

**DMS - 11000**

**EVALUATING AND USING NONHAZARDOUS RECYCLABLE  
MATERIALS GUIDELINES**

**EFFECTIVE DATE: OCTOBER 2008**

**11000.1. Description.** This Specification governs the process for evaluating the environmental factors associated with nonhazardous recyclable materials (NRMs) not addressed in other Department specifications. Applicable Department engineering specifications govern the evaluation of engineering factors associated with the NRM product.

The Department's goal is to use materials with environmental qualities that do not necessitate short-term or long-term management (i.e., worker protection, deed restrictions, tracking, monitoring, or special handling after the project life) in Department specification items.

The Department prohibits the use of hazardous wastes in Department projects; therefore, the Department will reject the use of those wastes as outlined in Item 6, "Control of Materials," Article 6.9, "Recyclable Materials," of the Department's *Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges*.

Hazardous waste definitions are located in the Texas Administrative Code (TAC), 30 TAC 335.1. Refer to 30 TAC 335.504 to determine if a material is a hazardous waste.

**11000.2. Definitions.** This Specification references the following terms:

- *NRM*—nonhazardous recyclable material that has been recovered or diverted from the nonhazardous waste stream for the purpose of reuse or recycling in the manufacture of products that may otherwise be produced using raw or virgin materials.
- *NRM Product*—a road construction material that includes one or more NRMs. NRM products must not endanger human health, the environment, or the waters of the state. Refer to 30 TAC 335.4 and Section 26.121 of the Texas Water Code. The relevant Texas environmental statutes are located at <http://www.sos.state.tx.us/tac>. Since the potential for environmental harm depends on the final physical state in which the NRM resides, the environmental suitability will ultimately be determined for the product that contains the NRM, not the NRM itself. Examples of typical Department NRM products include concrete, hot mix, base, subgrade, embankment and backfill materials, landscaping materials, and metal applications that contain one or more NRMs.
- *Contractor*—entity responsible for meeting the requirements of the bid item in which an NRM product is a component. The Contractor may receive NRM products from producers, suppliers, agents, generators, and other Contractors, but is the entity who must assure that all the requirements of this Specification are met, including product approval, testing, certification, document flow, handling, control and retention, and compliance with applicable waste management and recycling regulations.
- *Supplier/Producer*—entity that first introduces the NRM product into a construction material or process. The Contractor may be the supplier/producer.

- *Chemical of Concern (COC)*—any chemical in a product that has the potential to adversely affect human health, the environment, or waters in the state, when applied to the land, due to its concentration, distribution, and mode of toxicity. COCs are identified after considering the originating sources and processes that generated the recycled materials used in an NRM product.

**11000.3. Approval Criteria.** The Department’s decision regarding the use of an NRM product is dependent on two factors:

- Engineering—meets applicable department engineering specifications and other engineering evaluations deemed necessary by the Department
- Environmental—poses an acceptable level of potential environmental risk, following an evaluation of its environmental characteristics.

**11000.4. NRM Product Approval Process.**

**A. Eligibility.** To be eligible for use on Department projects, the NRM product must:

- meet all applicable Department engineering specifications and other engineering evaluations deemed necessary;
- contain only NRMs that meet the standards listed under Item 6, “Control of Materials,” Article 6.9, “Recyclable Materials,” of the *Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges*;
- contain only NRMs that are managed and protected from loss, as would be raw materials, ingredients, or products;
- be used without the need for short-term or long-term management, such as special worker protection precautions, deed restrictions or notices (i.e., institutional control requirements associated with the reuse of contaminated media as discussed in 30 TAC 350.36), tracking, monitoring, special handling after the project life, or special engineering controls; and
- not present an increased risk to human health, the environment, or waters in the state when applied to the land or used in products that are applied to the land.

The [NRM Product Eligibility Process](#) chart illustrates the NRM product eligibility process.

The following NRMs have established histories of use in Department construction projects and are administered by other Department specifications:

- aluminum;
- compost;
- glass beads;
- ground granulated blast furnace slag;
- shredded brush;
- steel;
- tire rubber;

- ceramics, glass cullet, plastics, and crushed concrete from non-industrial sources;
- reclaimed asphalt pavement;
- fly and bottom ash from electrical utility plants; and
- Department-owned materials.

Products containing these established NRMs and meeting the first four criteria of Article 11000.4 may be presumed to meet the fifth criterion if they have not come into contact with any hazardous materials.

To demonstrate that other NRM products meet the fifth criterion of Article 11000.4, the concentrations of all COCs must meet the following requirements.

The concentrations in the product must be either:

- less than the COC concentrations found in the traditional material that is being replaced;
- equal to or below the corresponding “Texas-Specific Background Concentrations” as defined by the Texas Commission on Environmental Quality (TCEQ) in 30 TAC 350.51(m); or
- less than the Tier 1 “Residential Protective Concentration Levels” (PCLs) for combined exposure pathways ( $^{Tot}Soil_{Comb}$ ), as defined in 30 TAC 350, when applying the general conservative assumptions for surface soil, Class 1 Groundwater, and a 30 acre source area.

The concentrations of all COCs must also meet one of the following requirements.

- The concentrations in the product must be either:
  - equal to or below the corresponding “Texas-Specific Background Concentrations” as defined by the TCEQ in 30 TAC 350.51(m); or
  - less than the Tier 1 “Groundwater Protective Soil PCLs” ( $^{Tot}Soil_{Comb}$ ) as defined in 30 TAC 350, when applying the general conservative assumptions for surface soil, Class 1 Groundwater, and a 30 acre source area.

or

- the concentrations measured in the leachate following a scientifically valid synthetic leaching procedure performed on a sample of the product must be either:
  - less than the allowable PCLs for groundwater ingestion ( $^{GW}GW_{Ing}$ ) as defined in 30 TAC 350 or
  - equal to or less than the leachate concentrations of the same COCs found in traditional materials, when comparing data using similar leachate testing methods. (Refer to the Table 1 for a partial listing of leachate COC concentrations identified in traditional materials. Use this table or other published and scientifically valid data with Department approval to demonstrate typical leachate concentrations in traditional construction materials, such as concrete, natural aggregates, bituminous materials, and others.)

NRM products that do not meet all of eligibility criteria may still be acceptable for use in Department projects. However, these materials must undergo additional analysis and

testing necessary to demonstrate to the Department that they do not present an increased risk to human health, the environment, or waters in the state when applied to the land or used in products that are applied to the land. Contractors should coordinate with the Department's Environmental Affairs Division when seeking approval for such materials. The Department reserves the right to reject without cause any NRM product that does not meet all of the eligibility criteria.

**B. Testing Protocol for Environmental Criteria.** To demonstrate compliance with this Specification, suppliers/producers supplying recycled materials not listed in Article 11000.4 as having an established history of use in Department construction projects must:

- collect environmental testing data for every 10,000 tons of those materials delivered to the Department or
- establish an internal testing program that regularly measures and documents that those products meet the environmental criteria outlined in this Specification.

The sampling and analysis plan must be developed in accordance with standard industry practices, including Chapter 9 of the EPA's SW-846, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," Third (or latest) Edition. The Department reserves the right to verify compliance with these environmental specifications and may perform additional verification testing.

Suppliers/producers who choose to use an internal testing program must first submit a detailed description of the program to the Department for review and approval before the Department receives any material.

The description must include the following information:

- a description of the originating sources and process that generated the recycled materials used;
- if applicable, waste characterization data for the recycled materials used;
- rationale for including and/or excluding COCs in the testing program based on the originating sources and processes that generated the recycled materials used;
- methods used to track the incoming sources of recycled materials to ensure that the rationale for including and/or excluding COCs in the testing program remains valid;
- the sampling protocol;
- the sampling frequency and rationale for the sampling frequency; and
- documentation procedures.

The Department reserves the right to periodically inspect documentation associated with the testing program. The schedule and frequency for the documentation inspections are at the Department's discretion. The Department also reserves the right to verify compliance with engineering and environmental specifications and may perform additional verification testing.

The Department may add NRM products to the Department's Material Producer List if the supplier/producer's testing program demonstrates a history of compliance with this Specification.

**11000.5. NRM Product Certification.** Contractors who intend to use any NRM products listed above under Article 11000.4 or those listed on the MPLs entitled "[Nonhazardous Recyclable Materials](#)" or "[Recycled Asphalt Shingles](#)" are not required to document the use of those materials.

Report other NRM products on Form [CSTM-NRM-2](#). A single Form CSTM-NRM-2 can list several products that a company plans to supply for a given project. This form must be signed, certified, and sealed by a licensed professional engineer, and must have an attached copy of form [CSTM-NRM-3](#) for each NRM from a supplier/producer certifying that the NRM meets all the environmental requirements of this Specification and states where that information can be reviewed.

**11000.6. Document Requirements.**

- A. CSTM-NRM-2.** Keep detailed documentation for the NRMs used in NRM products in the supplier/producer's files for ten calendar years, available for Department review. This documentation must include:
- documentation of the environmental sampling protocol,
  - rationale for including and/or excluding COCs for environmental analyses, and
  - analytical reports documenting that the COCs are at concentrations that meet the certification requirements.
- B. CSTM-NRM-3.** Keep detailed documentation for the NRMs used in NRM products in the supplier/producer's files for ten calendar years, available for Department review. This documentation must include:
- waste characterization data for the NRMs used,
  - tracking methods for incoming sources of NRM used,
  - copy of sampling protocol,
  - rationale for including and/or excluding COCs for environmental analyses,
  - analytical reports, including COCs and concentrations, and
  - Material Safety Data Sheets (MSDS), if available, for the NRM.

**11000.7. Compliance with Waste Management and Recycling Regulations Governed by Other Entities.** The Department does not make environmental regulatory determinations for Contractors or material suppliers. Contractors must ensure that they comply with applicable Department specifications and relevant local, state, and federal regulations, regulatory guidance, laws, and statutes.

The Contractors and supplier/producer must ensure and certify that the generating sources of their NRM comply with waste management and recycling regulations when applicable. The only

generating sources of NRMs currently suitable for recycling into Department projects are non-industrial, compost, petroleum-substance containing, or industrial.

- A. Non-Industrial Generators.** Non-industrial generators include schools, hospitals, churches, dry-cleaners, most service stations, and laboratories serving the public. Regulations for non-industrial generators are located in 30 TAC 330.

The recycling definition for non-industrial generators is expressed in 30 TAC 330.2 as: *Recycling — A process by which materials that have served their intended use or are scrapped, discarded, used, surplus, or obsolete are collected, separated, or processed and returned to use as a raw materials in the production of new products. Except for mixed municipal solid waste composting, that is, composting of the typical mixed solid waste stream generated by residential, commercial, and/or institutional sources, recycling includes the composting process if the compost material is put to beneficial use.*

- B. Compost Generators.** Regulations relevant to compost are located in 30 TAC 312 and 332. The Department allows the use of Class A biosolid compost.

- C. Petroleum-Substance Containing Generators.** Regulations relevant to petroleum-substance contaminated waste generators regulated by the TCEQ, plus environmental guidelines for reuse of certain petroleum-substance wastes in cold- and hot-mix paving applications, are located in 30 TAC 334.

Materials regulated by the Railroad Commission (RRC) in 16 TAC 1 must carry a permit from the RRC and meet Department's engineering and environmental criteria.

- D. Industrial Generators.** Industrial generators include power generation facilities, metal casters and other parts manufacturers, and laboratories serving an industry. Regulations relevant to industrial generators are located in 30 TAC 335.

Industrial generators that want to provide NRM products for Department projects must notify TCEQ of their intent to recycle, using TCEQ Form 0525, "Generator Notification Form For Recycling Hazardous or Industrial Waste," available at:

<http://www.TCEQ.state.tx.us>.

**11000.8. Leachate Concentrations for Traditional Construction Materials, ( $\mu\text{g/L}$ ).** To use this table, select the category for which the NRM product will be substituted. For example, a base product, including foundry sand as a fine aggregate, must not exceed the values shown in the aggregate column (in  $\mu\text{g/L}$ ).

**Table 1**  
**Substitution Table**

<b>Metal</b>	<b>Aggregates</b>	<b>Cementitious Materials</b>	<b>Asphaltic Binders</b>
Aluminum	24,000 <sup>1</sup>	24,000 <sup>1</sup>	24,000 <sup>1</sup>
Antimony	13	6 <sup>1</sup>	6 <sup>1</sup>
Arsenic	10 <sup>1</sup>	10 <sup>1</sup>	10 <sup>1</sup>
Barium	2,007	5,565	2,000 <sup>1</sup>
Beryllium	4 <sup>1</sup>	4 <sup>1</sup>	4 <sup>1</sup>
Cadmium	5 <sup>1</sup>	5 <sup>1</sup>	5 <sup>1</sup>
Chromium	100 <sup>1</sup>	162	100 <sup>1</sup>
Cobalt	1,500 <sup>1</sup>	1,500 <sup>1</sup>	1,500 <sup>1</sup>
Copper	1,300 <sup>1</sup>	1,300 <sup>1</sup>	1,300 <sup>1</sup>
Lead	16	47	15 <sup>1</sup>
Manganese	1,100 <sup>1</sup>	1,100 <sup>1</sup>	1,100 <sup>1</sup>
Mercury	20	3	2 <sup>1</sup>
Molybdenum	120 <sup>1</sup>	237	120 <sup>1</sup>
Nickel	490 <sup>1</sup>	490 <sup>1</sup>	490 <sup>1</sup>
Selenium	50 <sup>1</sup>	77	50 <sup>1</sup>
Silver	120 <sup>1</sup>	120 <sup>1</sup>	120 <sup>1</sup>
Thallium	2 <sup>1</sup>	2 <sup>1</sup>	2 <sup>1</sup>
Vanadium	170 <sup>1</sup>	287	170 <sup>1</sup>
Zinc	7,300 <sup>1</sup>	7,300 <sup>1</sup>	7,300 <sup>1</sup>

1. These numbers represent published risk-based values. Actual testing data resulted in lower levels.

In addition to these standards, conduct tests for other COCs if process knowledge indicates they may be present. Further, if the Contractor becomes aware of any other characteristics that could pose a hazard, the Contractor must reveal this data to Department.

**11000.9. Archived Versions.** Archived versions are available.