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OKLAHOMA DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION

MEMORANDUM

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SUBJECT: General Permit to Construct/Operate
Minor Source Hot Mix Asphalt Facilities

INTRODUCTION

This General Permit has been developed to authorize construction and/or operation of facilities with emissions less than major source thresholds (e.g., 100 TPY of any criteria pollutant and/or 10 TPY of any single HAP or 25 TPY of any combination of HAPs) and whose primary air pollutant emissions are from the production of hot mix asphalt (HMA). All of these facilities are typically categorized under a SIC code of 2951- Asphalt Paving Mixtures and Blocks.

Applicants with the same or substantially similar operations, emissions, activities, and facilities which emit the same types of regulated air pollutants, which are subject to the same or similar standards, limitations, operating requirements, and monitoring requirements can be covered under this permit. Permits issued to these facilities must address all air emissions from all sources at these facilities. Thus, the permit is designed to include those sources typically expected to be present at these facilities, including dryers, heaters, screens, crushers, elevators, conveyors, bagging operations, storage silo loading systems, fuel storage tanks, internal combustion (IC) engines, other miscellaneous equipment, and fugitives from roads, stockpiles, and loading and unloading operations. Other facilities which perform similar activities, such as batch processing cement plants or manufacturers of "earthen" materials (glassware, gypsum board, pottery, etc.) will not be eligible for coverage under this General Permit since they typically include additional significant emission sources; e.g., kilns, furnaces, thermal dryer, and other combustion equipment.

According to the TEAM database, in 1999, there are 75 Hot Mix asphalt facilities operating in the state of Oklahoma. The 1998 emissions inventory database shows that there are 52 Hot Mix asphalt facilities in operation. The breakdown of the number of facilities by permit continuum category is shown in Table 1.

TABLE 1
OKLAHOMA HMA FACILITIES BY CONTINUUM CATEGORY*

SIC #	Industry Type	Total Suspended Particulate (TPY)				
		< 5	5 - 40	40 - 99	>=100	Total
2951	Hot Mix Asphalt Facilities	19	32	1	0	52

*From 1998 Inventory Data

DESCRIPTION

A significant portion of the industry background information in this section was excerpted or developed from the AP-42 (1/95) "Compilation of Air Pollution Emission Factors". (Reference 1). Thus, a specific reference is not provided for each excerpt.

Activities typically associated with the production of hot mix asphalt are screening and crushing (if necessary) of aggregates, loading bins with different sized aggregates using a front end loader, and conveying aggregates into the rotary dryer. Hot oil heaters are used to keep the asphalt cement in liquid state. The hot asphalt cement is injected into the mixed and dried aggregate and is mixed thoroughly in a hot kiln to make a hot asphalt mix. The product is then discharged from the storage silo into dump trucks to transport to the final destination. Most fuel-burning equipment is fueled with gasoline, diesel, or #2 and #5 fuel oil. Thus, other activities include fueling of front end loaders, dump trucks, and engines. Gasoline, diesel, fuel oil, and asphalt cement storage tanks at these facilities are typically above ground horizontal tanks with capacities less than 40,000 gallons.

Hot mix asphalt (HMA) is a mixture of graded, high quality aggregate (which can include reclaimed asphalt pavement [RAP]), and liquid asphalt cement. Aggregates are the mixtures of different sizes of crushed stones, gravel, sand and/or other nonmetallic minerals. The asphalt cement is heated and mixed in measured quantities to produce HMA. Aggregate and RAP (if used) constitute over 92 percent by weight of the total mixture. Aside from the amount and grade of asphalt cement used, mix characteristics are determined by the relative amounts and types of aggregate and RAP used. A certain percentage of fine aggregate (less than 74 micrometers [μm] in physical diameter) is required for the production of good quality HMA.

Hot mix asphalt paving materials can be manufactured by: (1) batch mix plants, (2) continuous mix (mix outside drum) plants, (3) parallel flow drum mix plants, and (4) counterflow drum mix plants. This order of listing generally reflects the chronological order of development and use within the HMA industry.

An HMA plant can be constructed as a permanent plant, a skid-mounted (easily relocated) plant, or a portable plant. All plants can have RAP processing capabilities.

Batch Mix Plants

In the batch mix HMA production process, raw aggregate normally is stockpiled near the plant. The bulk aggregate moisture content typically stabilizes between 3 to 5 percent by weight. Processing begins as the aggregate is hauled from the storage piles and is placed in the

appropriate hoppers of the cold feed unit. The material is metered from the hoppers onto a conveyer belt and is transported into a rotary dryer (typically gas- or oil-fired). Dryers are equipped with flights designed to shower the aggregate inside the drum to promote the drying efficiency. As the hot aggregate leaves the dryer, it drops into a bucket elevator and is transferred to a set of vibrating screens, where it is classified into as many as four different grades (sizes), and is dropped into individual "hot" bins according to size. To control aggregate size distribution in the final batch mix, the operator opens various hot bins over a weigh hopper until the desired mix and weight are obtained. Reclaimed asphalt pavement may also be added at this point. Concurrent with the aggregate being weighed, liquid asphalt cement is pumped from a heated storage tank to an asphalt bucket, where it is weighed to achieve the desired aggregate-to-asphalt cement ratio in the final mix.

The aggregate from the weigh hopper is dropped into the mixer (pug mill) and dry-mixed for 6 to 10 seconds. The liquid asphalt is then dropped into the pug mill where it is mixed for an additional period of time. The total mixing time is usually less than 60 seconds. Then the hot mix is conveyed to a hot storage silo or is dropped directly into a truck and hauled to the job site.

Parallel-Flow Drum Mix Plants

The parallel-flow drum mix process is a continuous mixing type process, using proportioning cold feed controls for the process materials. The major difference between this process and the batch process is that the dryer is used not only to dry the material but also to mix the heated and dried aggregates with the liquid asphalt cement. Aggregate, which has been proportioned by size gradations, is introduced to the drum at the burner end. As the drum rotates, the aggregates, as well as the combustion products, move toward the other end of the drum in parallel. Liquid asphalt cement flow is controlled by a variable flow pump electronically linked to the new (virgin) aggregate and RAP weigh scales. The asphalt cement is introduced in the mixing zone midway down the drum in a lower temperature zone, along with any RAP and particulate matter (PM) from collectors.

The mixture is discharged at the end of the drum and is conveyed to either a surge bin or HMA storage silos. The exhaust gases also exit the end of the drum and pass to the collection system. Parallel flow drum mixers have an advantage, in that mixing in the discharge end of the drum captures a substantial portion of the aggregate dust, therefore lowering the load on the downstream PM collection equipment. For this reason, most parallel flow drum mixers are followed only by primary collection equipment (usually a baghouse or venturi scrubber). However, because the mixing of aggregate and liquid asphalt cement occurs in the hot combustion product flow, organic emissions (gaseous and liquid aerosol) may be greater than in other processes.

Counterflow Drum Mix Plants

In a counterflow drum mix type plant, the material flow in the drum is opposite or counterflow to the direction of exhaust gases. In addition, the liquid asphalt cement mixing zone is located behind the burner flame zone so as to remove the materials from direct contact with hot exhaust gases.

Liquid asphalt cement flow is controlled by a variable flow pump which is electronically linked to the virgin aggregate and RAP weigh scales. It is injected into the mixing zone along with any RAP and particulate matter from primary and secondary collectors. Because the liquid asphalt cement, virgin aggregate and RAP are mixed in a zone removed from the exhaust gas stream, counterflow drum mix plants will likely have organic emissions (gaseous and liquid aerosol) that are lower than parallel-flow drum mix plants. A counterflow drum mix plant can normally process RAP at ratios up to 50 percent with little or no observed effect upon emissions. Today's counterflow drum mix plants are designed for improved thermal efficiencies.

Recycle Processes

In recent years, the use of RAP has been initiated in the HMA industry. Reclaimed asphalt pavement significantly reduces the amount of virgin rock and asphalt cement needed to produce HMA.

In the reclamation process, old asphalt pavement is removed from the road base. This material is then transported to the plant, and is crushed and screened to the appropriate size for further processing. The paving material is then heated and mixed with new aggregate (if applicable), and the proper amount of new asphalt cement is added to produce a high quality grade of HMA.

EMISSIONS

Criteria Pollutants

The most significant ducted source of emissions from HMA plants is the rotary drum dryer. Emissions from the drum consist of water (as steam evaporated from the aggregate), PM, products of combustion (NO_x and CO), and small amounts of organic compounds of various species (including VOC, CH₄, and HAPs). The hot oil heater is another source of emissions of criteria pollutants. In Oklahoma, most of these facilities power their (stationary) machinery with engines fueled with diesel or fuel oils. Small amounts of VOCs are emitted from storage tanks holding diesel and gasoline and even lesser amounts of fugitives from the associated piping.

Fugitive emissions are included in estimates of potential to emit, if the facility is included in a stationary source category that as of August 7, 1980, is regulated by NSPS pursuant to Section 111 of the Act. Since NSPS Subpart I (Asphalt Concrete Plants) was promulgated on June 11, 1973, fugitive emissions are counted in the potential to emit calculations. There are fugitive PM and VOC emissions from the aggregate material feed, transport and handling of the HMA from the drum mixer to the storage silo, from the load-out operations to the delivery trucks, and also from batch/continuous drop operations of front-end loaders to piles and/or to the feeder/conveyor, vehicle traffic on unpaved haul roads, and wind erosion from stock piles.

Emissions estimates from hot mix asphalt facilities can be made using data available from AP-42. Emission factors for PM, NO_x, CO, and VOC for both batch mix and drum mix asphalt plants are available in AP-42 including fugitives. These factors were based on actual emissions tests at several facilities. However, in some cases limited data was available to calculate specific factors. Thus, some factors are not rated as reliable as others. Incorporation of a reasonable safety factor may be appropriate in developing final estimates.

Toxic and Hazardous Air Pollutants

In Oklahoma, these facilities have not historically reported emissions other than criteria pollutants. Hazardous Air Pollutants (HAPs) and Toxic Air Contaminants (TACs) (e.g., metals, phosphorus, formaldehyde and crystalline silica) have the potential to be emitted during the process of manufacturing of asphalt or as a fugitive (road dust or wind erosion of stockpiles). In addition, organic HAPs/TACs may be emitted from storage tanks holding fossil fuels, typically diesel or gasoline, and associated equipment, or from the incomplete combustion of fossil fuel. AP-42 has listed the potential HAPs and their emission factors with a rating of "D". However, these minor facilities have negligible potential to emit HAPs or TACs, except aldehydes. The emissions of aldehydes are mainly from the rotary dryer and from the hot oil heater.

Emissions estimates for HAPs and TACs for most of the various emissions units can be made using data available from AP-42 and manufacturer's data. The AP-42 factors were based on actual emissions tests at several facilities. However, in some cases limited data was available to calculate specific factors. Thus, some factors are not rated as reliable as others. Incorporation of a reasonable safety factor may be appropriate in developing final estimates.

Emissions of toxics from other operations are expected to be negligible. In those few cases where a TAC would be emitted at significant levels, a site-specific determination would be required to develop appropriate conditions (limits and/or control requirements). This type of determination cannot be accommodated in a general permit. Therefore, facilities that emit greater than the de minimis levels for category "A", "B", or "C" toxic air contaminants as defined in OAC 252:100-41-43, have been excluded from coverage by an Authorization to Construct issued under this permit. However, such are eligible for coverage under an Authorization to Operate under the permit if they obtain an individual construction permit and any limitations in that permit are incorporated into their Authorization to Operate.

PERMIT STRUCTURE

The general permit for hot mix asphalt facilities is designed to allow minor facilities to obtain either a construction permit or operating permit for modifications to existing facilities or initial construction and operating permits for new facilities. It has been developed to include requirements for all sources with emissions above the de minimis level of 5 TPY but less than 100 TPY. Thus, facilities typically eligible for Permit by Rule (< 40 TPY) or a minor facility permit (< 100 TPY) may obtain coverage under this permit if they meet the eligibility requirements. Major sources (\geq 100 TPY of any criteria pollutant and/or facilities emitting above 10 TPY of any single HAP or 25 TPY of combination of HAPs) will need to obtain coverage under an individual permit.

The general permit is structured so that eligible facilities can obtain an Authorization to Construct and Authorization to Operate under the permit, or can obtain an individual construction permit and then an Authorization to Operate under the permit. This should allow applicants the greatest flexibility for obtaining coverage under the permit. For example, existing facilities are not eligible for coverage under an Authorization to Construct under this permit if

they request to add an emissions unit that emits greater than the de minimis levels of a TAC. This is because an applicant would have to demonstrate, through modeling, that emissions of a TAC greater than de minimis levels do not exceed the MAAC. In addition, emissions of a Category "A" TAC greater than de minimis would require that the applicant perform a Best Available Control Technology (BACT) evaluation. However, no site-specific determinations can be made in issuance of an Authorization under a general permit. This type of process is best handled in an individual construction permit since the statutory time limit to issue Authorizations is 90 days. However, once these site-specific determinations have been completed and drafted into a construction permit as specific conditions or emissions limitations, they can then easily be incorporated into the Authorization to Operate under a general permit.

In addition, certain other options usually available by regulation had to be disallowed so that no site-specific determinations were made in issuance of an Authorization to Construct under the general permit. For example, alternate emissions reduction authorizations are not allowed under an Authorization to Construct under this permit. Development of these site-specific limitations requires Air Quality Council approval. Likewise, several regulations allow exceptions from specific requirements by showing that they are unreasonable, "if approved by the Executive Director." These approvals also require a site-specific determination that cannot be reasonably made in issuance of an Authorization to Construct under this permit.

All conditions in the permit have been derived directly from applicable requirements given in OAC 252:100 - Air Pollution Control, as promulgated to implement the Oklahoma Clean Air Act. The permit is formatted so that the first section establishes emissions limitations, then specific conditions are given for each emissions unit allowed under the permit, i.e., rotary drum dryer, hot oil heater, nonmetallic mineral processing equipment, storage tanks, and engines, as well as facility-wide requirements. In order to streamline the permit, specific conditions to assure compliance with fugitive emissions requirements were incorporated in the facility-wide section rather than being addressed in a separate stand-alone section. Each section contains a list of operational conditions, emissions limitations, and monitoring and recordkeeping conditions developed to assure compliance with applicable requirements. Conditions to assure compliance with those state regulations that implement federal requirements; e.g., NESHAP, NSPS Subpart I (Hot Mix Asphalt Facilities), Subpart GG (Stationary Gas Turbines), and Subpart OOO (Nonmetallic Mineral Processing) are incorporated as a specific condition for the permit. Associated monitoring and recordkeeping generally follows the same process; e.g., NSPS, Subpart Kb, Section 60.116b (Organic Liquid Storage Vessels). These emission unit-specific conditions, as required by Oklahoma regulations, are generally established in the Authorization to Construct under this permit, or by an individual permit, then incorporated into a subsequently issued Authorization to Operate for the facility. Additionally, a section of standard conditions is established to contain those requirements applicable to all minor facilities.

EMISSIONS LIMITATIONS

Emissions limitations specified in the permit are established from applicable requirements given in the permit, or from a limitation that the source assumes to avoid an applicable requirement, or from limitations established in previously issued state or federal permits for the facility. Provided, however, that source assumed limitations and/or limitations from previously issued

permits are equivalent or more stringent than those established from applicable requirements given in the permit.

Because of the nature of the emissions units at the facility, specific numeric emissions limitations need not be developed for all emissions units covered under all Authorizations to Construct/Operate under the permit. In general, specific numeric emissions limitations are required for those sources that have the potential to violate an applicable requirement. For example, specific numeric emissions limitations must be developed for all emissions units at the facility if total actual emissions from the facility exceed 80% of the major source thresholds of criteria pollutants and HAP levels (80 TPY of a criteria pollutant or 8/20 TPY of a HAP/combination of HAPs). These limitations are established as a facility-wide cap.

Calculation of actual emissions is required as a compliance demonstration method where a specific numerical limitation is given in the permit. This is typically given as an annual calculation. However, other shorter-term calculations may be required for a particular requirement. A direct comparison of the calculated emissions can then be compared to the permitted level to determine compliance with the specific condition in the permit. In those cases where a numerical limitation is not specifically developed to demonstrate compliance, other methods (e.g., work practices, parametric monitoring, etc.) are required by the permit to assure compliance. These are specified as "Operational Conditions" in the permit.

The most flexibility can be obtained under an Authorization to Operate under this permit when the applicant requests that a facility-wide cap be established at a level to not exceed major source thresholds. Note that facilities covered by a general permit, unlike an individual permit, are not required to obtain an Authorization to Construct when adding a piece of equipment subject to NSPS or NESHAP, or when the emissions increase is greater than 5 TPY. Thus, an Authorization to Construct, and new Authorization to Operate is not needed for most changes at the facility, so long as facility emissions after the change do not exceed the cap. However, the permit must include effective permit limits that assure that such changes do not exceed the facility-wide cap. To assure continuing compliance with these limits, the permittee must estimate emissions periodically—especially after a change at the facility, and maintain a current equipment inventory to document that such changes do not cause emissions to exceed the cap.

Compliance with the Cap

The most straightforward method to assure compliance with the emissions cap is to first restrict eligibility to equipment that burns only certain fuels. Since the amount of emissions generated by any fuel-burning equipment is proportional to the heat and sulfur content of the fuel, the size of the burner/engine, the number of hours the equipment is operated, and whether it uses a control device (e.g., scrubber, catalytic converter, etc.), then limiting fuel type is the easiest method to limit both the types of pollutants and their emissions.

The dryer and hot-oil heater, on asphalt plants in Oklahoma are typically fired with "commercial grade" natural gas, liquid petroleum gas, or #2 through #6 fuel oil. No wood or coal-fired facilities are known. However, one facility does use landfill gas and some facilities use waste oil. Compliance with the NO_x, CO, VOC, SO₂ and PM cap for natural gas, liquid petroleum gas,

and #2 through #6 fuel oil-fired equipment should be able to be easily determined, and documented by the permittee, by recording only the number of hours the equipment is operated if the heat and sulfur content range of the fuel is known. The heat and sulfur content for "commercial grade" natural gas, liquid petroleum gas, and #2 through #6 fuel oil is well established. Associated emissions can be estimated using factors from AP-42, once a supplier's certification establishes the grade of fuel oil. Compliance with various applicable requirements for this equipment will be demonstrated in this evaluation using a "worst case" lower heating value and maximum sulfur content of the particular fuel. Use of other fuels will most likely require a site-specific determination of heat or sulfur content. Thus, the permit restricts eligibility to only that fuel-burning equipment fired with "commercial grade" natural gas, liquid petroleum gas, or #2 through #6 fuel oil.

Engines at these facilities are typically fired with gasoline or diesel. Thus, emissions can be estimated by recording only the hours the equipment is operated, based on the fuel type. However, compliance with the cap for engines using a control device (i.e., catalytic converter) is not a straightforward determination. Catalytic converters are fairly efficient (90-95% pollutant reduction). Thus, if they fail, they would most likely cause that engine to become a major source, if operated for any length of time after failure. The typical method used to assure that the catalytic converter is functional is to require periodic testing. In order to assure that the catalytic converter is operating properly, a NO_x and CO lbs/hr limit is developed to assure continuing compliance.

Storage tank emissions at these facilities are related to the number of turnovers. However, most tanks are used to store fuels, or liquids used to cool or lube the engines. Thus, the number of turnovers is limited. The criteria pollutant emissions eligibility restriction will limit production, which should limit fuel use, and thus tank size, so that VOC emissions from tanks will not have the potential to violate the standard.

Emissions from other equipment at the facility, including screens, crushers, elevators, conveyors, bagging operations, storage silo loading systems, other miscellaneous equipment, and fugitives from roads, stockpiles, and loading and unloading operations are dependent upon production. Thus, compliance with the cap is easily demonstrated by calculation of their associated emissions using factors from AP-42.

ELIGIBILITY

In order to provide the broadest coverage to applicants under this permit and to assure compliance with all applicable requirements eligibility must be restricted to those minor facilities whose emission units are addressed in this permit. The permit has been developed for a facility designed and operated for the primary purpose of manufacturing hot mix asphalt by heating and drying aggregates and mixing with asphalt cements.

Emission units identified as typically present at such a facility, and addressed in the permit, include the rotary drum dryer, hot oil heater, nonmetallic mineral processing equipment (including crushers, grinders, screening devices, and conveyors), diesel or gasoline fired internal combustion engines, fuel storage tanks, and fugitive emissions sources (that includes aggregate stockpiles, piping fugitives). In addition, those emission units identified as de minimis are also recognized as typically present at such a facility, and are addressed in the permit. Any other

emission units subject to an applicable requirement not included in this permit makes that facility ineligible for coverage under this permit.

In general, the following facilities are not eligible for coverage under this permit.

1. Facilities for which material facts were misrepresented or omitted from the application and the applicant knew or should have known of such misrepresentation or omission.
2. Facilities with emissions units that are subject to:
 - a. OAC 252:100-8 (Permits for Part 70 Sources).
 - b. OAC 252:100-15 (Motor Vehicle Pollution Control Devices).
 - c. OAC 252:100-17 (Incinerators).
 - d. OAC 252:100-21 (Wood-Burning Equipment).
 - e. OAC 252:100-23 (Cotton Gins).
 - f. OAC 252:100-24 (Grain, Feed, or Seed Operations).
 - g. OAC 252:100-35 (Control of Emissions of Carbon Monoxide).
 - h. 40 CFR Part 59 (National VOC Standards).
 - i. 40 CFR Part 82, Subparts A, B, & C (Stratospheric Ozone Protection).
 - j. 40 CFR Part 264 (Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities).

The following facilities, unless qualified as a de minimis activity under OAC 252:100, Appendix H, are not eligible to obtain an Authorization to Construct under this permit, but may be eligible for coverage under an Authorization to Operate if they obtain an individual construction permit and all relevant requirements and limitations in that permit are incorporated into the Authorization to Operate.

1. Facilities with a design process rate greater than 1,000 tons HMA/hour or utilizing a particulate control device on the mixer with an overall (control and capture) efficiency of less than 99.8%.
2. Facilities with fuel-burning equipment fired with fuels other than: natural gas, liquid petroleum gas (LPG), diesel with a sulfur content less than 0.8% by weight, or #2 through #6 fuel oil with a maximum of 0.8 wt% sulfur.
3. Facilities with heaters with a rated heat input of 50 MMBTUH or more.
4. Facilities that store VOCs with a vapor pressure greater than 1.5 psia in storage tanks built after December 28, 1974, with a capacity greater than 151 m³ (40,000 gallons), or with a capacity greater than 400 gallons that are not equipped with a submerged fill.
5. Facilities located in Tulsa County which store gasoline or other VOCs (with vapor pressure greater than 1.5 psia) in storage tanks with a capacity greater than 2,000 gallons.
6. Facilities that store organic liquids other than liquid fuels (i.e., residual oil, distillate oil, or gasoline) unless qualified as a de minimis activity under OAC 252:100, Appendix H.

7. Facilities that use combustion devices (such as flares, incinerators or thermal oxidizers) to control emissions of VOCs.
8. Facilities with equipment subject to the existing equipment standards for sulfur dioxides at OAC 252:100-31-7(a).
9. Facilities with emission units that are not exempted from Part 5 ("Toxic Air Contaminants") of OAC 252:100-41, as specified in OAC 252:100-41-43.
10. Facilities with emissions units subject to:
 - a. NSPS requirements under 40 CFR Part 60, other than those addressed by Subpart A, Subpart Kb, Subpart GG, Subpart OOO, and/or Subpart I, or
 - b. NESHAP requirements under 40 CFR Part 61 or 63.

unless such requirements are specifically incorporated into the Authorization to Construct/Operate issued under this permit as provided for under Part 4, Section V of this permit.

11. Facilities located in an area that is federally designated as non-attainment.
12. Facilities that request an Alternative Emissions Reduction Authorization under OAC 252:100-11.

The DEQ may not issue a permit authorization sought by an applicant that has not paid all monies owed to the DEQ or is not in substantial compliance with the Environmental Quality Code, rules of the Board and the terms of any existing DEQ permits and orders. The DEQ may impose specific conditions on the applicant to assure compliance and/or a separate schedule that the DEQ considers necessary to achieve required compliance.

Facilities that are not in compliance with all applicable State and Federal air requirements may become eligible for coverage under this permit through submission of a compliance plan meeting the requirements of Part 3 of this Permit.

In addition, the DEQ may refuse issuance of an authorization to an applicant even though the facility meets the above eligibility criteria. In such a case, DEQ will provide in writing to the facility an explanation providing the reason(s) for the decision. This is necessary to handle certain situations where a particular emissions unit is not expected to be present at such facilities, but gives the agency the discretion to make the final decision as to whether coverage is appropriate.

POLLUTION PREVENTION

Pollution prevention is integrated into this permit using a six-fold approach. These six approaches are:

1. Permit Flexibility
2. Pollution Prevention Permit Conditions
3. Inclusion of Pollution Prevention Information in the Application
4. Accelerated Permit Review
5. Extended Compliance Time
6. Alternative or Reduced Monitoring for Pollution Prevention

Permit flexibility is provided by three primary methods, i.e., incorporating both construction and operating requirements into one general permit, allowing certain pre-approved changes without requiring a permit modification, and by allowing the use of a facility-wide emissions cap. Specifically, a facility may request issuance of either an Authorization to Construct and then Authorization to Operate, or an individual construction permit, then an Authorization to Operate under the General Permit. Flexibility is also provided by allowing certain pre-approved changes, such as the addition of new emission units or other changes that result in an emissions increase so long as they are foreseeable at the time of permit application and are addressed in the facility-wide cap, as well as the use of those alternative operating scenarios that are foreseeable at the time of permit application. Finally, flexibility is provided by allowing the facility to establish a facility-wide emissions cap, rather than limits on each individual emissions source at the facility.

Specific pollution prevention permit conditions are also included in the permit. These conditions require the facility to maintain an annual inventory of emissions. This inventory is to be used to develop an emission history for the facility. For each subsequent permit modification, this inventory and history may be used to assess potential pollution prevention alternatives as part of the application process. In addition, specific conditions are included in the permit that require good operating and housekeeping procedures to be followed to prevent pollution (See Table 3). Alternative or reduced monitoring is also provided in this permit for facilities that implement pollution prevention measures which result in emissions reductions below regulatory thresholds.

Pollution prevention information is provided to the applicant as part of the application process for an Authorization under this General Permit. This information includes advice on how to develop a site-specific pollution prevention plan for the facility, and an example plan that can be used at the site. In addition, information on compliance assistance with pollution prevention planning from DEQ is also provided.

Accelerated permit review will be provided to applicants making facility changes which involve pollution prevention projects. This accelerated permit review will be offered, in an informal process, between staff of the Air Quality Division and the Customer Services Division. Upon request, the Customer Assistance office makes a determination that the focus of the change is P2. The Customer Assistance office then notifies the Air Quality Division and informally requests that the permit be expedited.

The DEQ may extend compliance time for applications that include P2 measures. This extension of the compliance schedule may be granted where the long term benefits that may accrue from a facility's implementing P2 outweigh the short-term environmental detriment of not implementing some other type of other pollution control.

**TABLE 3
POLLUTION PREVENTION MEASURES**

Activity/Source	Control Measures/Practices (per ascending order of control efficiency)
PARTICULATES	
Fixed and portable hot mix asphalt equipment; including, screening operations, bucket elevators, belt conveyors, bagging operations, storage bins/areas, enclosed truck or railcar loading stations.	Watering Chemical Foam Partial enclosure Full enclosure Building under negative pressure*
Haul Roads	Watering Oiling Chemical foam Paved and w/o maintenance Paved and swept Paved and watered Paved and wet swept Paved and foamed Paved and vacuumed*
NOx and CO	
Rotary drum dryer	Burner Tune-up Use cleaner fuels
VOLATILE ORGANIC COMPOUNDS	
Gasoline Storage Tanks	Submerged fill, bottom fill piping or pressurized storage.

*with baghouse or other collection device

APPLICABLE RULES AND REGULATIONS

Applicable rules and regulations are given below for each emission unit and also for fugitive emissions authorized in this permit, unless qualified as a de minimis activity under OAC 252:100, Appendix H, including facility-wide requirements, rotary drum dryer, hot oil heaters, nonmetallic mineral processing equipment, storage tanks, and engines. For brevity, only those applicable requirements that are specific to the particular emissions unit, and not addressed in the Facility-wide requirements, are covered in each section.

FACILITY-WIDE REQUIREMENTS

Oklahoma Air Pollution Control Rules

OAC 252:100-7 (Permits for Minor Facilities)

[Applicable]

Part 1 includes definitions and subjects all permitting to the tiered Uniformed Permitting Act. Permits are required to meet public review requirements consistent with the Tier System given in the Uniform Permitting Act.

Part 2 establishes fees for construction and operating permits, Authorizations issued under General Permits, and applicability determinations.

Part 3 establishes construction permit categories and requirements, including that a construction permit require the permittee to comply with all applicable air pollution rules, federal NSPS and NESHAP established under Sections 111 and 112 of the Federal Clean Air Act and to not exceed ambient air quality standards. A construction permit and subsequent operating permit is required for new facilities. A permit modification is also required when making certain modifications to a facility.

Part 4 establishes operating permit requirements and requires a compliance demonstration of the construction permit, emission limits, and air pollution control requirements prior to issuing an operating permit.

However, no specific emission limitation, work practice condition, or other emission standard, or criteria is specified in this Subchapter.

The permit assures compliance with this regulation using the following approach:

The permit requires an applicant to obtain an Authorization to Construct and Authorization to Operate under this General Permit before starting construction and operation of an eligible facility. Tier II review will be provided for this permit and Tier I review will be provided for any Authorizations issued hereunder. In lieu of an Authorization to Construct, an applicant may obtain an individual construction permit, then apply for an Authorization to Operate under this permit. Permit conditions have been included in the permit which provide that conditions from an individual construction permit can be incorporated into the Authorization to Operate as long as the conditions are equivalent or more stringent than the corresponding conditions in the General Permit. Operational conditions have been included in the permit to require a source to construct and operate all emission units and associated control equipment within a practical range of operating conditions so as to achieve, on a continuous basis, a level of emissions that complies with applicable requirements. Operating and compliance requirements, as well as monitoring and recordkeeping requirements are specifically addressed in the permit for control devices. An initial compliance inspection of the facility will be conducted by the AQD prior to preparing the authorization to operate. Conditions have also been included in the permit to

require a compliance demonstration prior to issuance of an Authorization to Operate and continuing compliance demonstrations to assure that the source continues to meet applicable requirements. Compliance with the facility-wide emissions limitations shall be determined by calculating the actual emissions from all emission units located at the facility. Such emissions estimates shall be calculated as specified in the specific conditions for each particular emissions unit or for equipment not specified using the latest approved version of AP-42, Compilation of Air Pollution Emission Factors. Emissions limitations are required for those sources that have the potential to violate an applicable requirement. These limitations are established as part of the facility-wide cap, not to equal or exceed 100 TPY of any criteria pollutant, nor to equal or exceed 10 TPY of any single HAP, or 25 TPY of all HAPs. Specific conditions are also included in the permit to address any ambient air quality standards or NSPS and NESHAP requirement. Currently, under the SIP, minor facilities are not required to demonstrate compliance with the NAAQS. However, a permit condition is included in the permit that requires the facility to not exceed the ambient air quality standards. In addition, eligibility for an Authorization to Construct is restricted to those facilities which do not have emissions of TACs exceeding Subchapter 41 de minimis thresholds. Thus, this condition shall ensure compliance with the MAAC standards. Currently, no NESHAPs are applicable to these facilities. However, the permit allows facilities that become subject to a NESHAP to incorporate those requirements into an authorization. A new or modified facility, authorized under an individual construction permit or Authorization to Construct under this permit, must apply for an Authorization to Operate within 60 days of commencing operation. An existing facility, adding equipment subject to an NSPS or NESHAP not otherwise addressed in the permit (i.e., NSPS Kb, GG, OOO, and I), or making modifications that require a case-by-case determination, requires that an individual construction permit be issued for the modification. All other facility modifications may be constructed without an Authorization to Construct, or individual construction permit, provided that the permittee notifies the DEQ in writing of the intent to construct and operate within 7 days of the start of operation. A new Authorization to Operate is not required, unless the modification is authorized under an individual construction permit.

OAC 252:100-9 (Excess Emission Reporting Requirements)

[Applicable]

Subchapter 9 requires an owner or operator of a regulated facility to report all excess emissions from an air pollution source caused by malfunction, shutdown, start-up, or regularly scheduled maintenance that is in violation of the applicable air pollution control rule. However, no specific emission limitation, standard, or criteria is specified in this Subchapter.

The permit assures compliance with this regulation using the following approach:

Conditions are included in the standard conditions section of this permit which require prompt reporting to AQD should excess emissions occur.

OAC 252:100-13 (Prohibition of Open Burning)

[Applicable]

This Subchapter prohibits open burning of refuse and other combustible material except in compliance with OAC 252:100-13-7 and 9. No specific emission limitation or criteria is specified in this Subchapter. However, many work practice conditions and standards are specified.

The permit assures compliance with this regulation using the following approach:

Subchapter 13 applies to all facilities. Therefore, the permit includes a condition that requires compliance with this subchapter. However, open burning is not expected to be performed at hot

mix asphalt facilities. Therefore, no initial compliance demonstration or continuing monitoring, recordkeeping, or reporting requirements associated with this subchapter are included in the permit.

OAC 252:100-25 (Smoke, Visible Emissions and Particulates) [Applicable]

This Subchapter states no person shall allow or permit the discharge of any fumes, aerosol, mist, gas, smoke, vapor, particulate matter, or any combination thereof, exhibiting greater than 20 percent equivalent opacity except for short-term occurrences. At no time may the opacity exceed 20 percent for one six-minute period in any consecutive 60 minutes nor more than three such periods in any consecutive 24 hours. In no case shall the average of any six-minute period exceed 60% opacity.

The permit assures compliance with this regulation using the following approach:

Subchapter 25 compliance demonstrations require an opacity reading by a Certified Visible Emission Evaluator using Method 9 (40 CFR Part 60, Appendix A). The DEQ will, however, accept use of an alternative test method under limited circumstances. The permittee can demonstrate the presence or absence of visible emissions using Method 22 (40 CFR Part 60, Appendix A). The term "Fugitive emissions" as used in Method 22 shall be deemed to include all units subject to Subchapter 25 requirements. If visible emissions are present, Method 9 must be used to determine their level. Method 22 does not require a certified visible emissions observer, thus giving the facility some flexibility in meeting this requirement. Any source subject to an NSPS opacity limit is exempt from OAC 252:100-25-3 requirements.

OAC 252:100-29 (Control of Fugitive Dust) [Applicable]

This subchapter prohibits the handling, transportation, or storage of any substance or material in a way that may enable fugitive dust to become wind-borne, and result in air pollution, without taking reasonable precautions or measures to minimize atmospheric pollution. Subchapter 29 further prohibits discharge of visible fugitive dust beyond the property line on which the emissions originated in such a manner as to damage or interfere with the use of adjacent properties, or cause air quality standards to be exceeded, or to interfere with the maintenance of air quality standards. A list of reasonable precautions is specified in this subchapter.

The permit assures compliance with this regulation using the following approach:

The permit requires that the facility respond to any fugitive dust complaint within 48 hours. The facility shall take any necessary action to resolve the complaint, or they may refer the complaint to DEQ for response and investigation.

OAC 252:100-31 (Control of Emission of Sulfur Compounds) [Applicable]

Subchapter 31 limits the emissions of sulfur compounds from existing and new equipment. The existing equipment (constructed before July 1, 1972) limit for SO₂ is 1,300 µg/m³ (0.50 ppm) in a five (5) minute period of any hour, a one (1) hour average exposure of 1,200 µg/m³ (0.46 ppm), a three (3) hour average exposure of 650 µg/m³ (0.25 ppm), or a 24-hour average exposure of 130 µg/m³ (0.05 ppm) of sulfur dioxide contributed from any one source. The new gas fuel-burning equipment limit is 0.2 lbs/MMBTU heat input, maximum three-hour average (which is equivalent to approximately 0.2 weight percent sulfur in the fuel gas which is equivalent to 2000 ppm sulfur). Hydrogen sulfide requirements state that no person shall cause, let, suffer, or allow any emission of hydrogen sulfide from any existing (constructed prior to July 1, 1972) or new equipment which results in an ambient air concentration of hydrogen sulfide at any given point of 0.2 ppm or greater for a 24--hour period. These limitations shall not apply to ambient air

concentrations occurring on the property from which such emission occurs, providing such property, from the emission point to the point of any such concentration, is controlled by the person responsible for such emission.

The permit assures compliance with this regulation using the following approach:

Eligibility for an Authorization to Construct under the permit is restricted to those facilities using "commercial grade" natural gas, liquid petroleum gas, diesel, or #2 through #6 fuel oil with a maximum of 0.8 wt% sulfur to assure compliance with the new equipment requirements of this subchapter. A complete justification that demonstrates compliance with this rule is included as Appendix B of this memorandum. Eligibility for an Authorization to Construct under the permit is restricted to facilities with equipment that is not subject to the existing equipment standards of this subchapter. An attempt was made to use a screening model to estimate emissions of sulfur dioxide from a "worst-case" facility to document compliance with the ambient standards for SO₂. However, this was not successful at the production rates expected from these facilities. Thus, adding "existing equipment" to a facility will most likely require more sophisticated modeling, i.e., ISCS. Such a case-by-case determination must be made in issuance of an individual permit. Thus, eligibility for an Authorization to Construct under this permit is restricted to "new equipment."

OAC 252:100-43 (Specific Sampling and Testing Methods)

[Part 1 Applicable]

Part 1 specifies that all required testing must be conducted using methods approved by the Executive Director under the direction of qualified personnel.

Part 3 specifies specific methods to be used to determine leakage from gasoline trucks and associated vapor control systems.

The permit assures compliance with this regulation using the following approach:

A standard condition is included which states that all required tests shall be made and the results calculated in accordance with test procedures described or referenced in the permit and approved by Air Quality. Part 3 is not applicable since these facilities do not include gasoline tank truck loading facilities.

OAC 252:100-45 (Monitoring of Emissions)

[Applicable]

Subchapter 45 outlines the basic requirements for monitoring of emissions and their recording and reporting. The use of any credible evidence in establishing a violation is also addressed. However, no specific emission limitation, work practice condition, standard, or criteria is specified in this Subchapter.

The permit assures compliance with this regulation using the following approach:

Permit conditions include minimum monitoring requirements for control devices associated with emission units addressed in this permit. In addition, testing must be performed as specified in 40 CFR Parts 51, 60, 61, 63, and 75, as applicable, unless otherwise specified in an Authorization under this permit.

Federal Regulations

Certain state regulations require compliance with federally promulgated regulations. OAC 252:100-7-15(d) requires that construction permits include all applicable requirements, including NSPS and NESHAP. In addition, OAC 252:100-45 provides that any credible evidence may be

used for the purpose of establishing whether a person has violated or is in violation of the State Implementation Plan (SIP).

Credible Evidence, 40 CFR Part 51

[Applicable]

This regulation clarifies that "any credible evidence," including data gathered from means other than the use of a specified "reference test method," can be used to prove an alleged emission limitation violation.

The permit assures compliance with this regulation using the following approach:

Conditions are included in the Standard Conditions section of the permit to address the credible evidence requirements.

New Source Performance Standards (NSPS), 40 CFR Part 60

[Applicable]

NSPS means a standard of emissions of air pollutants which reflects the degree of emission limitation achievable through the application of the best system of emission reduction which, taking into account the cost of achieving such reduction and any non-air quality health and environmental impact and energy requirements, the Administrator of EPA determines has been adequately demonstrated. NSPS apply to the owner or operator of any stationary source which contains an affected facility, the construction or modification of which is commenced after the date of publication of the standard applicable to that facility. Certain notification, recordkeeping, emissions limitations, performance tests, and monitoring requirements are specified in these regulations.

The permit assures compliance with this regulation using the following approach:

Conditions are included to address the NSPS general notification, recordkeeping, emissions limitations, performance test, and monitoring requirements. Conditions specific to a particular NSPS are included for each emissions unit that may be determined to be an affected unit. Unless incorporated by reference into the Authorization, eligibility for this permit is restricted to facilities whose emissions units are not subject to any NSPS subpart other than Subpart I (Asphalt Concrete Plants), Subpart GG (Stationary Gas Turbines), and Subpart OOO (Nonmetallic Mineral Processing).

The following table lists the Oklahoma Air Quality Rules that are not applicable to hot mix asphalt plants on a facility-wide basis. Rules applicable to a specific emission unit are listed separately.

**Facility-wide Summary
Non-applicable Oklahoma Air Quality Rules**

OAC 252:100-8	Permits for Major Sources	Ineligible
OAC 252:100-11	Alternative Emissions Reduction	Ineligible*
OAC 252:100-15	Mobile Sources	not a covered source
OAC 252:100-17	Incinerators	not a covered source
OAC 252:100-21	PM from Wood waste Burning	not a covered source
OAC 252:100-23	Cotton Gins	not a covered source
OAC 252:100-24	Grain Elevators	not a covered source
OAC 252:100-31-12	Existing Equipment Standard for Sulfur Oxides	Ineligible*
OAC 252:100-35	Carbon Monoxide	not a covered source
OAC 252:100-37, Part 5	Control of Organic Solvents	not a covered source
OAC 252:100-37, Part 7	Control of Specific Processes	not a covered source
OAC 252:100-41	Hazardous and Toxic Air Contaminants	Ineligible*
OAC 252:100-43, Part 3	Specific Testing Methods	not a covered source

*Ineligible for Authorization to Construct. May be eligible if addressed in an individual permit and carried over into Authorization to Operate.

Non-applicable Federal Regulations

40 CFR Part 52	Prevention of Significant Deterioration	Not applicable at this time
40 CFR Part 59	National VOC Standards	not a covered source
40 CFR Part 64	Compliance Assurance Monitoring	ineligible
40 CFR Part 68	Chemical Accident Prevention	ineligible
40 CFR Part 82	Stratospheric Ozone Protection	not a covered source

DRYER REQUIREMENTS

Oklahoma Air Pollution Control Rules

OAC 252:100-19 (Control of Emissions of PM)

[Appendix G Applicable]

Subchapter 19 controls the emission of particulate matter from both fuel burning equipment and industrial processes. Allowable particulate matter emissions rates are established for both new and existing directly fired fuel-burning units and industrial processes. Emissions limits are specified in OAC 252:100, Appendix C for any new or existing indirectly fired fuel-burning unit, Appendix D for indirectly-fired wood fuel-burning units, and Appendix G for any new or existing directly-fired fuel-burning unit or from any emission point in an industrial process.

The permit assures compliance with this regulation using the following approach:

Eligibility for an Authorization to Construct under the permit is restricted to those facilities with a design process rate of 1,000 tons HMA/hour or less and a overall efficiency of at least 99.8% using "commercial grade" natural gas, liquid petroleum gas, diesel, or #2 through #6 fuel oil with a maximum of 0.8 wt% S to assure compliance with the requirements of this subchapter. A complete justification that demonstrates compliance with this rule is included as Appendix A and B of this memorandum. The compliance demonstration for using natural gas or liquid petroleum gas only requires certification in the application that equipment will be fueled by natural gas or liquid petroleum gas. The compliance demonstration for using diesel or fuel oil requires a fuel composition analysis be included in the application, and a fuel composition analysis to be performed each time the supplier changes thereafter. A permit condition is included which requires the permittee to monitor and keep records of the equipment ID, daily average production rate, cumulative annual throughput, type of control device used if any, efficiency of the control device, and the daily hours of operation.

OAC 252:100-33 (Control of Emission of Nitrogen Oxides)

[Applicable]

Subchapter 33 prohibits discharge into the atmosphere of NO_x in excess of 0.2 lb/MMBTU, 3-hour average of heat input from gas-fired fuel-burning equipment and 0.3 lb/MMBTU, 3-hour average of heat input from liquid-fired fuel-burning equipment, for any new equipment as defined in Section 1.1 of Subchapter 33, and with a rated heat input of 50 MMBTUH or more.

The permit assures compliance with this regulation using the following approach:

The permittee is required to keep a record of the manufacturer's specifications on the burner documenting initial compliance with this requirement for each type of fuel burned. This record shall be updated any time the burner is replaced or modified. To assure continuing compliance with this requirement, the permittee is required to perform an biennial combustion optimization (tune-up) using methods specified in Appendix B of the permit, unless the dryer is equipped with a continuous automated combustion management and control technology system. The purpose of the tune-up is to optimize combustion while minimizing NO_x emissions. Consistent with the Subchapter 37 requirement to minimize VOC emissions, the permittee must tune the burner to minimize VOC emissions while maintaining the NO_x standard. In addition, the permittee is required to maintain records of all tune-ups, maintenance, and adjustments made to the dryer burner, including all documents and calculations used to determine reduced NO_x emission settings.

OAC 252:100-37 (Control of Emissions of Volatile Organic Compounds) [Applicable]
Subchapter 37 limits the emission of organic materials from stationary sources. Emission limitations, design criteria, and work practice standards are specified in the regulation for various sources, including storage tanks, effluent water separators, pumps and compressors, coating operations, waste gas disposal, and fuel-burning and refuse-burning equipment.

Part 7 requires fuel-burning equipment to be operated and maintained so as to minimize emissions. Temperature and available air must be sufficient to provide essentially complete combustion.

The permit assures compliance with this regulation using the following approach:

The permittee is required to perform a biennial tune-up using methods specified in Appendix B of the permit, unless the dryer is equipped with a continuous automated combustion management and control technology system. The purpose of the tune-up is to optimize combustion while minimizing NOx emissions. Consistent with the Subchapter 37 requirement to minimize VOC emissions, the permittee must tune the burner to minimize VOC emissions while maintaining the NOx standard. In addition, the permittee is required to maintain records of all tune-ups, maintenance, and adjustments made to the dryer burner, including all documents and calculations used to determine reduced emissions settings.

Federal Regulations

New Source Performance Standards (NSPS), 40 CFR Part 60 [Applicable]
Subpart I (Asphalt Concrete Plants) affects hotmix asphalt plants which commence construction or modification after June 11, 1973. The following facilities in a hotmix asphalt plant are affected: dryers; systems for screening, handling, storing, and weighing hot aggregate; systems for loading, transferring, and storing mineral filler; systems for mixing hotmix asphalt; and the loading, transfer, and storage systems associated with emissions control systems. Subpart I prohibits discharge into the atmosphere of gases which contain 0.04 gr/dscf of particulate matter and gases which exhibit 20% opacity or greater. NSPS specifies performance testing on affected facilities.

The permit assures compliance with this regulation using the following approach:

Specific conditions are included in the permit that adopt these requirements by reference. Performance testing is required using NSPS reference Method 9 and Method 5 within 60 days of achieving the maximum production rate, but no later than 180 days after initial start-up.

HEATER REQUIREMENTS

Oklahoma Air Pollution Control Rules

OAC 252:100-19 (Control of Emissions of PM) [Appendix C Applicable]

Subchapter 19-4 regulates the amount of particulates released into the air by the use of fuel-burning equipment. Allowable particulate matter emissions rates are established for both new and existing directly fired fuel-burning units and industrial processes. Emissions limits are specified in OAC 252:100, Appendix C for any new or existing indirectly fired fuel-burning unit, Appendix D for indirectly-fired wood fuel-burning units, and Appendix G for any new or existing directly-fired fuel-burning unit or from any emission point in an industrial process.

The permit assures compliance with this regulation using the following approach:

Eligibility for an Authorization to Construct under the permit is restricted to those facilities using "commercial grade" natural gas, liquid petroleum gas, diesel, or #2 through #6 fuel oil with a maximum of 0.8 wt% S to assure compliance with the requirements of this subchapter. A complete justification that demonstrates compliance with this rule is included as Appendix B of this memorandum. The compliance demonstration for using natural gas or liquid petroleum gas only requires certification in the application that equipment will be fueled by natural gas. The compliance demonstration for using diesel or fuel oil requires a fuel composition analysis be included in the application, and a fuel composition analysis be performed each time the supplier changes thereafter.

OAC 252:100-33 (Control of Emission of Nitrogen Oxides) [Applicable]

Subchapter 33 prohibits discharge into the atmosphere of NO_x in excess of 0.2 lb/MMBTU, 3-hour average of heat input from gas-fired fuel-burning equipment and 0.3 lb/MMBTU, 3-hour average of heat input from liquid-fired fuel-burning equipment, for any new equipment as defined in Section 1.1 of Subchapter 33, and with a rated heat input of 50 MMBTUH or more.

The permit assures compliance with this regulation using the following approach:

The permittee is required to keep a record of the manufacturer's specifications on the heater burner documenting initial compliance for each type of fuel burned. This record is to be updated any time the burner is replaced or modified. To assure continuing compliance, the permittee is required to perform an annual combustion optimization (tune-up) using methods specified in Appendix B of the permit, unless the heater is equipped with a continuous automated combustion management and control technology system. The purpose of the tune-up is to optimize combustion while minimizing NO_x emissions. Consistent with the Subchapter 37 requirement to minimize VOC emissions, the permittee must tune the burner to minimize VOC emissions while maintaining the NO_x standard. In addition, the permittee is required to maintain records of all tune-ups, maintenance, and adjustments made to the heater burner, including all documents and calculations used to determine reduced NO emission settings.

OAC 252:100-37 (Control of Emission of Volatile Organic Compounds) [Applicable]

Subchapter 37 limits the emission of organic materials from stationary sources. Emission limitations, design criteria, and work practice standards are specified in the regulation for various sources, including storage tanks, effluent water separators, pumps and compressors, coating operations, waste gas disposal, and fuel-burning and refuse-burning equipment.

Part 7 requires fuel-burning equipment to be operated and maintained so as to minimize emissions. Temperature and available air must be sufficient to provide essentially complete combustion.

The permit assures compliance with this regulation using the following approach:

The permittee is required to perform a biennial combustion optimization (tune-up) using methods specified in Appendix B of the permit, unless the heater is equipped with a continuous automated combustion management and control technology system. The purpose of the tune-up is to optimize combustion while minimizing NOx emissions. Consistent with the Subchapter 37 requirement to minimize VOC emissions, the permittee must tune the burner to minimize VOC emissions while maintaining the NOx standard. In addition, the permittee is required to maintain records of all tune-ups, maintenance, and adjustments made to the heater burner, including all documents and calculations used to determine reduced emissions settings.

Federal Regulations

None are applicable.

NON METALLIC MINERAL PROCESSING EQUIPMENT REQUIREMENTS

Oklahoma Air Pollution Control Rules**OAC 252:100-19 (Control of Emissions of PM)****[Applicable]**

Subchapter 19 controls the emission of particulate matter from both fuel burning equipment and industrial processes. Allowable particulate matter emissions rates are established for both new and existing fuel-burning units and industrial processes. Emissions limits are specified in OAC 252:100, Appendix C for any new or existing fuel-burning unit, Appendix D for indirectly-fired wood fuel-burning units, and Appendix G for any new or existing directly-fired fuel-burning unit or from any emission point in an industrial process.

The permit assures compliance with this regulation using the following approach:

A permit condition is included which requires the permittee to monitor and keep records of the equipment ID, hourly process weight rate, annual throughput, type of control device used if any, efficiency of the control device, and the hours of operations. In addition, hourly limitations are established in the authorization for those emission points that have the potential to exceed allowable rates.

Federal Regulations**New Source Performance Standards (NSPS), 40 CFR Part 60****[Applicable]**

Subpart OOO (Nonmetallic Mineral Processing) applies to nonmetallic mineral processing operations with rated capacities of greater than 25 TPH for fixed/stationary facilities and 150 TPH for portable facilities. Underground mines and stand-alone screening operations at plants without crushers or grinding mills are not subject to this requirement. The following facilities at a nonmetallic minerals processing plant which commenced construction or modification after August 31, 1983, are affected by Subpart OOO: each crusher, grinding mill, bucket elevator, screening operation, belt conveyor, bagging operation, storage bin, and enclosed truck or railcar loading operation. Excluded from the list of affected facilities are truck dumping and transfer points from belt conveyors to stockpiles.

The permit assures compliance with this regulation using the following approach:

Specific conditions are included in the permit to adopt these requirements by reference. Generally, when these affected sources begin to process unsaturated material, they will become subject to the 10% opacity limit for any crusher and 15% opacity limit for any other affected facility, and be required to perform Method 9 testing within 60 days of achieving the maximum production rate, but no later than 180 days after initial start-up. However, OOO affected facilities following I affected facilities are exempt from OOO.

STORAGE TANK REQUIREMENTS

Oklahoma Air Pollution Control Rules

OAC 252:100-37 (Control of Emission of VOCs) [Applicable]

This Subchapter affects storage tanks (except pressure tanks) built after December 28, 1974 with a capacity of 400 gallons or more storing a VOC with a vapor pressure of 1.5 psia or greater under actual conditions. They must be equipped with a submerged fill pipe or a vapor-recovery system.

The permit assures compliance with this regulation using the following approach:

Tanks constructed after December 28, 1974, storing a VOC with a vapor pressure greater than 1.5 psia, with a capacity greater than 400 gallons must be equipped with a submerged fill pipe or vapor recovery system. To demonstrate compliance with this rule, the permit requires maintenance of records showing the types of volatile petroleum liquids stored, and the true vapor pressure of the liquid as stored, the dimension and capacity of the tank. No conditions are included in the permit for storage tanks with a capacity greater than 40,000 gallons since they are ineligible for coverage under this permit.

OAC 252:100-39 (Emission of VOCs in Non-Attainment Areas) [Applicable]

Control requirements are provided for certain existing and new facilities located in Tulsa and Oklahoma counties. These requirements address petroleum liquid storage in external floating roof tanks greater than 40,000 gallons and storage of volatile organic compounds in storage tanks greater than 400 gallons. A vapor control system is required for tanks in Tulsa County containing gasoline or other volatile organic compounds with capacity greater than 2,000 gallons and less than 40,000 gallons.

The permit assures compliance with this regulation using the following approach:

Eligibility is restricted to those gasoline or other VOCs (with vapor pressure greater than 1.5 psia) tanks constructed in Tulsa County with a capacity less than 2,000 gallons. Thus, the only requirement that applies is the installation and operation of a permanent submerged fill pipe for any tank with capacity greater than 400 gallons.

Federal Regulations

New Source Performance Standards (NSPS), 40 CFR Part 60 [Applicable]

Subpart Kb. This subpart applies to certain storage vessels for volatile organic liquids greater than 40 cubic meters (10,568 gallons) that were constructed or modified after July 23, 1984. Those vessels with a capacity less than 75 cubic meters (19,815 gallons) are only required to maintain records of dimension and capacity. Those vessels with a capacity between 75 and 151 cubic meters (39,894 gallons) and vapor pressure between 27.6 (4 psia) and 76.6 kPa (11.1 psia), and those vessels with a capacity greater than 151 cubic meters with a vapor pressure between 5.2 (0.75 psia) and 76.6 kPa must be equipped with a fixed roof in combination with an internal floating roof, an external floating roof, a closed vent system and control device, or their equivalent. Certain records are required to be kept for these facilities.

The permit assures compliance with this regulation using the following approach:

Specific operational conditions are included in the permit to adopt these requirements. No conditions are included in the permit for storage tanks with a capacity greater than 40,000 gallons since they are ineligible for coverage under this permit.

INTERNAL COMBUSTION ENGINE AND TURBINE REQUIREMENTS

Oklahoma Air Pollution Control Rules**OAC 252:100-19 (Control of Emissions of PM)****[Applicable]**

Subchapter 19 requires that the maximum allowable emissions of particulate matter from engines not exceed the following amount:

Y = 0.6	Pounds Per MMBTU	For Heat Input < 10 MMBTU/hr
Log(Y) =	-0.259Log(X) + 0.037	For 10 < Heat Input < 10,000 MMBTU/hr
Y = 0.1	Pounds Per MMBTU	For Heat Input > 10,000 MMBTU/hr
Where Y = Pounds per MMBTU		
X = MMBTU/hr		

The permit assures compliance with this regulation using the following approach:

Eligibility for an Authorization to Construct under the permit is restricted to those facilities using "commercial grade" natural gas, liquid petroleum gas, diesel, or #2 through #6 fuel oil with a maximum of 0.8 wt% S to assure compliance with the requirements of this subchapter. AP-42, Table 3.2-2 (10/96) lists natural gas PM₁₀ emissions to be about 0.046 lbs/MMBTU for 2-cycle engines and 0.007 lbs/MMBTU for 4-cycle engines which is in compliance for all heat input ranges. AP-42, Table 3.3-1 (10/96) lists gasoline fuel PM₁₀ emissions to be about 0.10 lbs/MMBTU which is also in compliance for all heat input ranges. AP-42, Table 3.3-1 (10/96) lists fuel-oil (diesel) PM₁₀ emissions to be about 0.31 lbs/MMBTU (2.2 E-3 lb/hp-hr), and NO_x emissions to be about 4.1 lbs/MMBTU (0.031 lb/hp-hr). The PM₁₀ emissions rate corresponds to an engine of about 50,237 HP. However, the largest diesel engine allowed at a minor facility could not exceed about 800 hp without exceeding the major source threshold for NO_x. Thus, any diesel or fuel-oil fired engine eligible for this permit is in compliance for all heat ranges. The compliance demonstration for using natural gas or liquid petroleum gas only requires certification in the application that equipment will be fueled by natural gas or liquid petroleum gas. The compliance demonstration for using diesel or fuel-oil requires a fuel composition analysis be included in the application, and a fuel composition analysis be performed each time the supplier changes thereafter.

OAC 252:100-37 (Control of Emission of Volatile Organic Compounds)**[Applicable]**

This subpart, as applied to engines, provides that all fuel-burning equipment shall be operated as to minimize emissions of hydrocarbons or other organic materials. The equipment should be operated such that it is not overloaded, that it is properly cleaned and maintained, and that temperature and available air are sufficient to provide essentially complete combustion.

The permit assures compliance with this regulation using the following approach:

Specific conditions are included in the permit that require that the permittee properly operate and maintain engines and associated control systems in a manner that will minimize emissions. Operational and maintenance records are required to be kept to document compliance with this requirement.

Federal Regulations

None are applicable for IC engines.

Subpart GG. Subpart GG affects stationary gas turbines which commenced construction, reconstruction, or modification after October 3, 1977, with a heat input at peak load of greater than or equal to 10 MMBTUH based on the lower heating value of the fuel. Subpart GG specifies a NO_x emissions limitation of 150 ppm_{dv} corrected to 15% oxygen. Sulfur dioxide standards specified in Subpart GG are that no fuel shall be used which exceed 0.8% by weight sulfur nor shall exhaust gases contain in excess of 150 ppm SO₂. For fuel supplies without intermediate bulk storage, the owner or operator shall either monitor the fuel nitrogen and sulfur content daily or develop custom schedules of fuel analysis based on the characteristics of the fuel supply; these custom schedules must be approved by the Administrator before they can be used for determinations of compliance with monitoring requirements. Performance testing is specified by Method 20.

The permit assures compliance with this regulation using the following approach:

Specific conditions are included in the permit to adopt these requirements by reference. Initial and continuing compliance demonstrations are as specified in the NSPS.

CONTROL DEVICES

Control devices typically expected at these facilities include baghouses and scrubbers to capture particulate matter from the rotary drum dryer, and catalytic reduction systems on the engines (primarily NSCR). Wet suppression may also be used at the facility to control fugitive dust from aggregate stockpiles and haul roads. Note that these requirements may be superseded by more stringent monitoring if an individual construction permit is needed to develop other site-specific conditions to assure compliance with a particular rule, e.g., compliance with a BACT determination or MAAC under OAC 252:100-41.

The primary operational parameter for fabric filters or baghouse systems is the pressure drop across the filters. The permittee is required to determine the normal range of differential pressure across the filters that will assure that the system is meeting emissions limitations at all times, i.e., when periodic testing is not required, or between tests. At least once per month, the permittee is required to inspect the baghouse cleaning system, dust removal system, and fan, and perform maintenance as needed. At least annually, or during each outage period that is longer in duration than 1 week, the permittee is required to conduct a thorough baghouse inspection, including the filter bags, baghouse structure, expansion joints, turning vanes, and dampers, and conduct a review of all inspection and maintenance logs. Maintenance is required to be performed as needed. The permittee is required to maintain logs of all visible emissions observations, baghouse inspections, pressure drop measured, and maintenance performed.

The primary operational parameters for wet scrubbers are the pressure drop across the scrubber and the flow rate of the scrubbing solution. The permittee is required to determine the normal range of differential pressure across the scrubber and flow rate of the scrubbing solution that will assure that the system is meeting emissions limitations at all times, i.e., when periodic testing is not required, or between tests. Monitoring and recording of the pressure drop and flow rate is required daily.

The primary operational parameter for a cyclone is the pressure drop across the cyclone. The permittee is required to determine the normal range of differential pressure across the cyclone that will assure that the system is meeting emissions limitations at all times, i.e., when periodic testing is not required, or between tests. In lieu of measuring the pressure drop across the cyclone, the permittee may measure the pressure drop across a wet scrubber located immediately upstream of the cyclone to determine that both the scrubber and cyclone are properly operated. Monitoring and recording of the pressure drop is required daily.

The primary operational parameters for NSCR systems include the outlet oxygen concentration and the temperature differential across the catalyst. Thus, NSCR systems must be constructed with an Air-to-Fuel Ratio Controller with an exhaust oxygen sensor and a sensor to measure the temperature across the catalyst. The permittee is required to determine the normal range of operating parameters that will assure that the system is meeting emissions limitations at all times, i.e., when periodic testing is not required, or between tests.

The primary operational parameter for water/chemical spray dust suppression systems is the amount of water/chemical applied. However, the amount needed is dependent upon the amount of moisture present in the processed material, which may vary from load to load. The permittee is required to operate water/chemical spray dust suppression systems on nonmetallic mineral processing equipment and transfer points on either a continuous or intermittent basis, depending on whether processed materials contain sufficient moisture such that operation of the plant does not cause a violation of applicable limitations. Water/chemical spray dust suppression systems necessary to comply with emissions limitations is required to be maintained in good operating condition at all times regardless of whether the system is in use at the time. At a minimum, the water pump, pipe system, spray nozzles, and any gauges (e.g., water pressure) is required to be inspected weekly. The permittee must maintain records of the description and the date of repairs on the water spray system.

The primary operational parameter for water/chemical spray dust suppression systems for fugitive dust control on roads is the amount of water/chemical applied. However, the amount needed is dependent upon the amount of moisture present, which may vary throughout the day. The permittee is required to operate water/chemical spray dust suppression systems on roads at the facility as needed such that operation of the plant does not cause a violation of applicable limitations.

TIER CLASSIFICATION AND PUBLIC REVIEW

Processing of a new General Permit has been classified as Tier II based on OAC 252:4-7-33(c)(1). A request for an Authorization under this General Permit will typically be classified as Tier I, unless a compliance schedule required by OAC 252:100-8-5(c)(8)(B)(i) is included, in which case it will be classified as Tier II.

DEQ published the "Notice of Tier II Draft Permit" in the *Daily Oklahoman* and the *Tulsa World* on October 24, 2002. The notice stated that the draft permit was available for public review at the AQD office in Oklahoma City and Tulsa, and on the Air Quality section of the DEQ web page at www.deq.state.ok.us. Comments were received during the 30-day comment period. A summary of the comments, and DEQ responses are included below.

RESPONSE TO COMMENTS

The Oklahoma Department of Environmental Quality (DEQ) published notice on October 24, 2002, that the draft Hot Mix Asphalt Facility General Permit was available for public review and comment. The public comment period expired November 25, 2002. Timely written comments were received from the Oklahoma Asphalt Pavement Association. The following is a summary of those comments and staff's responses.

Comment #1: The General Permit is designed for facilities that agree to operate as minor emission sources. Based on AP-42 emission factors, virtually all hot mix asphalt plants are major sources, having "potential" emissions above the defining threshold level of 100 tpy for carbon monoxide and sometimes particulate and nitrous oxides. Therefore, the General Permit is a "synthetic minor" permit. For an asphalt plant to operate as a synthetic minor, emissions must be controlled by using emission controls on the dryer (PM-10) and by limiting the annual production rate (NOx and CO) to below major source amounts.

Also, since the proposed permit allows modification of the facility as long as it doesn't cause the facility to become a major source, there is no need to limit production or specific equipment in the Authorization to Construct/Operate. It will be the responsibility of the operator to monitor and know the limitation on facility emissions. Therefore, the permit would be clarified if Part 2 Section I (A) would recognize the emissions cap necessary to remain a minor, rather than refer to the Authorization. We believe this would be more straightforward and easier to understand, and propose the following wording replace the present wording in its entirety:

Facility-wide annual emissions of the regulated air pollutants shown below are limited to amounts less than each pollutant's Major Source threshold under OAC 252:100-8. Facility production shall be controlled to levels that do not allow emissions of any regulated air pollutant to exceed its major source threshold. In addition, the daily average production rate of HMA shall not exceed 1,000 TPH.

REGULATED AIR POLLUTANT	MAJOR SOURCE THRESHOLD (TPY)
PM-10	100
NO _x	100
CO	100
VOC	100
SO ₂	100
Total HAP	25
Each HAP	10

Compliance with the annual limitations must be determined on a rolling monthly basis for all regulated air pollutants emitted in amounts greater than or equal to 80% of its major source threshold. Emissions of regulated air pollutants that are emitted at less than 80% of the major source threshold can be determined on an annual basis.

Response to Comment #1: We agree with your comments that the General Permit is a “synthetic minor” permit, there is generally no need to limit production or specific equipment in the Authorization to Construct/Operate, and that the permit allows modification of the facility w/o modification of an Authorization as long as it doesn’t cause the facility to become a major source. However, the language at Part 2 Section I (A) was specifically drafted in this particular manner to allow a facility to request an emissions cap be established at a level lower than the major source thresholds. This was done in this manner to recognize, and allow for facilities to continue the past practice of the division to not allow a facility to emit “any more than what they actually needed.” We recognize that very few facilities will request this option. However, it is included in all minor facility general permits issued to date, and won’t likely be revised until these permits are re-issued, at some later date. In addition, note that we have made every effort in these permits not to specify the major source threshold for each specific pollutant so that these permits need not be revised to reflect a lower threshold if an area is designated nonattainment. No change to the permit was made in response to this comment.

Comment #2: Recognizing the permit is a “synthetic minor” permit causes need to modify the permit Memorandum. The text within that document, especially in the “Permit Structure” and the “Emission Limitation”, is not clear on the basis of the permit, referring to such terms as the “potential to emit”.

Response to Comment #2:

Consistent with our response to Comment #1, we have modified both the permit and evaluation memorandum to reflect that, although the emissions cap is established considering potential to emit, the monitoring frequency is based on actual emissions. Part 2, Section I.A. (3rd paragraph), has been changed as follows. “Compliance with these emissions limitations shall be determined, on a monthly basis for any regulated pollutant with actual emissions greater than or equal to 80% of ...” Likewise, Part 2, Section VII.A. has been changed as follows. “The inventory shall include the equipment description, equipment serial or identification number, date of the change, description of the change, NSPS applicability, annualized potential actual emissions for each emission source, and the annualized potential actual emissions for the facility. Similar changes were made to the evaluation memorandum.

Comment #3: There are references throughout the permit for regulating processing equipment under NSPS Subpart 000 applicable to Nonmetallic Mineral Processing Plants. It is confusing why it would be in this permit and may be so in error. Is it included to cover a facility that has two operations at the same site, those being a quarry/mineral processing operation and a hot mix asphalt plant, or is it included because DEQ believes mineral processing equipment associated with an asphalt plant is subject to the subpart?. Please consider the following information in determining whether to keep or remove references to NSPS Subpart 000:

NSPS –Subpart 000 applies to mineral handling material at Nonmetallic Mineral Processing Plants. It does not apply to those same type of equipment located at Hot Mix Asphalt Plants. Under 40 CFR §60.670(b), mineral handling equipment subject to NSPS Subpart I (hot mix asphalt plants) is specifically referenced as not being subject to NSPS - Subpart 000.

NSPS – Subpart I applies to all releases of “gases” from hot mix asphalt plants. Each release is subject to a 20% opacity limit. In the definition of hot mix asphalt plants, the subpart doesn’t limit itself to just the drum mixer exhaust, but rather includes all equipment associated with the plant, including screens and systems for loading, transferring, and storing mineral filler. It is our interpretation that all mineral handling equipment at an asphalt plant are emission units and therefore subject to the opacity limitation under Subpart I.

For facilities that do combine a quarry operation with an asphalt plant, it would be only fair to consider each independently under Title V. In doing so, separate permits could be issued.

Response to Comment #3: We recognize that NSPS Subpart 000 exempts certain equipment subject to NSPS Subpart I, or that follows equipment subject to NSPS Subpart I. NSPS Subpart 000 requirements were included in this permit to allow a facility with both operations at the same site to obtain coverage under this permit. This issue was raised during issuance of the nonmetallic mineral processing GP (see response to comment #7 in the nonmetallic mineral processing GP memorandum). Note that we have developed an “NSPS Applicability Worksheet” to assist facility owner/operators in meeting NSPS requirements for facilities that obtain coverage under this general permit. Those facilities that perform nonmetallic mineral processing and hot mix asphalt production on the same site may obtain coverage under this permit and combined emissions from both activities will be used to determine permit requirements, including major source status. Although these activities may not, in all cases, necessarily be considered together for purposes of determining major source status, an individual permit, or applicability determination, would be required to make that determination. No change to the permit was made in response to this comment.

Comment #4: Please clarify what emissions sources are considered “de minimis facilities” under OAC 252:100 - Appendix H, and therefore exempt from having to comply with the specific conditions. Are de minimis sources exempt from being included in the emission inventory? The permit would be made clearer if exemptions were listed rather than left to interpretation of an unclear referenced appendix. Examples of why reference is unclear:

Heaters – under the “combustion equipment” category the appendix lists “space heaters and boilers less than 10 mmBtu/hr heat input”. Is all combustion equipment under the 10 mmBtu/hr rating considered a de minimis activity? It would clarify the permit if specific references to what size heater is considered de minimis rather than a reference to Appendix H.

Facilities subject to NSPS must include fugitive emissions in determining whether the source is major under Part 70. Appendix H lists “unpaved roadways and parking areas” as a de minimis

activity. Therefore, emissions from that source are not required to be included in the equipment inventory and the estimates of fugitive emissions as required under Section VII (A) and (C), respectively. Does the DEQ concur with this interpretation?

Storage Piles - Are the storage piles exempt under the Fugitives list, since they are not subject to NSPS Subpart OOO?

Response to Comment #4: The approach taken in the permit was to not specifically list equipment designated in Appendix H. Thus, the permit would not need revision if Appendix H changed. For the purposes of this permit, fugitive emissions of particulate matter from all activities at the facility must be counted, including roadways and storage piles. To clarify this requirement we have modified Part 2, Section VII. of the permit as follows. "The following specific conditions apply facility-wide unless qualified as a de minimis activity, emitting other than particulate matter, under OAC 252:100, Appendix H." We also plan on clarifying, in the application, the most practical way to maintain an equipment inventory and estimate emissions.

Comment #5: The reference to "potential" emissions should be deleted in Part 2 Section VII (A), as the permit status is not based on potential emissions, but rather is a synthetic minor based on a self-imposed limitation on production.

Response to Comment #5: See response to Comment #2.

Comment #6: Part 4 Section II (B), should be struck because adding new sources to the facility will not cause a facility to no longer be a minor source, since the permit is a synthetic minor based on self-imposed limits on production. Including such text causes confusion on what qualifications are necessary to operate under the permit. We propose the text be replaced with the following:

The permittee must apply for and obtain a Part 70 operating permit prior to operating the facility in exceedance of the permit limitations shown in Part 2 Section I (A).

Response to Comment #6: The language at Part 4 Section II (B) is taken from, and consistent with the rules at OAC 252:100-7-15(a) and 100-8-4(a)(1). No change to the permit was made in response to this comment.

Comment #7: Part 4 Section VI (B) should be changed to recognize that the General Permit is a synthetic minor permit. Therefore, permit limits will not be established in the "Authorization" based on emission factors in the application but rather on production limits that are self-imposed. The section would be clearer with the following text:

The permittee shall use best available data to calculate emissions for inventory purposes. If available, emission test results conducted on an emission source at the permitted facility shall be used. If test results are unavailable for an emission source, emission shall be determined using the latest edition of AP-42, unless other methods are approved by DEQ.

Response to Comment #7: We agree. The change was made to the permit.

Comment #8: Please eliminate the requirement for daily inspections of water spray dust suppression systems in Appendix A (D). That section could be worded as follows:

Dust suppression systems may be necessary for mineral processing equipment and transfer points to comply with opacity limits found in Part 2 Section VII (F). Such suppressions systems must be operating when required to meet applicable limits.

Response to Comment #8: A daily inspection seems reasonable, from both the standpoint that a nozzle may be plugged and contributing to opacity and/or emissions violations, and that a nozzle may be broken and piping hundreds of gallons of water onto the ground. No change to the permit was made in response to this comment.

SUMMARY

Applicants must demonstrate eligibility for coverage under this General Permit and that they are able to comply with applicable air quality rules and regulations. Ambient air quality standards are not threatened at any of the sites eligible for coverage under this General Permit. Issuance of the permit is recommended.

REFERENCES

1. AP-42 (1/95) "Compilation of Air Pollution Emission Factors".
2. AIRSWeb. SIC Emissions Report: Oklahoma PT Air Pollution Sources. EPA Office of Air Quality Planning and Standards. June 5, 1998. www.epa.gov/6703/airwdcd/owa/afs.sic
3. "Tuning the burner should be a top plant maintenance priority," *Asphalt Contractor*, September 2000, pp. 34-36.
4. USEPA, 40 CFR, Pt. 72, Subpart A, §72.2, Definitions, March 26, 1999.
5. AP-42 (9/98) "Compilation of Air Pollution Emission Factors," Appendix A.

Appendix A
Documentation of Compliance with OAC 252:100-19
For Drum and Batch Mix Dryers

Subchapter 19 controls the emission of particulate matter from both fuel burning equipment and industrial processes. Allowable particulate matter emissions rates are established for both new and existing directly fired fuel-burning units and industrial processes. Such emissions, as pertains to the dryer, shall not exceed the limits specified in OAC 252:100, Appendix G.

$$E_{STD} = 4.10P^{0.67} \quad P \text{ up to 30 tons/hour}$$

$$E_{STD} = 55.0P^{0.11} - 40 \quad P \text{ greater than 30 tons/hour}$$

where: E_{STD} = rate of emission in lb/hour
 P = process weight rate in tons/hour

Emissions of particulate matter from these facilities are high. AP-42, Table 11.1-1 (12/00) lists the uncontrolled PM emissions factor for a batch mix asphalt plant as 32 lb PM/ton HMA and 28 lb PM/ton HMA for a drum mix asphalt plant. Thus, drum and batch mix dryers are typically controlled at these facilities using either a scrubber or baghouse in order to meet these limitations. Typical control and capture efficiencies for these devices are high, i.e., 99% and above.

In order to demonstrate compliance with the allowable rates, the required control efficiency for a particular process rate can be calculated as follows.

$$E_{STD} = 4.10P^{0.67} = E_F P \times (1 - E_C)$$

$$\text{thus } E_C = 1 - 4.1 \frac{P^{-0.33}}{E_F} \quad P \text{ up to 30 tons/hour}$$

$$E_{STD} = 55.0P^{0.11} - 40 = 32P \times (1 - E_C)$$

$$\text{thus } E_C = 1 - \frac{55.0P^{0.11} - 40}{E_F P} \quad P \text{ greater than 30 tons/hour}$$

where: E_C = overall (control plus capture) efficiency, %
 P = process weight rate in tons/hour
 E_F = emissions factor,
 32 lb/ton HMA for batch mix, 28 lb/ton HMA for drum mix

The following table summarizes the required control efficiency necessary for each type of plant to assure that particulate matter emissions do not exceed the allowable rates.

**Required Control Efficiency to Assure Compliance
With OAC 252:100-19, Appendix G Allowable Emissions Rate**

Process Weight Rate P (Tons HMA/hour)	Overall Efficiency	
	E _C (%)	E _C (%)
	Batch Mix	Drum Mix
5	92.47	91.39
10	94.01	93.15
30	95.83	95.23
60	97.59	97.24
100	98.40	98.17
250	99.24	99.13
500	99.57	99.51
600	99.63	99.58
700	99.67	99.63
800	99.71	99.67
900	99.74	99.70
1000	99.76	99.72

Note that at process rates exceeding about 100 tons HMA/hour the facility has the potential to exceed major source thresholds for PM and other criteria pollutants, depending upon the type of plant, hours of operation, control devices used, etc. For example, operating a 250 TPH drum mix plant continuously (8,760 hrs/year) with a control device with an efficiency of 99.13% would result in emissions of PM of 267 TPY. However, plants (or combinations of plants at the same facility) may operate at higher capacities so long as hours of operation are curtailed (or additional controls are utilized). In order to provide the applicant the greatest flexibility, yet simplify the permitting process, an eligibility restriction will be established in the permit to assure compliance with OAC 252:100-19. Thus, eligibility for an Authorization to Construct under the permit is restricted to those facilities with a design process rate of 1,000 tons HMA/hour or less and a overall efficiency of at least 99.8%. A permittee not meeting this eligibility requirement may be eligible for coverage under an Authorization to Operate if they obtain an individual construction permit and all relevant requirements and limitations in that permit are incorporated into the Authorization to Operate.

APPENDIX B
Justification to Document Compliance w/OAC 252:100-31
Fuel-burning equipment

PART 5. NEW EQUIPMENT STANDARDS

252:100-31-25 Fuel-burning equipment.

(a) Emission limit.

(1) **Gas-fired-fuel-burning equipment.** Sulfur oxide emissions (measured as sulfur dioxide) from any new gas-fired fuel-burning equipment shall not exceed 0.2 lbs/MMBTU heat input (86 ng/J).

(2) **Liquid-fired fuel-burning equipment.** Sulfur oxide emissions (measured as sulfur dioxide) from new liquid-fired fuel-burning equipment shall not exceed 0.8 lbs/MMBTU heat input (340 ng/J).

Justification: New Equipment Standard

The amount of SO₂ produced by burning natural gas is dependent upon the conversion of sulfur compounds in the gas, measured as TRS, to SO₂. Sulfur levels in natural gas used to fuel these facilities are not expected to exceed 2 grains/100 scf.⁴ If the conversion of all sulfur compounds, measured as TRS, is on a one mole TRS to one mole SO₂ basis, then the amount of SO₂ generated can be calculated as:

$$\frac{2 \text{ grain S}}{100 \text{ scf}} \times \frac{1 \text{ pound}}{7000 \text{ grains}} \times \frac{1 \text{ mole}}{32 \text{ lb S}} \times \frac{64 \text{ lb SO}_2}{1 \text{ mole}} = 5.714 \times 10^{-6} \frac{\text{lb SO}_2}{\text{scf}}$$

$$5.714 \times 10^{-6} \frac{\text{lb SO}_2}{\text{scf}} \times \frac{1 \text{ scf}}{1050 \text{ BTU}} \times \frac{10^6 \text{ BTU}}{\text{MMBTU}} = 0.005 \frac{\text{lb SO}_2}{\text{MMBTU}}$$

This is much less than the standard, even considering that about half of the fuel-bound sulfur, up to a maximum (as SO₂) of 0.1 lb/ton HMA, is expected to be retained in the product. Thus, this eligibility restriction assures compliance with the new equipment standard of 0.2 lbs/MMBTU heat input.

Likewise, the amount of SO₂ produced by burning liquid fuels can be calculated in a similar manner. The following table shows the characteristics of the various fuels expected to be used at an asphalt plant. Note that liquid petroleum gas (LPG), typically made by fractionating natural gas into its various components, has negligible sulfur content. No SO₂ emissions are expected from using LPG as a fuel.

Fuel Characteristics⁵

Fuel Type	Density (lb/gallon)	Heating Value (BTU/gallon)	Wt. % Sulfur
Residual Oil	7.88	150,000	0.5-4.0
Distillate Oil	7.05	140,000	0.2-1.0
Diesel Fuel	7.0	137,000	0.4
Liquid Petroleum Gas	NA	94,000	negligible

The maximum allowable sulfur content of the fuel oil can be calculated using a worst case of a liquid fuel with 135,000 BTU/gallon and density of 7.0 lb/gallon, as follows.

$$\frac{0.8 \text{ lbSO}_2}{\text{MMBTU}} \times \frac{135,000 \text{ BTU}}{\text{gallon}} \times \frac{1 \text{ gallon}}{7 \text{ pounds}} \times \frac{\text{MMBTU}}{10^6 \text{ BTU}} \times \frac{1 \text{ mole}}{64 \text{ lbSO}_2} \times \frac{32 \text{ lbS}}{1 \text{ mole}} = 0.0077 \frac{\text{lbS}}{\text{lbfuel}}$$

$$0.0077 \frac{\text{lbS}}{\text{lbfuel}} \times 100 = 0.8 \text{ wt}\%$$

Thus, an eligibility restriction of liquid fuels consisting of only residual or distillate oil or diesel fuel with a maximum of 0.8 wt% S assures compliance with the new equipment standard of 0.8 lbs/MMBTU heat input. A permittee not meeting this eligibility requirement may be eligible for coverage under an Authorization to Operate if they obtain an individual construction permit and all relevant requirements and limitations in that permit are incorporated into the Authorization to Operate.

