

## ASPHALT BATCH & DRUM MIX PLANTS

### **Date Initiated:**

May 24, 1993

### **Dates Modified / Updated:**

October 11, 1993

February 3, 1994

November 4, 1998

### **PROCESS DESCRIPTION:**

Asphaltic concrete plants are significant sources of particulate, combustion, and trace organic emissions. These emissions usually include NO<sub>x</sub>, CO, SO<sub>x</sub>, TOG, ROG, TSP, PM<sub>10</sub>, arsenic, beryllium, cadmium, chromium, hexavalent chromium, lead, manganese, mercury, nickel, zinc, benzene, formaldehyde, toluene, Xylenes, and various polycyclic aromatic hydrocarbons (PAH's). Asphalt production consists of several interrelated processes including aggregate storage areas, conveyors, aggregate transfer points, a rotary aggregate dryer, weigh hoppers, asphaltic cement (oil) heating & storage, screens, pugmills, product storage silos, drop zones, and haul roads. The dryer, weigh hoppers, pugmill, and asphalt storage silos are typically vented to a common baghouse.

Two types of asphalt plants currently exist in San Diego county; conventional batch mix plants and drum mix plants. These operations primarily differ in the procedure used to add asphaltic concrete oil to the aggregate mixture. Conventional batch plants add the oil to the heated aggregate after the rotary dryer and then mix the combination in a pugmill. Drum mix plants inject the oil directly into the rotary dryer with the aggregate and then heat the entire mixture. Higher organic emissions are expected from the drum mix plants since the oil is exposed to both higher aggregate temperatures and the open flame of the rotary dryer. The following estimation techniques are used by the District to quantify asphalt plant emissions;

$$E_a = U_a \times EF$$

$$E_h = U_h \times EF$$

Where:

**Ea** = Annual emissions of each listed substance, (lbs/year)

**Eh** = Maximum hourly emissions of each listed substance, (lbs/hour)

**Ua** = Annual asphaltic concrete production, (tons/year)

**Uh** = Maximum hourly asphaltic concrete production, (tons/hour)

**EF** = Emission factor, (lbs/ton of asphaltic concrete produced or lbs/unit of fuel burned)

### **EMISSIONS INFORMATION:**

Section 11.1 (1/95) of AP-42 contains general information regarding process descriptions, estimation techniques, emission factors, and control efficiencies. The AP-42 emission factors are in units of lbs pollutant released per ton asphalt produced. The District has determined that NO<sub>x</sub> and CO emissions are more accurately estimated using emission factors based on fuel consumption.

AP-42 emission factors apply to the control device exhaust. Other process emissions (i.e.; material storage, material handling, haul roads, drop zones, etc.) must be calculated separately to quantify total site releases. Drop zone emissions are not discussed in the current version of AP-42. Local testing indicates a combination of oil mist and fine particulates is released at the drop zone during truck loading (i.e.; blue smoke) at an average uncontrolled emission rate of 0.018 lbs PM<sub>10</sub>/ton asphalt produced. This factor will be used to predict drop zone releases for all plant types until more accurate information becomes available. No speciation information currently exists regarding the composition of 'blue smoke'. Some sites are equipped with collection devices which capture ~50% of the blue smoke and vent the emissions to the baghouse.

### **ASSUMPTIONS / LIMITATIONS:**

- NO<sub>x</sub> and CO emissions are more accurately estimated using fuel consumption information. Default emission factors have been developed and should be used where site specific test data is not available. All fuel combustion byproducts are assumed emitted through the baghouse (ducted) exhaust.
- Site specific TSP and PM<sub>10</sub> data may be used to quantify baghouse exhaust emissions instead of default values where available. AP-42 trace toxic speciation factors should be used unless more accurate site specific information is developed.
- Fugitive emissions of 'blue smoke' at the drop zone are composed of asphalt oil droplets and fine particulates. While the oil droplets are

probably composed of long chained aliphatic hydrocarbons, some PAH's and trace metals may be present. Actual speciation information does not currently exist. The District will assume an uncontrolled fugitive 'blue smoke' emission rate of 0.018 lbs PM10/ton product for all asphalt plant types until more accurate information becomes available. Sites with collection hoods should provide a capture efficiency for fugitive particulate releases on the reporting form to properly reduce this emission estimate. Trace toxic baghouse emissions are assumed unchanged by the blue smoke collection equipment.

- All asphalt plants are equipped with oil storage and heating equipment. Asphaltic concrete (oil) is a semi-solid mixture of organic substances at ambient temperature that must be heated prior to pumping. Small electric or natural gas fired heaters are continuously used to keep the material in a liquid state. Emissions from these heaters are assumed to be negligible relative to the fuel combustion of the dryer. Quantification of emissions from these sources may be required at a later date.

- Some asphalt production facilities crush recycled asphalt products and blend the RAP into the aggregate feed of the rotary dryer (i.e.; California Commercial Asphalt). Particulate emissions from RAP crushing and handling equipment should be quantified separately from the asphalt production.

- Asphalt operations require a variety of support operations in addition to the actual production plant (i.e.; material storage, handling, haul roads, etc.). Emissions from these processes should be quantified separately from the asphalt production.

#### **FORMS:**

Each asphalt production plant should be quantified separately. An estimate of the annual production for each fuel used on site must be provided. Other material handling equipment and processes must be quantified separately.