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DARM-PER-37

SUBJECT: Guidance on Using Ground Tire Rubber in Asphalt

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Section 336.044(2), Florida Statutes, requires the addition of ground tire rubber (GTR) to the asphalt cement used for state road construction. This will require some asphalt plants to use a GTR/asphalt mix instead of asphalt cement alone to make asphalt concrete. In this process, GTR will be mixed with hot asphalt cement at approximately a 5 to 20 percent by weight ratio, depending on the paving specifications. Then the asphalt cement/GTR mix will be blended with the hot dried aggregate at the asphalt plant in a ratio of approximately 7.2 percent mix and 92.8 percent aggregate to produce asphalt concrete. The maximum amount of GTR in the total mixture (asphalt concrete) will be approximately 1 percent. It is estimated that a minimum of 9,500 tons of GTR will be used in asphalt concrete in Florida in 1994. In carrying out this program, the following **activities** could be involved:

1. Manufacture of GTR from tires. During this process, tires are ground to a powder, -20, -40 or -80 mesh. This is approximately 830, 350 and 175 microns in diameter, respectively. The grinding of the tires could be a source of particulate matter (PM), fugitive dust, and odor emissions.

2. Handling of GTR (transportation, loading/unloading, and storage) and mixing GTR with asphalt cement. Some of these operations could occur at the GTR manufacturing plant, the bulk terminal where asphalt cement is received prior to distribution to the hot-mix asphalt plants, and at the hot-mix asphalt plant. Stationary and mobile equipment may be used to mix the GTR with the asphalt cement. Although some GTR may be transferred pneumatically (moving GTR in an air stream), most of the GTR is expected to be shipped in 50 and 1,500 pound bags. Handling operations will typically involve pouring GTR from 50 pound bags into a hopper and then conveying and mixing the material with the hot asphalt cement. Due to the size of the GTR, -20 to -80 mesh or approximately 830 to 175 microns in diameter, minimal dust should be generated. As tire rubber volatilizes at about 475°F (and emits potentially hazardous organic compounds and objectionable odors), the temperature of the asphalt cement and aggregate should always be less than 375°F. There is a low potential for PM and fugitive dust emissions from the handling of GTR in bags along with a low potential for odor emissions from the mixing of GTR with hot asphalt cement below 375°F.

3. Blending of the GTR/asphalt cement with dried aggregate at the hot-mix asphalt plant. The GTR/asphalt mix is handled by the same equipment and procedures that is used to handle asphalt cement. There is a minimal potential for the PM, fugitive dust, and odor emissions to change when the GTR/asphalt mix is included in the process.

4. Application of the GTR/asphalt concrete to the road. The GTR/asphalt concrete is applied to the road in the same manner as asphalt concrete. There is a potential for a slight change in odors when the GTR/asphalt concrete is used. Data submitted by DOT indicated that emissions will not be a problem (see August 20, 1991, letter from Clair Fancy to Murphy, DOT).

For consistency under our current regulations, the air permitting activity should be handled as follows:

1. GTR manufacturing plants will need air construction and operation permits issued by the district or county air program offices. Particulate matter and fugitive emissions along with objectionable odors shall be addressed in the permits. Particulate matter emission standards shall be based on the unconfined emissions of particulate matter regulation (F.A.C. Rule 62-296.320 (4)(c)) PM RACT standard (F.A.C. Rule 62-296.700), or the alternate procedures regulations (F.A.C. Rule 62-297.620) if a filter is used to control emissions - whichever regulation is applicable. Also, an objectionable odor condition (F.A.C. Rule 62-296.320(2)) shall be included in the permits. The construction permitting fee will be based on the calculated TPY PM emissions from the GTR facility. Visible emission testing and an odor evaluation (test team's opinion on whether objectionable odors are being emitted by the facility) shall be required annually. Particulate matter tests shall be required initially and upon renewal of the operating permit unless the 5 percent opacity standard in lieu of a particulate matter test is specified in the permits (F.A.C. Rule 62-297.620).

2. Manually operated GTR transfer/mixing facilities (both stationary and mobile). When used in conjunction with an asphalt terminal or hot-mix asphalt plant, these will not require air construction and operation permits.

3. Pneumatically operated GTR transfer equipment (both stationary and mobile) will need air permits. Particulate matter and fugitive emissions along with objectionable odors shall be addressed in the permits. Particulate matter emission standards shall be based on the unconfined emissions of particulate matter regulation (F.A.C. Rule 62-296-320(4)(c)), PM RACT standard (F.A.C. Rule 62-296.700), or the alternate procedures regulations (F.A.C. Rule 62-297.620) if a filter is used to control emissions - whichever regulation is applicable. Also, an objectionable odor condition (F.A.C. Rule 62-296.320(2)) shall be included in the permits. The construction permitting fee will be based on the calculated TPY PM emissions from the GTR transfer/mixing facility. Visible emission testing and an odor evaluation (test team's opinion on whether objectionable odors are being emitted from the facility) shall be required annually. Particulate matter tests shall be required initially and upon renewal of the operating permit unless the 5

percent opacity standard in lieu of a particulate matter test is specified in the permits (F.A.C. Rule 62-297-620)).

4. The hot-mix asphalt plant permit need not be amended or modified to allow the use of GTR/asphalt mix. Facility testing requirements should not change because of the use of GTR/asphalt mix in the plant.

5. Application of GTR/asphalt concrete to a road. An air permit is not required for this operation.

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