

The Texas Commission on Environmental Quality (commission) adopts amendments to §§330.2, 330.3, 330.14, 330.51, 330.53, 330.56, 330.64, 330.230, 330.231, 330.235, 330.238, 330.242, 330.303 - 330.305, 330.415, and 330.416. Sections 330.2, 330.51, 330.56, 330.238, 330.242, and 330.416 are adopted *with changes* to the proposed text as published in the May 30, 2003 issue of the *Texas Register* (28 TexReg 4238). Sections 330.3, 330.14, 330.53, 330.64, 330.230, 330.231, 330.235, 330.303 - 330.305, and 330.415 are adopted *without changes* to the proposed text and will not be republished.

#### BACKGROUND AND SUMMARY OF THE FACTUAL BASIS FOR THE ADOPTED RULES

Senate Bill (SB) 405, 77th Legislature, established the Texas Board of Professional Geoscientists and the regulation of professional geoscientists. The Texas Geoscience Practice Act (the Act) requires that a person may not take responsible charge of a geoscientific report or a geoscientific portion of a report required by state agency rule unless the person is licensed through the Texas Board of Professional Geoscientists. The primary purpose of the amendments is to establish regulations for the public practice of geoscience in conformance with the Act by requiring a person who prepares and submits geoscientific information to the commission to be a licensed professional geoscientist. The Act also allows certain specified engineers to publicly practice geoscience in conformance with the Act. According to the bill analysis prepared at the time of passage, the ultimate purpose of the Act was public safety through the public registration of the practice of geoscience.

## SECTION BY SECTION DISCUSSION

Adopted §330.2, Definitions, amends the introductory paragraph by deleting the word “shall” and the phrase “unless the context clearly indicates otherwise.” The definition of licensed professional geoscientist is added as new paragraph (67). The definition of qualified groundwater scientist is renumbered as paragraph (107) and revised to replace “scientist or engineer” with “licensed geoscientist or licensed engineer.” The definition of special waste is renumbered as paragraph (135) and revised to update citations. The definitions of commission, EPA, executive director, person, RCRA, and SWDA are deleted because they are defined in 30 TAC §3.2, concerning Definitions, and TWC and TACB are deleted because they are no longer used. The definitions of shall and should are deleted because the Legislative Council’s Drafting Manual discusses the use of shall and certain other words for the purpose of drafting regulatory requirements or prohibitions or authorizing certain powers. The subsequent paragraphs are renumbered accordingly. Administrative changes are made in paragraphs (8), (72), (135), and (137) from proposal to correct punctuation and typographical errors.

The commission adopts several revisions to §330.3, Applicability, including the addition of acronyms (e.g., “MSW” in subsections (a) and (h) and “MSWLFs” in subsection (b)), and correction of references in subsections (c) and (e) - (g). In subsection (f), a change is adopted to indicate that a professional engineer must be licensed to practice in Texas, rather than being registered to practice.

Adopted §330.14, Arid Exemption Process, amends paragraphs (8) and (9) by eliminating the phrase “where appropriate” because the sealing of work done for the public by licensed professional geoscientists or engineers will always be appropriate. The term “groundwater scientist” is substituted

for “groundwater professional” in paragraph (9). Adopted §330.14 also includes several administrative formatting corrections (e.g., correcting the name of the agency from “Texas Water Commission” to “Texas Commission on Environmental Quality”).

Adopted §330.51(d), Permit Application for Municipal Solid Waste Facilities, makes the legal citation to the Act and to the Engineering Practice Act. Subsection (d)(1) states the responsibilities of the responsible engineer more concisely and corrects the section number and title of the citation in the Texas Administrative Code governing the use of engineers’ seals. The commission adopts new subsection (d)(2) which requires the responsible licensed professional geoscientist to seal, sign, and date applicable items as required by the Act and in accordance with any rules subsequently adopted by the Texas Board of Professional Geoscientists concerning geoscientists’ seals. Previously existing subsection (d)(2) is renumbered as subsection (d)(3). An administrative change is made in subsection (a)(2) from proposal to delete a cross-reference title.

The commission adopts amended §330.53(b)(11)(A) to simplify the double preposition. In addition, the commission adopts several administrative revisions, including correction of the statutory citation to the Texas Health and Safety Code, addition of acronyms, addition of introductory clauses for grammatical clarity, and correction of rule references to 30 TAC Chapter 301, concerning Levee Improvement Districts, District Plans of Reclamation, and Levees and Other Improvements.

The commission adopts revisions to §330.56, Attachments to the Site Development Plan, which involve correcting typographical errors and acronyms, rearranging wording and rewording to provide a more

accurate description (e.g., replacing “after-level” with “after-equilibrium” in subsection (d)(5)(C)(i)), and correcting rule references (e.g., changing the reference from §330.200 to §330.241 in subsection (e)(6) - (8) and other rule reference corrections in subsection (k)). Administrative changes are made in subsections (d) and (n) from proposal to correct formatting and typographical errors.

Adopted §330.64, Additional Standard Permit Conditions for Municipal Solid Waste Facilities, requires that all revised drawings prepared by a licensed professional engineer or a licensed professional geoscientist shall be signed and sealed in accordance with the Act. The commission adopts a streamlining measure by deleting existing §330.64(a), because the permit or permit amendment is based on earlier submissions, and the post-permit issuance or post-permit amendment issuance versions of the site development plan are considered to be unnecessary. The remaining subsections are relettered to account for this deletion. Other adopted revisions to §330.64 are the addition of acronyms and the term “executive director” to replace outdated references and streamlining the rule language in §330.64(b) to refer to the application requirements of §330.51(e) instead of repeating those requirements in relettered subsection (b). The commission also adopts adding requirements for geoscientific plans and reports to relettered subsection (b), with similar signing and sealing requirements for geoscientists as are currently required for engineers.

Adopted §330.230, Applicability, corrects rule references and deletes obsolete language. In subsection (a), the commission adds the statement, “Owners and operators of MSWLF units shall comply with the groundwater monitoring requirements of this subchapter.” This statement retains the requirement to

comply with groundwater monitoring requirements which had been specified in previously existing subsections (c) and (d) which are now deleted.

Adopted §330.231(e), Groundwater Monitoring Systems, substitutes “must” for “shall” as discussed previously in this preamble and deletes unneeded language in references.

Adopted §330.235, Assessment Monitoring Program, makes acronym additions and nonsubstantive corrections to rule language and references.

Adopted §330.238, Implementation of the Corrective Action Program, corrects rule references and makes nonsubstantive changes to rule language. Administrative changes are made in subsection (e) from proposal to correct formatting errors.

Adopted §330.242(a), Monitor-Well Construction Specifications, removes an unnecessary hyphen between “solid” and “waste.” Other nonsubstantive changes to rule language are adopted. In subsection (a)(1)(A) and (D), the term “licensed professional geoscientist” is substituted for “qualified geologist.” The commission adopts a rule reference correction in subsection (g) relating to plugging and abandonment of monitoring wells. An administrative change is made in subsection (a)(2)(A) from proposal to spell out an acronym.

Adopted §330.303(b), Fault Areas, replaces the demonstrative adjective “such” with specific references to studies or conditions of differential subsidence or faulting; replaces “geologist” with “licensed

professional geoscientist”; and adds “licensed” before “professional engineer.” Other revisions to §330.303(b) are minor editorial revisions.

Adopted §330.304, Seismic Impact Zones, and adopted §330.305, Unstable Areas, substitute “must” for “shall” as discussed previously in this preamble.

Adopted §330.415(c), Additional Requirements for Municipal Solid Waste Mining Facilities, replaces the phrase “a Registered Professional Engineer” with “the licensed professional engineer”; replaces an indefinite article with the definite article; and requires that all revised geological drawings be signed and sealed by the licensed professional geoscientist responsible for their preparation and included in the loose-leaf binder.

Adopted §330.416(f), Registration Application Preparation, corrects the use of the demonstrative pronoun by substituting “that” for “which” to introduce the restrictive clause describing the soil boring plan; and changes a future tense to present tense. The phrases “soil boring plan” and “site development plan” are lowercased throughout the section. In subsections (a) and (m)(1), the term “registered” is replaced by “licensed” before “professional engineer.” Adopted subsection (m) recognizes the agency accepted use of “groundwater” as a single word; inserts four necessary commas; lowercases the phrase “unified soil classification”; replaces the demonstrative pronoun introducing a restrictive clause by a conjunction; replaces a comma with a semicolon; and substitutes the word “licensed” for “registered” before “professional engineer.” Administrative changes are made in subsections (h) and (m) from proposal to correct formatting and typographical errors.

#### FINAL REGULATORY IMPACT ANALYSIS DETERMINATION

The commission reviewed the adopted rulemaking in light of the regulatory analysis requirements of Texas Government Code, §2001.0225, and determined that the rulemaking is not subject to §2001.0225 because it does not meet the criteria for a “major environmental rule” as defined in that statute.

A “major environmental rule” means a rule, the specific intent of which, is to protect the environment or reduce risks to human health from environmental exposure and that may adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, or the public health and safety of the state or a sector of the state.

The specific intent of the adopted rules is to establish regulations allowing for the public practice of geoscience in agency procedures in conformance with the Act. The Act requires that a person may not take responsible charge of a geoscientific report or a geoscientific portion of a report required by a state agency rule unless the person is licensed through the Texas Board of Professional Geoscientists. The Act also allows certain specified engineers to publicly practice geoscience in conformance with the Act. The adopted rules are not specifically intended to protect the environment or reduce risks to human health. The adopted rules are intended to establish procedures to require that specific reports and necessary data submitted to the commission be produced, signed, sealed, and dated by licensed professional geoscientists who have obtained their licenses through the Texas Board of Professional Geoscientists, and to make other corrections to the rules. Therefore, it is not anticipated that the adopted rules will adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, or the public health and safety of the state or a sector

of the state. The commission concludes that these adopted rules do not meet the definition of major environmental rule.

Furthermore, even if the adopted rulemaking did meet the definition of a major environmental rule, the amendments are not subject to Texas Government Code, §2001.0225, because they do not accomplish any of the four results specified in §2001.0225(a). Section 2001.0225(a) applies to a rule adopted by an agency, the result of which is to: 1) exceed a standard set by federal law, unless the rule is specifically required by state law; 2) exceed an express requirement of state law, unless the rule is specifically required by federal law; 3) exceed a requirement of a delegation agreement or contract between the state and an agency or representative of the federal government to implement a state and federal program; or 4) adopt a rule solely under the general powers of the agency instead of under a specific state law.

In this case, the adopted amendments to Chapter 330 do not meet any of these requirements. First, there are no applicable federal standards that these rules would address. Second, the adopted rules do not exceed an express requirement of state law. Third, there is no delegation agreement that would be exceeded by these adopted rules. Fourth, the commission adopts these rules to allow for the public practice of geoscience in agency procedures in conformance with the Act. Therefore, the commission does not adopt the rules solely under the commission's general powers.

#### TAKINGS IMPACT ASSESSMENT

The commission evaluated these rules and performed an assessment of whether these rules constitute a takings under Texas Government Code, Chapter 2007. The specific intent of the rules is to establish regulations allowing for the public practice of geoscience in agency procedures in conformance with the Act. The rules would substantially advance this stated purpose by requiring that specific reports and necessary data submitted to the commission be produced, signed, sealed, and dated by licensed professional geoscientists who have obtained their licenses through the Texas Board of Professional Geoscientists.

Promulgation and enforcement of these rules would be neither a statutory nor a constitutional taking of private real property. Specifically, the rules do not affect a landowner's rights in private real property by burdening private real property, nor restricting or limiting a landowner's right to property, or reducing the value of property by 25% or more beyond that which would otherwise exist in the absence of the adopted rulemaking. These rules simply require that specific portions of applications or necessary data submitted to the commission be produced, signed, sealed, and dated by a qualified professional individual who has demonstrated his or her qualifications by obtaining a license to engage in the public practice of geoscience from the Texas Board of Professional Geoscientists. The Act also allows certain specified engineers to publicly practice geoscience in conformance with the Act. These rules do not affect any private real property.

There are no burdens imposed on private real property, and the benefits to society are better applications for environmental permits based upon reliable reports and data submitted by qualified licensed professional geoscientists.

#### CONSISTENCY WITH THE COASTAL MANAGEMENT PROGRAM

The commission reviewed the adopted rulemaking and found that the adoption is a rulemaking identified in Coastal Coordination Act Implementation Rules, 31 TAC §505.11(b)(2), relating to Actions and Rules Subject to the Texas Coastal Management Program (CMP), or will affect an action and/or authorization identified in Coastal Coordination Act Implementation Rules, 31 TAC §505.11(a)(6).

The commission prepared a consistency determination for the rules under 31 TAC §505.22 and found that the rulemaking is consistent with the applicable CMP goals and policies. The CMP goal applicable to the rulemaking is the goal to protect, preserve, restore, and enhance the diversity, quality, quantity, functions, and values of coastal natural resource areas. CMP policies applicable to the adopted rules include the construction and operation of solid waste treatment, storage, and disposal facilities, and the discharge of municipal and industrial wastewater to coastal waters. Promulgation and enforcement of these rules will not violate (exceed) any standards identified in the applicable CMP goals and policies because the adopted rule changes do not modify or alter standards set forth in existing rules, and do not govern or authorize any actions subject to the CMP. The adopted rulemaking would require a person who prepares and submits geoscientific information to the agency to be a licensed professional geoscientist. The Act also allows certain specified engineers to publicly practice geoscience in conformance with the Act.

PUBLIC COMMENT

A public hearing was not held on this rulemaking and no comments were received during the comment period, which closed June 30, 2003.

## **SUBCHAPTER A: GENERAL INFORMATION**

### **§§330.2, 330.3, 330.14**

#### **STATUTORY AUTHORITY**

The amendments are adopted under Texas Water Code, §5.103, which provides the commission with the authority to adopt rules necessary to carry out its power and duties under this code and other laws of this state; Texas Water Code, §5.105, which authorizes the commission to establish and approve all general policy of the commission by rule; Texas Health and Safety Code, §361.024, which authorizes the commission to establish standards of operation for the management and control of solid waste; and Texas Civil Statutes, Article 3271b, the Act, which authorizes the public practice of geoscience in the State of Texas.

#### **§330.2. Definitions.**

Unless otherwise noted, all terms contained in this section are defined by their plain meaning. This section contains definitions for terms that appear throughout this chapter. Additional definitions may appear in the specific section to which they apply. As used in this chapter, words in the masculine gender also include the feminine and neuter genders, words in the feminine gender also include the masculine and neuter genders; words in the singular include the plural and words in the plural include the singular. The following words and terms, when used in this chapter, have the following meanings.

(1) **100-year flood** - A flood that has a 1.0% or greater chance of recurring in any given year or a flood of a magnitude equalled or exceeded once in 100 years on the average over a significantly long period.

(2) **Acid** - A substance containing hydrogen that will release hydrogen (hydronium) ions when dissolved in water. Acids will have a pH of less than 7.0 and usually have a sour taste and will cause blue litmus dye to turn red.

(3) **Active life** - The period of operation beginning with the initial receipt of solid waste and ending at certification/completion of closure activities in accordance with §§330.250 - 330.253 of this title (relating to Closure and Post-Closure).

(4) **Active portion** - That part of a facility or unit that has received or is receiving wastes and that has not been closed in accordance with §§330.250 - 330.253 of this title.

(5) **Airport** - A public-use airport open to the public without prior permission and without restrictions within the physical capacities of available facilities.

(6) **Aquifer** - A geological formation, group of formations, or portion of a formation capable of yielding significant quantities of groundwater to wells or springs.

(7) **Areas susceptible to mass movements** - Areas of influence (i.e., areas characterized as having an active or substantial possibility of mass movement) where the movement of earth material at, beneath, or adjacent to the municipal solid waste landfill unit, because of natural or man-induced events, results in the downslope transport of soil and rock material by means of gravitational influence. Areas of mass movement include, but are not limited to, landslides, avalanches, debris slides and flows, soil fluctuation, block sliding, and rock fall.

(8) **Asbestos-containing materials** - Include the following.

(A) Category I nonfriable asbestos-containing material (ACM) means asbestos-containing packings, gaskets, resilient floor covering, and asphalt roofing products containing more than 1.0% asbestos as determined using the method specified in Appendix A, Subpart F, 40 Code of Federal Regulations (CFR), Part 763, §1, Polarized Light Microscopy (40 CFR Part 763, §1).

(B) Category II nonfriable ACM means any material, excluding Category I nonfriable ACM, containing more than 1.0% asbestos as determined using the methods specified in 40 CFR Part 763, §1, that, when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure.

(C) Friable ACM means any material containing more than 1.0% asbestos that, when dry, can be crumbled, pulverized, or reduced to powder by hand pressure.

(D) Nonfriable ACM means any material containing more than 1.0% asbestos that, when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure.

(9) **ASTM** - The American Society of Testing and Materials.

(10) **Battery** - An electrochemical device that generates electric current by converting chemical energy. Its essential components are positive and negative electrodes made of more or less electrically conductive materials, a separate medium, and an electrolyte. There are four major types:

(A) primary batteries (dry cells);

(B) storage or secondary batteries;

(C) nuclear and solar cells or energy converters; and

(D) fuel cells.

(11) **Battery acid (also known as electrolyte acid)** - A solution of not more than 47% sulfuric acid in water suitable for use in storage batteries, which is water white, odorless, and practically free from iron.

(12) **Battery retailer** - A person or business location that sells lead-acid batteries to the general public, without restrictions to limit purchases to institutional or industrial clients only.

(13) **Battery wholesaler** - A person or business location that sells lead-acid batteries directly to battery retailers, to government entities by contract sale, or to large-volume users, either directly or by contract sale.

(14) **Bird hazard** - An increase in the likelihood of bird/aircraft collisions that may cause damage to an aircraft or injury to its occupants.

(15) **Brush** - Cuttings or trimmings from trees, shrubs, or lawns and similar materials.

(16) **Buffer zone** - A zone free of municipal solid waste processing and disposal activities adjacent to the site boundary.

(17) **CFR** - Code of Federal Regulations.

(18) **Citizens' collection station** - A facility established for the convenience and exclusive use of residents (not commercial or industrial users or collection vehicles). The facility may consist of one or more storage containers, bins, or trailers.

(19) **Class I industrial solid waste** - See industrial solid waste.

(20) **Collection** - The act of removing solid waste (or materials that have been separated for the purpose of recycling) for transport elsewhere.

(21) **Collection system** - The total process of collecting and transporting solid waste. It includes storage containers; collection crews, vehicles, equipment and management; and operating procedures. Systems are classified as municipal, contractor, or private.

(22) **Commercial solid waste** - All types of solid waste generated by stores, offices, restaurants, warehouses, and other nonmanufacturing activities, excluding residential and industrial wastes.

(23) **Compacted waste** - Waste that has been reduced in volume by a collection vehicle or other means including, but not limited to, dewatering, composting, incineration, and similar processes, with the exception of waste that has been reduced in volume by a small, in-house compactor device owned and/or operated by the generator of the waste.

(24) **Composite liner** - A liner system consisting of two components: the upper component must consist of a minimum 30-mil flexible membrane liner (FML) or minimum 60-mil high-density polyethylene and the lower component must consist of at least a two-foot layer of compacted soil with a hydraulic conductivity of no more than  $1 \times 10^{-7}$  cm/sec. The FML component must be installed in direct and uniform contact with the compacted soil component.

(25) **Compost** - The stabilized product of the decomposition process that is used or sold for use as a soil amendment, artificial top soil, growing medium amendment, or other similar uses.

(26) **Composting** - The controlled biological decomposition of organic materials through microbial activity.

(27) **Conditionally exempt small-quantity generator** - A person who generates no more than 220 pounds of hazardous waste in a calendar month.

(28) **Construction-demolition waste** - Waste resulting from construction or demolition projects; includes all materials that are directly or indirectly the by-products of construction work or that result from demolition of buildings and other structures, including, but not limited to, paper, cartons, gypsum board, wood, excelsior, rubber, and plastics.

(29) **Contaminate** - The man-made or man-induced alteration of the chemical, physical, biological, or radiological integrity of ground or surface water.

(30) **Controlled burning** - The combustion of solid waste with control of combustion air to maintain adequate temperature for efficient combustion; containment of the combustion reaction in an enclosed device to provide sufficient residence time and mixing for complete combustion; and control of the emission of the combustion products, i.e., incineration in an incinerator.

(31) **Discard** - To abandon a material and not use, reuse, reclaim, or recycle it. A material is abandoned by being disposed of; burned or incinerated (except where the material is being burned as a fuel for the purpose of recovering usable energy); or physically, chemically, or biologically treated (other than burned or incinerated) in lieu of or prior to being disposed.

(32) **Discharge** - Includes deposit, conduct, drain, emit, throw, run, allow to seep, or otherwise release, or to allow, permit, or suffer any of these acts or omissions.

(33) **Discharge of dredged material** - Any addition of dredged material into the waters of the United States. The term includes, without limitation, the addition of dredged material to a specified disposal site located in waters of the United States and the runoff or overflow from a contained land or water disposal area.

(34) **Discharge of fill material** - The addition of fill material into waters of the United States. The term generally includes placement of fill necessary to the construction of any structure in waters of the United States: the building of any structure or improvement requiring rock, sand, dirt, or other inert material for its construction; the building of dams, dikes, levees, and riprap.

(35) **Discharge of pollutant** - Any addition of any pollutant to navigable waters from any point source or any addition of any pollutant to the waters of the contiguous zone or the ocean from any point source.

(36) **Displacement** - The measured or estimated distance between two formerly adjacent points situated on opposite walls of a fault (synonymous with net slip).

(37) **Disposal** - The discharge, deposit, injection, dumping, spilling, leaking, or placing of any solid waste or hazardous waste (whether containerized or uncontainerized) into or on any land or water so that such solid waste or hazardous waste or any constituent thereof may enter the environment or be emitted into the air or discharged into any waters, including groundwater.

(38) **Dredged material** - Material that is excavated or dredged from waters of the United States.

(39) **Drinking-water intake** - The point at which water is withdrawn from any water well, spring, or surface water body for use as drinking water for humans, including standby public water supplies.

(40) **Elements of nature** - Rainfall, snow, sleet, hail, wind, sunlight, or other natural phenomenon.

(41) **Endangered or threatened species** - Any species listed as such under Federal Endangered Species Act, §4, 16 United States Code, §1536, as amended or under the Texas Endangered Species Act.

(42) **Essentially insoluble** - Any material that, if representatively sampled and placed in static or dynamic contact with deionized water at ambient temperature for seven days, will not leach any quantity of any constituent of the material into the water in excess of the maximum contaminant levels in 40 Code of Federal Regulations (CFR) Part 141, Subparts B and G, and 40 CFR Part 143 for total dissolved solids.

(43) **Existing municipal solid waste landfill unit** - Any municipal solid waste landfill unit that received solid waste as of October 9, 1993. Waste placement in existing units must be consistent with past operating practices or modified practices to ensure good management.

(44) **Experimental project** - Any new proposed method of managing municipal solid waste, including resource and energy recovery projects, that appears to have sufficient merit to warrant commission approval.

(45) **Facility** - All contiguous land and structures, other appurtenances, and improvements on the land used for the storage, processing, or disposal of solid waste.

(46) **Fault** - A fracture or a zone of fractures in any material along which strata, rocks, or soils on one side have been displaced with respect to those on the other side.

(47) **Fill material** - Any material used for the primary purpose of filling an excavation.

(48) **Floodplain** - The lowland and relatively flat areas adjoining inland and coastal waters, including flood-prone areas of offshore islands, that are inundated by the 100-year flood.

(49) **Garbage** - Solid waste consisting of putrescible animal and vegetable waste materials resulting from the handling, preparation, cooking, and consumption of food, including waste materials from markets, storage facilities, handling, and sale of produce and other food products.

(50) **Gas condensate** - The liquid generated as a result of any gas recovery process at a municipal solid waste facility.

(51) **Generator** - Any person, by site or location, whose act or process produces a solid waste or first causes it to become regulated.

(52) **Groundwater** - Water below the land surface in a zone of saturation.

(53) **Hazardous waste** - Any solid waste identified or listed as a hazardous waste by the administrator of the EPA under the federal Solid Waste Disposal Act, as amended by RCRA, 42 United States Code, §§6901 *et seq.*, as amended.

(54) **Holocene** - The most recent epoch of the Quaternary Period, extending from the end of the Pleistocene Epoch to the present.

(55) **Household waste** - Any solid waste (including garbage, trash, and sanitary waste in septic tanks) derived from households (including single and multiple residences, hotels, and motels, bunkhouses, ranger stations, crew quarters, campgrounds, picnic grounds, and day-use recreation areas); does not include yard waste or brush that is completely free of any household wastes.

(56) **Industrial hazardous waste** - Hazardous waste determined to be of industrial origin.

(57) **Industrial solid waste** - Solid waste resulting from or incidental to any process of industry or manufacturing, or mining or agricultural operations, classified as follows.

(A) Class I industrial solid waste or Class I waste is any industrial solid waste designated as Class I by the executive director as any industrial solid waste or mixture of industrial solid wastes that because of its concentration or physical or chemical characteristics is toxic, corrosive, flammable, a strong sensitizer or irritant, a generator of sudden pressure by decomposition, heat, or other means, and may pose a substantial present or potential danger to human health or the environment when improperly processed, stored, transported, or otherwise managed, including hazardous industrial waste, as defined in §335.1 of this title (relating to Definitions) and §335.505 of this title (relating to Class 1 Waste Determination).

(B) Class II industrial solid waste is any individual solid waste or combination of industrial solid wastes that cannot be described as Class I or Class III, as defined in §335.506 of this title (relating to Class 2 Waste Determination).

(C) Class III industrial solid waste is any inert and essentially insoluble industrial solid waste, including materials such as rock, brick, glass, dirt, and certain plastics and rubber, etc., that are not readily decomposable as defined in §335.507 of this title (relating to Class 3 Waste Determination).

(58) **Inert material** - A naturally occurring nonputrescible material that is essentially insoluble such as soil, dirt, clay, sand, gravel, and rock.

(59) **In situ** - In natural or original position.

(60) **Karst terrain** - An area where karst topography, with its characteristic surface and/or subterranean features, is developed principally as the result of dissolution of limestone, dolomite, or other soluble rock. Characteristic physiographic features present in karst terrains include, but are not limited to, sinkholes, sinking streams, caves, large springs, and blind valleys.

(61) **Lateral expansion** - A horizontal expansion of the waste boundaries of an existing municipal solid waste landfill unit.

(62) **Land application of solid waste** - The disposal or use of solid waste (including, but not limited to, sludge or septic tank pumpings or mixture of shredded waste and sludge) in which the solid waste is applied within three feet of the surface of the land.

(63) **Leachate** - A liquid that has passed through or emerged from solid waste and contains soluble, suspended, or miscible materials removed from such waste.

(64) **Lead** - The metal element, atomic number 82, atomic weight 207.2, with the chemical symbol Pb.

(65) **Lead acid battery** - A secondary or storage battery that uses lead as the electrode and dilute sulfuric acid as the electrolyte and is used to generate electrical current.

(66) **License** -

(A) A document issued by an approved county authorizing and governing the operation and maintenance of a municipal solid waste facility used to process, treat, store, or dispose of municipal solid waste, other than hazardous waste, in an area not in the territorial limits or extraterritorial jurisdiction of a municipality.

(B) An occupational license as defined in Chapter 30 of this title (relating to Occupational Licenses and Registrations).

(67) **Licensed professional geoscientist** - A geoscientist who maintains a current license through the Texas Board of Professional Geoscientists in accordance with its requirements for professional practice.

(68) **Liquid waste** - Any waste material that is determined to contain “free liquids” as defined by EPA Method 9095 (Paint Filter Test), as described in “Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods” (EPA Publication Number SW-846).

(69) **Litter** - Rubbish and putrescible waste.

(70) **Lower explosive limit** - The lowest percent by volume of a mixture of explosive gases in air that will propagate a flame at 25 degrees Celsius and atmospheric pressure.

(71) **Man-made inert material** - Those non-putrescible, essentially insoluble materials fabricated by man that are not included under the definition of rubbish.

(72) **Medical waste** - Waste generated by health care-related facilities and associated with health care activities, not including garbage or rubbish generated from offices, kitchens, or other non-health care activities. The term includes special waste from health care-related facilities which is comprised of animal waste, bulk blood and blood products, microbiological waste, pathological waste, and sharps as those terms are defined in 25 TAC §1.132 (relating to Definitions). The term does not include medical waste produced on farmland and ranchland as defined in Agriculture Code,

§252.001(6) (Definitions - Farmland or ranchland), nor does the term include artificial, nonhuman materials removed from a patient and requested by the patient, including, but not limited to, orthopedic devices and breast implants.

(73) **Monofill** - A landfill or landfill trench into which only one type of waste is placed.

(74) **MSWLF** - Municipal solid waste landfill facility.

(75) **Municipal hazardous waste** - Any municipal solid waste or mixture of municipal solid wastes that has been identified or listed as a hazardous waste by the administrator of the EPA.

(76) **Municipal solid waste** - Solid waste resulting from, or incidental to, municipal, community, commercial, institutional, and recreational activities, including garbage, rubbish, ashes, street cleanings, dead animals, abandoned automobiles, and all other solid waste other than industrial solid waste.

(77) **Municipal solid waste facility** - All contiguous land, structures, other appurtenances, and improvements on the land used for processing, storing, or disposing of solid waste. A facility may be publicly or privately owned and may consist of several processing, storage, or disposal operational units, e.g., one or more landfills, surface impoundments, or combinations of them.

(78) **Municipal solid waste landfill unit** - A discrete area of land or an excavation that receives household waste and that is not a land application unit, surface impoundment, injection well, or waste pile, as those terms are defined under 40 Code of Federal Regulations §257.2. A municipal solid waste landfill (MSWLF) unit also may receive other types of RCRA Subtitle D wastes, such as commercial solid waste, nonhazardous sludge, conditionally exempt small-quantity generator waste, and industrial solid waste. Such a landfill may be publicly or privately owned. An MSWLF unit may be a new MSWLF unit, an existing MSWLF unit, or a lateral expansion.

(79) **Municipal solid waste site** - A plot of ground designated or used for the processing, storage, or disposal of solid waste.

(80) **Navigable waters** - The waters of the United States, including the territorial seas.

(81) **New municipal solid waste landfill unit** - Any municipal solid waste landfill unit that has not received waste prior to October 9, 1993.

(82) **Nonpoint source** - Any origin from which pollutants emanate in an unconfined and unchanneled manner, including, but not limited to, surface runoff and leachate seeps.

(83) **Non-RACM** - Non-regulated asbestos-containing material as defined in 40 Code of Federal Regulations Part 61. This is asbestos material in a form such that potential health risks resulting from exposure to it are minimal.

(84) **Nuisance** - Municipal solid waste that is stored, processed, or disposed of in a manner that causes the pollution of the surrounding land, the contamination of groundwater or surface water, the breeding of insects or rodents, or the creation of odors adverse to human health, safety, or welfare.

(85) **Open burning** - The combustion of solid waste without:

(A) control of combustion air to maintain adequate temperature for efficient combustion;

(B) containment of the combustion reaction in an enclosed device to provide sufficient residence time and mixing for complete combustion; and

(C) control of the emission of the combustion products.

(86) **Operate** - To conduct, work, run, manage, or control.

(87) **Operating record** - All plans, submittals, and correspondence for a municipal solid waste landfill facility required under this chapter; required to be maintained at the facility or at a nearby site acceptable to the executive director.

(88) **Operation** - A municipal solid waste site or facility is considered to be in operation from the date that solid waste is first received or deposited at the municipal solid waste site or facility until the date that the site or facility is properly closed in accordance with this chapter.

(89) **Operator** - The person(s) responsible for operating the facility or part of a facility.

(90) **Opposed case** - A case when one or more parties appear, or make their appearance, in opposition to an application and are designated as opponent parties by the hearing examiner either at or before the public hearing on the application.

(91) **Other regulated medical waste** - Medical waste that is not included within special waste from health care-related facilities but that is subject to special handling requirements within the generating facility by other state or federal agencies, excluding medical waste subject to 25 TAC Chapter 289 (concerning Radiation Control).

(92) **Owner** - The person who owns a facility or part of a facility.

(93) **PCB** - Polychlorinated biphenyl molecule.

(94) **Polychlorinated biphenyl waste(s)** - Those polychlorinated biphenyls (PCBs) and PCB items that are subject to the disposal requirements of 40 Code of Federal Regulations (CFR) Part

761. Substances that are regulated by 40 CFR Part 761 include, but are not limited to: PCB articles, PCB article containers, PCB containers, PCB-contaminated electrical equipment, PCB equipment, PCB transformers, recycled PCBs, capacitors, microwave ovens, electronic equipment, and light ballasts and fixtures.

(95) **Permit** - A written permit issued by the commission that, by its conditions, may authorize the owner or operator to construct, install, modify, or operate a specified municipal solid waste storage, processing, or disposal facility in accordance with specific limitations.

(96) **Point of compliance** - A vertical surface located no more than 500 feet from the hydraulically downgradient limit of the waste management unit boundary, extending down through the uppermost aquifer underlying the regulated units, and located on land owned by the owner of the permitted facility.

(97) **Point source** - Any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, or discrete fissure from which pollutants are or may be discharged.

(98) **Pollutant** - Contaminated dredged spoil, solid waste, contaminated incinerator residue, sewage, sewage sludge, munitions, chemical wastes, or biological materials discharged into water.

(99) **Pollution** - The man-made or man-induced alteration of the chemical, physical, biological, or radiological integrity of an aquatic ecosystem.

(100) **Poor foundation conditions** - Areas where features exist which indicate that a natural or man-induced event may result in inadequate foundation support for the structural components of a municipal solid waste landfill unit.

(101) **Population equivalent** - The hypothetical population that would generate an amount of solid waste equivalent to that actually being managed based on a generation rate of five pounds per capita per day and applied to situations involving solid waste not necessarily generated by individuals. It is assumed, for the purpose of these sections, that the average volume per ton of waste entering a municipal solid waste disposal facility is three cubic yards. For the purposes of these sections, the following population equivalents shall apply:

(A) 8,000 persons - 20 tons per day or 60 cubic yards per day;

(B) 5,000 persons - 12 1/2 tons or 37 1/2 cubic yards per day;

(C) 1,500 persons - 3 3/4 tons or 11 1/4 cubic yards per day;

(D) 1,000 persons - 225 pounds of wastewater treatment plant sludge per day (dry-weight basis).

(102) **Post-consumer waste** - A material or product that has served its intended use and has been discarded after passing through the hands of a final user. For the purposes of this subchapter, the term does not include industrial or hazardous waste.

(103) **Premises** - A tract of land with the buildings thereon, or a building or part of a building with its grounds or other appurtenances.

(104) **Processing** - Activities including, but not limited to, the extraction of materials, transfer, volume reduction, conversion to energy, or other separation and preparation of solid waste for reuse or disposal, including the treatment or neutralization of hazardous waste, designed to change the physical, chemical, or biological character or composition of any hazardous waste to neutralize such waste, or to recover energy or material from the waste, or to render such waste nonhazardous or less hazardous; safer to transport, store, dispose of, or make it amenable for recovery, amenable for storage, or reduced in volume. Unless the executive director determines that regulation of such activity under these rules is necessary to protect human health or the environment, the definition of “processing” does not include activities relating to those materials exempted by the administrator of the EPA under the federal Solid Waste Disposal Act, as amended by RCRA, 42 United States Code, §§6901 *et seq.*, as amended.

(105) **Public highway** - The entire width between property lines of any road, street, way, thoroughfare, bridge, public beach, or park in this state, not privately owned or controlled, if any part of the road, street, way, thoroughfare, bridge, public beach, or park is opened to the public for

vehicular traffic, is used as a public recreational area, or is under the state's legislative jurisdiction through its police power.

(106) **Putrescible waste** - Organic wastes, such as garbage, wastewater treatment plant sludge, and grease trap waste, that is capable of being decomposed by microorganisms with sufficient rapidity as to cause odors or gases or is capable of providing food for or attracting birds, animals, and disease vectors.

(107) **Qualified groundwater scientist** - A licensed geoscientist or licensed engineer who has received a baccalaureate or post-graduate degree in the natural sciences or engineering and has sufficient training in groundwater hydrology and related fields as may be demonstrated by state registration, professional certifications, or completion of accredited university programs that enable the individual to make sound professional judgments regarding groundwater monitoring, contaminant fate and transport, and corrective action.

(108) **RACM** - Regulated asbestos-containing material as defined in 40 Code of Federal Regulations Part 61, as amended, includes: friable asbestos material, Category I nonfriable asbestos-containing material (ACM) that has become friable; Category I nonfriable ACM that will be, or has been, subjected to sanding, grinding, cutting, or abrading; or Category II nonfriable ACM that has a high probability of becoming, or has become, crumbled, pulverized, or reduced to powder by the forces expected to act on the material in the course of demolition or renovation operations.

(109) **Radioactive waste** - Waste that requires specific licensing under Texas Health and Safety Code, Chapter 401, and the rules adopted by the commission under that law.

(110) **Recyclable material** - A material that has been recovered or diverted from the nonhazardous waste stream for purposes of reuse, recycling, or reclamation, a substantial portion of which is consistently used in the manufacture of products that may otherwise be produced using raw or virgin materials. Recyclable material is not solid waste. However, recyclable material may become solid waste at such time, if any, as it is abandoned or disposed of rather than recycled, whereupon it will be solid waste with respect only to the party actually abandoning or disposing of the material.

(111) **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 in the form of 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.

(112) **Refuse** - Same as rubbish.

(113) **Registration** - The act of filing information for specific solid waste management activities that do not require a permit, as determined by this chapter.

(114) **Regulated hazardous waste** - A solid waste that is a hazardous waste as defined in 40 Code of Federal Regulations (CFR) §261.3, and that is not excluded from regulation as a hazardous waste under 40 CFR §261.4(b), or that was not generated by a conditionally exempt small-quantity generator.

(115) **Relevant point of compliance** - See point of compliance.

(116) **Resource recovery** - The recovery of material or energy from solid waste.

(117) **Resource recovery site** - A solid waste processing site at which solid waste is processed for the purpose of extracting, converting to energy, or otherwise separating and preparing solid waste for reuse.

(118) **Rubbish** - Nonputrescible solid waste (excluding ashes), consisting of both combustible and noncombustible waste materials. Combustible rubbish includes paper, rags, cartons, wood, excelsior, furniture, rubber, plastics, yard trimmings, leaves, or similar materials; noncombustible rubbish includes glass, crockery, tin cans, aluminum cans, metal furniture, and similar materials that will not burn at ordinary incinerator temperatures (1,600 degrees Fahrenheit to 1,800 degrees Fahrenheit).

(119) **Run-off** - Any rainwater, leachate, or other liquid that drains over land from any part of a facility.

(120) **Run-on** - Any rainwater, leachate, or other liquid that drains over land onto any part of a facility.

(121) **Salvaging** - The controlled removal of waste materials for utilization, recycling, or sale.

(122) **Saturated zone** - That part of the earth's crust in which all voids are filled with water.

(123) **Scavenging** - The uncontrolled and unauthorized removal of materials at any point in the solid waste management system.

(124) **Scrap tire** - Any tire that can no longer be used for its original intended purpose.

(125) **Seasonal high water table** - The highest measured or calculated water level in an aquifer during investigations for a permit application and/or any groundwater characterization studies at a site.

(126) **Septage** - The liquid and solid material pumped from a septic tank, cesspool, or similar sewage treatment system.

(127) **Site** - Same as facility.

(128) **Site development plan** - A document, prepared by the design engineer, that provides a detailed design with supporting calculations and data for the development and operation of a solid waste site.

(129) **Site operating plan** - A document, prepared by the design engineer in collaboration with the site operator, that provides guidance to site management and operating personnel in sufficient detail to enable them to conduct day-to-day operations throughout the life of the site in a manner consistent with the engineer's design and the commission's regulations.

(130) **Site operator** - The holder of, or the applicant for, a permit (or license) for a municipal solid waste site.

(131) **Sludge** - Any solid, semi-solid, or liquid waste generated from a municipal, commercial, or industrial wastewater treatment plant, water-supply treatment plant, or air pollution control facility, exclusive of the treated effluent from a wastewater treatment plant.

(132) **Small municipal solid waste landfill** - A municipal solid waste landfill at which less than 20 tons of municipal solid waste are disposed of daily based on an annual average.

(133) **Solid waste** - Garbage, rubbish, refuse, sludge from a wastewater treatment plant, water supply treatment plant, or air pollution control facility, and other discarded material, including solid, liquid, semi-solid, or contained gaseous material resulting from industrial, municipal, commercial, mining, and agricultural operations and from community and institutional activities. The term does not include:

(A) solid or dissolved material in domestic sewage, or solid or dissolved material in irrigation return flows, or industrial discharges subject to regulation by permit issued under Texas Water Code, Chapter 26;

(B) soil, dirt, rock, sand, and other natural or man-made inert solid materials used to fill land if the object of the fill is to make the land suitable for the construction of surface improvements; or

(C) waste materials that result from activities associated with the exploration, development, or production of oil or gas or geothermal resources and other substance or material regulated by the Railroad Commission of Texas under [the] Natural Resources Code, §91.101, unless the waste, substance, or material results from activities associated with gasoline plants, natural gas liquids processing plants, pressure maintenance plants, or repressurizing plants and is hazardous waste as defined by the administrator of the EPA under the federal Solid Waste Disposal Act, as amended by RCRA, as amended (42 United States Code, §§6901 *et seq.*).

(134) **Source-separated recyclable material** - Recyclable material from residential, commercial, municipal, institutional, recreational, industrial, and other community activities, that at the point of generation has been separated, collected, and transported separately from municipal solid waste, or transported in the same vehicle as municipal solid waste, but in separate containers or compartments. Source-separation does not require the recovery or separation of non-recyclable components that are integral to a recyclable product, including:

(A) the non-recyclable components of white goods, whole computers, whole automobiles, or other manufactured items for which dismantling and separation of recyclable from non-recyclable components by the generator are impractical, such as insulation or electronic components in white goods;

(B) source-separated recyclable material rendered unmarketable by damage during collection, unloading, and sorting, such as broken recyclable glass; and

(C) tramp materials, such as:

(i) glass from recyclable metal windows;

(ii) nails and roofing felt attached to recyclable shingles;

(iii) nails and sheetrock attached to recyclable lumber generated through the demolition of buildings; and

(iv) pallets and packaging materials.

(135) **Special waste** - Any solid waste or combination of solid wastes that because of its quantity, concentration, physical or chemical characteristics, or biological properties requires special handling and disposal to protect the human health or the environment. If improperly handled, transported, stored, processed, or disposed of or otherwise managed, it may pose a present or potential danger to the human health or the environment. Special wastes are:

(A) hazardous waste from conditionally exempt small-quantity generators that may be exempt from full controls under §§335.401 - 335.403 and 335.405 - 335.412 of this title (relating to Household Materials Which Could Be Classified as Hazardous Wastes);

(B) Class I industrial nonhazardous waste not routinely collected with municipal solid waste;

(C) special waste from health care-related facilities (refers to certain items of medical waste);

(D) municipal wastewater treatment plant sludges, other types of domestic sewage treatment plant sludges, and water-supply treatment plant sludges;

(E) septic tank pumpings;

(F) grease and grit trap wastes;

(G) wastes from commercial or industrial wastewater treatment plants; air pollution control facilities; and tanks, drums, or containers, used for shipping or storing any material that has been listed as a hazardous constituent in 40 Code of Federal Regulations (CFR), Part 261, Appendix VIII but has not been listed as a commercial chemical product in 40 CFR §261.33(e) or (f);

(H) slaughterhouse wastes;

(I) dead animals;

(J) drugs, contaminated foods, or contaminated beverages, other than those contained in normal household waste;

(K) pesticide (insecticide, herbicide, fungicide, or rodenticide) containers;

(L) discarded materials containing asbestos;

(M) incinerator ash;

(N) soil contaminated by petroleum products, crude oils, or chemicals;

(O) used oil;

(P) light ballasts and/or small capacitors containing polychlorinated biphenyl compounds;

(Q) waste from oil, gas, and geothermal activities subject to regulation by the Railroad Commission of Texas when those wastes are to be processed, treated, or disposed of at a solid waste management facility permitted under this chapter;

(R) waste generated outside the boundaries of Texas that contains:

(i) any industrial waste;

(ii) any waste associated with oil, gas, and geothermal exploration, production, or development activities; or

(iii) any item listed as a special waste in this paragraph;

(S) any waste stream other than household or commercial garbage, refuse, or rubbish;

(T) lead acid storage batteries; and

(U) used-oil filters from internal combustion engines.

(136) **Special waste from health care-related facilities** - Includes animal waste, bulk human blood, blood products, body fluids, microbiological waste, pathological waste, and sharps as defined in 25 TAC §1.132 (concerning Definitions).

(137) **Stabilized sludges** - Those sludges processed to significantly reduce pathogens, by processes specified in 40 Code of Federal Regulations Part 257, Appendix II.

(138) **Storage** - The holding of solid waste for a temporary period, at the end of which the solid waste is processed, disposed of, or stored elsewhere. Facilities established as a neighborhood collection point for only nonputrescible source-separated recyclable material, as a collection point for consolidation of parking lot or street sweepings or wastes collected and received in sealed plastic bags from such activities as periodic city-wide cleanup campaigns and cleanup of rights-of-way or roadside parks, or for accumulation of used or scrap tires prior to transportation to a processing or disposal site are considered examples of storage facilities. Storage includes operation of pre-collection and post-collection as follows:

(A) pre-collection - that storage by the generator, normally on his premises, prior to initial collection;

(B) post-collection - that storage by a transporter or processor, at a processing site, while the waste is awaiting processing or transfer to another storage, disposal, or recovery facility.

(139) **Storage battery** - A secondary battery, so called because the conversion from chemical to electrical energy is reversible and the battery is thus rechargeable. Secondary or storage batteries contain an electrode made of sponge lead and lead dioxide, nickel-iron, nickel-cadmium, silver-zinc, or silver-cadmium. The electrolyte used is sulfuric acid. Other types of storage batteries contain lithium, sodium-liquid sulfur, or chlorine-zinc using titanium electrodes.

(140) **Store** - To keep, hold, accumulate, or aggregate.

(141) **Structural components** - Liners, leachate collections systems, final covers, run-on/run-off systems, and any other component used in the construction and operation of the municipal solid waste landfill that is necessary for protection of human health and the environment.

(142) **Surface impoundment** - A facility or part of a facility that is a natural topographic depression, human-made excavation, or diked area formed primarily of earthen materials (although it may be lined with human-made materials) that is designed to hold an accumulation of liquids; examples include holding, storage, settling, and aeration pits, ponds, or lagoons.

(143) **Surface water** - Surface water as included in water in the state.

(144) **Texas Civil Statutes** - Vernon's Texas Revised Civil Statutes Annotated.

(145) **Transfer station** - A fixed facility used for transferring solid waste from collection vehicles to long-haul vehicles (one transportation unit to another transportation unit). It is not a storage facility such as one where individual residents can dispose of their wastes in bulk storage containers that are serviced by collection vehicles.

(146) **Transportation unit** - A truck, trailer, open-top box, enclosed container, rail car, piggy-back trailer, ship, barge, or other transportation vehicle used to contain solid waste being transported from one geographical area to another.

(147) **Transporter** - A person who collects and transports solid waste; does not include a person transporting his or her household waste.

(148) **Trash** - Same as Rubbish.

(149) **Treatment** - Same as Processing.

(150) **Triple rinse** - To rinse a container three times using a volume of solvent capable of removing the contents equal to 10% of the volume of the container or liner for each rinse.

(151) **Uncompacted waste** - Any waste that is not a liquid or a sludge, has not been mechanically compacted by a collection vehicle, has not been driven over by heavy equipment prior to collection, or has not been compacted prior to collection by any type of mechanical device other than small, in-house compactor devices owned and/or operated by the generator of the waste.

(152) **Unified soil classification system** - The standardized system devised by the United States Army Corps of Engineers for classifying soil types.

(153) **Unconfined water** - Water that is not controlled or impeded in its direction or velocity.

(154) **Unit** - Municipal solid waste landfill unit.

(155) **Unstable area** - A location that is susceptible to natural or human-induced events or forces capable of impairing the integrity of some or all of the landfill structural components responsible for preventing releases from a landfill. Unstable areas can include poor foundation conditions, areas susceptible to mass movements, and karst terrains.

(156) **Uppermost aquifer** - The geologic formation nearest the natural ground surface that is an aquifer; includes lower aquifers that are hydraulically interconnected with this aquifer within the facility's property boundary.

(157) **Vector** - An agent, such as an insect, snake, rodent, bird, or animal capable of mechanically or biologically transferring a pathogen from one organism to another.

(158) **Washout** - The carrying away of solid waste by waters.

(159) **Waste management unit boundary** - A vertical surface located at the hydraulically downgradient limit of the unit. This vertical surface extends down into the uppermost aquifer.

(160) **Waste-separation/intermediate-processing center** - A facility, sometimes referred to as a materials recovery facility, to which recyclable materials arrive as source-separated materials, or where recyclable materials are separated from the municipal waste stream and processed for transport off-site for reuse, recycling, or other beneficial use.

(161) **Waste-separation/recycling facility** - A facility, sometimes referred to as a material recovery facility, in which recyclable materials are removed from the waste stream for transport off-site for reuse, recycling, or other beneficial use.

(162) **Water in the state** - Groundwater, percolating or otherwise, lakes, bays, ponds, impounding reservoirs, springs, rivers, streams, creeks, estuaries, marshes, inlets, canals, the Gulf of Mexico inside the territorial limits of the state, and all other bodies of surface water, natural or artificial, inland or coastal, fresh or salt, navigable or non-navigable, and including the beds and banks

of all watercourses and bodies of surface water, that are wholly or partially inside or bordering the state or inside the jurisdiction of the state.

(163) **Water table** - The upper surface of the zone of saturation at which water pressure is equal to atmospheric pressure, except where that surface is formed by a confining unit.

(164) **Waters of the United States** - All waters that are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters that are subject to the ebb and flow of the tide, with their tributaries and adjacent wetlands, interstate waters and their tributaries, including interstate wetlands; all other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, and wetlands, the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce including any such waters that are or could be used by interstate or foreign travelers for recreational or other purposes; from which fish or shellfish are or could be taken and sold in interstate or foreign commerce; that are used or could be used for industrial purposes by industries in interstate commerce; and all impoundments of waters otherwise considered as navigable waters; including tributaries of and wetlands adjacent to waters identified herein.

(165) **Wetlands** - As defined in Chapter 307 of this title (relating to Texas Surface Water Quality Standards) and areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence

of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include playa lakes, swamps, marshes, bogs, and similar areas.

(166) **Yard waste** - Leaves, grass clippings, yard and garden debris, and brush, including clean woody vegetative material not greater than six inches in diameter, that results from landscaping maintenance and land-clearing operations. The term does not include stumps, roots, or shrubs with intact root balls.

**§330.3. Applicability.**

(a) The provisions of this chapter apply to any person as defined in §330.2 of this title (relating to Definitions) involved in any aspect of the management and control of municipal solid waste (MSW) including, but not limited to, storage, collection, handling, transportation, processing, and disposal. Furthermore, these regulations apply to any person who by contract, agreement, or otherwise, arrange to process, store, or dispose of, or arranged with a transporter for transport to process, store, or dispose of, solid waste owned or possessed by the person, or by any other person or entity.

(b) For municipal solid waste landfills (MSWLFs) that stopped receiving waste before October 9, 1991, and MSW sites, only the provisions of §330.251 of this title (relating to Closure Requirements for MSWLF Units That Stop Receiving Waste Prior to October 9, 1991, and MSW Sites) apply. If not previously submitted, owners or operators shall submit a closure report that documents that MSWLF units or MSW site(s), or portions thereof, have received final cover.

(c) MSWLF units that receive waste after October 9, 1991, but stop receiving waste before October 9, 1993, are exempt from the requirements of this chapter except for the final cover requirements specified in §330.252 of this title (relating to Closure Requirements for MSWLF Units That Receive Waste on or after October 9, 1991, but Stop Receiving Waste Prior to October 9, 1993). The final cover must be installed and certified in accordance with the requirements contained in §§330.250 - 330.253 of this title (relating to Closure and Post-Closure). Owners or operators of MSWLF units described in this subsection that fail to complete cover installation and certification within the time limits specified in §§330.250 - 330.256 of this title will be subject to all the requirements of these regulations.

(d) All MSWLF units and MSW sites that receive waste on or after October 9, 1993, must comply with all requirements of these regulations, unless otherwise specified.

(e) Owners or operators of new, existing, and lateral expansions of small MSWLF units that dispose of less than 20 tons of MSW daily in the small MSWLF unit based on an annual average are exempt from §§330.200 - 330.206 of this title (relating to Groundwater Protection Design and Operation) and §§330.230, 330.231, and 330.233 - 330.242 of this title (relating to Groundwater Monitoring and Corrective Action), so long as there is no evidence of existing groundwater contamination from the small MSWLF unit, the small MSWLF unit serves a community that has no practicable waste management alternative, and the small MSWLF unit is located in an area that receives less than or equal to 25 inches of annual average precipitation. Requests for exemptions under subsection (f) of this section may be approved administratively by the executive director, upon

demonstration of compliance with these criteria. An exemption request may be denied by the executive director if he determines that granting the exemption could result in a substantial threat of groundwater contamination, based upon information made available to him from the applicant or agency files.

Owners or operators may appeal such denials to the commission for decision.

(f) Owners or operators of new, existing, and lateral expansions of small MSWLF units that meet the criteria in subsection (e) of this section must submit a certification of eligibility to the executive director and place a copy of the certification in the operating record. The certification shall be signed by a principal executive officer, a ranking elected official, or an independent professional engineer licensed to practice in the State of Texas, except that the groundwater certification must be submitted in accordance with §330.14 of this title (relating to Arid Exemption Process) and signed by a qualified groundwater scientist, as defined in this chapter. The certification must contain the following information:

(1) a certification that the MSWLF unit meets all requirements contained in subsection (e) of this section for exemptions from §§330.200 - 330.206, 330.230, 330.231, and 330.233 - 330.242 of this title;

(2) a report prepared by a qualified groundwater scientist in accordance with §330.14 of this title documenting that there is no evidence of groundwater contamination;

(3) documentation that the small MSWLF unit receives for disposal an annual average of less than 20 tons per day based upon the most recent four reporting quarters; or a certification that programs have been put in place, or will be implemented to reduce the annual average to less than 20 tons per day within one year;

(4) documentation that there are no practicable waste management alternatives available. The documentation shall demonstrate one of the following:

(A) additional costs of available alternatives are estimated to exceed 1.0% of the owner's or operating community's budget for all public services; or

(B) haul distances to alternative sites are unreasonably long; or

(C) all other alternatives are not feasible to implement, given the community location and economic condition;

(5) documentation that the small MSWLF unit receives less than or equal to 25 inches of average annual precipitation, as determined from the following map (Map 1) based on average annual precipitation for the years 1951 - 1980, or from precipitation data for the nearest official precipitation recording station for the most recent 30-year reporting period.

Figure: 30 TAC §330.3(f)(5) (No change.)

(g) If the owner or operator of a new, existing, or lateral expansion of a small MSWLF unit who has previously asserted eligibility in subsections (e) and (f) of this section has knowledge or becomes aware of groundwater contamination from the small MSWLF unit within a one-mile radius of the small MSWLF unit, or the unit no longer meets the definition of a small MSWLF, or the waste reduction program is ineffective (based upon an evaluation of trends established after a minimum period of a year), or a practicable alternative becomes available, the owner or operator shall notify in writing the executive director of such condition(s) and thereafter comply with §§330.200 - 330.206, 330.230, 330.231, and 330.233 - 330.242 of this title on a schedule specified by the executive director. The executive director may consider the economic investment made by the owner or operator in establishing the schedule for compliance. The minimum time allowed for compliance necessitated by loss of small MSWLF status or availability of a practicable alternative shall be 18 months.

(h) Owners or operators of MSW facilities are required to comply with the financial assurance requirements specified in Chapter 37, Subchapter R of this title (relating to Financial Assurance for Municipal Solid Waste Facilities) and Chapter 330, Subchapter K of this title (relating to Closure, Post-Closure, and Corrective Action).

(i) A small MSWLF facility that meets the requirements of subsections (e) and (f) of this section shall maintain the integrity of any existing on-site groundwater monitor wells and make them available to the executive director for the collection of groundwater samples.

**§330.14. Arid Exemption Process.**

The following process must be used for meeting the provisions for groundwater certification of the arid exemption, as described in §330.3(f) of this title (relating to Applicability).

(1) Locate and plot the site accurately on a topographic map (7 1/2-minute or 15-minute United States Geological Survey quadrangle). Draw a line to enclose all of the area within one mile of the site boundary (site area).

(2) Visit the site and locate by physical inspection water wells and springs in the site area. Determine the locations and plot them on the topographic map.

(A) If no wells or springs exist within the site area, refer to paragraph (7) of this section. Otherwise, refer to subparagraph (B) of this paragraph.

(B) Determine from appropriate records (for example, water-well drillers, pump installers, city records, underground water conservation district, Texas Water Development Board, Texas Commission on Environmental Quality, United States Geological Survey, etc.) which of the wells are completed in the shallowest aquifer. If no wells are completed in the shallowest aquifer or if the shallowest aquifer is more than 150 feet below the land surface at the site, refer to paragraph (7) of this section. Otherwise, refer to paragraph (3) of this section.

(3) Determine the groundwater gradient of the shallowest aquifer in the vicinity of the site. This can be done by measuring stabilized water levels in wells completed in the shallowest aquifer

in the site area (from paragraph (2) of this section) or from previous hydrogeologic studies using contemporaneous stabilized water-level measurements. Care should be taken to measure water levels when nearby high-volume wells, such as irrigation wells, have not been pumped for a long enough period to allow the water level to stabilize. Where no data exist or cannot be determined, the regional gradient can be used.

(4) From springs and from the wells completed in the shallowest aquifer, select the two wells/springs downgradient of and nearest to the site based on the findings from paragraph (3) of this section. Select a well/spring upgradient or lateral to the site, where groundwater quality is not likely to have been affected by landfill activities and preferably not by other human activities such as oil and gas operations, feedlots, sewage treatment plants, septic systems, etc.

(5) Sample the three selected wells/springs determined by paragraphs (3) and (4) of this section in accordance with accepted practices, such as described in technical guidance from the executive director. Have the samples analyzed by a qualified laboratory for the following parameters:

(A) chloride;

(B) nitrate (as N);

(C) sulfate;

(D) total dissolved solids;

(E) specific conductance;

(F) pH;

(G) chromium;

(H) non-purgeable organic carbon;

(I) volatile organic compounds listed in §330.241 of this title (relating to  
Constituents for Detection Monitoring):

(i) if permission cannot be obtained to sample one or more of the three  
selected wells/springs, select one or more alternate wells/springs, within the plotted area. If fewer than  
three wells/springs are available, sample those that are available;

(ii) if permission cannot be obtained to sample any appropriately  
located wells/springs, submit written documentation of the facts to the executive director. If the  
executive director confirms that permission cannot be obtained for sampling, the well(s) may be  
eliminated from consideration.

(6) Compile the data from paragraphs (1) - (5) of this section in a report comprising:

(A) map showing all known wells, springs, site boundaries, sampling points,  
etc.;

(B) map showing the groundwater gradient and data points;

(C) chemical analyses, showing analytical methods used;

(D) logs and construction information for the sampled wells and description  
and flow rate for sampled springs;

(E) text describing methods of investigation, such as sampling and water-level  
measurements; and

(F) conclusions with respect to presence or lack of evidence of groundwater  
contamination by the site.

(7) Where no wells or springs are present in the site area or the shallowest water level  
is more than 150 feet below land surface at the site, submit a brief report describing the site (with a  
map of the area) and the method(s) of determining the lack of appropriate sampling points or depth to

the shallowest aquifer. Confirmed absence of sampling points will be deemed to be "no evidence of groundwater contamination."

(8) The report shall be signed and sealed by the qualified groundwater scientist who reviewed the data and reached the conclusions.

(9) If there is no evidence of groundwater contamination by the landfill, the qualified groundwater scientist who reviewed the data and reached the conclusions shall sign and seal a statement in the following format: I (we) have reviewed the groundwater data described in a report submitted with this certification and have found no evidence that the \_\_\_\_\_ Municipal Solid Waste Landfill (MSWLF) unit located at \_\_\_\_\_ has contaminated groundwater in the uppermost aquifer.

(10) The executive director may accept information and data, other than that described, as showing that there is no evidence of groundwater contamination by the landfill, if the information and data are deemed to be adequate for such a determination.

## **SUBCHAPTER E: PERMIT PROCEDURES**

### **§§330.51, 330.53, 330.56, 330.64**

#### **STATUTORY AUTHORITY**

The amendments are adopted under Texas Water Code, §5.103, which provides the commission with the authority to adopt rules necessary to carry out its power and duties under this code and other laws of this state; Texas Water Code, §5.105, which authorizes the commission to establish and approve all general policy of the commission by rule; Texas Health and Safety Code, §361.024, which authorizes the commission to establish standards of operation for the management and control of solid waste; and Texas Civil Statutes, Article 3271b, the Act, which authorizes the public practice of geoscience in the State of Texas.

#### **§330.51. Permit Application for Municipal Solid Waste Facilities.**

(a) Permit application. The application for a municipal solid waste facility is divided into Parts I - V. Parts I - IV of the application shall be required before the application is declared "administratively complete" in accordance with Chapter 281 of this title (relating to Applications Processing). A complete application, containing Parts I - IV, shall be submitted before a hearing can be conducted on the technical design merits of the application. If the executive director determines that a "land-use only public hearing" as described in §330.61 of this title (relating to Land-Use Public Hearing) is appropriate, the owner or operator shall submit a partial application consisting of Parts I and II of the application. A complete application, consisting of Parts I - IV of the application, shall be

submitted based upon the results of the land-use only public hearing. The owner or operator shall be required to comply with the design, construction, and operating procedures proposed in his application. Part V shall be submitted upon completion of construction of the facility. It is intended that this subchapter completely define the information needed for permit review, but the executive director may request additional data if such is reasonably required to allow a decision to be made. Applicants for Type I-AE municipal solid waste landfills (MSWLFs) are required to submit all parts of the application except for those items pertaining to but not limited to §§330.200 - 330.206 of this title (relating to Groundwater Protection Design and Operation) and §§330.230 - 330.242 of this title (relating to Groundwater Monitoring and Corrective Action). Applicants for a Type I-AE facility are exempt from §330.56(d) of this title (relating to Attachments to the Site Development Plan).

(1) Part I of the application shall consist of the information required in §305.45 of this title (relating to Contents of Application for Permit) and §330.52 of this title (relating to Technical Requirements of Part I of the Application).

(2) Part II of the application shall describe the existing conditions and character of the site and surrounding area. Part II of the application shall consist of the information contained in §330.53 of this title (relating to Technical Requirements of Part II of the Application). An applicant must submit Parts I and II of his application before a land-use public hearing is conducted in accordance with §330.61 of this title.

(3) Part III of the application shall contain most of the necessary engineering information, detailed investigative reports, the schematic designs of the facility, and the required plans. Part III shall consist of the documents required in §§330.54 - 330.56 of this title (relating to Permit Procedures).

(4) Part IV of the application shall contain the site operating plan that shall discuss how the applicant plans to conduct his daily operations at the site. Part IV shall consist of the documents required in §330.57 of this title (relating to Technical Requirements of Part IV of the Application).

(5) Part V of the application is reserved for construction documents. Construction plans and specifications shall be handled as required by §330.58 of this title (relating to Technical Requirements of Part V of the Application).

(b) Required information. The information required by this subchapter defines the basic elements for an application.

(1) All aspects of the application and design requirements must be addressed by the applicant, even if only to show why they are not applicable for that particular site.

(2) It is the responsibility of the applicant to provide the executive director data of sufficient completeness, accuracy, and clarity to provide assurance that operation of the site will pose no reasonable probability of adverse effects on the health, welfare, environment, or physical property of

nearby residents or property owners. Failure to provide complete information as required by this chapter may be cause for the executive director to return the application without further action.

Submission of false information shall constitute grounds for denial of the permit.

(3) The applicant is responsible for determining and reporting to the executive director any site-specific conditions that require special design considerations.

(4) For construction in a floodplain, the following must be submitted, where applicable:

(A) approval from the governmental entity with jurisdiction under Texas Water Code, §16.236, as implemented by Chapter 301 of this title (relating to Levee Improvement Districts, District Plans of Reclamation, and Levees and Other Improvements);

(B) a floodplain development permit from the city, county, or other agency with jurisdiction over the proposed improvements;

(C) a Conditional Letter of Map Amendment (CLOMA) from The Federal Emergency Management Agency (FEMA); and

(D) a Corps of Engineers Section 404 Specification of Disposal Sites for Dredged or Fill Material for construction of all necessary improvements.

(5) The applicant shall submit demonstration of compliance with National Pollution Discharge Elimination System (NPDES) under CWA, §402, as amended.

(6) The applicant shall submit documentation of coordination with the following agencies, where applicable:

(A) Texas Commission on Environmental Quality for compliance with CWA, §208;

(B) Federal Aviation Administration, for compliance with airport location restrictions; and

(C) Texas Department of Transportation for traffic and location restrictions.

(7) The applicant shall submit wetlands determination under applicable federal, state, and local laws.

(8) The applicant shall submit Endangered Species Act compliance demonstrations under state and federal laws.

(9) The applicant shall submit a review letter from Texas Antiquities Committee.

(10) The applicant shall submit demonstration of compliance with regional solid waste plan.

(c) Number of copies. Applications shall be initially submitted in four copies. The applicant shall furnish up to 18 additional copies of the application for use by required reviewing agencies, upon request of the executive director.

(d) Preparation. Preparation of the application must conform with Texas Civil Statutes, Texas Engineering Practice Act, Article 3271a and Texas Geoscience Practice Act, Article 3271b.

(1) The responsible engineer shall seal, sign, and date each sheet of engineering plans, drawings, and the title or contents page of the application as required by Texas Engineering Practice Act, §15c, and in accordance with 22 TAC §131.166 (relating to Engineers' Seals).

(2) The responsible geoscientist shall seal, sign, and date applicable items as required by Texas Geoscience Practice Act, §6.13(b).

(3) Applications that have not been sealed shall be considered incomplete for the intended purpose and shall be returned to the applicant.

(e) Application format.

(1) Applications shall be submitted in three-ring loose-leaf binders.

(2) The narrative of the report shall be printed on 8 1/2 by 11 inches white paper.

Drawings or other sheets shall be no larger than 11 by 17 inches so that they can be reproduced by standard office copy machines.

(3) All pages shall contain a page number and date.

(4) Revisions shall have the revision date and note that the sheet is revised in the header or footer of each revised sheet. The revised text shall be marked to highlight the revision.

(5) Dividers and tabs are encouraged.

(f) Application drawings.

(1) All information contained on a drawing shall be legible, even if it has been reduced. The drawings shall be 8 1/2 by 11 inches or 11 by 17 inches. Standard sized drawings (24 by 36 inches) folded to 8 1/2 by 11 inches may be submitted or required if reduction would render them illegible or difficult to interpret.

(2) If color coding is used, it should be legible and the code distinct when reproduced on black and white photocopy machines.

(3) Drawings shall be submitted at a standard engineering scale.

(4) Each drawing shall have a:

(A) dated title block;

(B) bar scale at least one-inch long;

(C) revision block;

(D) responsible engineer's seal, if required; and

(E) drawing number and a page number.

(5) Each map or plan drawing shall also have:

(A) a north arrow. Preferred orientation is to have the north arrow pointing toward the top of the page;

(B) a reference to the base map source and date if the map is based upon another map. The latest published edition of the base map should be used;

(C) a legend; and

(D) two longitudes and latitudes shall be shown on all general location maps.

(6) Match lines and section lines shall reference the drawing where the match or section is shown. Section drawings should note from where the section was taken.

**§330.53. Technical Requirements of Part II of the Application.**

(a) General.

(1) Part II of the application must describe the existing conditions and character of the site and surrounding area. Parts I and II of the application must provide information relating to land-use compatibility under the provisions of Texas Health and Safety Code, §361.069.

(2) Part II may be combined with Part I of the application or may be issued as a separate document. If it is combined, it is not necessary to provide a separate Part II title page, table of contents, supplementary technical report, or location maps. All other items required by subsection (b) of this section shall be submitted.

(b) Requirements of Part II.

(1) Title page. The title page shall show the name of the project, the municipal solid waste (MSW) permit application number if known, the name of the applicant, the location by city and county, the date the part was prepared, and, if appropriate, the number and date of the revision. It shall be sealed as required by the Texas Engineering Practice Act.

(2) Table of contents. The Table of Contents shall list and give the page numbers for the main sections of the application. It shall be sealed as required by the Texas Engineering Practice Act.

(3) Supplementary technical report. The applicant shall describe the purpose of the facility or the application in a supplementary technical report and provide any information necessary to understand the application.

(4) Existing conditions summary. The applicant may discuss any land use, environmental, or special issues he desires in an existing conditions summary.

(5) General location maps. The applicant shall provide maps in addition to those required by §330.52(b)(4) of this title (relating to Technical Requirements of Part I of the Application) as necessary to accurately show proximity to surrounding features.

(6) Aerial photograph.

(A) This should be an aerial photograph approximately nine inches by nine inches with a scale within a range of one inch equals 1,667 feet to one inch equals 3,334 feet and showing the area within at least a one-mile radius of the site boundaries. The site boundaries and actual fill areas shall be marked.

(B) A series of aerial photographs can be used to show growth trends.

(C) Photocopies of photographs are not acceptable substitutes for photographs.

(7) Land-use map. This is a constructed map of the site showing the boundary of the property and any existing zoning on or surrounding the property and actual uses (e.g., agricultural, industrial, residential, etc.) both within the site and within one mile of the site. The applicant shall make every effort to show the location of residences, commercial establishments, schools, licensed child care facilities, churches, cemeteries, ponds or lakes, and recreational areas within one mile of the site boundary. Drainage, pipeline, and utility easements within the site shall be shown. Access roads serving the site shall also be shown.

(8) Land use. A primary concern is that the use of any land for an MSW site not adversely impact human health or the environment. The impact of the site upon a city, community, group of property owners, or individuals must be considered in terms of compatibility of land use, zoning in the vicinity, community growth patterns, and other factors associated with the public interest.

To assist the executive director in evaluating the impact of the site on the surrounding area, the applicant shall provide the following:

(A) zoning at the site and in the vicinity. If the site requires approval as a nonconforming use or a special permit from the local government having jurisdiction, a copy of such approval shall be submitted;

(B) character of surrounding land uses within one mile of the proposed facility;

(C) growth trends of the nearest community with directions of major development;

(D) proximity to residences and other uses (e.g., schools, churches, cemeteries, historic structures and sites, archaeologically significant sites, sites having exceptional aesthetic quality, etc.). Give the approximate number of residences and business establishments within one mile of the proposed facility including the distances and directions to the nearest residences and businesses; and

(E) description and discussion of all known wells within 500 feet of the proposed site.

(9) Transportation.

(A) Provide data on the availability and adequacy of roads that the applicant will use to access the site.

(B) Provide data on the volume of vehicular traffic on access roads within one mile of the proposed facility, both existing and expected, during the expected life of the proposed facility.

(C) Project the volume of traffic expected to be generated by the facility on the access roads within one mile of the proposed facility.

(D) Analyze the impact of the facility upon airports in accordance with §330.300 of this title (relating to Airport Safety).

(10) General geology and soils statement. The reports prepared under this paragraph must meet the following requirements:

(A) discuss in general terms the geology and soils of the proposed site;

(B) identify and provide data on fault areas located within the proposed site in accordance with §330.303 of this title (relating to Fault Areas);

(C) identify and provide data on seismic impact zones in accordance with §330.304 of this title (relating to Seismic Impact Zones); and

(D) identify and provide data on unstable areas in accordance with §330.305 of this title (relating to Unstable Areas).

(11) Ground and surface water statement. The report prepared under this paragraph must provide:

(A) data about the site-specific groundwater conditions at and near the site; and

(B) data on surface water at and near the site.

(12) Floodplains and wetlands statement. The floodplains and wetlands statement must:

(A) provide data on floodplains in accordance with Chapter 301, Subchapter C of this title (relating to Approval of Levees and Other Improvements); and

(B) discuss wetlands in accordance with §330.302 of this title (relating to Wetlands). For the purpose of this rule, demonstration can be made by providing evidence that the facility has a Corps of Engineers permit for the use of any wetlands area.

(13) Protection of endangered species.

(A) The following words and terms shall have the following meanings, unless the context clearly indicates otherwise.

(i) Endangered or threatened species as defined in §330.2 of this title (relating to Definitions).

(ii) Taking - Harassing, harming, pursuing, hunting, wounding, trapping, capturing, or collecting an endangered or threatened species or attempting to engage in such conduct.

(iii) Harassing - An intentional or negligent act or omission that creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns that include, but are not limited to, breeding, feeding, or sheltering.

(iv) Harming - An act of omission that actually injures or kills wildlife, including acts that annoy it to such an extent as to significantly disrupt essential behavioral patterns, that include, but are not limited to, breeding, feeding, or sheltering; significant environmental modification or degradation that has such effects is included within the meaning of harming.

(B) The impact of a solid waste disposal facility upon endangered or threatened species shall be considered. The facility and the operation of the facility shall not result in the destruction or adverse modification of the critical habitat of endangered or threatened species, or cause or contribute to the taking of any endangered or threatened species.

(C) The permit applicant should consult with the executive director to determine the need for specific information relating to protection of endangered species. If the facility is located in the range of an endangered or threatened species, a biological assessment may be required to be prepared by a qualified biologist in accordance with standard procedures of the United States Fish and Wildlife Service and the Texas Parks and Wildlife Department to determine the effect of the facility on the endangered or threatened species. Where a previous biological assessment has been made for another project in the general vicinity, a copy of that assessment may be submitted for evaluation. The United States Fish and Wildlife Service and the Texas Parks and Wildlife Department should be contacted for locations and specific data relating to endangered and threatened species in Texas.

**§330.56. Attachments to the Site Development Plan.**

(a) Attachment 1 - site layout plan.

(1) This is the basic element of the site development plan consisting of a site layout plan on a constructed map showing the outline of the units and fill sectors with appropriate notations

thereon to communicate the types of wastes to be disposed of in individual sectors, the general sequence of filling operations, locations of all interior site roadways to provide access to all fill areas, locations of monitor wells, dimensions of trenches, locations of buildings, and any other graphic representations or marginal explanatory notes necessary to communicate the proposed step-by-step construction of the site. The layout should include: fencing; sequence of excavations, filling, maximum waste elevations and final cover; provisions for the maintenance of natural windbreaks, such as greenbelts, where they will improve the appearance and operation of the site; and, where appropriate, plans for screening the site from public view.

(2) A generalized design of all site entrance roads from public access roads shall be included. All designs of proposed public roadway improvements such as turning lanes, storage lanes, etc., associated with site entrances should be coordinated with the agency exercising maintenance responsibility of the public roadway involved.

(3) This plan is the basis for operational planning and budgeting, and therefore shall contain sufficient detail to provide an effective site management tool.

(b) Attachment 2 - fill cross-section.

(1) The fill cross-sections must consist of plan profiles across the site clearly showing the top of the levee, top of the proposed fill (top of the final cover), maximum elevation of proposed fill, top of the wastes, existing ground, bottom of the excavations, side slopes of trenches and fill areas,

gas vents or wells, and groundwater monitoring wells, plus the initial and static levels of any water encountered.

(2) The fill cross-sections shall go through or very near the soil borings in order that the boring logs obtained from the soils report can also be shown on the profile.

(3) Large sites shall provide sufficient fill cross-sections, both latitudinally and longitudinally, so as to accurately depict the existing and proposed depths of all fill areas within the site. The plan portion shall be shown on an inset key map.

(4) Construction and design details of compacted perimeter or toe berms which are proposed in conjunction with aboveground (aerial-fill) waste disposal areas shall be included in the fill cross-sections.

(c) Attachment 3 - existing contour map. This is a constructed map showing the contours prior to any grading, excavation, and/or filling operations on the site. Appropriate vertical contour intervals shall be selected so that contours are not further apart than 100 feet as measured horizontally on the ground. Wider spacing may be used when approved by the executive director. The map should show the location and quantities of surface drainage entering, exiting, or internal to the site and the area subject to flooding by a 100-year frequency flood.

(d) Attachment 4 - geology report. This portion of the application applies to owners or operators of municipal solid waste (MSW) facilities that store, process, or dispose of MSW in landfills. If the municipal solid waste landfill (MSWLF) facility contains two or more MSWLF units, the information requested pertaining to regional geology and regional aquifers need only be provided once. The geology report shall be prepared and signed by a qualified groundwater scientist except that the reports required under paragraph (5) of this subsection shall be signed and sealed, where appropriate, as required by the Texas Engineering Practice Act. Previously prepared documents may be submitted but must be supplemented as necessary to provide the requested information. Sources and references for information must be provided. The geology report must contain the information in paragraphs (1) - (6) of this subsection.

(1) The owner or operator shall provide a discussion of the regional physiography and topography in the vicinity of the facility. The discussion shall include, at a minimum, the distance to local surface water bodies and drainage features, the slope of the land surface (direction and rate), and the maximum and minimum elevations of the facility. Any limitation of the facility due to unfavorable topography (e.g., cliffs, floodplains) shall be discussed.

(2) The owner or operator shall provide a description of the regional geology of the area. This section shall include:

(A) a geologic map of the region with text describing the stratigraphy and lithology of the map units. An appropriate section of a published map series such as the Geologic Atlas of Texas prepared by the Bureau of Economic Geology is acceptable;

(B) a description of the generalized stratigraphic column in the facility area from the base of the lowermost aquifer capable of providing usable groundwater, or from a depth of 1,000 feet, whichever is less, to the land surface. The geologic age, lithology, variations in lithology, thickness, depth, geometry, hydraulic conductivity, and depositional history of each geologic unit should be described based upon available geologic information. Regional stratigraphic cross-sections should be provided.

(3) The owner or operator shall provide a description of the geologic processes active in the vicinity of the facility. This description shall include:

(A) an identification of any faults and subsidence in the area of the facility. The information about faulting and subsidence shall include at least that required in §330.303(b) and §330.305 of this title (relating to Fault Areas and Unstable Areas, respectively);

(B) a discussion of the degree to which the facility is subject to erosion. The potential for erosion due to surface water processes such as overland flow, channeling, gullying, and fluvial processes such as meandering streams and undercut banks shall be evaluated. If the facility is located in a low-lying coastal area, historical rates of shoreline erosion shall also be provided; and

(C) an identification of wetlands located within the facility boundary.

(4) The owner or operator shall provide a description of the regional aquifers in the vicinity of the facility based upon published and open-file sources. The section shall provide:

(A) aquifer names and their association with geologic units described in paragraph (2) of this subsection;

(B) a description of the composition of the aquifer(s);

(C) a description of the hydraulic properties of the aquifer(s);

(D) information on whether the aquifers are under water table or artesian conditions;

(E) information on whether the aquifers are hydraulically connected;

(F) a regional water-table contour map or potentiometric surface map for each aquifer, if available;

(G) an estimate of the rate of groundwater flow;

(H) typical values or a range of values for total dissolved solids content of groundwater from the aquifers;

(I) identification of areas of recharge to the aquifers within five miles of the site; and

(J) the present use of groundwater withdrawn from aquifers in the vicinity of the facility. The identification, location, and aquifer of all water wells within one mile of the property boundaries of the facility shall be provided.

(5) The owner or operator shall provide the results of investigations of subsurface conditions at a particular waste management unit in the following reports.

(A) Subsurface investigation report. This report must describe all borings drilled on-site to test soils and characterize groundwater and must include a site map drawn to scale showing the surveyed locations and elevations of the borings. Boring logs must include a detailed description of materials encountered including any discontinuities such as fractures, fissures, slickensides, lenses, or seams. Geophysical logs of the boreholes may be useful in evaluating the stratigraphy. Each boring must be presented in the form of a log that contains, at a minimum, the boring number; surface elevation and location coordinates; and a columnar section with text showing the elevation of all contacts between soil and rock layers, description of each layer using the unified soil classification, color, degree of compaction, and moisture content. A key explaining the symbols used

on the boring logs and the classification terminology for soil type, consistency, and structure must be provided.

(i) A sufficient number of borings shall be performed to establish subsurface stratigraphy and to determine geotechnical properties of the soils and rocks beneath the facility. Other types of samples may also be taken to provide geologic and geotechnical data. The number of borings necessary can only be determined after the general characteristics of a site are analyzed and will vary depending on the heterogeneity of subsurface materials. Locations with stratigraphic complexities such as non-uniform beds that pinch out, vary significantly in thickness, coalesce, or grade into other units, will require a significantly greater degree of subsurface investigation than areas with simple geologic frameworks.

(ii) Borings shall be sufficiently deep to allow identification of the uppermost aquifer and underlying hydraulically interconnected aquifers. Borings shall penetrate the uppermost aquifer and all deeper hydraulically interconnected aquifers and be deep enough to identify the aquiclude at the lower boundary. All the borings shall be at least five feet deeper than the elevation of the deepest excavation. In addition, at least the number of borings shown on the Table of Borings shall be drilled to a depth at least 30 feet below the deepest excavation planned at the waste management unit, unless the executive director approves a different depth. If no aquifers exist within 50 feet of the elevation of the deepest excavation, at least one test hole shall be drilled to the top of the first perennial aquifer beneath the site, if sufficient data does not exist to accurately locate it. The executive director may accept data equivalent to a deep boring on the site to determine information for

aquifers more than 50 feet below the site. Aquifers more than 300 feet below the lowest excavation and where the estimated travel times for constituents to the aquifer are in excess of 30 years plus the estimated life of the site need not be identified through borings.

Figure: 30 TAC §330.56(d)(5)(A)(ii) (No change.)

(iii) All borings shall be conducted in accordance with established field exploration methods. The hollow-stem auger boring method is recommended for softer materials; coring may be required for harder rocks. Other methods shall be used as necessary to obtain adequate samples for soil testing required in this paragraph. Investigation procedures shall be discussed in the report.

(iv) The boring plan, including locations and depths of all proposed borings, shall be approved by the executive director prior to initiation of the work.

(v) Installation, abandonment, and plugging of the borings shall be in accordance with the rules of the commission.

(vi) Both the number and depth of borings may be modified because of site conditions with prior approval of the executive director.

(vii) Geophysical methods, such as electrical resistivity, may be used with authorization of the executive director to reduce the number of borings that may be necessary or to provide additional information between borings.

(viii) Cross-sections must be prepared from the borings depicting the generalized strata at the facility. For small waste management units two perpendicular cross-sections will normally suffice.

(ix) A narrative that describes the investigator's interpretations of the subsurface stratigraphy based upon the field investigation shall be provided.

(B) Geotechnical report. This report shall include engineering data that describes the geotechnical properties of the subsurface soil materials and a discussion with conclusions about the suitability of the soils and strata for the uses for which they are intended. All engineering tests shall be performed in accordance with industry practice and recognized procedures such as described below. A brief discussion of engineering test procedures shall be included in the report.

(i) A laboratory report of soil characteristics shall be determined from at least one sample from each soil layer or stratum that will form the bottom and side of the proposed excavation and from those that are less than 30 feet below the lowest elevation of the proposed excavation. As many additional tests shall be performed as necessary to provide a typical profile of soil stratification within the site. No laboratory work need be performed on highly permeable soil layers

such as sand or gravel. The samples shall be tested by a competent independent third-party soils laboratory.

(ii) Permeability tests shall be performed according to one of the following standards on undisturbed soil samples. Permeability tests shall be performed using tap water or .05 Normal solution of  $\text{CaSO}_4$ , and not distilled water, as the permeant. Those undisturbed samples that represent the sidewall of any proposed trench, pit, or excavation shall be tested for the coefficient of permeability on the sample's in-situ horizontal axis; all others shall be tested on the in-situ vertical axis. All test results shall indicate the type of tests used and the orientation of each tested sample. All calculations for the final coefficient of permeability tests result for each sample tested shall be included in the report:

(I) constant head with back pressure per Appendix VII of Corps of Engineers Manual EM1110-2-1906, "Laboratory Soils Testing;" ASTM D5084 "Saturated Porous Materials Using a Flexible Wall Permeameter";

(II) falling head per Appendix VII of Corps of Engineers Manual EM1110-2-1906, "Laboratory Soils Testing";

(III) sieve analysis for the 200, and less than 200 fraction per ASTM D1140;

(IV) Atterberg limits per ASTM D4318;

(V) moisture content per ASTM D2216.

(C) A groundwater investigation report. This report must include the following:

(i) the depth at which groundwater was encountered and records of after-equilibrium measurements in all borings. The cross-sections prepared in response to subparagraph (A)(viii) of this paragraph must be annotated to note the level at which groundwater was first encountered and the level of groundwater after equilibrium is reached or just prior to plugging, whichever is later. This water-level information must also be presented on all borings required by this paragraph and presented in a table format in the report;

(ii) records of water-level measurements in monitor wells. Historic water-level measurements made during any previous groundwater monitoring shall be presented in a table for each well;

(iii) all the information and data required in §330.231(e)(1) of this title (relating to Groundwater Monitoring Systems); and

(iv) an analysis of the most likely pathway(s) for pollutant migration in the event that the primary barrier liner system is penetrated. This must include any groundwater modeling data and results as described in §330.231(e)(2) of this title and must consider changes in groundwater flow that are expected to result from construction of the facility.

(6) The owner or operator shall provide a description of the existing or proposed monitoring system that meets the requirements of §330.231 of this title. The owner or operator shall also provide engineering drawings of a typical monitoring well and a table of data for all proposed wells that includes the following information for each well: total depth of the well; depth to groundwater; surveyed elevation of the ground surface at the well; surveyed elevation of the top of each well casing (or that point consistently used to determine depth to groundwater); depth to the top and base of the screen; and depth to the top and base of the filter pack.

(e) Attachment 5 - groundwater characterization report. A groundwater characterization study and report is required from owners and operators of proposed MSWLF units or proposed lateral expansions except for Soils and Liner Evaluation Reports and Flexible Membrane Liner Evaluation Reports covering previously permitted and approved designs. The report must contain the following information:

(1) a tabulation of all relevant groundwater monitoring data from wells on site or on adjacent MSWLF unit(s);

(2) identification of the uppermost aquifer and any lower aquifers that are hydraulically connected to it beneath the facility, including groundwater flow direction and rate, and the basis for such identification (i.e., the information obtained from hydrogeologic investigations of the facility area);

(3) on a topographic map as required under §330.52(b)(4)(C) of this title (relating to Technical Requirements of Part I of the Application), a delineation of the waste management area, the property boundary, the proposed "point of compliance" as defined under §330.200(d) of this title (relating to Design Criteria), the proposed location of groundwater monitoring wells as required under §330.231 of this title, and, to the extent possible, the information required in paragraph (2) of this subsection;

(4) a description of any plume of contamination that has entered the groundwater from the MSWLF facility at the time that the application was submitted that:

(A) delineates the extent of the plume on the topographic map required under §330.52(b)(4)(C) of this title; and

(B) identifies the concentration of each assessment constituent as defined in §330.235 of this title (relating to Assessment Monitoring Program) throughout the plume or identifies the maximum concentration of each assessment constituent in the plume;

(5) detailed plans and an engineering report describing the proposed groundwater monitoring program to be implemented to meet the requirements of §330.231 of this title;

(6) if the hazardous constituents listed in Table I of §330.241 of this title (relating to Constituents for Detection Monitoring) have not been detected in the groundwater at the time of permit application, the owner or operator shall submit sufficient information, supporting data, and analyses to establish a detection monitoring program that meets the requirements of §330.234 of this title (relating to Detection Monitoring Program). This submission must address the following items specified under §330.234 of this title:

(A) a proposed groundwater monitoring system;

(B) background values for each monitoring parameter or constituent listed in §330.241 of this title, or procedures to calculate such values; and

(C) a description of proposed sampling, analysis, and statistical comparison procedures to be utilized in evaluating groundwater monitoring data;

(7) if the presence of hazardous constituents listed in Table I of §330.241 of this title has been detected in the groundwater at the time of the permit application, the owner or operator shall submit sufficient information, supporting data, and analyses to establish an assessment monitoring

program that meets the requirements of §330.235 of this title. To demonstrate compliance with §330.235 of this title, the owner or operator shall address the following items:

(A) a description of any special wastes previously handled at the MSWLF facility;

(B) a characterization of the contaminated groundwater, including concentration of assessment constituents as defined in §330.235 of this title;

(C) a list of assessment constituents as defined in §330.235 of this title for which assessment monitoring will be undertaken in accordance with §330.233 of this title (relating to Groundwater Sampling and Analysis Requirements) and §330.235 of this title;

(D) detailed plans and an engineering report describing the proposed groundwater monitoring system, in accordance with the requirements of §330.233 of this title; and

(E) a description of proposed sampling, analysis, and statistical comparison procedures to be utilized in evaluating groundwater monitoring data; and

(8) if hazardous constituents have been measured in the groundwater that exceed the concentration limits established in Table 1 of §330.241 of this title, the owner or operator shall submit sufficient information, supporting data, and analyses to establish a corrective action program that meets

the requirements of §330.236 of this title (relating to Assessment of Corrective Measures) and §330.237 of this title (relating to Selection of Remedy). To demonstrate compliance with §330.236 of this title, the owner or operator shall address, at a minimum, the following items:

- (A) a characterization of the contaminated groundwater, including concentrations of assessment constituents as defined in §330.235 of this title;
- (B) the concentration limit for each constituent found in the groundwater;
- (C) detailed plans and an engineering report describing the corrective action to be taken;
- (D) a description of how the groundwater monitoring program will demonstrate the adequacy of the corrective action; and
- (E) the permit may contain a schedule for submittal of the information required in subparagraphs (C) and (D) of this paragraph provided the owner or operator obtains written authorization from the executive director prior to submittal of the complete permit application.

(f) Attachment 6 - groundwater and surface water protection plan and drainage plan. These plans must reflect locations, details, and typical sections of levees, dikes, drainage channels, culverts, holding ponds, trench liners, storm sewers, leachate collection systems, or any other facilities relating

to the protection of groundwater and surface water. Adequacy of provisions for safe passage of any internal or externally adjacent floodwaters should be reflected here.

(1) A drawing(s) showing the drainage areas and drainage calculations shall be provided.

(2) Cross-sections or elevations of levees should be shown tied into contours. Natural drainage patterns shall not be significantly altered.

(3) The 100-year floodplain shall be shown on this attachment.

(4) As part of the attachment, the following information and analyses must be submitted for review, as applicable.

(A) Drainage and run-off control analyses:

(i) a description of the hydrologic method and calculations used to estimate peak flow rates and run-off volumes including justification of necessary assumptions;

(ii) the 25-year rainfall intensity used for facility design including the source of the data; all other data and necessary input parameters used in conjunction with the selected hydrologic method and their sources should be documented and described;

(iii) hydraulic calculations and designs for sizing the necessary collection, drainage, and/or detention facilities shall be provided.

(iv) discussion and analyses to demonstrate that natural drainage patterns will not be significantly altered as a result of the proposed landfill development;

(v) structural designs of the collection, drainage, and/or storage facilities, and results of all field tests to ensure compatibility with soils;

(vi) a maintenance plan for ensuring the continued operation of the collection, drainage, and/or storage facilities, as designed along with the plan for restoration and repair in the event of a washout or failure; and

(vii) erosion and sedimentation control plan, including interim controls for phased development.

(B) Flood control and analyses.

(i) Identify whether the site is located within a 100-year floodplain.

Indicate the source of all data for such determination and include a copy of the relevant Federal Emergency Management Agency (FEMA) flood map, if used, or the calculations and maps used where a FEMA map is not available. Information shall also be provided identifying the 100-year flood level

and any other special flooding factors (e. g., wave action) that must be considered in designing, constructing, operating, or maintaining the proposed facility to withstand washout from a 100-year flood. The boundaries of the proposed landfill facility should be shown on the floodplain map.

(ii) If the site is located within the 100-year floodplain, the applicant shall provide information detailing the specific flooding levels and other events (e.g., design hurricane projected by Corps of Engineers) that impact the flood protection of the facility. Data should be that required by §§301.33 - 301.36 of this title (relating to Approval of Levees and Other Improvements).

(iii) No solid waste disposal and treatment operations shall be permitted in areas that are located in a floodway as defined by FEMA.

(g) Attachment 7 - final contour map. This is a constructed map showing the final contour of the entire landfill to include internal drainage and side slopes plus accommodation of surface drainage entering and departing the completed fill area plus areas subject to flooding due to a 100-year frequency flood. Cross-sections shall be provided.

(h) Attachment 8 - cost estimate for closure and post-closure care. The applicant shall submit a cost estimate for closure and post-closure care costs in accordance with Subchapter K of this chapter (relating to Closure, Post-Closure, and Corrective Action).

(i) Attachment 9 - Applicant's statement. The applicant, or the authorized representative empowered to make commitments for the applicant, shall provide a statement that he is familiar with the site development plan and is aware of all commitments represented in the plan, that he is also familiar with all pertinent requirements in this chapter, and that he agrees to develop and operate the site in accordance with the plan, the regulations, and any permit special provisions that may be imposed.

(j) Attachment 10 - soil and liner quality control plan. The soil and liner quality control plan must be prepared in accordance with §§330.200 - 330.206 of this title (relating to Groundwater Protection Design and Operation).

(k) Attachment 11 - groundwater sampling and analysis plan. The groundwater sampling and analysis plan must be prepared in accordance with §§330.230, 330.231, and 330.233 - 330.242 of this title (relating to Groundwater Monitoring and Corrective Action) or §330.239 of this title (relating to Groundwater Monitoring at Type IV Landfills).

(l) Attachment 12 - final closure plan. The final closure plan shall be prepared in accordance with §§330.250 - 330.256 of this title (relating to Closure and Post-Closure).

(m) Attachment 13 - post-closure care plan. The post-closure care plan shall be prepared in accordance with §§330.250 - 330.256 of this title (relating to Closure and Post-Closure).

(n) Attachment 14 - landfill gas management plan.

(1) Owners or operators of all MSWLF units shall ensure that:

(A) the concentration of methane gas generated by the facility does not exceed 25% of the lower explosive limit for methane in facility structures (excluding gas control or recovery system components); and

(B) the concentration of methane gas does not exceed the lower explosive limit for methane at the facility property boundary. For purposes of this section, "lower explosive limit" means the lowest percent by volume of a mixture of explosive gases in air that will propagate a flame at 25 degrees Celsius and atmospheric pressure.

(2) Owners or operators of all MSWLF units shall implement a routine methane monitoring program to ensure that the standards of paragraph (1) of this subsection are met.

(A) The type and frequency of monitoring shall be determined based on the following factors.

(i) soil conditions;

(ii) the hydrogeologic conditions surrounding the facility;

(iii) the hydraulic conditions surrounding the facility;

(iv) the location of facility structures and property boundaries; and

(v) the location of any utility lines or pipelines that cross the MSWLF facility.

(B) The minimum frequency of monitoring shall be quarterly.

(3) If methane gas levels exceeding the limits specified in paragraph (1) of this subsection are detected, the owner or operator shall:

(A) immediately take all necessary steps to ensure protection of human health and notify the executive director, local and county officials, emergency officials, and the public;

(B) within seven days of detection, place in the operating record the methane gas levels detected and a description of the steps taken to protect human health; and

(C) within 60 days of detection, implement a remediation plan for the methane gas releases, place a copy of the plan in the operating record, provide a copy to the executive director and notify the executive director that the plan has been implemented. The plan shall describe the nature

and extent of the problem and the proposed remedy. After review, the executive director may require additional remedial measures.

(4) The executive director may establish alternative schedules for demonstrating compliance with paragraphs (2) and (3) of this subsection.

(5) The gas monitoring and control program shall continue for a period of thirty years after the final closure of the facility or until the owner or operator receives written authorization to reduce the program. Authorization to reduce gas monitoring and control shall be based on a demonstration by the owner or operator that there is no potential for gas migration beyond the property boundary or into on-site structures. Demonstration of this proposal shall be supported by data collected and additional studies as required.

(6) Gas monitoring and control systems shall be modified as needed to reflect changing on-site and adjacent land uses. Post-closure land use at the site shall not interfere with the function of gas monitoring and control systems. Any underground utility trenches that cross the MSWLF facility boundary shall be vented and monitored regularly.

(7) A landfill gas management plan shall be prepared that includes the following:

(A) a description of how landfill gases will be managed and controlled;

(B) a description of the proposed system(s), including installation procedures and time lines for installation, monitoring procedures, and procedures to be used during maintenance; and

(C) a backup plan to be used if the main system breaks down or becomes ineffective.

(8) Perimeter monitoring network shall be installed in accordance with the following provisions:

(A) initial monitoring at small MSWLFs and larger MSWLFs that have no habitable structures within 3,000 feet of the waste placement boundary may consist of perimeter subsurface monitoring around the perimeter of the site using portable equipment and probes. If test results show the presence of methane gas above 10% of the lower explosive limit, a permanent monitoring system shall be installed; and

(B) permanent monitoring systems shall be installed on all other MSWLFs.

Technical guidance on monitoring systems may be issued by the executive director.

(9) The monitoring network design shall include provisions for monitoring on-site structures, including, but not limited to, buildings, subsurface vaults, utilities, or any other areas where potential gas buildup would be of concern.

(10) All monitoring probes and on-site structures shall be sampled for methane during the monitoring period. Sampling for specified trace gases may be required by the executive director when there is a possibility of acute or chronic exposure due to carcinogenic or toxic compounds.

(11) Monitoring frequency shall be determined as follows.

(A) As a minimum, quarterly monitoring is required. The executive director may require more frequent monitoring based upon the factors listed in this section. When more frequent monitoring is necessary, the executive director shall notify the owner or operator.

(B) More frequent monitoring shall also be required at those locations where results of monitoring indicate that landfill gas migration is occurring or is accumulating in structures.

(o) Attachment 15 - leachate and contaminated water plan.

(1) The plan shall provide the details of the storage, collection, treatment and disposal of the contaminated water, leachate and/or gas condensate from the leachate collection system and/or the gas monitoring and collection system, where used. Contaminated water is water which has come into contact with waste, leachate or gas condensate. This plan shall include the following information:

(A) estimated rate of leachate removal;

(B) capacity of sumps;

(C) pipe material and strength;

(D) pipe network spacing and grading;

(E) collection sump materials and strength;

(F) drainage media specifications and performance; and

(G) demonstration that pipes and perforations will be resistant to clogging and can be cleaned or rehabilitated.

(2) Leachate and gas condensate may be disposed of in a MSWLF unit that is designed and constructed with a composite liner system and a leachate collection system that meets the requirements of §330.200(a)(2) of this title (relating to Design Criteria). Contaminated surface water and groundwater may not be placed in or on the MSWLF unit.

(3) Leachate, gas condensate, contaminated surface water, and contaminated groundwater shall be disposed of at an authorized facility or as authorized by a National Pollutant Discharge Elimination System permit.

(4) On-site collection ponds and impoundments for contaminated water shall be lined with an approved liner.

**§330.64. Additional Standard Permit Conditions for Municipal Solid Waste Facilities.**

(a) If at any time during the life of the site the site owner or operator becomes aware of any condition in the approved site development plan that necessitates a change to accommodate new technology or improved methods or that makes it impractical to keep the site in compliance, the site owner or operator shall submit to the executive director a revised plan. Such proposed changes to the approved site development plan must be made in accordance with §305.62 of this title (relating to Amendment) and/or §305.70 of this title (relating to Municipal Solid Waste Permit and Registration Modifications) and must be approved prior to their implementation.

(b) All drawings or other sheets prepared for revisions to a site development plan or other previously approved documents, that may be required by this subchapter, must be submitted in triplicate following the format in §330.51(e) of this title (relating to Permit Application for Municipal Solid Waste Facilities). The revised pages must be marked for the current revision (i.e., "Revision Number 3"), dated, and punched for insertion into the loose-leaf binder. All revised engineering and geoscientific plans, drawings, and reports shall be signed and sealed by a licensed professional engineer or geoscientist as specified in §330.51(d) of this title.

(c) Prior to the beginning of initial excavation or construction for a municipal solid waste (MSW) facility or a lateral expansion, a preconstruction conference shall be held. All aspects of the permit, construction activities, and inspections shall be discussed. An initial preconstruction conference shall be held within 90 days after the issuance of a permit. Additional preconstruction conferences may be held prior to the opening of a new MSW landfill unit. The executive director and owner's representatives, including the engineer, the geotechnical consultant, the contractor, and the site manager, shall attend the preconstruction conference.

(d) After all initial construction activity has been completed and prior to accepting any solid waste, the owner/operator shall contact the executive director and request a pre-opening inspection. A pre-opening inspection shall be conducted by the executive director within 14 days of notification by the owner or operator that all construction activities have been completed, accompanied by representatives of the owner/operator and the engineer.

(e) The MSW facility shall not accept solid waste until the executive director has confirmed in writing that all applicable submissions required by the permit, the approved site development plan, and this chapter have been received and found to be acceptable, and that construction is in compliance with the permit and the approved site development plan. If the executive director has not provided a written or verbal response within 14 days of completion of the pre-opening inspection, the facility shall be considered approved for placement of waste.

**SUBCHAPTER I: GROUNDWATER MONITORING AND CORRECTIVE ACTION**

**§§330.230, 330.231, 330.235, 330.238, 330.242**

**STATUTORY AUTHORITY**

The amendments are adopted under Texas Water Code, §5.103, which provides the commission with the authority to adopt rules necessary to carry out its power and duties under this code and other laws of this state; Texas Water Code, §5.105, which authorizes the commission to establish and approve all general policy of the commission by rule; Texas Health and Safety Code, §361.024, which authorizes the commission to establish standards of operation for the management and control of solid waste; and Texas Civil Statutes, Article 3271b, the Act, which authorizes the public practice of geoscience in the State of Texas.

**§330.230. Applicability.**

(a) The requirements in this subchapter apply to all municipal solid waste landfill (MSWLF) units, except as provided in §330.3(e) of this title (relating to Applicability), in §330.239 of this title (relating to Groundwater Monitoring at Type IV Landfills), in §330.240 of this title (relating to Groundwater Monitoring at Other Types of Landfills and Facilities), and in subsection (b) of this section. Owners and operators of MSWLF units shall comply with the groundwater monitoring requirements of this subchapter.

(b) Groundwater monitoring requirements under §§330.231 and 330.233 - 330.235 of this title (relating to Groundwater Monitoring and Corrective Action) may be suspended by the executive director for an MSWLF unit if the owner or operator can demonstrate that there is no potential for migration of hazardous constituents from that MSWLF unit to the uppermost aquifer as defined in §330.2 of this title (relating to Definitions) during the active life and the closure and post-closure care period of the unit. This demonstration shall be certified by a qualified groundwater scientist and approved by the executive director, and must be based upon:

(1) site-specific field-collected measurements, sampling, and analysis of physical, chemical, and biological processes affecting contaminant fate and transport; and

(2) contaminant fate and transport predictions that maximize contaminant migration and consider impacts on human health and the environment.

(c) Owners or operators of new MSWLF units must submit to the executive director a documented certification signed by a qualified groundwater scientist that the facility is in compliance with the groundwater monitoring requirements specified in §330.231 and §§330.233 - 330.235 of this title before waste can be placed in the unit.

(d) Once established at an MSWLF unit, groundwater monitoring must be conducted throughout the active life and post-closure care period of that MSWLF unit as specified in §330.254 of this title (relating to Post-Closure Care Maintenance Requirements).

**§330.231. Groundwater Monitoring Systems.**

(a) A groundwater monitoring system must be installed that consists of a sufficient number of monitoring wells, installed at appropriate locations and depths, to yield representative groundwater samples from the uppermost aquifer as defined in §330.2 of this title (relating to Definitions).

(1) Background wells shall be installed to allow determination of the quality of background groundwater that has not been affected by leakage from a unit. A determination of background quality may include sampling of wells that are not hydraulically upgradient of the waste management area if hydrogeologic conditions do not allow the owner or operator to determine which wells are hydraulically upgradient or if sampling at other wells will provide a better indication of background groundwater quality than is possible from upgradient wells.

(2) The downgradient monitoring system must include monitoring wells installed to allow determination of the quality of groundwater passing the relevant point of compliance as defined in §330.2 of this title. The downgradient monitoring system must be installed to ensure the detection of groundwater contamination in the uppermost aquifer. When physical obstacles preclude installation of the groundwater monitoring wells at existing units, the wells may be installed at the closest practicable distance hydraulically downgradient from the relevant point of compliance as defined in §330.2 of this title that will ensure detection of groundwater contamination of the uppermost aquifer.

(b) The executive director may approve a multi-unit groundwater monitoring system instead of separate groundwater monitoring systems for each municipal solid waste landfill (MSWLF) unit when the facility has several units, provided the multi-unit system meets the requirement of subsection (a) of this section and will be as protective of human health and the environment as individual monitoring systems for each MSWLF unit, based on the following factors:

- (1) number, spacing, and orientation of the MSWLF units;
- (2) hydrogeologic setting;
- (3) site history;
- (4) engineering design of the MSWLF units; and
- (5) type of waste accepted at the MSWLF units.

(c) The executive director may approve an alternative design for a groundwater monitoring system that uses other means in conjunction with monitoring wells to ensure detection of groundwater contamination in the uppermost aquifer from an MSWLF unit. The alternative design shall be at least as protective of human health and the environment as a monitoring-well system as specified in §330.231(a) of this title (relating to Groundwater Monitoring Systems).

(d) Monitoring wells shall be constructed in accordance with the rules of the commission and §330.242 of this title (relating to Monitor-Well Construction Specifications). Monitoring-well construction shall provide for maintenance of the integrity of the bore hole, collection of representative groundwater samples from the water-bearing zone(s) of concern, and prevention of migration of groundwater and surface water within the bore hole.

(1) Within 30 days of the completion of a monitoring well or any other part of a monitoring system, details of its construction shall be submitted to the executive director and shall include, as appropriate, a detailed geologic log of the boring, a description of development procedures, a detailed location map drawn to scale showing the relationship of the well to the MSWLF unit and relevant point(s) of compliance, and any other data obtained during installation or construction of the well or system.

(2) All parts of a groundwater monitoring system shall be operated and maintained so that they perform at least to design specifications through the life of the groundwater monitoring program.

(e) A groundwater monitoring system, including the number, spacing, and depths of monitoring wells or other sampling points, shall be designed and certified by a qualified groundwater scientist. Within 14 days of the certification, the owner or operator shall submit the certification to the executive director and place a copy of the certification in the operating record. The plan for the

monitoring system and all supporting data must be submitted to the executive director for review and approval prior to construction.

(1) The design of a monitoring system shall be based on site-specific technical information that must include a thorough characterization of: aquifer thickness; ground-water flow rate; groundwater flow direction including seasonal and temporal fluctuations in flow; effect of site construction and operations on groundwater flow direction and rates; and thickness, stratigraphy, lithology, and hydraulic characteristics of saturated and unsaturated geologic units and fill materials overlying the uppermost aquifer, materials of the uppermost aquifer, and materials of the lower confining unit of the uppermost aquifer. A geologic unit is any distinct or definable native rock or soil stratum.

(2) Groundwater modeling may be used to supplement the determination of the spacing of monitoring wells or other sampling points and shall consider site-specific characteristics of groundwater flow as well as dispersion and diffusion of possible contaminants in the materials of the uppermost aquifer. Any model used shall:

(A) have supporting documentation that establishes its ability to represent groundwater flow and contaminant transport, as needed;

(B) have a sound set of equations based on accepted theory representing groundwater movement and contaminant transport;

(C) have numerical solution methods that are based on sound mathematical principles and supported by verification and checking techniques;

(D) be calibrated against site-specific field data;

(E) have a sensitivity analysis to measure its response to changes in the values of major parameters, error tolerances, and other parameters;

(F) show mass-balance calculations, where necessary; and

(G) be based on actual field or laboratory measurements, or equivalent methods, that document the validity of chosen parameter values.

(3) The owner or operator of an MSWLF unit or facility shall promptly notify the executive director in writing of changes in site construction or operation or changes in adjacent property that affect or are likely to affect the direction and rate of groundwater flow and the potential for detecting groundwater contamination from an MSWLF unit and that may require the installation of additional monitoring wells or sampling points. Such additional wells or sampling points require a modification of the site development plan.

**§330.235. Assessment Monitoring Program.**

(a) Assessment monitoring is required whenever a statistically significant change from background has been detected for one or more of the constituents listed in §330.241 of this title (relating to Constituents for Detection Monitoring), or in the alternative list established in accordance with §330.234(a)(2) of this title (relating to Detection Monitoring Program), and this constitutes triggering.

(b) Within 90 days of triggering an assessment monitoring program in accordance with §330.234(d) of this title, and not less than annually thereafter, the owner or operator shall sample and analyze the groundwater monitoring system for all constituents identified in paragraph (1) of this subsection.

(1) The constituents to be analyzed in samples collected in accordance with subsection (b) of this section shall be those listed in Appendix II to 40 Code of Federal Regulations (CFR) Part 258 and those in the alternative list established in accordance with §330.234(a)(2) of this title. All of these constituents are hereinafter referred as "assessment constituents." Appendix II to 40 CFR Part 258, effective October 9, 1993, is herein adopted by reference.

(2) A minimum of one sample shall be collected from each well and analyzed for the assessment constituents during each new sampling event. For any constituent(s) detected in the downgradient wells as a result of the analysis of the assessment constituents, a minimum of four

statistically independent samples from each background and downgradient well shall be collected and analyzed to establish background levels for the constituent(s). The executive director may specify an appropriate subset of wells to be sampled and analyzed for the assessment constituents during assessment monitoring and may delete any of the assessment constituents for a municipal solid waste landfill (MSWLF) unit if it can be documented that the removed constituents are not reasonably expected to be in or derived from the waste contained in the unit.

(c) The executive director may specify an appropriate alternative frequency for repeated sampling and analysis for the assessment constituents required by subsection (b) of this section during the active life and the closure and post-closure care period of the unit. The alternative frequency shall be no less than annual and shall be based on factors such as lithology and hydraulic conductivity of the aquifer and unsaturated zone, groundwater flow rates, minimum distance of travel from the waste nearest to any downgradient monitoring well, resource value of the uppermost aquifer, and nature (fate and transport) of any constituents detected in response to this section.

(d) Not later than 45 days after each sampling event, the owner or operator shall submit to the executive director the results from the initial and subsequent sampling events required in subsection (b) of this section and also place them in the operating record. The owner or operator shall also:

(1) within 90 days of submittal of the results from a sampling event and on at least a semiannual basis thereafter, resample all wells specified by §330.231(a) of this title (relating to Groundwater Monitoring Systems) and conduct analyses for all constituents in §330.241 of this title or

in the alternative list established in accordance with §330.234(a)(2) of this title and for those constituents in Appendix II of 40 CFR Part 258 that are detected in response to subsection (b) of this section. The results must be submitted to the executive director not later than 45 days after the sampling event and shall also be placed in the operating record. At least one sample must be collected and analyzed from each background and downgradient well at each sampling event. The executive director may specify an alternative monitoring frequency during the active life and the closure and post-closure care period for the constituents referred to in this paragraph. The alternative frequency for constituents in §330.241 of this title, or the alternative list established in accordance with §330.234(a)(2) of this title, during the active life and the closure and post-closure care period shall be not less than annual. The alternative frequency shall be based on consideration of the factors described in subsection (c) of this section;

(2) establish background concentrations for any constituents detected in accordance with subsection (b) of this section or paragraph (1) of this subsection;

(3) establish groundwater protection standards for all constituents in downgradient wells detected in accordance with subsection (b) of this section or paragraph (1) of this subsection. The groundwater protection standards shall be established in accordance with subsection (h) or (i) of this section.

(e) If the concentrations of all assessment constituents are shown to be at or below background values, using the statistical procedures in §330.233(g) of this title (relating to Groundwater Sampling

and Analysis Requirements) for two consecutive sampling events, the owner or operator must notify the executive director in writing and return to detection monitoring if approved.

(f) If the concentrations of any assessment constituents are above background values, but all concentrations are below the groundwater protection standard established under subsection (h) or (i) of this section, using the statistical procedures in §330.233(g) of this title, the owner or operator shall continue assessment monitoring in accordance with this section.

(g) If one or more assessment constituents are detected at statistically significant levels above the groundwater protection standard established under subsection (h) or (i) of this section in any sampling event, the owner or operator shall notify the executive director and appropriate local government officials in writing and place a notice in the operating record within 60 days of the sampling event identifying the assessment constituents that have exceeded the groundwater protection standard.

(1) The owner or operator shall also:

(A) characterize the nature and extent of the release by installing additional monitoring wells as necessary;

(B) install at least one additional monitoring well at the facility boundary in the direction of contaminant migration and sample this well in accordance with §330.235(d)(1) of this title (relating to Assessment Monitoring Program);

(C) notify in writing all persons who own or occupy the land that directly overlies any part of the plume of contamination if contaminants have migrated off site as indicated by sampling of wells in accordance with subsection (d)(1) of this section; and

(D) initiate an assessment of corrective measures as required by §330.236 of this title (relating to Assessment of Corrective Measures) all within 90 days of the notice to the executive director.

(2) The owner or operator may demonstrate that a source other than an MSWLF unit caused the contamination or that the statistically significant change resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. A report documenting this demonstration must be prepared and certified by a qualified groundwater scientist and submitted to the executive director for review and approval, and must be placed in the operating record. If a successful demonstration is made, the owner or operator shall continue monitoring in accordance with the assessment monitoring program required by this section and may return to detection monitoring if the assessment constituents are at or below background as specified in subsection (e) of this section. Until a successful demonstration is made, the owner or operator shall comply with paragraph (1) of this subsection including initiating an assessment of corrective measures.

(h) The owner or operator shall establish a groundwater protection standard for each assessment constituent detected in the downgradient monitoring wells. The groundwater protection standard must be:

(1) for constituents for which a maximum contaminant level (MCL) has been promulgated under 40 CFR Part 141, Safe Drinking Water Act (codified), §1412, the MCL for that constituent;

(2) for constituents for which MCLs have not been promulgated, the background concentration for the constituent established from wells in accordance with §330.231(a)(1) of this title;  
or

(3) for constituents for which the background level is higher than the MCL identified under paragraph (1) of this subsection or health-based levels identified under subsection (i) of this section, the background concentration.

(i) The executive director may establish an alternative groundwater protection standard for assessment constituents for which MCLs have not been established. These groundwater protection standards shall be appropriate health-based levels that satisfy the following criteria:

(1) the level is derived in a manner consistent with EPA guidelines for assessing the health risks of environmental pollutants (51 FR 33992, 34006, 34014, 34028, September 24, 1986);

(2) the level is based on scientifically valid studies conducted in accordance with the Toxic Substances Control Act Good Laboratory Practice Standards (40 (CFR) Part 792) or equivalent;

(3) for carcinogens, the level represents a concentration associated with an excess lifetime cancer risk level (due to continuous lifetime exposure) with the  $1 \times 10^{-4}$  to  $1 \times 10^{-6}$  range; and

(4) for systemic toxicants, the level represents a concentration to which the human population (including sensitive subgroups) could be exposed to on a daily basis that is likely to be without appreciable risk of deleterious effects during a lifetime. For purposes of this subchapter, systemic toxicants include toxic chemicals that cause effects other than cancer or mutation.

(j) In establishing groundwater protection standards under subsection (i) of this section, the executive director may consider multiple contaminants in the groundwater, exposure threats to sensitive environmental receptors, and other site-specific exposure or potential exposure to groundwater.

**§330.238. Implementation of the Corrective Action Program.**

(a) Based on the schedule established under §330.237(d) of this title (relating to Selection of Remedy) for initiation and completion of remedial activities, the owner or operator shall:

(1) establish and implement a corrective action groundwater monitoring program that:

(A) at least meets the requirements of an assessment monitoring program under §330.235 of this title (relating to Assessment Monitoring Program);

(B) indicates the effectiveness of the corrective action remedy; and

(C) demonstrates compliance with groundwater protection standards under subsection (e) of this section;

(2) implement the corrective action remedy selected under §330.237 of this title; and

(3) take any interim measures necessary to ensure the protection of human health and the environment. Interim measures should, to the greatest extent practicable, be consistent with the objectives of and contribute to the performance of any remedy that may be required under §330.237 of this title. The following factors shall be considered by an owner or operator in determining if interim measures are necessary:

(A) time required to develop and implement a final remedy;

(B) actual or potential exposure of nearby populations or environmental receptors to hazardous constituents;

(C) actual or potential contamination of drinking-water supplies or sensitive ecosystems;

(D) further degradation of the groundwater that may occur if remedial action is not initiated expeditiously;

(E) weather conditions that may cause hazardous constituents to migrate or be released;

(F) risks of fire or explosion, or potential for exposure to hazardous constituents as a result of an accident or failure of a container or handling system; and

(G) other situations that may pose threats to human health and the environment.

(b) An owner or operator may determine, based on information developed after implementation of the remedy has begun or other information, that compliance with requirements of §330.237(b) of this title are not being achieved through the remedy selected. In such cases, the owner or operator shall, with approval of the executive director, implement other methods or techniques that could practicably achieve compliance with the requirements unless the owner or operator makes the determination under subsection (c) of this section and if it is approved by the executive director. Failure to obtain approval

from the executive director for the other methods and techniques does not relieve the owner or operator of the burden to implement an acceptable remedy.

(c) If the owner or operator determines that compliance with requirements under §330.237(b) of this title cannot be practically achieved with any currently available methods, the owner or operator shall:

(1) present to the executive director certification by a qualified groundwater scientist that compliance with requirements under §330.237(b) of this title cannot be practically achieved with any currently available methods;

(2) implement alternate measures, with the approval of the executive director, to control exposure of humans or the environment to residual contamination, as necessary to protect human health and the environment;

(3) implement alternate measures, with the approval of the executive director, for control of the sources of contamination, or for removal or decontamination of equipment, units, devices, or structures that are technically practicable and consistent with the overall objective of the remedy; and

(4) place a copy of all approved alternate measures in the operating record.

(d) All solid wastes that are managed in accordance with a remedy required under §330.237 of this title, or an interim measure required under subsection (a)(3) of this section, shall be managed in a manner that is protective of human health and the environment and that complies with applicable RCRA requirements.

(e) Remedies selected under §330.237 of this title shall be considered complete when:

(1) the owner or operator complies with the groundwater protection standards established under §330.235(h) or (i) of this title at all points within the plume of contamination that lies within or beyond the groundwater monitoring system established under §330.231(a) of this title (relating to Groundwater Monitoring Systems);

(2) compliance with the groundwater protection standards established under §330.235(h) or (i) of this title has been achieved by demonstrating that concentrations of assessment constituents have not exceeded the groundwater protection standards for a period of three consecutive years, using the statistical procedures and performance standards in §330.233(g) and (h) of this title (relating to Groundwater Sampling and Analysis Requirements). The executive director may specify an alternative length of time during which the owner or operator shall demonstrate that concentrations of assessment constituents have not exceeded the groundwater protection standards. The alternative length of time shall be based on:

(A) extent and concentration of the release;

(B) behavior characteristics of the hazardous constituents in the groundwater;

(C) accuracy of monitoring or modeling techniques, including any seasonal, meteorological, or other environmental variabilities that may affect the accuracy; and

(D) characteristics of the groundwater; and

(3) all actions required to complete the remedy have been satisfied.

(f) Within 15 days of completion of the remedy, the owner or operator shall submit to the executive director and also place in the operating record a certification by a qualified groundwater scientist that the remedy has been completed in compliance with the requirements of subsection (e) of this section.

(g) Upon submittal of satisfactory certification of the completion of the corrective action remedy, the executive director may release the owner or operator from the requirements for financial assurance for corrective action under §330.284 of this title (relating to Corrective Action for Landfills).

**§330.242. Monitor-Well Construction Specifications.**

(a) The following specifications must be used for the installation of groundwater monitoring wells at municipal solid waste landfills. Equivalent alternatives to these specifications may be used if prior written approval is obtained in advance from the executive director.

(1) Drilling.

(A) Monitoring wells must be drilled by a Texas-licensed driller who is qualified to drill and install monitoring wells. The installation and development shall be supervised by a licensed professional geoscientist or engineer who is familiar with the geology of the area.

(B) The well shall be drilled by a method that will allow installation of the casing, screen, etc., and that will not introduce contaminants into the borehole or casing. Drilling techniques used for boring shall take into account the materials to be drilled, depth to groundwater, total depth of the hole, adequate soil sampling, and other such factors that affect the selection of the drilling method. If any fluids are necessary in drilling or installation, then clean, treated city water shall be used; other fluids must be approved in writing by the executive director before use. If city water is used, a current chemical analysis of the city water shall be provided with the monitor-well report.

(C) The diameter of the boring shall be at least four inches larger than the diameter of the casing. When the boring is in hard rock, a smaller annulus may be approved by the executive director.

(D) During drilling of the monitoring well, a log of the boring shall be made by a licensed professional geoscientist or engineer who is familiar with the geology of the area.

(2) Casing, screen, filter pack, and seals.

(A) The well casing shall be: two to four inches in diameter; National Science Foundation-certified polyvinyl chloride (PVC) Schedule 40 or 80 pipe, flush-thread, screw joint (no glue or solvents); polytetrafluorethylene (PTFE, such as Teflon) tape or O-rings in the joints; no collar couplings. The top of the casing shall be at least two feet above ground level. Where high levels of volatile organic compounds or corrosive compounds are anticipated, stainless steel or PTFE casing and screen may be used, subject to approval by the executive director. Four-inch diameter casing is recommended because it allows larger volume samples to be obtained and provides easier access for development, pumps, and repairs. The casing shall be cleaned and packaged at the place of manufacture; the packaging shall include a PVC wrapping on each section of casing to keep it from being contaminated prior to installation. The casing shall be free of ink, labels, or other markings. The casing (and screen) shall be centered in the hole to allow installation of a good filter pack and annular seal, using appropriately placed centralizers. The top of the casing shall be protected by a threaded or slip-on top cap or by a sealing cap or screw-plug seal inserted into the top of the casing. The cap shall be vented to prevent buildup of methane or other gases and shall be designed to prevent moisture from entering the well.

(B) The screen shall be compatible with the casing and should generally be of the same material. The screen shall not involve the use of any glues or solvents for construction. A wire-wound screen is recommended to provide maximum inflow area. Field-cut slots are not permitted for well screen. Filter cloth shall not be used. A blank-pipe sediment trap, typically one to two feet, should be installed below the screen. A bottom cap is typically placed on the bottom of the sediment trap. The sediment trap shall not extend through the lower confining layer of the water-bearing zone being tested. Screen sterilization methods are the same as those for casing. Selection of the size of the screen opening should be done by a person experienced with such work and shall include consideration of the distribution of particle sizes both in the water-bearing zone and in the filter pack surrounding the screen. The screen opening shall not be larger than the smallest fraction of the filter pack.

(C) The filter pack, placed between the screen and the well bore, shall consist of pre-packaged, inert, clean silica sand or glass beads; it shall extend from one to four feet above the top of the screen. Open stockpile sources of sand or gravel are not permitted. The filter pack usually has a 30% finer grain size that is about four to ten times larger than the 30% finer grain size of the water-bearing zone; the filter pack should have a uniformity coefficient less than 2.5. The filter pack should be placed with a tremie pipe to ensure that the material completely surrounds the screen and casing without bridging. The tremie pipe shall be steam cleaned prior to the first well and before each subsequent well.

(D) The annular seal shall be placed on top of the filter pack and shall be at least two feet thick. It should be placed in the zone of saturation to maintain hydration. The seal

should be composed of coarse-grain sodium bentonite, coarse-grit sodium bentonite, or bentonite grout. Special care should be taken to ensure that fine material or grout does not plug the underlying filter pack. Placement of a few inches of pre-packaged clean fine sand on top of the filter pack will help to prevent migration of the annular seal material into the filter pack. The seal should be placed on top of the filter pack with a steam-cleaned tremie pipe to ensure good distribution and should be tamped with a steam-cleaned rod to determine that the seal is thick enough. The bentonite shall be hydrated with clean water prior to any further activities on the well and left to stand until hydration is complete (eight to 12 hours, depending on the grain size of the bentonite). If a bentonite-grout (without cement) casing seal is used in the well bore, then it may replace the annular seal described in this paragraph.

(E) A casing seal shall be placed on top of the annular seal to prevent fluids and contaminants from entering the borehole from the surface. The casing seal shall consist of a commercial bentonite grout or a cement-bentonite mixture. Drilling spoil, cuttings, or other native materials are not permitted for use as a casing seal. Quick-setting cements are not permitted for use because contaminants may leach from them into the groundwater. The top of the casing seal shall be between five and two feet from the surface.

(3) Concrete pad. High-quality structural-type concrete shall be placed from the top of the casing seal (two to five feet below the surface) continuously to the top of the ground to form a pad at the surface. This formed surface pad shall be at least six inches thick and not less than four (preferably six) feet square or five (preferably six) feet in diameter. The pad shall contain sufficient reinforcing steel to ensure its structural integrity in the event that soil support is lost. The top of the

pad shall slope away from the well bore to the edges to prevent ponding of water around the casing or collar.

(4) Protective collar. A steel protective pipe collar shall be placed around the casing "stickup" to protect it from damage and unwanted entry. The collar shall be set at least one foot into the surface pad during its construction and should extend at least three inches above the top of the well casing (and top cap, if present). The top of the collar shall have a lockable hinged top flap or cover. A sturdy lock shall be installed, maintained in working order, and kept locked when the well is not being bailed/purged or sampled. The well number or other designation shall be marked permanently on the protective steel collar; it is useful to mark the total depth of the well and its elevation on the collar.

(5) Protective barrier. Where monitoring wells are likely to be damaged by moving equipment or are located in heavily traveled areas, a protective barrier shall be installed. A typical barrier is three or four six- to 12-inch diameter pipes set in concrete just off the protective pad. The pipes can be joined by pipes welded between them, but consideration must be given to well access for sampling and other activities. Separation of such a pipe barrier from the pad means that the barrier can be damaged without risk to the pad and well. Other types of barriers may be approved by the executive director.

(b) Unusual conditions. Where monitoring wells are installed in unusual conditions, all aspects of the installation shall be approved in writing in advance by the executive director. Such aspects

include, for example, the use of cellar-type enclosures for the top-well equipment or multiple completions in a single hole.

(c) Development. After a monitoring well is installed, it shall be developed to remove artifacts of drilling (clay films, bentonite pellets in the casing, etc.) and to open the water-bearing zone for maximum flow into the well. Development should continue until all of the water used or affected during drilling activities has been removed and field measurements of pH, specific conductance, and temperature have stabilized. Failure to develop a well properly may mean that it is not properly monitoring the water-bearing zone or may not yield adequate water for sampling even though the water-bearing zone is prolific.

(d) Location and elevation. Upon completion of a monitoring well, the location of the well and all appropriate elevations associated with the top-well equipment shall be surveyed by a registered professional surveyor. The elevation shall be surveyed to the nearest 0.01 foot above mean sea level (with year of the sea-level datum shown). The point on the well casing for which the elevation was determined shall be permanently marked on the casing. The location shall be given in terms of the latitude and longitude at least to the nearest tenth of a second or shall be accurately located with respect to the landfill grid system described in §330.55(a)(10)(F) of this title (relating to Site Development Plan).

(e) Reporting. Monitoring well installation and construction details must be submitted on forms available from the commission and must be completed and submitted within 30 days of well

completion. A copy of the detailed geologic log of the boring, any particle size or other sample data from the well, and a site map drawn to scale showing the location of all monitoring wells must be submitted to the executive director at the same time. The licensed driller should be familiar with the forms required by other agencies; a copy of those forms must also be submitted to the commission.

(f) Damaged wells. Any monitoring well that is damaged to the extent that it is no longer suitable for sampling shall be reported to the executive director who may make a determination about whether to repair or replace the well.

(g) Plugging and abandonment. Any monitoring well that is no longer used shall be properly abandoned and plugged in accordance with 16 TAC §76.702 (relating to Responsibilities of the Licensee and Landowner Well Drilling, Completion, Capping, and Plugging) and §76.1004 (relating to Technical Requirements Standards for Capping and Plugging of Wells and Plugging Wells that Penetrate Undesirable Water or Constituent Zones). No abandonment shall take place without prior authorization in writing by the executive director.

## **SUBCHAPTER L: LOCATION RESTRICTIONS**

### **§§330.303 - 330.305**

#### **STATUTORY AUTHORITY**

The amendments are adopted under Texas Water Code, §5.103, which provides the commission with the authority to adopt rules necessary to carry out its power and duties under this code and other laws of this state; Texas Water Code, §5.105, which authorizes the commission to establish and approve all general policy of the commission by rule; Texas Health and Safety Code, §361.024, which authorizes the commission to establish standards of operation for the management and control of solid waste; and Texas Civil Statutes, Article 3271b, the Act, which authorizes the public practice of geoscience in the State of Texas.

#### **§330.303. Fault Areas.**

(a) New municipal solid waste landfill (MSWLF) units and lateral expansions shall not be located within 200 feet of a fault that has had displacement in Holocene time unless the owner or operator demonstrates to the executive director that an alternative setback distance of less than 200 feet will prevent damage to the structural integrity of the MSWLF unit and will be protective of human health and the environment. The owner or operator shall submit the demonstration with a permit application, a permit amendment application, or a permit transfer request.

(b) Applications submitted for the operation of sites located within areas that may be subject to differential subsidence or active geological faulting must include detailed fault studies. When an active fault is known to exist within 1/2 mile of the site, the site must be investigated for unknown faults. Areas experiencing withdrawal of crude oil, natural gas, sulfur, etc., or significant amounts of groundwater must be investigated in detail for the possibility of differential subsidence or faulting that could adversely affect the integrity of landfill liners. Studies of differential subsidence or faulting shall be conducted under the direct supervision of a licensed professional engineer experienced in geotechnical engineering or a licensed professional geoscientist qualified to evaluate conditions of differential subsidence or faulting. The studies must establish the limits (both upthrown and downthrown) of the zones of influence of all active faulted areas within the site vicinity. Unless the applicant can provide substantial evidence that the zone of influence will not affect the site, no solid waste disposal shall be accomplished within a zone of influence of active geological faulting or differential subsidence because active faulting results in slippage along failure planes, thus creating preferred seepage paths for liquids. The studies must include information or data on the items in paragraphs (1) - (12) of this subsection, as applicable:

- (1) structural damage to constructed facilities (roadways, railways, and buildings);
- (2) scarps in natural ground;
- (3) presence of surface depressions (sag ponds and ponded water);

- (4) lineations noted on aerial maps and topographic sheets;
- (5) structural control of natural streams;
- (6) vegetation changes;
- (7) crude oil and natural gas accumulations;
- (8) electrical spontaneous potential and resistivity logs (correlation of subsurface strata to check for stratigraphic offsets);
- (9) earth electrical resistivity surveys (indications of anomalies that may represent fault planes);
- (10) open trench excavations (visual examinations to detect changes in subsoil texturing and/or weathering indicating stratigraphic offsets);
- (11) changes in elevations of established benchmarks; and
- (12) references to published geological literature pertaining to area conditions.

**§330.304. Seismic Impact Zones.**

For the purposes of this section, a seismic impact zone is defined as an area with a 10% or greater probability that the maximum horizontal acceleration in rock, expressed as a percentage of the earth's gravitational pull, will exceed 0.10g in 250 years. Maximum horizontal acceleration is defined as the maximum expected horizontal acceleration depicted on a seismic hazard map, with a 90% or greater probability that the acceleration will not be exceeded in 250 years, or the maximum expected horizontal acceleration based on a site-specific seismic risk assessment. Lithified earth material is defined as all rocks, including all naturally occurring and naturally formed aggregates or masses of minerals or small particles of older rock that formed by crystallization of magma or by induration of loose sediments. This term does not include man-made materials, such as fill, concrete, and asphalt, or unconsolidated earth materials, soil, or regolith lying at or near the earth surface. New municipal solid waste landfill units and lateral expansions shall not be located in seismic impact zones, unless the owner or operator demonstrates to the executive director that all containment structures, including liners, leachate collection systems, and surface water control systems, are designed to resist the maximum horizontal acceleration in lithified earth material for the site. The owner or operator shall submit the demonstration with a permit application, a permit amendment application, or a permit transfer. The demonstration must become part of the operating record once approved.

**§330.305. Unstable Areas.**

For the purposes of this section, an unstable area is defined to be a location that is susceptible to natural or human-induced events or forces capable of impairing the integrity of some or all of a landfill's structural components responsible for preventing releases from the landfill; unstable areas can include poor foundation conditions, areas susceptible to mass movement, and karst terrains. Owners or operators of new municipal solid waste landfill (MSWLF) units, existing MSWLF units, and lateral expansions located in an unstable area shall demonstrate that engineering measures have been incorporated into the MSWLF unit's design to ensure that the integrity of the structural components of the MSWLF unit will not be disrupted. The owner or operator shall submit the demonstration with a permit application, a permit amendment application, or a permit transfer. The demonstration must become part of the operating record once approved. The owner or operator shall consider the following factors, at a minimum, when determining whether an area is unstable:

- (1) on-site or local soil conditions that may result in significant differential settling;
- (2) on-site or local geologic or geomorphologic features; and
- (3) on-site or local human-made features or events (both surface and subsurface).

**SUBCHAPTER N: LANDFILL MINING**

**§330.415, §330.416**

**STATUTORY AUTHORITY**

The amendments are adopted under Texas Water Code, §5.103, which provides the commission with the authority to adopt rules necessary to carry out its power and duties under this code and other laws of this state; Texas Water Code, §5.105, which authorizes the commission to establish and approve all general policy of the commission by rule; Texas Health and Safety Code, §361.024, which authorizes the commission to establish standards of operation for the management and control of solid waste; and Texas Civil Statutes, Article 3271b, the Act, which authorizes the public practice of geoscience in the State of Texas.

**§330.415. Additional Requirements for Municipal Solid Waste Mining Facilities.**

(a) Within 30 days after the approval of a registration of a municipal solid waste (MSW) facility, the owner or operator shall submit three copies of the final approved site development plan to the executive director. These copies must be loose-leaf bound and must include all drawings and sketches. The outside binder must be marked "Approved Site Development Plan" and must indicate the date of executive director approval. The executive director may allow an extension of the deadline if work required cannot reasonably be completed within 30 days.

(b) If at any time during the life of the site the site owner or operator becomes aware of any condition in the approved site development plan that necessitates a change to accommodate new technology or improved methods or that makes it impractical to keep the site in compliance, the site owner or operator shall submit to the executive director a revised plan.

(c) All drawings or other sheets prepared for revisions to a site development plan or other previously approved documents, that may be required by this subchapter, must be submitted in triplicate. The revised pages must be marked for the current revision (i.e., "Revision Number 3"), dated, and punched for insertion into the loose-leaf binder. Drawings must be 8 1/2 by 11 inches or 11 by 17 inches. However, standard-sized drawings (24 by 36 inches) folded to 8 1/2 by 11 inches may be submitted or required if reduction would render them illegible or difficult to interpret. All revised engineering drawings must be signed and sealed by the licensed professional engineer responsible for their preparation and must be included in the loose-leaf binder. All revised geological drawings shall be signed and sealed by the licensed professional geoscientist responsible for their preparation and must be included in the loose-leaf binder.

(d) Prior to the beginning of initial excavation or construction for an MSW mining facility, a preconstruction conference shall be held. All aspects of the application, construction activities, and inspections shall be discussed. An initial preconstruction conference shall be held within 90 days after the issuance of a registration. Executive director representatives and owner's representatives, including the engineer, the geotechnical consultant, the contractor, and the site manager, shall attend the preconstruction conference.

(e) After all initial construction activity has been completed and prior to processing waste, the owner/operator shall contact executive director representatives and request a pre-opening inspection. A pre-opening inspection shall be conducted by executive director representatives within 14 days of notification by the owner or operator that all construction activities have been completed, accompanied by representatives of the owner/operator and the engineer.

(f) The MSW mining facility shall not process solid waste until the executive director has confirmed in writing that all applicable submissions required by the registration, the approved site development plan, and this chapter have been received and found to be acceptable, and that construction is in compliance with the application and the approved site development plan. If the executive director has not provided a written or verbal response within 14 days of completion of the pre-opening inspection, the facility shall be considered approved for mining.

**§330.416. Registration Application Preparation.**

(a) General instruction and title page. To assist the executive director in evaluating the technical merits of a landfill mining facility, a site development plan shall be prepared and submitted to the commission along with a Registration Application Form. The site development plan shall be sealed by a licensed professional engineer in accordance with the provisions of 22 TAC §131.166 (relating to Engineers' Seals). All submittals must be in a complete final form. The site development plan must contain all of the information specified in this section. A title page must show the name of the project, the county (and city if applicable) in which the proposed project is located, the name of the applicant,

the name of the engineer, the date the application was prepared, and the latest date the application was revised.

(b) Table of contents. A table of contents shall be included which lists the main sections of the plan, any requested variances and includes page numbers.

(c) Engineer's appointment. An engineer's appointment shall be included which consists of a letter from the applicant to the executive director identifying the consulting engineering firm responsible for the submission of the plan, specifications and any other technical data to be evaluated by the commission regarding the project. The notice of appointment shall identify by name both the applicant's consulting and the individual engineer of record. Include the mailing address, phone number and facsimile (FAX) number of the engineer.

(d) Construction plans and specifications. Those applications receiving authorization shall be required to prepare and maintain Construction Plans and Specifications, and Record Documents.

(1) Construction Plans and Specifications of the proposed or modified facility shall be prepared and one copy maintained at the facility at all times during construction.

(2) After completion of a construction phase, a record document set of construction plans and specifications shall prepared and maintained at the facility and/or at the owner or operator's

main office. These plans shall be made available for inspection by the commission or other interested parties.

(3) Final Construction Plans and Specifications are not required for authorization.

(e) Applicants responsibilities.

(1) All aspects of the application must be addressed by the applicant, even if only to show why they are not applicable for that particular site.

(2) It is the responsibility of the applicant to provide the executive director data of sufficient completeness, accuracy, and clarity to provide assurance that operation of the site will pose no reasonable probability of adverse effects on the health, welfare, environment, or physical property of nearby residents or property owners. Failure to provide complete information as required by this chapter may be cause for the executive director to return the application without further action. Submission of false information shall constitute grounds for denial.

(3) The applicant is responsible for determining and reporting to the executive director any site-specific conditions that require special design considerations.

(f) Soil boring plan approval. The applicant is responsible for submitting to the executive director a soil boring plan that conforms to the requirements found in the applicable subchapter. The soil boring plan shall be approved by the executive director prior to initiation of the work.

(g) Permanent site benchmark. A permanent benchmark must be established at the site in an area of the site that is readily accessible. This benchmark must be a bronze or other suitable metal survey marker set in concrete at a sufficient depth to retain a stable and distinctive location and be of sufficient size to withstand the deteriorating forces of nature to best achieve this goal. The benchmark elevation and survey date must be stamped on it. The benchmark elevation must be surveyed from a known National Geodetic Survey benchmark or other compatible and comparable benchmark. The location and elevation of the reference benchmark and the permanent benchmark must be identified on a map and must be included in the site development plan. Horizontal monumentation must be in accordance with 22 TAC §663.15 (relating to Precision) of the Texas Board of Professional Land Surveying rules. Vertical control precision must be  $\pm 0.1$  feet relative to the elevation of the benchmark of origin.

(h) Application considerations. The application for a municipal solid waste registration shall be organized in the order of the rules of the subchapter and in conformance with the following requirements.

(1) Preparation. Preparation of the application shall conform with the Texas Civil Statutes, Engineering Practice Act, Article 3271a.

(A) The responsible engineer shall affix his seal, sign his name, place the date of execution and state the intended purpose on each sheet of engineering plans, drawings, maps, calculations, computer models, cost estimates, and on the title or contents page of the application as required by the Texas Engineering Practice Act.

(B) Applications that have not been signed and sealed shall be considered incomplete for the intended purpose and shall be returned to the applicant.

(2) Application document.

(A) Applications shall be submitted in three-ring loose-leaf binders.

(B) The narrative of the report shall be printed on 8 1/2 by 11 inches white paper.

(C) All pages shall contain a page number and date.

(D) During technical review revisions shall have the revision date and note that the sheet is revised in the header or footer of each revised sheet. The cover sheet to the application shall note all revision dates. The revised text shall be marked to highlight the revision.

(E) Dividers and tabs are encouraged.

(F) The application shall be organized in the format directed by these rules.

(G) Applications shall be initially submitted in three copies. The applicant shall furnish additional copies of the application for use by required reviewing agencies, on request of the executive director.

(i) Application drawings.

(1) All information contained on a drawing shall be legible, even if it has been reduced. The drawings shall be 8 1/2 by 11 inches or 11 by 17 inches. Standard sized drawings (24 by 36 inches) folded to 8 1/2 by 11 inches may be submitted or required if reduction would render them illegible or difficult to interpret.

(2) If color coding is used, it should be legible and the code distinct when reproduced on black and white photocopy machines.

(3) Drawings shall be submitted at a standard engineering scale.

(4) Each map or plan drawing shall have:

(A) a dated title block;

- (B) a bar scale at least one inch long;
- (C) a revision block;
- (D) the responsible engineer's signature and seal with intended purpose, if required;
- (E) the drawing number and a page number;
- (F) a north arrow. Preferred orientation is to have the north arrow pointing toward the top of the page;
- (G) a reference to the base map source and date if the map is based on another map. The latest published edition of the base map should be used;
- (H) a legend;
- (I) two longitudes and two latitudes showing on all general location maps;
- (J) the boundary of the site; and

(K) match lines and section lines which shall reference the drawing where the match or section is shown. Section drawings should note from where the section was taken.

(j) Application format.

(1) General information. The first part of the application, Part A, is designed to provide information that is required regardless of the type of site involved. All items required by this section shall be submitted.

(2) Title page. The title page shall show the name of the project, the municipal solid waste registration application number if known, the name of the applicant, the location by city and county, the date of preparation and, if appropriate, the number and date of the revision. It shall be signed and sealed as required by the Texas Engineering Practice Act.

(3) Table of contents. The table of contents shall list and give the page numbers for the main sections of the application.

(4) Part A Application Form. The Part A Application Form shall be completed, signed by the applicant, and notarized on a form provided by the agency.

(k) Land use. To assist the executive director in evaluating the impact of the facility on the surrounding area, the applicant shall provide the following:

- (1) a description of the zoning, if any, at the facility and within one mile of the facility.

If the facility requires approval as a nonconforming use or a special use permit from the local government having jurisdiction, a copy of such approval shall be submitted with the application;

- (2) a description of the character of the surrounding land uses within one mile of the proposed facility;

- (3) proximity to residences and other uses (e.g. schools, churches, cemeteries, historic structures, historic sites, archaeologically significant sites, sites having exceptional aesthetic quality, parks, recreational sites, recreational facilities, licensed day care etc.). Give the approximate number of residences and business establishments within one mile of the proposed facility including the distances and directions to the nearest residences and businesses;

- (4) a discussion that shows the facility is compatible with the surrounding land uses;
- and

- (5) a constructed land use map showing the land use, zoning, residences, businesses, schools, churches, cemeteries, historic structures, historic sites, archaeologically significant sites, sites having exceptional aesthetic quality, licensed day care centers, parks, recreational sites and recreational facilities within one mile of the facility and wells within 500 feet of the facility.

(l) Access. To assist the executive director in evaluating the impact of the facility on the surrounding roadway system, the applicant shall provide the following:

- (1) data on the roadways, within one mile of the facility, used to access the facility.

The data shall include dimensions, surfacing, general condition, capacity and load limits;

- (2) data on the volume of vehicular traffic on access roads within one mile of the proposed facility. The applicant shall include both existing and projected traffic during the life of the facility (for projected include both traffic generated by the facility and anticipated increase without the facility);

- (3) an analysis of the impact the facility will have on the area roadway system, including a discussion on any mitigating measures (turning lanes, roadway improvements, intersection improvements, etc.) proposed with the project; and

- (4) an access roadway map showing all area roadways within a mile of the facility.

The data and analysis required in paragraphs (1) - (3) of this subsection must be keyed to this map.

(m) Site plans. To assist the executive director in evaluating the impact of the facility on the environment, public safety, and public health, the applicant shall provide the following.

(1) Surface water protection plan. The surface water protection plan shall be prepared by a licensed professional engineer. At a minimum the applicant shall provide all of the following.

(A) A design for a run-on control system capable of preventing flow onto the facility and into active excavation areas during the peak discharge from at least a 25-year, 24-hour rainfall event.

(B) A design for a run-off management system to collect and control at least the peak discharge from the facility generated by a 25-year 24-hour rainfall event.

(C) A design for a contaminated water collection system to collect and contain all leachate. Leachate shall not be used in any of the facility processes.

(D) Drainage calculations as follows.

(i) Calculations for areas of 200 acres or less shall follow the rational method as specified in the Texas Department of Transportation Bridge Division Hydraulic Manual.

(ii) Calculations for discharges from areas greater than 200 acres shall be computed by using USGS/DHT hydraulic equations compiled by the United States Geological Survey and the Texas Department of Transportation Bridge Division Hydraulic Manual, the HEC-1 and

HEC-2 computer programs developed through the Hydrologic Engineering Center of the United States Army Corps of Engineers, or an equivalent or better method approved by the executive director.

(iii) Calculations for sizing containment facilities for leachate shall be shown to be determined based on the facilities proposed leachate disposal method.

(iv) Temporary and permanent erosion control measures shall be discussed.

(v) Drainage Maps and Drainage Plans shall be provided as follows:

(I) an off-site topographic drainage map showing all areas which contribute to the facilities run-on. The map shall delineate the drainage basins and sub-basins, show the direction of flow, time of concentration, basin area, rainfall intensity and flow rate. This map shall also show all creeks, rivers, intermittent streams, lakes, bayous, bays, estuaries, arroyos, and other surface waters in the state. All calculations shall be provided.

(II) a pre-construction on-site drainage map. The map shall delineate the drainage basins and sub-basins, show the direction of flow, time of concentration, basin area, rainfall intensity and flow rate. All calculations shall be provided.

(III) a post-construction on-site drainage map. The map shall delineate the drainage basins and sub-basins, show the direction of flow, time of concentration, basin area, rainfall intensity and flow rate. All calculations shall be provided.

(IV) a drainage facilities map. The map shall show all proposed drainage facilities (ditches, ponds, piping, inlets, outfalls, structures, etc.) and design parameters (velocities, cross-section areas, grades, flowline elevations, flow rates, etc.). Complete cross sections of all ditches and ponds shall be included.

(V) a profile drawing. The drawing shall include profiles of all ditches and pipes. Profiles shall include top of bank, flowline, hydraulic grade flowrate, velocities, and existing groundline. Ditches and swales shall have a minimum of one foot of freeboard.

(VI) a floodplain and wetlands map. The map shall show the location and lateral extent of all floodplains and wetlands on the site and on lands within 500 feet of the site.

(VII) an erosion control map and sedimentation control plan which indicates placement of erosion control features on the site.

(E) The test pit evaluation report shall be prepared by an engineer. Prior approval of a test pit plan must be obtained from the executive director before excavation of test pits

including location and depth of all test pits. The applicant shall include a discussion and information on the following:

(i) a description of the characteristics of waste observed in test pits excavated on the site to include the percent of paper, plastics, ferrous metal, other metal, glass, other constituents, and soil fraction by weight.

(ii) test pits shall extend four feet beneath the waste or to a depth authorized by the executive director and information submitted shall include a Toxicity Characteristic Leaching Procedure (TCLP) of the soil to characterize the soil beneath the site. Liners if present shall not be disrupted.

(iii) a TCLP of each representative type of waste excavated must be included in the report. Additionally, waste excavated from each test pit must be analyzed for asbestos and polychlorinated biphenyl. Consideration should be given to analysis of waste material from each test pit for hazardous waste constituents.

(iv) a sufficient number of test pits shall be performed to establish the properties of the waste. The number of test pits shall be three for a site of five acres or less. For sites larger than five acres the required number of test pits shall be three pits plus one for every five acres or fraction thereof. The number of test pits shall be approved by the executive director prior to making the pits. The test pits should be sufficiently large to provide representative information.

(v) all test pits where waste is removed shall be backfilled with clean CH or CL clay. The excavation shall be backfilled to exceed the existing grade and provide positive drainage.

(vi) the applicant shall prepare a cross-section drawing using the information from the test pits to depict the top and bottom elevations of the landfill.

(vii) the applicant shall include a plan view map depicting the location and extent (vertical and lateral) of the waste unit and proposed extent of mining/recovery operations. In areas with liners, mining operations should not extend below the top of the protective cover of the liner. In areas where no liner exists, excavation operations may extend below the waste.

(viii) as a part of the test pit evaluation report, historical records of landfill operations, where available, shall be evaluated to determine such things as hazardous waste potential, receipt of special waste, types of waste received, special waste disposal areas, construction and demolition material disposal areas, methane and leachate records, age, volume, and disposal methods, existence of liners, gas collection systems, and leachate collection systems.

(ix) all waste removed in test pit evaluation must be disposed of in a permitted landfill.

(F) In cases where a geologic/hydrogeologic report is determined to be needed by the executive director, the geologic/hydrogeologic report shall be prepared and signed by a licensed professional engineer or geoscientist. If determined to be needed by the executive director, the applicant shall include discussion and information on all of the following:

(i) a description of the regional geology of the area. This section must include:

(I) a geologic map of the region with text describing the stratigraphy and lithology of the map units. An appropriate section of a published map series such as the Geologic Atlas of Texas prepared by the Bureau of Economic Geology is acceptable;

(II) a description of the generalized stratigraphic column in the facility area from the base of the lowermost aquifer capable of providing usable groundwater, or from a depth of 1,000 feet, whichever is less, to the land surface. The geologic age, lithology, variation in lithology, thickness, depth geometry, hydraulic conductivity, and depositional history of each geologic unit should be described based upon available geologic information.

(ii) a description of the geologic processes active in the vicinity of the facility. This description shall include an identification of any faults and/or subsidence in the area of the facility.

(iii) a description of the regional aquifers in the vicinity of the facility based upon published and open-file sources. The section must provide:

(I) aquifer names and their association with geologic units described in clause (ii) of this subparagraph;

(II) a description of the composition of the aquifer(s);

(III) a description of the hydraulic properties of the aquifer(s);

(IV) information on whether the aquifers are under water table or artesian conditions;

(V) information on whether the aquifers are hydraulically connected;

(VI) a regional water-table contour map or potentiometric surface map for each aquifer, if available;

(VII) an estimate of the rate of groundwater flow;

(VIII) typical values or a range of values for total dissolved solids content of groundwater from the aquifers;

(IX) identification of areas of recharge to the aquifers within five miles of the site; and

(X) the present use of groundwater withdrawn from aquifers in the vicinity of the facility. The identification, location, and aquifer of all water wells within one mile of the property boundaries of the facility must be provided.

(iv) a subsurface investigation report. If determined to be needed by the executive director, the subsurface investigation report must include all or any part of the following details. The report must describe all borings drilled on-site to test soils and characterize groundwater and must include a site map drawn to scale showing the surveyed locations and elevations of the boring. Boring logs must include a detailed description of materials encountered including any discontinuities such as fractures, fissures, slickensides, lenses, or seams. Each boring must be presented in the form of a log that contains, at a minimum, the boring number; surface elevation and location coordinates; and a columnar section with text showing the elevation of all contacts between soil and rock layers, description of each layer using the unified soil classification, color, degree of compaction, and moisture content. A key explaining the symbols used on the boring logs and the classification terminology for soil type, consistency, and structure must be provided.

(I) If determined to be necessary by the executive director, a sufficient number of borings shall be performed to establish subsurface stratigraphy and to determine geotechnical properties of the soils and rocks beneath the facility. If borings records exist from a previous authorization, additional borings may not be necessary. The number of borings necessary can only be determined after the general characteristics of a site are analyzed. The minimum number of borings required for a site shall be three for sites of five acres or less, for sites larger than five acres the required number of borings shall be three borings plus one boring for each additional five acres or fraction thereof. The boring plan shall be approved by the executive director prior to making the borings.

(II) Borings shall be sufficiently deep to allow identification of the uppermost aquifer and underlying hydraulically interconnected aquifers. Borings shall penetrate the uppermost aquifer and all deeper hydraulically interconnected aquifers and be deep enough to identify the aquiclude at the lower boundary. All the borings shall be at least five feet deeper than the elevation of the deepest excavation. In addition, at least the number of borings shown on the Table of Borings shall be drilled to a depth at least 30 feet below the deepest excavation planned at the waste management unit, unless the executive director approves a different depth. If no aquifers exist within 50 feet of the elevation of the deepest excavation, at least one test hole shall be drilled to the top of the first perennial aquifer beneath the site, if sufficient data does not exist to accurately locate it. The executive director may accept data equivalent to a deep boring on the site to determine information for aquifers more than 50 feet below the site. Aquifers more than 300 feet below the lowest excavation and where the estimated travel times for constituents to the aquifer are in excess of 30 years plus the

estimated life of the site, need not be identified through borings. The number of borings shall be determined in consultation with the executive director.

(III) All borings shall be conducted in accordance with established field exploration methods. Care must be taken to not extend borings through buried waste and into groundwater.

(IV) Installation, abandonment, and plugging of the boring shall be in accordance with the rules of the commission.

(V) The applicant shall prepare cross-sections utilizing the information from the boring and depicting the generalized strata at the facility.

(VI) The report shall contain a summary of the investigator's interpretations of the subsurface stratigraphy based upon the field investigation.

(v) a groundwater investigation report. If required by the executive director, this report must establish and present the groundwater flow characteristics at the site and must include groundwater elevation, gradient, and direction of flow. The flow characteristics and most likely pathway(s) for pollutant migration must be discussed in a narrative format and shown graphically on a piezometric contour map. The groundwater data must be collected from piezometers installed at the site. The minimum number of piezometers required for the site must be three for sites of five acres

or less; for sites greater than five acres the total number of piezometers required must be three piezometers plus one piezometer for each additional five acres or fraction thereof unless otherwise approved by the executive director.

(G) The application shall demonstrate the processing facility is designed so as not to contaminate the groundwater and so as to protect the existing groundwater quality from degradation. At a minimum, groundwater protection must consist of all of the following.

(i) Liner system. All excavated waste storage, processing, and screening shall be located on a surface which is adequately lined to control seepage. The liner shall be covered with a material designed to withstand normal traffic from the processing operations.

(ii) Groundwater monitor system. If required by the executive director, a groundwater monitoring system must be designed and installed such that the system will reasonably assure detection of any contamination of the groundwater before it migrates beyond the boundaries of the processing area.

(I) If required, details of monitor well construction and placement of monitor wells shall be shown on the site plan;

(II) A groundwater sampling program in accordance with Subchapter I of this chapter (relating to Groundwater Monitoring and Corrective Action) shall be

provided. Monitoring shall be continued through the duration of processing and until the executive director determines monitoring is no longer needed.

(iii) Interface with existing groundwater protection facilities.

Consideration must be given to how excavations around any existing liners, leachate collection systems, and gas collection systems will be handled. Any existing liner, leachate collection system, or gas collection system must be maintained as functional and operated until made obsolete by the progression of excavation.

(H) The facility plan and facility layout shall be prepared by a licensed professional engineer. All proposed facilities, structures, and improvements must be clearly shown and annotated on this drawing. The plan must be drawn to standard engineering scale. Any necessary details or sections must be included. As a minimum the plan must show property boundaries, fencing, internal roadways, processing area, facility office, sanitary facilities, potable water facilities, storage areas, etc. If phasing is proposed for the facility, a separate facility plan for each phase is required.

(I) The process description shall be composed of a descriptive narrative along with a process diagram. The process description shall include all of the following.

(i) Material identification. The applicant shall prepare a list of the typical materials intended for processing along with the anticipated volume to be processed. This

section shall also contain an estimate of the daily quantity of material to be processed at the facility along with a description of the proposed process of screening for hazardous materials.

(ii) Excavation process. Indicate the methods of excavating the buried waste materials. Indicate how the material is handled, how long it remains in the area, what equipment is used, how the material is moved from the excavation area, how the area of excavation can be held to a minimum, the maximum side slopes in buried waste, and the maximum area of excavation at any one time. The sequence of excavation shall be shown.

(iii) Process. Indicate what happens to process the waste to recover reusable or recyclable material. Indicate what process or processes are used. The narrative shall include, any water addition, processing rates, equipment, and mass balance calculations.

(iv) Process waters. Indicate how any process water will be handled and disposed of if a wet mining process is to be used.

(v) Product distribution. Provide a complete narrative on product distribution to include items such as disposition of material recovered and probable use of soils on-site and off-site.

(vi) Process diagram. Provide a process diagram that depicts graphically the general process.

(J) The health and safety plan must be composed of a descriptive narrative describing types of equipment and methods of its use for all of the following:

- (i) air monitoring;
- (ii) radiation monitoring;
- (iii) pathogen monitoring;
- (iv) hazardous constituent monitoring;
- (v) personal protective equipment;
- (vi) decontamination plans;
- (vii) emergency response plans; and
- (viii) fire protection.

(K) Contingency plans must include a description of the courses of action which should be taken in response to abnormal or unsafe events that may occur during excavation or material processing. The contingency plan must address hazard evaluation and protection from

potential hazards, including engineering controls, personal protection equipment, and air monitoring techniques. The plan must include decontamination procedures, on-site communication procedures, and emergency procedures. The contingency plan must be composed of a narrative describing actions taken in response to all of the following:

- (i) hazardous constituents;
- (ii) leachate;
- (iii) drums;
- (iv) compressed gas cylinders;
- (v) unanticipated releases;
- (vi) unanticipated emergency;
- (vii) fires and explosions;
- (viii) hydrogen sulfide; and
- (ix) respiratory protection.

(2) Site operating plan. This document is to provide guidance from the design engineer to site management and operating personnel in sufficient detail to enable them to conduct day to day operations in a manner consistent with the engineer's design. As a minimum, the site operating plan shall include specific guidance or instructions on the all of the following:

(A) the minimum number of personnel and their functions to be provided by the site operator in order to have adequate capability to conduct the operation in conformance with the design and operational standards;

(B) the minimum number and operational capacity of each type of equipment to be provided by the site operator in order to have adequate capability to conduct the operation in conformance with the design and operational standards;

(C) security, site access control, traffic control and safety;

(D) control of dumping within designated areas, screening for unprocessable or unauthorized material;

(E) fire prevention and control plan that shall comply with provisions of the local fire code, provision for fire-fighting equipment, and special training requirements for fire fighting personnel;

(F) control of windblown material;

(G) vector control;

(H) quality assurance and quality control. As a minimum the applicant shall provide testing and assurance in accordance with the provisions of §330.417 of this title (relating to Sampling and Analysis Requirements for Soil Final Product);

(I) control of airborne emissions;

(J) minimizing odors;

(K) equipment failures and alternative disposal and storage plans in the event of equipment failure;

(L) a description of the intended final use of materials;

(M) a description of how saturated waste will be dried;

(N) a description of how mining operations will be conducted;

(O) a description of how oversized material such as white goods will be managed;

(P) consideration of odor masking agents;

(Q) a description of how mining operations will be conducted to avoid interference with any daily landfill practices; and

(R) evaluation of excavated material at a determined frequency.

(3) Legal description of the facility. The applicant shall submit an official metes and bounds description, and plat of the landfill area to be mined and an official metes and bounds description, and plat of the process area if the process area is not within the boundaries of the landfill to be mined. The description and plat shall be prepared and sealed by a registered professional land surveyor.

(4) Financial assurance. Municipal solid waste landfill facilities are subject to the requirements specified in Subchapter K of this chapter (relating to Closure, Post-Closure, and Corrective Action) and Chapter 37, Subchapter R of this title (relating to Financial Assurance for Municipal Solid Waste Facilities).

(5) Landowner list. The applicant shall include a list of landowners, residents, and businesses within one-half mile of the facility boundaries along with an appropriately scaled map locating property owned by the landowners.