the permit application, the proposed permit, technical memorandum, and other supportive documentation. On March 12, 2001 the state office received these material for a general review since standard permit forms were used. Additional documentation from Granite Construction was received upon request.

Sveral key issues were not addressed in the proposed permit submitted by Granite Construktion. Among others items, these issues included the allowable sulfur content of waste oil, required modeling for each location (and each unit if units are collocated), source tests, and regulations regarding the monitoring of waste fuel oil. All of the out standing issues have been resolved and the permit has been determined complete and ready for issuance. A public comment period for this permit began on March 19, 2001, in accordance with IDAPA 58.01.01.209.

## DISCUSSION

All of the required materials were submitted using the DEQ standard forms for a HMA facility, with one exception. The standard form for fuel used in a drum dryer allows the drum dryer to be fueled by residual oil, distillate oil, propane, or natural gas. Granite Construction's drum dryer is to be fueled by waste oil. Therefore additional analysis of the proposed permit was required.

The outstanding issues were addressed in phone conversations between the Idaho Department of Environmental Quality (DEQ) and Granite Construction's consultant, and during a meeting that took place on March 23, 2001. The following list includes some of the items that were addressed in these conversations.

- Section A.1.1 of the permit stated an emission rate was not to exceed a particulate limit; however no source test was included to assure compliance. A source test has now been included in the permit
- Section A.2.6 discusses the Code of Federal Register's (40 CFR 279.11) allowable concentration of contaminants is any used fuel oil, but does not establish a method for determining the concentration or mention CFR 40 279.72, 279.73, and 279.74(b), which require monitoring, recordkeeping, and compliance determination for used fuel oil. This section has been amended to include a monitoring method and to include all of the appropriate language from 40 CFR 279.
- Section A.4.1 (Performance Test Protocol) was eliminated from proposed permit. This section has been included in the amended permit.
- Section A.4.2 (Performance Test Report) was eliminated from the proposed permit. This section has been included in the amended permit.
- Section D.1.1 was missing the standard paragraph language that should state, "When located in any PM<sub>10</sub> non-attainment area or proposed PM<sub>10</sub> non-attainment area..." This language has been added.

Granite Construction has addressed the following topics since the March 23 meeting:

- In the proposed permit, a concentration limit of sulfur in waste oil was not established for the waste oil to be burned. To avoid needing a Tier 1 operating permit, the facility must emit less than 99 tons of SO<sub>x</sub> per year. If the sulfur concentration level established in IDAPA 58.01.01.727 were used, the SO<sub>2</sub> emissions would exceed the 100 tons per year when operating 3373 hours per year as requested in the proposed permit. The supplier of waste oil has indicated that the sulfur concentration in the waste oil varies from 0.17 to 1.4 percent. Calculations

indicate that this HMA must be supplied with no greater than 0.93 percent sulfur waste oil to remain below the 99 tons per year limit. Since this permit is requesting the ability to collocate, the sulfur content of the portable source must also not exceed the 0.93 percent sulfur when it is collocated with a HMA, portable rock crushing plant, or a portable concrete batch plant.

- The modeling submitted with the proposed permit was for flat terrain with no buildings (no downwash effects); however, the permit application requested that the HMA operate in all types of terrain, in both attainment and non-attainment areas. In addition, Granite Construction has specified that the facility will be collocated with other sources. In order to show compliance with the National Ambient Air Quality Standards, modeling will be needed for each specific location. Language requiring modeling for each specific location, and for each unit when units are collocated, is now included in the permit.
- The emissions levels of several carcinogenic substances specified in the proposed permit are above the average annual acceptable ambient carcinogenic concentration. Formaldehyde exceeds this level by a factor of ten. The facility consultant addressed this issue by prorating the maximum annual throughput by the same ratio as the actual ambient carcinogenic concentration and the acceptable ambient carcinogenic concentration. The annual throughput for a hot mix asphalt plant is 454,623 tons per year. This was established by the facility as being in compliance with the acceptable ambient carcinogenic concentration modeled exceedence. This type of reduction does not eliminate the possibility of the facility operating 24 hours per day until the allowable tons for the year are processed. During this period of time the actual ambient air carcinogenic concentration being emitted would be on an annual level basis of approximately ten times that of the acceptable ambient carcinogenic concentration. However, DEQ's present policy is to allow the prorated reduced annual throughput limit to demonstrate compliance with the average annual acceptable carcinogenic concentration.

While not necessary for compliance given DEQ's present policy, the staff engineer recommends the facility take further steps to reduce the high concentration of carcinogenic substances released during burning. One possible way to reduce this high concentration would be to reduce the concentration of the carcinogenic in the fuel being burned through mixing waste oil with another energy source with lower carcinogenic components. Another possibility would be to limit the amount of hourly throughput. However, reducing the amount of throughput per hour alone could result in non-profitability for the facility. Another option would be to reduce the hours of operation within a consecutive 24-hour period. This would allow a period of dispersion within a 24-hour period. This may be especially important in non-attainment areas (which are generally also highly populated), and when units are collocated. The worst-case exposure scenario allowed by the proposed permit would be to have the facility located within a very highly populated attainment area. Of the above listed possibilities for reducing released carcinogens, the staff engineer recommends the facility mix the waste oil with another fuel of lesser carcinogenic

component concentrations to reduce the amount of carcinogenic concentration and other hazardous waste emitted within the air. The staff engineer also recommends that when operating within 50 miles of an urban area, this facility would not only operate on a reduced carcinogenic producing fuel mixture, but also reduce the hours of operation during consecutive 24-hour periods.

### RECOMMENDATION

The facility has addressed all of the above-mentioned issues to the satisfaction of DEQ. Therefore, DEQ staff recommends that Granite Construction (portable division) be issued the requested permit.

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April 19, 2001

## **MEMORANDUM**

**TO:** Mark Dietrich, Administrator  
Pocatello Regional Office

**FROM:** Daniel Heiser, P.E.  
JBR Environmental Consultants, Inc.

**SUBJECT:** ***PERMIT TO CONSTRUCT TECHNICAL ANALYSIS***  
P-000349, Granite Construction Company, Portable  
(Hot-Mix Asphalt Plant Permit to Construct No. 777-00282; Including Aggregate,  
Asphalt, and Concrete Production when Collocated in Attainment Areas)

### **PURPOSE**

The purpose of 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 (PTC).

### **PROJECT DESCRIPTION**

Granite Construction 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 this 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 400 tons per hour (400 T/hr) of waste oil. The HMA facility will be initially located near Juniper Pit in Idaho (Township 15 S, Range 30 East, FUP SW 1/4, NW 1/4).

### **SUMMARY OF EVENTS**

On February 9, 2001, the Idaho Department of Health and Welfare, Division of Environmental Quality (DEQ) received a PTC application.

### **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 waste oil.

The 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 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 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 PTC.

## 2. Equipment Listing

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

### 2.1 Portable Hot-Mix Asphalt Plant

|                              |                       |
|------------------------------|-----------------------|
| Manufacturer/Model:          | Cedar Rapids / E-400P |
| Type:                        | Drum Mix              |
| Throughput Capacity (T/hr):  | 400 T/hr              |
| Burner Fuel Type:            | Waste oil             |
| Dryer heat Input (MMBtu/hr): | 92 MMBtu/hr           |

### 2.2 Air Pollution Control Device

|               |          |
|---------------|----------|
| Type:         | Baghouse |
| Manufacturer: | CX 01626 |

### 2.3 HMA Stack Information

|                              |             |
|------------------------------|-------------|
| Stack Height (ft):           | 35 ft       |
| Stack Diameter (ft):         | 4 ft        |
| Exhaust Gas Flowrate (acfm): | 35,000 acfm |
| Stack Exhaust Temp (°F):     | 190 °F      |

### 2.4 Generator

|                              |               |
|------------------------------|---------------|
| Manufacturer/Model:          | Cat 3508 DITA |
| Rated Power Output (kW):     | 900 kW        |
| Fuel Type (gasoline/diesel): | Diesel        |
| Fuel Usage (gal/hr):         | 60.8 gal/hr   |
| Stack Height (ft):           | 12 ft         |
| Stack Diameter (ft):         | 0.75 ft       |
| Exhaust Gas Flowrate (acfm): | 7,051 acfm    |

Stack Exhaust Temp (°F): ~~490~~°F-879 °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/Excel spreadsheet (developed by IDEQ) and emission factors obtained from AP-42, Section 11.1, 12/00 edition (emission factors for waste oil). For purposes of maximum flexibility, the spreadsheet calculates the potential to emit (PTE) based on the worst-case emission factor of waste oil. 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<sub>x</sub> (oxides of nitrogen), SO<sub>2</sub> (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 in the hot mix asphalt plant and diesel fuel in the generator were analyzed. As shown in Appendix A, benzene, nickel, formaldehyde, and hexavalent chromium emissions are estimated to exceed the acceptable ambient concentrations for carcinogens (AACC) at full capacity (400 T/hr, 8,760 hr/yr). When limited to 454,623 tons per year of asphalt using waste oil as the burner fuel, the AACCs are not exceeded. Therefore, the permit will include limits on the amount of throughput with waste oil based on this toxics analysis.

In summary, the emission estimates for this facility assume 400 T/hr throughput to a

drum-mix HMA plant, waste oil-fired dryer, and fugitive dust emissions from specified sources (see the spreadsheet). The most limiting criteria pollutant, which gives the facility a PTE of 99 T/hr, is CO. The most limiting toxic pollutant is formaldehyde.

#### 4.1 Collocated Operations in Attainment Areas

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 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 or half of the toxic emission triggering level are used as limits for calculating throughput for each source. The hot-mix asphalt plant throughput is then established based on the most limiting toxic or criteria pollutant or pollutants (i.e., the pollutant whose criteria emission rate is closest to 49.5 T/yr, or whose toxic emission rate is 50% of non-collocation levels). For collocated attainment area operations, the most limiting criteria pollutant which gives the hot-mix asphalt facility a PTE of 49.5 T/yr is CO, and the most limiting toxic pollutant to meet screening levels is formaldehyde. Collocation production rates are based on meeting formaldehyde screening levels.

#### 5. Modeling

Modeling of the asphalt plant stack emissions and the electrical generator set 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 3.71 ug/m<sup>3</sup> using a 1 lb/hr unity emission rate input to the model. The maximum one (1) hour impact from the electrical generator set was calculated to be 13.37 ug/m<sup>3</sup>, also using a 1 lb/hr unity input. The spreadsheet calculates the ambient impact for each air pollutant (PM, PM-10, NOx, SO<sub>2</sub>, CO and toxic emissions) 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 58.01.01.577, Acceptable Ambient Concentrations in IDAPA 58.01.01.585, and Acceptable Ambient Concentrations for Carcinogens in IDAPA 58.01.01.586. 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 58.01.01.006.89. 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 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 58.01.01.006.27. This facility is not a major facility as defined in IDAPA 58.01.01.006.55 and IDAPA 58.01.01.008.10. 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 58.01.01.201       | Permit to Construct                                               |
| IDAPA 58.01.01.202       | Application Procedures                                            |
| IDAPA 58.01.01.203       | Permit Requirements for New and Modified Stationary Sources       |
| IDAPA 58.01.01.209       | Procedures for Issuing Permits                                    |
| IDAPA 58.01.01.210       | Demonstration of Pre-construction Compliance with Toxic Standards |
| IDAPA 58.01.01.211       | Conditions for Permits to Construct                               |
| IDAPA 58.01.01.212       | Obligation to Comply                                              |
| IDAPA 58.01.01.577       | Ambient Air Quality Standards                                     |
| IDAPA 58.01.01.585 & 586 | Toxic Air Pollutants Non-Carcinogenic and Carcinogenic Increments |
| IDAPA 58.01.01.625       | Visible Emissions                                                 |

|                    |                                                 |
|--------------------|-------------------------------------------------|
| IDAPA 58.01.01.650 | Rules for Control of Fugitive Dust              |
| IDAPA 58.01.01.725 | Rules for Sulfur Content of Fuels               |
| IDAPA 58.01.01.805 | Rules for the Control of Hot-Mix Asphalt Plants |
| 40 CFR 279         | Standards for the Management of Used Oil        |

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 58.01.01.006.55 and IDAPA 58.01.01.008.10. 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 58.01.01.006.104(b). In accordance with IDAPA 58.01.01.301.02(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 58.01.01.008.10. Therefore, registration and registration fees in accordance with IDAPA 58.01.01.526 are not applicable.

RECOMMENDATION

Based on review of application materials and state and federal rules and regulations, staff recommend that Granite Construction 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.

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cc: State Technical Services  
Pocatello RO  
EPA Region 10

# **Appendix A**

## ***Emission Estimate Calculations***

### ***Granite Construction, Portable***

**INPUT SECTION - enter info in highlighted areas only**

Company: Granite Construction  
 Permit Engineer: DH  
 Date: 07/16/2001  
 File Name:

Enter the MMA 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)

Dryer Dryer Stack Flow Rate: 35,000 [ ] scfm cubic feet per minute (scfm)  
 Dryer Dryer Stack Temperature (°F): 400 [ ]  
 Enter Dryer Stack Moisture: 12.0 [ ] moisture % (Basis all 16 wt%)  
 Enter Dryer Stack Pressure: 2.0 [ ] stack pressure (Basis 29.92 in-Hg)  
 Calculated Corrected Flow Rate: 23,316 [ ] dry standard cubic feet per minute (dscfm)

Enter MMA Maximum Capacity: 400 [ ] Tons/hr (Asphalt Tons roughcut)

Enter MMA Maximum Concentration: 3.76 [ ] lb/ft<sup>3</sup> (1.18 concentration (g/L) (PPM))

Is a PMA performance test required for this MMA plant? Y or N (Based on 40 CFR 61.850 Reg. 61.850(a)(1))

Does Plant Require a Generator? Y or N  
 Enter Generator Size: 600 [ ] kW  
 Enter Util: B (A - No generator or B - KVA/hrs)

Calculated Generator Size: 1200.0 [ ] Horsepower

Enter Generator Fuel Type: A (A - Diesel-Fired Generator) (B - Gasoline-Fired or Dual-Fired Generator)

Enter Generator Fuel Usage: 68.8 [ ] gal/hr  
 Calculated Generator Heat Output: 8.37 [ ] MM Btu/hr

Is the gen. modeled concentration: 0.337 [ ] ug/m<sup>3</sup> (1.18 concentration (g/L) (lb/ft<sup>3</sup>))

Note: Use 100 Tpy for TMB Y Emission  
 Use 350 Tpy for PSD Limitation

**Standard Hot Mix Asphalt Plant Emissions Data - information used by spreadsheet**

| State Wide Background Concentrations for Criteria Air Pollutants |                 |                 |                |                |
|------------------------------------------------------------------|-----------------|-----------------|----------------|----------------|
| PM-10                                                            | SO <sub>2</sub> | NO <sub>x</sub> | CO             | Lead           |
| 11,400                                                           | 543             | 5130            | 86             | 33.7           |
| 10 [ ] mph                                                       | 10 [ ] mph      | 2.5 [ ] %       | 0.0034 [ ] BMT | 0.0053 [ ] BMT |
| 0.35 [ ] diameters                                               |                 |                 |                |                |

Parameters used in the Facility Emissions Calculations:  
 Mean Wind Speed (U) 10 [ ] mph  
 Molecular Weight Correction (M) 2.5 [ ] %  
 Particle Size Multiplier (P) 0.35 [ ] diameters  
 Correction Factor (C) 0.0034 [ ] BMT  
 PM-10 (<10 µm) 0.0053 [ ] BMT  
 PM-10 (<2.5 µm) 0.0034 [ ] BMT  
 Notes: ul EP = 1.0, 0.027 (0.097 / 4.10693) / 4.4  
 Drop-Peak Equation, Rating "A," AP-41, Sub EA, p.132.4.3.  
 Assumptions: Wind Speed = 10 mph; Moisture = 2.5%; and  
 Aggregate = 94% of product.

**FACILITY CLASSIFICATION INPUT**

Enter Annual Emission Limit:  
 Use 100 Tpy for TMB Y Emission  
 Use 350 Tpy for PSD Limitation  
 For the standard MMA permit, use 100 Tpy.

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

| Non-attainment Area          |                                | Attainment Area           |                 |
|------------------------------|--------------------------------|---------------------------|-----------------|
| Allowable Emission Limits    |                                | Allowable Emission Limits |                 |
| HMA Dryer Stack:             | 8.0 lb/hr of PM                | NA T/yr                   | 87.7 T/yr of CO |
| Generator:                   | 8.4 hr/day<br>3,049.39 hr/year | NA T/yr                   | 11.3 T/yr of CO |
| HMA Plant Throughput Limits: | 3,342 T/day                    | 1,219,757 T/yr            | 1,349,212 T/yr  |

| Collocated Attainment Area   |                                 | CO 1-hr Standard |     | SO2 3-hr standard |  | CO 8-hr Standard |  |
|------------------------------|---------------------------------|------------------|-----|-------------------|--|------------------|--|
| Allowable Emission Limits    |                                 | emissions/hr     |     | hr/3-hr           |  | br/8-hr          |  |
| HMA Dryer Stack:             | 8.0 lb/hr of PM                 | 60.0             | 3.0 | 8.0               |  |                  |  |
| Generator:                   | 24.0 hr/day<br>1,686.52 hr/year | 5.7 T/yr of CO   |     |                   |  |                  |  |
| HMA Plant Throughput Limits: | N/A T/day                       | 674,606 T/yr     |     |                   |  |                  |  |

| INPUTS TO PERMIT TO CONSTRUCT (PTC)                       |            | Value     | Units   |
|-----------------------------------------------------------|------------|-----------|---------|
| <b>Section B "Attainment Area When Not Collocated"</b>    |            |           |         |
| Section B.1.1 Facility Throughput Annual Throughput Limit | <<OR>>     | 1,349,212 | T/yr    |
| Daily Throughput Limit                                    |            | N/A       | T/day   |
| Annual Throughput Limit                                   |            | 1,349,212 | T/yr    |
| Section B.1.3 Generator Hours of Operation                | <<AND/OR>> | 3,373     | hr/year |
| Daily Hours of Operation                                  |            | 24        | hr/day  |
| <b>Section C "Attainment Area When Collocated"</b>        |            |           |         |
| Section C.1.3 Facility Throughput Annual Throughput Limit | <<OR>>     | 674,606   | T/yr    |
| Daily Throughput Limit                                    |            | N/A       | T/day   |
| Annual Throughput Limit                                   |            | 674,606   | T/yr    |
| Section C.1.4 Generator Hours of Operation                | <<AND/OR>> | 1,687     | hr/year |
| Daily Hours of Operation                                  |            | 24.0      | hr/day  |
| <b>Section D "Nonattainment Area"</b>                     |            |           |         |
| Section D.1.1 Facility Throughput Annual Throughput Limit | <<OR>>     | 1,219,757 | T/yr    |
| Daily Throughput Limit                                    |            | 3,342     | T/day   |
| Annual Throughput Limit                                   |            | 1,219,757 | T/yr    |
| Section D.1.3 Generator Hours of Operation                | <<AND/OR>> | 3,049     | hr/year |
| Daily Hours of Operation                                  |            | 8.4       | hr/day  |

Standard Hot Mol. Asph. Plant (Controlled) EMISSION RATE CALCULATIONS

| Pollutant   | DRYER STACK             |                                    | GENERATOR STACK         |                                    |
|-------------|-------------------------|------------------------------------|-------------------------|------------------------------------|
|             | Emission Factor (lb/hr) | Emission Rate (Controlled) (lb/hr) | Emission Factor (lb/hr) | Emission Rate (Controlled) (lb/hr) |
| Total PM    | 0.02                    | 9.28                               | 0.07                    | 0.58                               |
| Total PM-10 | 0.04                    | 1,720.00                           | 0.06                    | 0.47                               |
| CO          | 0.130                   | 91.00                              | 0.81                    | 6.70                               |
| NO dx       | 0.655                   | 21.00                              | 3.10                    | 25.65                              |
| SO dx       | 0.658                   | 23.20                              | 0.51                    | 4.18                               |

NMA emission factors for CO, NO dx, SO dx and uncontrolled PM & PM-10 are from AP-42 Section 11.1. Controlled PM & PM-10 is from dx NSPS 0.04 g/dwt.

MODELING ANALYSIS CALCULATIONS FOR ATTAINMENT AREAS

| Pollutant | Allowable Impact            |                            |       | NAAQS                       |                            |       | Permitted Impact            |                            |       |
|-----------|-----------------------------|----------------------------|-------|-----------------------------|----------------------------|-------|-----------------------------|----------------------------|-------|
|           | Hours of Operation (hr/day) | Hours of Operation (hr/yr) | Other | Hours of Operation (hr/day) | Hours of Operation (hr/yr) | Other | Hours of Operation (hr/day) | Hours of Operation (hr/yr) | Other |
| PM-10     | N/S                         | 24.0                       | N/S   | N/S                         | 8,760                      | 3,373 | 24.0                        | 3,373                      | 3,373 |
| CO        | N/S                         | 24.0                       | 1.0   | N/S                         | 8,760                      | 1.0   | 24.0                        | 8,760                      | 1.0   |
| NO dx     | N/S                         | 24.0                       | 8.0   | N/S                         | 8,760                      | 8.0   | 24.0                        | 8,760                      | 8.0   |
| SO dx     | N/S                         | 24.0                       | 3.0   | N/S                         | 8,760                      | 3.0   | 24.0                        | 8,760                      | 3.0   |

MODELING ANALYSIS CALCULATIONS FOR NONATTAINMENT AREAS

| Pollutant | Allowable Impact            |                            |       | NAAQS                       |                            |       | Permitted Impact            |                            |       |
|-----------|-----------------------------|----------------------------|-------|-----------------------------|----------------------------|-------|-----------------------------|----------------------------|-------|
|           | Hours of Operation (hr/day) | Hours of Operation (hr/yr) | Other | Hours of Operation (hr/day) | Hours of Operation (hr/yr) | Other | Hours of Operation (hr/day) | Hours of Operation (hr/yr) | Other |
| PM-10     | N/S                         | 8.4                        | N/S   | 8.4                         | 3,049                      | 3,049 | 8.4                         | 3,049                      | 3,049 |
| CO        | N/S                         | 8.4                        | 1.0   | N/S                         | 8,760                      | 1.0   | 8.4                         | 8,760                      | 1.0   |
| NO dx     | N/S                         | 24.0                       | 8.0   | N/S                         | 8,760                      | 8.0   | 24.0                        | 8,760                      | 8.0   |
| SO dx     | N/S                         | 24.0                       | 3.0   | N/S                         | 8,760                      | 3.0   | 24.0                        | 8,760                      | 3.0   |

| Pollutant   | DRYER STACK             |                                    | GENERATOR STACK         |                                    |
|-------------|-------------------------|------------------------------------|-------------------------|------------------------------------|
|             | Emission Factor (lb/hr) | Emission Rate (Controlled) (lb/hr) | Emission Factor (lb/hr) | Emission Rate (Controlled) (lb/hr) |
| Total PM    | 0.02                    | 9.28                               | 0.07                    | 0.58                               |
| Total PM-10 | 0.04                    | 1,720.00                           | 0.06                    | 0.47                               |
| CO          | 0.130                   | 91.00                              | 0.81                    | 6.70                               |
| NO dx       | 0.655                   | 21.00                              | 3.10                    | 25.65                              |
| SO dx       | 0.658                   | 23.20                              | 0.51                    | 4.18                               |

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

| Pollutant | Allowable Impact            |                            |       | NAAQS                       |                            |       | Permitted Impact            |                            |       |
|-----------|-----------------------------|----------------------------|-------|-----------------------------|----------------------------|-------|-----------------------------|----------------------------|-------|
|           | Hours of Operation (hr/day) | Hours of Operation (hr/yr) | Other | Hours of Operation (hr/day) | Hours of Operation (hr/yr) | Other | Hours of Operation (hr/day) | Hours of Operation (hr/yr) | Other |
| PM-10     | N/S                         | 8.4                        | N/S   | 8.4                         | 3,049                      | 3,049 | 8.4                         | 3,049                      | 3,049 |
| CO        | N/S                         | 8.4                        | 1.0   | N/S                         | 8,760                      | 1.0   | 8.4                         | 8,760                      | 1.0   |
| NO dx     | N/S                         | 24.0                       | 8.0   | N/S                         | 8,760                      | 8.0   | 24.0                        | 8,760                      | 8.0   |
| SO dx     | N/S                         | 24.0                       | 3.0   | N/S                         | 8,760                      | 3.0   | 24.0                        | 8,760                      | 3.0   |

| Pollutant | Allowable Impact            |                            |       | NAAQS                       |                            |       | Permitted Impact            |                            |       |
|-----------|-----------------------------|----------------------------|-------|-----------------------------|----------------------------|-------|-----------------------------|----------------------------|-------|
|           | Hours of Operation (hr/day) | Hours of Operation (hr/yr) | Other | Hours of Operation (hr/day) | Hours of Operation (hr/yr) | Other | Hours of Operation (hr/day) | Hours of Operation (hr/yr) | Other |
| PM-10     | N/S                         | 8.4                        | N/S   | 8.4                         | 3,049                      | 3,049 | 8.4                         | 3,049                      | 3,049 |
| CO        | N/S                         | 8.4                        | 1.0   | N/S                         | 8,760                      | 1.0   | 8.4                         | 8,760                      | 1.0   |
| NO dx     | N/S                         | 24.0                       | 8.0   | N/S                         | 8,760                      | 8.0   | 24.0                        | 8,760                      | 8.0   |
| SO dx     | N/S                         | 24.0                       | 3.0   | N/S                         | 8,760                      | 3.0   | 24.0                        | 8,760                      | 3.0   |

Standard Hot-Mix Asphalt Plant Exhaustive Emission Calculations for Non-Attainment Areas

|                                        | PM    | PM10 |
|----------------------------------------|-------|------|
| Pre-Dryer Source Emissions (t-1/6hr)   |       |      |
| Loader -> Cold Aggregate Bin           | 2.01  | 0.76 |
| Cold Aggregate Bin -> Conveyor         | 2.01  | 0.76 |
| Conveyor -> Drum Dryer                 | 2.01  | 0.76 |
| Total Pre-Dryer Source Emissions       | 6.03  | 2.28 |
| Post-Dryer Source Emissions            |       |      |
| Screening Process                      | N/A   | N/A  |
| Screen -> Hot Bin                      | N/A   | N/A  |
| Hot Bin -> Weigh Hopper                | N/A   | N/A  |
| Weigh Hopper -> Pug Mill               | N/A   | N/A  |
| Total Post-Dryer Source Emissions      | N/A   | N/A  |
| Scavenger Control Efficiency           |       |      |
| Total Uncontrolled Emissions (t-1/6hr) | 6.03  | 2.28 |
| Total Uncontrolled Emissions (t-1/7yr) | 10.95 | 3.64 |
| Total Controlled Emissions (t-1/6hr)   | 6.03  | 2.28 |
| Total Controlled Emissions (t-1/7yr)   | 10.95 | 3.64 |

Source: National Asphalt Pavement Association  
 us CO2-hr Averaging Period  
 us CO2-7 Averaging Period  
 us 60 dB 3-hr Averaging Period

|                                        | PM   | PM10 |
|----------------------------------------|------|------|
| Pre-Dryer Source Emissions (t-1/6hr)   |      |      |
| Loader -> Cold Aggregate Bin           | 2.00 | 0.76 |
| Cold Aggregate Bin -> Conveyor         | 2.00 | 0.76 |
| Conveyor -> Drum Dryer                 | 2.00 | 0.76 |
| Total Pre-Dryer Source Emissions       | 6.00 | 2.28 |
| Post-Dryer Source Emissions            |      |      |
| Screening Process                      | N/A  | N/A  |
| Screen -> Hot Bin                      | N/A  | N/A  |
| Hot Bin -> Weigh Hopper                | N/A  | N/A  |
| Weigh Hopper -> Pug Mill               | N/A  | N/A  |
| Total Post-Dryer Source Emissions      | N/A  | N/A  |
| Scavenger Control Efficiency           |      |      |
| Total Uncontrolled Emissions (t-1/6hr) | 6.00 | 2.28 |
| Total Uncontrolled Emissions (t-1/7yr) | 9.17 | 3.47 |
| Total Controlled Emissions (t-1/6hr)   | 6.00 | 2.28 |
| Total Controlled Emissions (t-1/7yr)   | 9.17 | 3.47 |

SPREADSHEET SUMMARY - results of emission and modeling calculations for all pollutants based on: Applied Plant Emissions and Ambient Impact Calculations

ATTAINMENT & INCL ASSURABLE AREAS

NONATTAINMENT AREAS

| Uncontrolled                                |            | Controlled  |            | Dryer                                    |             | Controlled |  |
|---------------------------------------------|------------|-------------|------------|------------------------------------------|-------------|------------|--|
| 155 T/yr                                    | 13.5 T/yr  | 14.0 T/yr   | 12.2 T/yr  | PM                                       | 14.0 T/yr   | 12.2 T/yr  |  |
| 3900.8 T/yr                                 | 13.5 T/yr  | 2621.5 T/yr | 13.2 T/yr  | PM-10                                    | 2621.5 T/yr | 13.2 T/yr  |  |
| 87.3 T/yr                                   | 87.3 T/yr  | 79.3 T/yr   | 79.3 T/yr  | CO                                       | 79.3 T/yr   | 79.3 T/yr  |  |
| 37.1 T/yr                                   | 37.1 T/yr  | 33.5 T/yr   | 33.5 T/yr  | NOx                                      | 33.5 T/yr   | 33.5 T/yr  |  |
| 39.1 T/yr                                   | 39.1 T/yr  | 35.4 T/yr   | 35.4 T/yr  | SO d2                                    | 35.4 T/yr   | 35.4 T/yr  |  |
| <b>Generator</b>                            |            |             |            |                                          |             |            |  |
| 1.9 T/yr                                    | 1.9 T/yr   | 0.9 T/yr    | 0.9 T/yr   | PM                                       | 0.9 T/yr    | 0.9 T/yr   |  |
| 0.8 T/yr                                    | 0.8 T/yr   | 0.7 T/yr    | 0.7 T/yr   | PM-10                                    | 0.7 T/yr    | 0.7 T/yr   |  |
| 11.3 T/yr                                   | 11.3 T/yr  | 10.2 T/yr   | 10.2 T/yr  | CO                                       | 10.2 T/yr   | 10.2 T/yr  |  |
| 43.3 T/yr                                   | 43.3 T/yr  | 39.1 T/yr   | 39.1 T/yr  | NOx                                      | 39.1 T/yr   | 39.1 T/yr  |  |
| 7.0 T/yr                                    | 7.0 T/yr   | 6.4 T/yr    | 6.4 T/yr   | SO d2                                    | 6.4 T/yr    | 6.4 T/yr   |  |
| <b>Emissions</b>                            |            |             |            |                                          |             |            |  |
| 10.1 T/yr                                   | 10.1 T/yr  | 9.2 T/yr    | 9.2 T/yr   | PM                                       | 9.2 T/yr    | 9.2 T/yr   |  |
| 3.6 T/yr                                    | 3.6 T/yr   | 3.5 T/yr    | 3.5 T/yr   | PM-10                                    | 3.5 T/yr    | 3.5 T/yr   |  |
| <b>Total pl</b>                             |            |             |            |                                          |             |            |  |
| 26.6 T/yr                                   | 24.6 T/yr  | 24.1 T/yr   | 22.2 T/yr  | PM                                       | 24.1 T/yr   | 22.2 T/yr  |  |
| 2905.4 T/yr                                 | 16.1 T/yr  | 2626.7 T/yr | 16.4 T/yr  | PM-10                                    | 2626.7 T/yr | 16.4 T/yr  |  |
| 99.0 T/yr                                   | 99.0 T/yr  | 89.5 T/yr   | 89.5 T/yr  | CO                                       | 89.5 T/yr   | 89.5 T/yr  |  |
| 80.4 T/yr                                   | 80.4 T/yr  | 72.6 T/yr   | 72.6 T/yr  | NOx                                      | 72.6 T/yr   | 72.6 T/yr  |  |
| 46.3 T/yr                                   | 46.3 T/yr  | 41.7 T/yr   | 41.7 T/yr  | SO d2                                    | 41.7 T/yr   | 41.7 T/yr  |  |
| <b>TRIE V PTE</b>                           |            |             |            |                                          |             |            |  |
| 2905.4 T/yr                                 | 99.0 T/yr  | 2626.7 T/yr | 99.0 T/yr  | Summary of CO                            | 2626.7 T/yr | 99.0 T/yr  |  |
| 2905.4 T/yr                                 | 99.0 T/yr  | 2626.7 T/yr | 99.0 T/yr  | Summary of PM-10                         | 2626.7 T/yr | 99.0 T/yr  |  |
| <b>Enforceable Limits - Attainment Area</b> |            |             |            |                                          |             |            |  |
| 24.8 lb/day                                 | 3373 lb/yr | 8.4 lb/day  | 3049 lb/yr | Enforceable Limits - Non-Attainment Area | 8.4 lb/day  | 3049 lb/yr |  |
| <b>Dryer Controlled Emission Rates</b>      |            |             |            |                                          |             |            |  |
| 8.0 lb/hr                                   | 13.5 T/yr  | 8.0 lb/hr   | 12.2 T/yr  | Dryer Controlled Emission Rates          | 8.0 lb/hr   | 12.2 T/yr  |  |
| 52.8 lb/hr                                  | 87.3 T/yr  | 51.0 lb/hr  | 79.3 T/yr  | CO                                       | 51.0 lb/hr  | 79.3 T/yr  |  |
| 22.0 lb/hr                                  | 37.1 T/yr  | 21.0 lb/hr  | 33.5 T/yr  | NOx                                      | 21.0 lb/hr  | 33.5 T/yr  |  |
| 23.2 lb/hr                                  | 39.1 T/yr  | 21.2 lb/hr  | 35.4 T/yr  | SO d2                                    | 21.2 lb/hr  | 35.4 T/yr  |  |
| <b>Generator Controlled Emission Rates</b>  |            |             |            |                                          |             |            |  |
| 0.5 lb/hr                                   | 0.9 T/yr   | 0.5 lb/hr   | 0.9 T/yr   | Generator Controlled Emission Rates      | 0.5 lb/hr   | 0.9 T/yr   |  |
| 6.7 lb/hr                                   | 11.3 T/yr  | 6.7 lb/hr   | 10.2 T/yr  | CO                                       | 6.7 lb/hr   | 10.2 T/yr  |  |
| 25.6 lb/hr                                  | 43.3 T/yr  | 25.6 lb/hr  | 39.1 T/yr  | NOx                                      | 25.6 lb/hr  | 39.1 T/yr  |  |
| 4.2 lb/hr                                   | 7.0 T/yr   | 4.2 lb/hr   | 6.4 T/yr   | SO d2                                    | 4.2 lb/hr   | 6.4 T/yr   |  |

u1 Total lb dryer, generator and fugitive added together for total PTE.  
u2 Total V PTE summary does not account for PM, only PM-10.

| Ambient Air - Commercial Units - CUB, 10/1/92                      |           | Collection Ambient Air Quality Standards - Calculations |            | Annual (50% Attainment (6225)) |
|--------------------------------------------------------------------|-----------|---------------------------------------------------------|------------|--------------------------------|
|                                                                    |           | 1-hr                                                    | 8-hr       | 24-hr                          |
| (1-hr, 24-hr) 24-hr standard is not in table for collection        |           |                                                         |            |                                |
| PM10                                                               | 148160838 |                                                         | 2237606004 | 176248351 8.1990911            |
| CO                                                                 |           |                                                         |            |                                |
| NOx                                                                |           |                                                         |            |                                |
| SOx                                                                |           | 2389712575                                              |            | 214652459                      |
| TDC                                                                |           |                                                         |            | 53 8214178 76 065975           |
| Background Concentration - Attainment/Non-Attainment Area: (ug/m3) |           |                                                         |            |                                |
|                                                                    | 1-hr      | 3-hr                                                    | 6-hr       | 24-hr                          |
| PM10                                                               |           |                                                         |            | Annual                         |
| CO                                                                 | 11400     |                                                         | 5130       | 65 12.7                        |
| NOx                                                                |           |                                                         |            | 40                             |
| SOx                                                                |           | 543                                                     |            | 146 33.5                       |
| TDC                                                                |           |                                                         |            |                                |

Emissions Analysis for Non-Carcinogenic Pollutants

| Pollutant           | Emission Factor, lb/ton | Generator                 |          | EL Standard, lb/hr | Actual, lb/hr | Actual 24 hr. Ambient Conc., ug/m <sup>3</sup> | AAC, ug/m <sup>3</sup> (24 Hour average) |
|---------------------|-------------------------|---------------------------|----------|--------------------|---------------|------------------------------------------------|------------------------------------------|
|                     |                         | Emission Factor, lb/MMBtu | lb/hr    |                    |               |                                                |                                          |
| Phosphorous         | 2.80E-05                |                           | 0.01     | 0.007              | 0.0166208     |                                                | 5                                        |
| Silver              | 4.80E-07                |                           | 1.92E-04 | 0.007              | 2.85E-04      |                                                | 5                                        |
| Zinc                | 6.10E-05                |                           | 2.44E-02 | 0.667              | 3.62E-02      |                                                | 500                                      |
| Chromium            | 5.50E-06                |                           | 2.20E-03 | 0.033              | 3.26E-03      |                                                | 25                                       |
| Copper              | 3.10E-06                |                           | 1.24E-03 | 0.013              | 1.84E-03      |                                                | 10                                       |
| Manganese           | 7.7E-06                 |                           | 3.08E-03 | 0.067              | 4.57E-03      |                                                | 50                                       |
| Mercury             | 2.6E-06                 |                           | 1.04E-03 | 0.0001             | 1.54E-03      |                                                | 1                                        |
| Acrolein            | 2.6E-05                 | 7.9E-06                   | 1.11E-02 | 0.017              | 1.65E-02      |                                                | 13                                       |
| Methyl Ethyl Ketone | 2E-05                   |                           | 8.00E-03 | 0.007              | 1.19E-02      |                                                | 6                                        |
| Propionaldehyde     | 0.00013                 |                           | 5.20E-02 | 0.0287             | 7.72E-02      |                                                | 22                                       |
| Quinone             | 0.00016                 |                           | 6.40E-02 | 0.027              | 9.50E-02      |                                                | 20                                       |
| Toluene             | 0.0029                  | 2.81E-04                  | 1.19E+00 | 25                 | 1.76E+00      |                                                | 18,750                                   |
| Acetone             | 0.00083                 |                           | 3.32E-01 | 1.33               | 4.93E-01      |                                                | 1,000                                    |
| Crotonaldehyde      | 8.6E-05                 |                           | 3.44E-02 | 0.38               | 5.10E-02      |                                                | 285                                      |
| Valeraldehyde       | 6.7E-05                 |                           | 2.68E-02 | 11.7               | 3.98E-02      |                                                | 8,750                                    |

**Emissions Analysis for Non-Carcinogenic Pollutants**

| Pollutant         | Emission Factor, lb/ton | Generator                 |               | Actual, lb/hr | EL Standard, lb/hr | Actual 24 hr. Ambient Conc., ug/m <sup>3</sup> | AAC, ug/m <sup>3</sup> (24 Hour average) |
|-------------------|-------------------------|---------------------------|---------------|---------------|--------------------|------------------------------------------------|------------------------------------------|
|                   |                         | Emission Factor, lb/MMBtu | Actual, lb/hr |               |                    |                                                |                                          |
| Ethylbenzene      | 0.00024                 |                           | 9.60E-02      | 29            | 1.42E-01           | 21,750                                         |                                          |
| Methyl chloroform | 4.8E-05                 |                           | 1.92E-02      | 127           | 2.85E-02           | 95,500                                         |                                          |
| Xylene            | 0.0002                  | 1.93E-04                  | 9.78E-02      | 29            | 1.45E-01           | 21,750                                         |                                          |
| Naphthalene       | 0.00065                 | 1.30E-04                  | 2.72E-01      | 3.33          | 4.04E-01           | 2,500                                          |                                          |
| Selenium          | 3.50E-07                |                           | 1.40E-04      | 1.30E-02      | 2.08E-04           | 10                                             |                                          |
| Thallium          | 4.10E-09                |                           | 1.64E-06      | 0.007         | 2.43E-06           | 5                                              |                                          |
| Antimony          | 1.80E-07                |                           | 7.20E-05      | 0.033         | 1.07E-04           | 25                                             |                                          |
| Barium            | 5.80E-06                |                           | 2.32E-03      | 0.033         | 3.44E-03           | 25                                             |                                          |
| Hexane            | 0.00092                 |                           | 3.68E-01      | 12            | 5.46E-01           | 9,000                                          |                                          |
| Heptane           | 9.40E-03                |                           | 3.76E+00      | 109           | 5.58E+00           | 82,000                                         |                                          |
| Pentane           | 2.10E-04                |                           | 8.40E-02      | 0.033         | 1.25E-01           | 25                                             |                                          |

Source: AP-42, 12/00, Tables 11.1-10 and 11.1-12.

**Emissions Analysis for Non-Carcinogenic Pollutants**

| Pollutant           | Emission Factor, lb/ton | Generator                 |          | EL Standard, lb/hr | Actual, lb/hr | Actual 24 hr. Ambient Conc., ug/m <sup>3</sup> | AAC, ug/m <sup>3</sup> (24 Hour average) |
|---------------------|-------------------------|---------------------------|----------|--------------------|---------------|------------------------------------------------|------------------------------------------|
|                     |                         | Emission Factor, lb/MMBtu | lb/hr    |                    |               |                                                |                                          |
| Phosphorous         | 2.80E-05                |                           | 0.01     | 0.007              | 0.0166208     | 5                                              |                                          |
| Silver              | 4.80E-07                |                           | 1.92E-04 | 0.007              | 2.85E-04      | 5                                              |                                          |
| Zinc                | 6.10E-05                |                           | 2.44E-02 | 0.667              | 3.62E-02      | 500                                            |                                          |
| Chromium            | 5.50E-06                |                           | 2.20E-03 | 0.033              | 3.26E-03      | 25                                             |                                          |
| Copper              | 3.10E-06                |                           | 1.24E-03 | 0.013              | 1.84E-03      | 10                                             |                                          |
| Manganese           | 7.7E-06                 |                           | 3.08E-03 | 0.067              | 4.57E-03      | 50                                             |                                          |
| Mercury             | 2.6E-06                 |                           | 1.04E-03 | 0.0001             | 1.54E-03      | 1                                              |                                          |
| Acrolein            | 2.6E-05                 | 7.9E-06                   | 1.11E-02 | 0.017              | 1.65E-02      | 13                                             |                                          |
| Methyl Ethyl Ketone | 2E-05                   |                           | 8.00E-03 | 0.007              | 1.19E-02      | 6                                              |                                          |
| Propionaldehyde     | 0.00013                 |                           | 5.20E-02 | 0.0287             | 7.72E-02      | 22                                             |                                          |
| Quinone             | 0.00016                 |                           | 6.40E-02 | 0.027              | 9.50E-02      | 20                                             |                                          |
| Toluene             | 0.0029                  | 2.81E-04                  | 1.19E+00 | 25                 | 1.76E+00      | 18,750                                         |                                          |
| Acetone             | 0.00083                 |                           | 3.32E-01 | 1.33               | 4.93E-01      | 1,000                                          |                                          |
| Crotonaldehyde      | 8.6E-05                 |                           | 3.44E-02 | 0.38               | 5.10E-02      | 285                                            |                                          |
| Valeraldehyde       | 6.7E-05                 |                           | 2.68E-02 | 11.7               | 3.98E-02      | 8,750                                          |                                          |

**Emissions Analysis for Non-Carcinogenic Pollutants**

| Pollutant         | Emission Factor, lb/ton | Generator                 |               |                    | AAC, ug/m <sup>3</sup> (24 Hour average) |                                                |
|-------------------|-------------------------|---------------------------|---------------|--------------------|------------------------------------------|------------------------------------------------|
|                   |                         | Emission Factor, lb/MMBtu | Actual, lb/hr | EL Standard, lb/hr |                                          | Actual 24 hr. Ambient Conc., ug/m <sup>3</sup> |
| Ethylbenzene      | 0.00024                 |                           | 9.60E-02      | 29                 | 1.42E-01                                 | 21,750                                         |
| Methyl chloroform | 4.8E-05                 |                           | 1.92E-02      | 127                | 2.85E-02                                 | 95,500                                         |
| Xylene            | 0.0002                  | 1.93E-04                  | 9.78E-02      | 29                 | 1.45E-01                                 | 21,750                                         |
| Naphthalene       | 0.00065                 | 1.30E-04                  | 2.72E-01      | 3.33               | 4.04E-01                                 | 2,500                                          |
| Selenium          | 3.50E-07                |                           | 1.40E-04      | 1.30E-02           | 2.08E-04                                 | 10                                             |
| Thallium          | 4.10E-09                |                           | 1.64E-06      | 0.007              | 2.43E-06                                 | 5                                              |
| Antimony          | 1.80E-07                |                           | 7.20E-05      | 0.033              | 1.07E-04                                 | 25                                             |
| Barium            | 5.80E-06                |                           | 2.32E-03      | 0.033              | 3.44E-03                                 | 25                                             |
| Hexane            | 0.00092                 |                           | 3.68E-01      | 12                 | 5.46E-01                                 | 9,000                                          |
| Heptane           | 9.40E-03                |                           | 3.76E+00      | 109                | 5.58E+00                                 | 82,000                                         |
| Pentane           | 2.10E-04                |                           | 8.40E-02      | 0.033              | 1.25E-01                                 | 25                                             |

Source: AP-42, 12/00, Tables 11.1-10 and 11.1-12.

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 |
|-------------------------|---------------------------------|-------------------|---------------------------------------------|------------------------------------------------|-------------------------------------------|
| 1.50E-05<br>lb/ton      | 0.03<br>tons/yr                 | 0.6<br>ton/yr     | 0.02226<br>ug/m3                            | 0.0050085<br>ug/m3                             | 1.5<br>ug/m3                              |

Source: AP-42, 12/00, Tables 11.1-10 and 11.1-12.

## **Appendix B**

### ***Modeling Results***

#### ***Granite Construction, Portable***

02/16/01  
15:17:08

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

Granite Construction Generator

SIMPLE TERRAIN INPUTS:

SOURCE TYPE = POINT  
EMISSION RATE (G/S) = .126000  
STACK HEIGHT (M) = 3.6600  
STK INSIDE DIAM (M) = .2300  
STK EXIT VELOCITY (M/S)= 80.0938  
STK GAS EXIT TEMP (K) = 743.6000  
AMBIENT AIR TEMP (K) = 293.0000  
RECEPTOR HEIGHT (M) = .0000  
URBAN/RURAL OPTION = RURAL  
BUILDING HEIGHT (M) = .0000  
MIN HORIZ BLDG DIM (M) = .0000  
MAX HORIZ BLDG DIM (M) = .0000

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 = 7051.0000 (ACFM)

BUOY. FLUX = 6.294 M<sup>4</sup>/S<sup>3</sup>; MOM. FLUX = 33.429 M<sup>4</sup>/S<sup>2</sup>.

\*\*\* FULL METEOROLOGY \*\*\*

\*\*\*\*\*  
\*\*\* SCREEN AUTOMATED DISTANCES \*\*\*  
\*\*\*\*\*

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

| DIST<br>(M) | CONC<br>(UG/M <sup>3</sup> ) | U10M<br>STAB | USTK<br>(M/S) | MIX HT<br>(M/S) | PLUME<br>HT (M) | SIGMA<br>Y (M) | SIGMA<br>Z (M) | SIGMA<br>DWASH |    |
|-------------|------------------------------|--------------|---------------|-----------------|-----------------|----------------|----------------|----------------|----|
| 1.          | .0000                        | 1            | 1.0           | 1.0             | 320.0           | 88.80          | 2.73           | 2.70           | NO |
| 100.        | 12.71                        | 4            | 20.0          | 20.0            | 6400.0          | 7.92           | 8.25           | 4.74           | NO |
| 200.        | 11.16                        | 4            | 10.0          | 10.0            | 3200.0          | 12.17          | 15.75          | 8.84           | NO |
| 300.        | 9.128                        | 4            | 8.0           | 8.0             | 2560.0          | 14.30          | 22.81          | 12.47          | NO |
| 400.        | 7.287                        | 4            | 5.0           | 5.0             | 1600.0          | 20.69          | 29.85          | 16.03          | NO |
| 500.        | 6.394                        | 4            | 5.0           | 5.0             | 1600.0          | 20.69          | 36.47          | 18.93          | NO |
| 600.        | 5.559                        | 4            | 4.0           | 4.0             | 1280.0          | 24.94          | 43.15          | 22.07          | NO |
| 700.        | 4.932                        | 4            | 3.5           | 3.5             | 1120.0          | 27.99          | 49.68          | 25.02          | NO |
| 800.        | 4.434                        | 4            | 3.5           | 3.5             | 1120.0          | 27.99          | 56.01          | 27.67          | NO |
| 900.        | 4.046                        | 4            | 3.0           | 3.0             | 960.0           | 32.04          | 62.41          | 30.56          | NO |
| 1000.       | 3.693                        | 4            | 2.5           | 2.5             | 800.0           | 37.72          | 68.82          | 33.54          | NO |

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 1. M:  
119. 13.37 4 20.0 20.0 6400.0 7.92 9.76 5.55 NO

DWASH= MEANS NO CALC MADE (CONC = 0.0)

DWASH=NO MEANS NO BUILDING DOWNWASH USED  
DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED  
DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED  
DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3\*LB

\*\*\*\*\*  
\*\*\* SUMMARY OF SCREEN MODEL RESULTS \*\*\*  
\*\*\*\*\*

| CALCULATION<br>PROCEDURE | MAX CONC<br>(UG/M**3) | DIST TO<br>MAX (M) | TERRAIN<br>HT (M) |
|--------------------------|-----------------------|--------------------|-------------------|
| SIMPLE TERRAIN           | 13.37                 | 119.               | 0.                |

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

02/16/01  
10:11:24

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

Granite HMA Drum

SIMPLE TERRAIN INPUTS:

SOURCE TYPE = POINT  
EMISSION RATE (G/S) = .126000  
STACK HEIGHT (M) = 10.7000  
STK INSIDE DIAM (M) = 1.2000  
STK EXIT VELOCITY (M/S) = 14.6053  
STK GAS EXIT TEMP (K) = 360.8000  
AMBIENT AIR TEMP (K) = 293.0000  
RECEPTOR HEIGHT (M) = .0000  
URBAN/RURAL OPTION = RURAL  
BUILDING HEIGHT (M) = .0000  
MIN HORIZ BLDG DIM (M) = .0000  
MAX HORIZ BLDG DIM (M) = .0000

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 = 35000.000 (ACFM)

BUOY. FLUX = 9.689 M<sup>4</sup>/S<sup>3</sup>; MOM. FLUX = 62.362 M<sup>4</sup>/S<sup>2</sup>.

\*\*\* FULL METEOROLOGY \*\*\*

\*\*\*\*\*  
\*\*\* SCREEN AUTOMATED DISTANCES \*\*\*  
\*\*\*\*\*

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

| DIST<br>(M) | CONC<br>(UG/M <sup>3</sup> ) | U10M<br>STAB | USTK<br>(M/S) | MIX HT<br>(M) | PLUME<br>HT (M) | SIGMA<br>Y (M) | SIGMA<br>Z (M) | SIGMA<br>DWASH |    |
|-------------|------------------------------|--------------|---------------|---------------|-----------------|----------------|----------------|----------------|----|
| 1.          | .0000                        | 1            | 1.0           | 1.0           | 320.0           | 127.80         | 3.02           | 3.00           | NO |
| 100.        | .6425                        | 3            | 10.0          | 10.1          | 3200.0          | 22.27          | 12.64          | 7.73           | NO |
| 200.        | 3.513                        | 3            | 10.0          | 10.1          | 3200.0          | 22.27          | 23.85          | 14.41          | NO |
| 300.        | 3.570                        | 4            | 15.0          | 15.2          | 4800.0          | 17.18          | 22.72          | 12.29          | NO |
| 400.        | 3.125                        | 4            | 15.0          | 15.2          | 4800.0          | 17.18          | 29.54          | 15.43          | NO |
| 500.        | 2.938                        | 4            | 8.0           | 8.1           | 2560.0          | 25.26          | 36.38          | 18.76          | NO |
| 600.        | 2.703                        | 4            | 8.0           | 8.1           | 2560.0          | 25.26          | 42.92          | 21.62          | NO |
| 700.        | 2.533                        | 4            | 5.0           | 5.1           | 1600.0          | 33.99          | 49.64          | 24.94          | NO |
| 800.        | 2.407                        | 4            | 5.0           | 5.1           | 1600.0          | 33.99          | 55.97          | 27.60          | NO |
| 900.        | 2.257                        | 4            | 4.5           | 4.5           | 1440.0          | 36.58          | 62.32          | 30.38          | NO |
| 1000.       | 2.121                        | 4            | 4.0           | 4.0           | 1280.0          | 39.82          | 68.63          | 33.15          | NO |

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 1. M:  
242. 3.708 4 20.0 20.2 6400.0 14.66 18.70 10.20 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<br>PROCEDURE | MAX CONC<br>(UG/M**3) | DIST TO<br>MAX (M) | TERRAIN<br>HT (M) |
|--------------------------|-----------------------|--------------------|-------------------|
| SIMPLE TERRAIN           | 3.708                 | 242.               | 0.                |

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

## **Appendix C**

### ***AIRS Information***

### ***Granite Construction, Portable***

