

**SUBCHAPTER N: LANDFILL MINING**  
**§§330.601, 330.603, 330.605, 330.607, 330.609, 330.611, 330.613, 330.615**  
**Effective March 27, 2006**

**§330.601. General Requirements.**

All landfill mining operations shall comply with all of the following general requirements.

(1) Operations on a municipal solid waste landfill unit. Landfill mining activities shall be conducted in such a manner that they do not disrupt landfill operations.

(2) Leachate. Leachate found while uncovering buried waste shall be properly disposed of in an authorized facility.

Adopted March 1, 2006

Effective March 27, 2006

**§330.603. Variances.**

(a) In specific cases the executive director may approve a variance from the requirements of this subchapter due to special conditions, if the variance is not contrary to safeguarding the health, welfare, and physical property of the people and to protecting the environment. A variance may not be approved concerning the procedural requirements of this subchapter, including application procedures and the filing of reports, or concerning the provisions of §330.607 of this title (relating to Air Quality Requirements).

(b) A request for a variance must be submitted in writing to the executive director. The request may be made in an application for a registration. Any approval of a variance must be in writing from the executive director.

Adopted March 1, 2006

Effective March 27, 2006

**§330.605. Relationship with Operating Landfills.**

Landfill mining facilities considered to be in conjunction with permitted landfill facilities may be located at municipal solid waste permitted facilities. The owner shall prepare and submit an application for a permit modification in accordance with the provisions of §305.70 of this title (relating to Municipal Solid Waste Permit and Registration Modifications).

Adopted March 1, 2006

Effective March 27, 2006

**§330.607. Air Quality Requirements.**

(a) General requirements.

(1) Any landfill mining process operation that has existing authority under the Texas Clean Air Act does not have to meet the air quality criteria of this subchapter. In accordance with the Texas Health and Safety Code, Texas Clean Air Act, §382.051, any new landfill mining operation that meets all of the applicable requirements of this subchapter is entitled to an air quality standard permit authorization under this subchapter in lieu of the requirement to obtain an air quality permit under Chapter 116 of this title (relating to Control of Air Pollution by Permits for New Construction or Modification).

(2) Those operations that would otherwise be required to obtain air quality authorization under Chapter 116 of this title, which cannot satisfy all of the requirements of this subchapter, shall apply for and obtain air quality authorization in accordance with Chapter 116 of this title in addition to any registration required in this subchapter.

(3) Any operation authorized under this subchapter that is a new major source or any modification that constitutes a major modification under nonattainment review or prevention of significant deterioration review as amended by the Federal Clean Air Act amendments of 1990, and regulations promulgated thereunder, shall be subject to the requirements of Chapter 116 of this title in addition to any registration required in this subchapter.

(4) Operations that do not wish to comply with the requirements of this section are required to apply for and obtain air quality authorization under Chapter 116 of this title. Once a person has applied for and obtained air quality authorization under Chapter 116 of this title, the person is exempt from the air quality requirements of this subchapter.

(5) No person may concurrently hold an air quality permit issued under Chapter 116 of this title and an air quality standard permit authorized under this subchapter for landfill mining operations at the same facility.

(6) The operator of a landfill mining operation operating under an air quality standard permit shall maintain on file at all times within the operating record of the facility documentation that shows compliance with this section.

(b) Air quality standard permit. Landfill mining operations required to obtain authorization under §330.9 of this title (relating to Registration Required) that meet the following requirements are entitled to an air quality standard permit.

(1) All permanent on-site roads shall be watered, treated with dust-suppressant chemicals, or paved and cleaned as necessary to achieve maximum control of dust emissions. Vehicular speeds on non-paved roads shall not exceed ten miles per hour. Leachate and gas condensate are prohibited from use as dust-suppressant.

(2) Prior to processing any material with a high odor potential, the operator shall insure that there are means to prevent nuisance odors from leaving the facility boundaries.

(3) All material shall be conveyed mechanically, or if conveyed pneumatically, the conveying air shall be vented to the atmosphere through a fabric filter(s) having a maximum filtering velocity of 4.0 feet/minute with mechanical cleaning or 7.0 feet/minute with air cleaning.

(4) Except for initial start-up and shut-down, all processing equipment not enclosed inside a building shall be equipped with low-velocity fog nozzles spaced to create a continuous fog curtain or the operator shall have portable watering equipment available during the processing operation. These controls shall be utilized as necessary for maximum control of dust when loading vehicles and stockpiling recyclable material, reusable soil, or waste material. Excavation equipment is not considered as processing equipment. Leachate from process water is prohibited from use as dust-suppressant.

(5) All conveyors that off-load materials from processing equipment at a point that is not enclosed inside a building shall have available a water or mechanical dust suppression system. These controls shall be utilized as necessary for maximum control of dust when stockpiling material.

(6) All activities that could result in increased odor emissions shall be conducted in a manner that does not create nuisance conditions or shall only be conducted inside a building maintained under negative pressure and controlled with a chemical oxidation scrubbing system or bio filter system.

(7) Excavated waste material transported from the landfill facility shall be transported in covered trucks to minimize the loss of material.

Adopted March 1, 2006

Effective March 27, 2006

### **§330.609. Operational Requirements and Design Criteria.**

The operation of the facility shall comply with all of the following operational requirements.

(1) Protection of groundwater. The owner or operator shall install and maintain a liner system constructed in accordance with one of the provisions of subparagraphs (A) or (B) of this paragraph. The liner system shall be provided where receiving, processing, post-processing, screening, and storage areas would be in contact with the ground or in areas where leachate, contaminated materials, contaminated products, or contaminated water is stored or retained. The application shall demonstrate that the facility is designed so as not to contaminate the groundwater and so as to protect the existing groundwater quality from degradation. The owner or operator shall submit a liner quality control plan as specified in §330.339 of this title (relating to Liner Quality Control Plan). For the purposes of this paragraph, protection of the groundwater includes the protection of perched water or shallow surface infiltration. The liner shall be covered with a material designed to withstand normal traffic from the processing operations. The owner or operator of the facility shall demonstrate that any liner system constructed will not undergo uplift from hydrostatic forces during its construction or operational life and that any existing liner system will not undergo uplift from hydrostatic forces during mining operations. Acceptable demonstration methods are listed within §330.337(b)(1) - (4) of this title (relating to Special Liner Design Constraints):

(A) a composite liner consisting of two components. The upper component must consist of a minimum 30 mil geomembrane and the lower component must consist of at least a two-foot layer of compacted soil with a hydraulic conductivity of no more than  $1 \times 10^{-7}$  centimeters/second. Geomembrane components consisting of high density polyethylene shall be at least 60 mil thick. The geomembrane shall be installed in direct and uniform contact with the soil component;

(B) an alternative design approved by the executive director that is protective of groundwater. When approving a design that complies with this subsection, the executive director shall consider at least the following factors:

- (i) the hydrogeologic factors of the area;
- (ii) the climatic factors of the area; and
- (iii) the volume and physical and chemical characteristics of the waste and leachate;

(C) a demonstration that any liner system constructed will not undergo uplift from hydrostatic forces during its construction or operational life and that any existing liner system will not undergo uplift from hydrostatic forces during mining operations. Acceptable demonstration methods are listed within §330.337(b)(1) - (4) of this title;

(D) submission of liner construction certifications as required by §330.341 of this title (relating to Soil Liner Evaluation Report and Geomembrane Liner Evaluation Report).

(2) Prohibited materials. The operator shall operate the recovery process in a manner that will preclude the entry of hazardous constituents. The operator shall not arrange for waste disposal at an unauthorized facility.

(3) Waste slopes. Side slopes of excavations into buried waste for the sake of obtaining material to process shall be no steeper than 34 degrees (per Occupational Safety and Health Administration 1926.652) unless otherwise approved.

(4) Authorization required for significant changes. The operator shall obtain written permission from the executive director before changing the processing method or other significant changes to the original registration application.

(5) Existing systems. On landfills where leachate collection systems, liners, or gas collection systems exist, care must be taken to not destroy or disrupt these systems if it is planned to retain these features on-site, and these systems must remain operational until they are removed.

(6) Soil end-product standards.

(A) Particle sizes found in soil to be beneficially used shall not exceed the screen size and the foreign matter criteria contained §330.615, of this title (relating to Final Soil Product Grades and Allowable Uses).

(B) The operator shall meet processing testing requirements set forth in §330.613 of this title (relating to Sampling and Analysis Requirements for Final Soil Product), final product grades set forth in §330.615 of this title.

(7) Certified operator. The operator shall employ at least one agency-certified landfill operator who shall routinely be available on-site during the hours of operation.

(8) Health and safety coordinator. The operator shall employ at least one health and safety coordinator on a full-time basis to be on-site at least 70% of the time during excavation and waste processing. The health and safety coordinator shall be trained in hazardous waste and emergency response operations.

(9) Personal protection equipment. The operator shall specify personal protection equipment and its operational characteristics and the equipment must be located on-site.

(10) Health and safety plan. Operations must be conducted in accordance with an approved health and safety plan.

(11) Covered trucks. Covered trucks must be used for transporting excavated material off-site.

Adopted March 1, 2006

Effective March 27, 2006

**§330.611. Required Reportings.**

The operator shall submit all of the following.

(1) Annual report. The operator shall submit annual written reports. These reports shall at a minimum include input and output quantities, a description of the soil end-product distribution, and all results of any required laboratory testing. A copy of the annual report shall be kept on-site for a period of five years.

(2) Final soil product testing report. Facilities requiring registration must submit reports on final product testing to the executive director in compliance with §330.613 of this title (relating to Sampling and Analysis Requirements for Final Soil Product) on a quarterly basis.

Adopted March 1, 2006

Effective March 27, 2006

**§330.613. Sampling and Analysis Requirements for Final Soil Product.**

(a) Applicability. Facilities that receive a registration under this subchapter are required to test their final product in accordance with this section.

(b) Analytical methods. Facilities that use analytical methods to characterize their final product must use methods such as those described in the following publications.

(1) Chemical and physical analysis shall utilize:

(A) "Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods" (SW-846); or

(B) "Methods for Chemical Analysis of Water and Wastes" (EPA-600).

(2) Analysis of pathogens shall utilize "Standard Methods for the Examination of Water and Wastewater" (Water Pollution Control Federation, 1995).

(3) Analysis for salinity and pH shall utilize North Central Regional (NCR) Method 14 for Saturated Media Extract Method contained in "Recommended Test Procedure for Greenhouse Growth Media" NCR Publication Number 221 (Revised), Recommended Chemical Soil Test Procedures, Bulletin Number 49 (Revised), October 1988, pages 34-37.

(4) Analysis of total, fixed, and volatile solids shall utilize Method 2540 G (Total, Fixed, and Volatile Solids in Solid and Semi-solid Samples) as described in "Standard Methods for the Examination of Water and Wastewater" (Water Pollution Control Federation, 1995).

(c) Sample collection. Sample collection, preservation, and analysis shall assure valid and representative results in accordance with Subchapter F of this chapter (relating to Analytical Quality Assurance and Quality Control).

(d) Documentation.

(1) Owners or operators of registered facilities shall record and maintain all of the following information regarding their activities of operation for three years after the final product is shipped off-site or upon facility closure:

(A) batch numbers identifying the final product sampling batch;

(B) the quantities, types, and sources of materials processed and the dates processed;

(C) the quantity and final product grade assigned described in §330.615 of this title (relating to Final Soil Product Grades and Allowable Uses);

(D) the date of sampling; and

(E) all analytical data used to characterize the final product, including laboratory quality assurance/quality control data.

(2) The following records shall be maintained on-site permanently or until facility closure:

- (A) sampling plan and procedures;
- (B) training and certification records of staff; and
- (C) final soil product test results.

(3) Records shall be available for inspection by executive director representatives during normal business hours.

(4) The executive director may at any time request by registered or certified mail that a soil generator submit copies of all documentation listed in paragraph (1) of this subsection for auditing the final soil product grade. Documentation requested under this section shall be submitted within ten working days of receipt of the request.

(e) Sampling frequencies. All final soil product must be sampled and assigned a final product grade set forth in §330.615 of this title at a minimum rate of one sample for every 5,000 cubic yard batch of final soil product or annually, whichever is more frequent. Each sample will be a composite of nine grab samples as discussed in subsection (f) of this section.

(f) Sampling requirements. The operator shall utilize the protocol specified in Subchapter F of this chapter. The executive director may at any time request that split samples be provided to an agency representative. Specific sampling requirements that must be satisfied include those listed in paragraphs (1) and (2) of this subsection.

(1) Sampling from stockpiles. One-third of the grab samples shall be taken from the base of the stockpile (at least 12 inches into the pile at ground level), one-third from the exposed surface, and one-third from a depth of two feet from the exposed surface of the stockpile.

(2) Sampling from conveyors. Sampling times shall be selected randomly at frequencies that provide the same number of subsamples per volume of mined soil product as is required in subsection (d) of this section.

(A) If samples are taken from a conveyor belt, the belt shall be stopped at that time. Sampling shall be done along the entire width and depth of the belt.

(B) If samples are taken as the material falls from the end of a conveyor, the conveyor does not need to be stopped. Free-falling samples need to be taken to minimize the bias created as larger particles segregate or heavier particles sink to the bottom as the belt moves. In order to minimize sampling bias, the sample container shall be moved in the shape of a "D" under the falling product to be sampled. The flat portion of the "D" shall be perpendicular to the beltline. The circular portion of the "D" shall be accomplished to return the sampling container to the starting point in a manner so that no product to be sampled is included.

(g) Analytical requirements. The final product subject to the sampling requirements of this section will be tested for all of the following parameters. The executive director may at any time request that additional parameters be tested. These parameters are intended to address public health and environmental protection:

(1) total metals, to include:

- (A) arsenic;
- (B) cadmium;
- (C) chromium;
- (D) copper;
- (E) lead;
- (F) mercury;
- (G) molybdenum;
- (H) nickel;
- (I) selenium; and
- (J) zinc;

(2) weight percent of foreign matter, dry weight basis;

(3) pH by the saturated media extract method;

(4) salinity by the saturated media extract electrical conductivity method;

(5) pathogens:

- (A) salmonella; and
- (B) fecal coliform;

(6) polychlorinated-biphenyls; and

(7) asbestos.

(h) Data precision and accuracy. Analytical data quality shall be established as specified in Subchapter F of this chapter.

(i) Reporting requirements.

(1) Facilities must report the following information to the executive director on a semiannual basis for each sampling batch of final soil product. Reports must include, but may not be limited to, all of the following information:

- (A) batch numbers identifying the final soil product sampling batch;
- (B) the quantities and types of waste materials processed and the dates processed;
- (C) the quantity of final soil product;
- (D) the final soil product grade or permit number of the disposal facility receiving the final product if it is not Grade 1 or Grade 2 as established in §330.615 of this title;
- (E) all analytical results used to characterize the final soil product, including laboratory quality assurance/quality control data and chain-of-custody documentation; and
- (F) the date of sampling.

(2) Reports must be submitted to the executive director within two months after the reporting period ends.

Adopted March 1, 2006

Effective March 27, 2006

**§330.615. Final Soil Product Grades and Allowable Uses.**

(a) Applicability. Facilities that receive a registration under this subchapter are required to test final soil products in accordance with this section.

(b) Final soil product testing. The final soil product shall be regularly tested under §330.613 of this title (relating to Sampling and Analysis Requirements for Final Soil Product) to determine the product's grade. Testing of final product and interpretation of test results shall be conducted in accordance with Subchapter F of this chapter (relating to Analytical Quality Assurance and Quality Control).

(c) Final product classification and usage. The final soil product shall be classified according to the following classification system.

(1) Grade 1 Soil. There are no restrictions on the use of Grade 1 Soil. To be considered Grade 1 Soil, the final product shall meet all of the following criteria:

- (A) shall contain no foreign matter of a size or shape that can cause human or animal injury;

(B) shall not exceed all Maximum Allowable Concentrations for Grade 1 Soil in Table 1 of this subparagraph:

Table 1: Maximum Allowable Concentrations		
PARAMETER	Grade 1 Soil (mg/kg)	Grade 2 Soil (mg/kg)
As	10	41
Cd	16	39
Cr (total)	180	1200
Cu	1020	1500
Pb	300	300
Hg	11	17
Mo	75	75
Ni	160	420
Se	36	36
Zn	2190	2800
PCBs	1	10

(C) shall not contain foreign matter in quantities that cumulatively are greater than 1.5% dry weight on a four millimeter screen;

(D) shall meet the requirements for pathogen reduction for Grade 1 Soil as described in Table 2 of this subparagraph; and

Table 2: Additional Final Product Standards.		
PARAMETER	Grade 1 Soil	Grade 2 Soil
Salinity (mmhos/cm) <sup>1</sup>	10	10
pH <sup>1</sup>	5.0 to 8.5	5.0 to 8.5
Pathogens:		
Fecal Coliform	less than 1,000 MPN per gram of solid or meets PFRP	geometric mean density less than 2,000,000 MPN per gram of solids or meets PSRP
Salmonella	less than 3 MPN per 4 grams total solid or meets PFRP	No value

<sup>1</sup> A higher conductivity or pH outside the indicated range may be appropriate if the soil is specified for a special use.

(E) shall meet the requirements for salinity and pH for Grade 1 Soil as described in Table 2 of subparagraph (D) of this paragraph.

(2) Grade 2 Soil. To be considered Grade 2 Soil, the final product shall meet all of the following criteria:

(A) shall contain no foreign matter of a size or shape that can cause human or animal injury;

(B) shall not exceed all Maximum Allowable Concentrations for Grade 2 Soil in Table 1 of paragraph (1)(B) of this subsection;

(C) shall not contain foreign matter in quantities that cumulatively are greater than 1.5% dry weight on a four millimeter screen;

(D) shall meet the requirements for pathogen reduction for Grade 2 Soil as described in Table 2 of paragraph (1)(D) of this subsection;

(E) shall meet the requirements for salinity and pH for Grade 2 Soil as described in Table 2 of paragraph (1)(D) of this subsection; and

(F) shall not be used at a residence, recreational area, or licensed child-care facility, or for food chain crops.

(3) Waste grade soil. Waste grade soil:

(A) exceeds any one of the Maximum Allowable Concentrations for Grade 2 final product in Table 1 of paragraph (1)(B) of this subsection;

(B) does not meet the other requirements of Grade 1 or Grade 2 Soil; and

(C) shall be appropriately disposed at a permitted municipal solid waste facility.

Adopted March 1, 2006

Effective March 27, 2006