

Illinois Environmental Protection Agency
Bureau of Air, Permit Section
1021 N. Grand Avenue East
P.O. Box 19506
Springfield, Illinois 62794-9506

Project Summary for a Request from
The Illinois Asphalt Pavement Association for Renewal of the
General Federally Enforceable State Operating Permits (FESOP) for
Hot Mix Asphalt Plants

General Permit Nos.: G2951A1 (Drum-Mix Asphalt Plant with Generator),
G2951A2 (Drum-Mix Asphalt Plant), &
G2951B (Batch-Mix Asphalt Plant with Generator)

Schedule

Public Comment Period Begins: September 30, 2009
Public Comment Period Closes: October 30, 2009

Illinois EPA Contacts

Permit Analyst: Robert Bernoteit
Community Relations Coordinator: Brad Frost

I. INTRODUCTION

The Illinois Asphalt Pavement Association (IAPA) has requested the renewal of the three General Federally Enforceable State Operating Permits (FESOPs) for Hot Mix Asphalt Plants. Hot mix asphalt plants require an air pollution control operating permit because they are a source of emissions. The Illinois EPA has prepared drafts of the renewed permits that it would propose to issue for such plants. However, before renewing the permit, the Illinois EPA is holding a public comment period to receive comments on this proposed action and the terms and conditions of the draft permit that it would propose to issue.

II. SOURCE DESCRIPTION

An asphalt plant is used to manufacture hot-mix asphalt for use as pavement in road construction projects. The process consists of blending prescribed portions of cold feed materials (sand, gravel, screenings, chips, etc.) uniformly and adding sufficient hot asphalt oil to bind the mixture together. After the hot asphalt mix is manufactured at the plant, it is transported to the location where it is to be applied.

The following is a general description of an asphalt plant's manufacturing process:

Batch-Mix Plants:

Processing begins as the aggregate is hauled from the storage piles and is placed in the appropriate hoppers of the cold feed units. 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 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. 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. The liquid asphalt is then dropped into the pug mill where it is mixed for an additional period of time. At older plants, RAP typically is conveyed directly to the pug mill from storage hoppers and combined with the hot aggregate. Then the hot mix is conveyed to a hot storage silo or is dropped directly into a truck and hauled to the job site.

Drum-Mix Plants:

These plants use 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, may be introduced to the drum at the burner end or from behind the burner flame zone, depending on the configuration of the plant. Liquid asphalt cement flow is controlled by a variable flow pump, which is electronically linked to the aggregate weigh scales. It is injected into the mixing zone along with any particulate matter from primary and secondary collectors.

The dryers and drum mixers use a burner fired with fuel oils (Grades No. 1 - No. 6), LPG, natural gas, and used oil (only if prior written approval for this fuel was granted to a source) to heat air to dry the aggregate, and the motion of the rotating drum to blend the aggregate. The air is drawn into the system via an exhaust fan. After passing through the gas burner and the dryer or mixing drum, the air passes through a baghouse. The exhaust gasses are drawn through the baghouse and discharged to the atmosphere through the stack. The particulate matter, which is removed by the baghouse, is reinjected into the dryer or drum mixer.

Aggregate Processing:

In conjunction with the production of hot mix asphalt an asphalt plant may also operate an aggregate processing plant, including crushers, screens, conveyors and other processing equipment. An aggregate processing plant is responsible for producing or refining the nonmetallic minerals to be used as an ingredient in the asphalt mix. Large chunks of rock, recycled concrete, or Reclaimed Asphalt Pavement (RAP) are fed into a series of crushers and screening units where the aggregate is crushed into usable sizes and separated into storage piles or bins.

Diesel-Powered Generator:

Asphalt plants located in rural or remote areas may utilize a diesel-powered generator in order to generate electricity needed to operate certain components of the asphalt plant.

Emissions:

The principal air contaminants emitted from asphalt plants are Particulate Matter (PM), Carbon Monoxide (CO), Nitrogen Oxide (NO_x), Sulfur Dioxide (SO₂), and Volatile Organic Material (VOM) generated by the asphalt plant (dryer and heaters) as the result of by-products of combustion. The CO and VOM emissions result primarily from incomplete combustion of the fuel, and from heating and mixing of the liquid asphalt cement inside the drum. The PM emissions are primarily the result of the drying of the cold feed materials.

NO_x will also be emitted from the burning of fuels in the dryers, diesel-powered generator, tank heaters and boilers. NO_x is formed thermally by the combination of oxygen and nitrogen in the air at the temperatures at which fuel is burned. Thermal NO_x is formed during all common high temperature combustion processes.

The secondary air contaminant from the dryers, generator, boilers, and heaters is CO. It is formed by the incomplete combustion of fuel. CO is associated with most combustion processes and is found in measurable amount in boiler exhaust. Other contaminants formed by combustion are PM, SO₂, and VOM. These are normally found only in trace amounts from the combustion of natural gas or diesel fuel in the generator or boilers.

The principal air contaminant emitted from the aggregate crushing plant is PM, generated by the crushing, screening, or transfer of the aggregate as well as that emitted from storage piles and plant roads. Emissions from the crushing, screening, and conveying operation may be controlled by the use of water spray bars to provide moisture that will reduce emissions of particulate matter. Fugitive dust is also controlled by water as required to keep emissions to a minimum.

The General FESOPs limit the operation and annual emissions of an asphalt plant to below the major-source-thresholds of 100 tons for CO, NO_x, and SO₂. Therefore an asphalt plant operating under a General FESOP will be exempt from the requirements of Clean Air Act Permit Program.

IV. APPLICABLE EMISSION STANDARDS

All emission sources in Illinois must comply with the Illinois Pollution Control Board emission standards. The board's emission standards represent the basic requirements for sources in Illinois. The board has standards for sources of regulated pollutants for an asphalt plant. An asphalt plant operating under a General FESOP would readily comply with all applicable Board standards.

The USEPA has also adopted standards for new hot mix asphalt plants for which construction was commenced after June 11, 1973, the federal New Source Performance Standards (NSPS) for Hot Mix Asphalt Facilities, 40 CFR 60 Subpart I. The Illinois EPA is administering the NSPS in Illinois on behalf of the United States EPA under a delegation agreement. These general permits address compliance with the USEPA's standard for Hot Mix Asphalt Facilities.

The crushers, conveyors, and screens for the aggregate processing plant are also subject to the federal New Source Performance Standards (NSPS) for Nonmetallic Mineral Processing Plants, 40 CFR 60 Subpart OOO. These general permits address compliance with the USEPA's standard for the aggregate processing plant associated with the hot mix asphalt plant.

V. CONTENTS OF THE PERMIT

The renewed permits that the Illinois EPA is proposing to issue will continue to identify the specific emission standards that apply to the emission units at an asphalt plant. As explained, hot mix asphalt plants are subject to the NSPS for Hot Mix Asphalt Facilities, which requires emission control equipment for PM emissions and stack testing to verify compliance with the emission standard. The conditions of this permit are intended to ensure that the source continues to comply with these applicable emission standards.

The permit would also contain limitations and requirements to assure that any hot mix asphalt plant operating under a General FESOP is operated as a non-major source. The permits will limit the operation and annual emissions of the plant to below the major-source-thresholds of 100 tons for CO, NO_x and SO₂. Annual emissions of other pollutants from the plant are well below the 100 ton major source threshold.

The permit would also set limitations on the amount of asphalt produced, the types of fuels to be combusted in an asphalt plant, the amount of fuel combusted in the heaters, boilers, and generators associated with an asphalt plant, and the amount to aggregate material processed in a processing plant associated with an asphalt plant. These limitations are consistent with the historical operation of emission units at the plant.

The permit conditions would also continue to require appropriate compliance procedures, including inspection practices as well as recordkeeping and reporting requirements. Each source must carry out these procedures on an on-going basis to demonstrate that the plant is being operated within the limitations set by the permit and the plant's emissions are being properly controlled.

VI. REQUEST FOR COMMENTS

It is the Illinois EPA's preliminary determination that any asphalt plant, which meets the findings specified by the General FESOPs, will have met the requirements for renewal of its permit. The Illinois EPA is therefore proposing to renew these permits.

Comments are requested on this proposed action by the Illinois EPA and the proposed conditions on the draft permit. If substantial public interest is shown in this matter, the Illinois EPA will consider holding a public hearing in accordance with 35 IAC Part 166.