



South Carolina Department of Health  
and Environmental Control

## **Regulation 61-107.258**

# **SWM: Municipal Solid Waste Landfills**

**Effective Date: June 23, 1995**

**Bureau of Land & Waste Management  
Division of Mining & Solid Waste Management  
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Columbia, SC 29201**

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DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL  
CHAPTER 61

Statutory Authority: 1976 Code  
Sections 44-96-260, 44-96-290, 44-96-300, 44-96-320  
44-96-330, 44-96-450, 44-96-460 and 44-96-470

**R. 61-107.258. Solid Waste Management: Municipal Solid Waste Landfills.**

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**SUBPART A - GENERAL PROVISIONS**

**258.1. PURPOSE, SCOPE, AND APPLICABILITY**

a. The purpose of this regulation is to establish minimum criteria under the South Carolina Solid Waste Policy and Management Act of 1991, as amended, and all applicable federal regulations, for all municipal solid waste landfill (MSWLF) units, as well as, for municipal solid waste landfills that are used to dispose of sewage sludge. These minimum criteria ensure the protection of human health and the environment.

b. These regulations apply to owners and operators of new MSWLF units, existing MSWLF units, and lateral expansions, except as otherwise specifically provided in this regulation.

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 part 258, with the exception of the closure criteria in 258.60 and post-closure care requirements in section 258.61. The final cover must be installed within six months of last receipt of wastes. Owners or operators of MSWLF units described in this paragraph that fail to complete cover installation within this six (6) month period will be subject to all the requirements of this part 258, unless otherwise specified.

d. All MSWLF units that receive waste on or after October 9, 1993 must comply with all requirements of this regulation unless otherwise specified.

e. The effective date of this regulation is October 9, 1993, except subpart G of this regulation is effective April 9, 1994.

f. The Department may allow vertical expansion of an existing MSWLF unit for a period not to exceed two (2) years after the effective date of these regulations (October 9, 1993), on a case by case basis. Vertical expansions allowing capacity after October 9, 1993 shall be exempted from the requirements of Subpart B and Subpart D. Any request for a temporary exemption from the requirements of Subparts B and D shall be made to the Department in the form of an application for a vertical expansion to the Department prior to the effective date of this regulation. Vertical expansions shall apply only to those portions of the MSWLF unit that have previously received waste prior to October 9, 1993, and have received waste consistent with past operating practices.

g. No facility for the disposal of municipal solid waste shall be operated in the State of South Carolina without first obtaining a written permit from the South Carolina Department of Health and Environmental Control.

h. MSWLF units failing to satisfy these criteria are considered open dumps for purposes of State solid waste management planning under RCRA.

i. MSWLF units failing to satisfy these criteria constitute open dumps, which are prohibited under section 4005 of RCRA.

j. MSWLF units containing sewage sludge and failing to satisfy these criteria violate sections 309 and 405(e) of the Clean Water Act.

k. All MSWLF units permitted prior to, and after the effective date of this regulation, which receive waste on or after October 9, 1998, must comply with all requirements of this regulation. All MSWLF units which do not meet the criteria specified in Subparts B, C, D, E, and F of this regulation must close prior to October 9, 1998.

## 258.2. DEFINITIONS

a. "Active life" means the period of operation beginning with the initial receipt of solid waste and ending at completion of closure activities in accordance with 258.60 of this part.

b. "Active portion" means that part of a facility or unit that has received or is receiving wastes and that has not been closed in accordance with 258.60 of this part.

c. "Areas of complex hydrogeology" typically include, but are not limited to, karst terrane; fractured rock formations (joints and faults; excludes healed fractures) irregularly stratified geologic deposits (e.g., certain fluvial, deltaic and barrier island deposits); mixed hydrogeologic regimes (e.g., sedimentary deposits overlying fractured crystalline bedrock); folded areas where flow paths may be contorted, and recharge zones where background water quality cannot be determined.

d. "Aquifer" means a geological formation, group of formations, or portion of a formation capable of yielding significant quantities of groundwater to wells or springs.

e. "Class GA groundwater" is defined in the South Carolina Water Classifications and Standards, R.61-68, as those groundwaters that are characterized by either of the following factors: the groundwater is irreplaceable because no reasonable alternative source of drinking water is available to substantial populations, or the groundwater is ecologically vital because it provides the base flow for a particularly

sensitive ecological system that, if polluted, would destroy a unique habitat.

f. "Commercial solid waste" means all types of solid waste generated by stores, offices, restaurants, warehouses, and other nonmanufacturing activities, excluding residential and industrial wastes.

g. "Department" means the South Carolina Department of Health and Environmental Control.

h. "Existing MSWLF unit" means any municipal solid waste landfill unit that is receiving solid waste as of the effective date of this part (October 9, 1993). Waste placement in existing units must be consistent with past operating practices or modified practices to ensure good management.

i. "Facility" means all contiguous land and structures, other appurtenances, and improvements on the land used for the disposal of solid waste.

j. "Groundwater" means water below the land surface in a zone of saturation.

k. "High water table" means the highest water levels measured in on-site monitoring wells for a period consisting of four (4) consecutive quarters.

l. "Household waste" means 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).

m. "Industrial solid waste" means solid waste generated by manufacturing or industrial processes that is not a hazardous waste regulated under subtitle C of RCRA. Such waste may include, but is not limited to, waste resulting from the following manufacturing processes: Electric power generation; fertilizer/agricultural chemicals; food and related products/by-products; inorganic chemicals; iron and steel manufacturing; leather and leather products; nonferrous metals manufacturing/foundries; organic chemicals; plastics and resins manufacturing; pulp and paper industry; rubber and miscellaneous plastic products; stone, glass, clay, and concrete products; textile manufacturing; transportation equipment; and water treatment. This term does not include mining waste or oil and gas waste.

n. "Lateral expansion" means a horizontal expansion of the waste boundaries of an existing MSWLF unit.

o. "Leachate" means a liquid that has passed through or emerged from solid waste and contains soluble, suspended, or miscible materials removed from such waste.

p. "Municipal solid waste landfill unit" means 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 257.2. A 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. A MSWLF unit may be a new MSWLF unit, an existing MSWLF unit or a lateral expansion.

q. "New MSWLF unit" means any municipal solid waste landfill unit that has not received waste prior to the effective date of this part (October 9, 1993).

r. "Open burning" means the combustion of solid waste without:

(1) Control of combustion air to maintain adequate temperature for efficient combustion,

(2) Containment of the combustion reaction in an enclosed device to provide sufficient residence time and mixing for complete combustion, and

(3) Control of the emission of the combustion products.

s. "Operator" means any person, including the owner, who is principally engaged in, or is in charge of, the actual operation, supervision, and maintenance of a solid waste management facility and includes the person in charge of a shift or period during any part of the day.

t. "Owner" means the person(s) who owns a facility or part of a facility.

u. "Perennial stream" means a stream or reach of a stream that flows continuously throughout the year and whose upper surface generally stands lower than the water table in the region adjoining the stream.

v. "Recharge area" for a particular aquifer is defined as areas where water enters the aquifer through downward migration. Principal examples include: outcrop areas of a particular aquifer where the potentiometric head within the unit decreases with depth; and, in the subsurface, where the potentiometric head relationship and leakage factors across any confining unit allow for downward flow into other aquifer systems.

w. "Run-off" means any rainwater, leachate, or other liquid that drains over land from any part of a facility.

x. "Run-on" means any rainwater, leachate, or other liquid that drains over land onto any part of a facility.

y. "Saturated zone" means that part of the earth's crust in which all voids are filled with water.

z. "Sludge" means 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.

aa. "Sole source aquifer" is defined as specified in the Federal Safe Drinking Water Act.

bb. "Solid waste" means any garbage, or 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, commercial, mining, and agricultural operations, and from community activities, but does not include solid or dissolved materials in domestic sewage, or solid or dissolved materials in irrigation return flows or industrial discharges that are point sources subject to permit under 33 U.S.C. 1342, or source, special nuclear, or by-product material as defined by the Atomic Energy Act of 1954, as amended (68 Stat. 923).

cc. "Special Wastes" means nonresidential or commercial solid wastes, other than regulated hazardous wastes, that are either difficult or dangerous to handle and require unusual management at Municipal Solid Waste Landfills, including, but not limited to, those wastes contained in code section 44-96-390.(A).

dd. "State" means the State of South Carolina.

ee. "Structural integrity" means the ability of a unit to withstand physical forces exerted upon designed components, appurtenances, and containment structures (e.g., liners, dikes) of the unit.

ff. "Uppermost aquifer" means the geologic formation nearest the natural ground surface that is an

aquifer, as well as, lower aquifers that are hydraulically interconnected with this aquifer within the facility's property boundary.

gg. "Vertical expansion" means an expansion of an existing waste management unit above previously permitted elevations for the purposes of gaining additional capacity.

hh. "Waste management unit boundary" means a vertical surface located at the hydraulically downgradient limit of the unit. This vertical surface extends down into the uppermost aquifer.

### 258.3. Considerations of other Federal Laws

The owner or operator of a municipal solid waste landfill unit must comply with any other applicable Federal rules, laws, regulations, or other requirements.

258.4. - 258.9. [Reserved]

## **SUBPART B - LOCATION RESTRICTIONS**

### 258.10. AIRPORT SAFETY

a. Owners or operators of new MSWLF units, existing MSWLF units, and lateral expansions that are located within ten thousand (10,000) feet (3,048 meters) of any airport runway end used by turbojet aircraft or within five thousand (5,000) feet (1,524 meters) of any airport runway end used by only piston-type aircraft must demonstrate that the units are designed and operated so that the MSWLF unit does not pose a bird hazard to aircraft.

b. Owners or operators proposing to site new MSWLF units and lateral expansions located within a five (5) mile radius of any airport runway end used by turbojet or piston-type aircraft must notify the affected airport and the Federal Aviation Administration (FAA).

c. The owner or operator must place the demonstration in paragraph a. of this section in the operating record and notify the Department that it has been placed in the operating record.

d. For purposes of this section:

(1) "Airport" means public-use airport open to the public without prior permission and without restrictions within the physical capacities of available facilities.

(2) "Bird hazard" means an increase in the likelihood of bird/aircraft collisions that may cause damage to the aircraft or injury to its occupants.

### 258.11. FLOODPLAINS

a. Owners or operators of new MSWLF units, existing MSWLF units, and lateral expansions located in 100-year floodplains must demonstrate that the unit will not restrict the flow of the 100-year flood, reduce the temporary water storage capacity of the floodplain, or result in washout of solid waste so as to pose a hazard to human health and the environment. The owner or operator must place the demonstration in the operating record and notify the Department that it has been placed in the operating record.

b. For purposes of this section:

(1) "Floodplain" means 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.

(2) "100-year flood" means a flood that has a 1-percent or greater chance of recurring in any given year or a flood of a magnitude equalled or exceeded once in one hundred (100) years on the average over a significantly long period.

(3) "Washout" means the carrying away of solid waste by waters of the base flood.

#### 258.12. WETLANDS

a. New MSWLF units and lateral expansions shall not be located in wetlands, unless the owner or operator can make the following demonstrations to the Department:

(1) Where applicable under section 404 of the Clean Water Act, or other applicable State wetlands laws, the presumption that a practicable alternative to the proposed landfill is available which does not involve wetlands is clearly rebutted:

(2) The construction and operation of the MSWLF unit will not:

(a) Cause or contribute to violations of any applicable State water quality standard,

(b) Violate any applicable toxic effluent standard or prohibition under Section 307 of the Clean Water Act,

(c) Jeopardize the continued existence of endangered or threatened species or result in the destruction or adverse modification of a critical habitat, protected under the Endangered Species Act of 1973, and

(d) Violate any requirement under the Marine Protection, Research, and Sanctuaries Act of 1972 for the protection of a marine sanctuary;

(3) The MSWLF unit will not cause or contribute to significant degradation of wetlands. The owner/operator must demonstrate the integrity of the MSWLF unit and its ability to protect ecological resources by addressing the following factors:

(a) Erosion, stability, and migration potential of native wetland soils, muds and deposits used to support the MSWLF unit;

(b) Erosion, stability, and migration potential of dredged and fill materials used to support the MSWLF unit;

(c) The volume and chemical nature of the waste managed in the MSWLF unit;

(d) Impacts on fish, wildlife, and other aquatic resources and their habitat from release of the solid waste;

(e) The potential effects of catastrophic release of waste to the wetland and the resulting impacts on the environment; and

(f) Any additional factors, as necessary, to demonstrate that ecological resources in the wetland are sufficiently protected.

(4) To the extent required under section 404 of the Clean Water Act, or other applicable State wetlands laws, steps have been taken to attempt to achieve no net loss of wetlands (as defined by acreage and function) by first avoiding impacts to wetlands to the maximum extent practicable as required by paragraph a.(1) of this section, then minimizing unavoidable impacts to the maximum extent practicable, and finally offsetting remaining unavoidable wetland impacts through all appropriate and practicable compensatory mitigation actions (e.g., restoration of existing degraded wetlands or creation of man-made wetlands); and

(5) Sufficient information is available to make a reasonable determination with respect to these demonstrations.

b. For purposes of this section, wetlands means those areas that are defined in 40 CFR 232.2(r).

c. In lieu of the demonstration required by subsection (a) of this section, the applicant may submit proof that it has obtained the permits and/or authorizations required by all other state and federal laws and regulations applicable to the use of such wetlands.

#### 258.13. FAULT AREAS

a. New MSWLF units and lateral expansions shall not be located within two hundred (200) feet (60 meters) of a fault that has had displacement in Holocene time unless the owner or operator demonstrates to the Department that an alternative setback distance of less than two hundred (200) feet (60 meters) will prevent damage to the structural integrity of the MSWLF unit and will be protective of human health and the environment.

b. For the purposes of this section:

(1) "Fault" means a fracture or a zone of fractures in any material along which strata on one side have been displaced with respect to that on the other side.

(2) "Displacement" means the relative movement of any two (2) sides of a fault measured in any direction.

(3) "Holocene" means the most recent epoch of the Quaternary period, extending from the end of the Pleistocene Epoch to the present.

#### 258.14. SEISMIC IMPACT ZONES

a. New MSWLF units and lateral expansions shall not be located in seismic impact zones, unless the owner or operator demonstrates to the Department 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 must place the demonstration in the operating record and notify the Department that it has been placed in the operating record.

b. For the purposes of this section:

(1) "Seismic impact zone" means an area with a ten (10) percent or greater probability that the maximum horizontal acceleration in lithified earth material, expressed as a percentage of the earth's gravitational pull (g), will exceed 0.10g in two hundred fifty (250) years.

(2) "Maximum horizontal acceleration in lithified earth material" means the maximum expected



horizontal acceleration depicted on a seismic hazard map, with a ninety (90) percent or greater probability that the acceleration will not be exceeded in two hundred fifty (250) years, or the maximum expected horizontal acceleration based on a site-specific seismic risk assessment.

(3) "Lithified earth material" means all rock, 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.

#### 258.15. UNSTABLE AREAS

a. Owners or operators of new MSWLF units, existing MSWLF units, and lateral expansions located in an unstable area must 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 must place the demonstration in the operating record and notify the Department that it has been placed in the operating record. The owner or operator must 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).

b. For purposes of this section:

(1) "Unstable area" means 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 terranes.

(2) "Structural components" means liners, leachate collection systems, final covers, run-on/run-off systems, and any other component used in the construction and operation of the MSWLF that is necessary for protection of human health and the environment.

(3) "Poor foundation conditions" means those areas where features exist which indicate that a natural or man-induced event may result in inadequate foundation support for the structural components of an MSWLF unit.

(4) "Areas susceptible to mass movement" means those 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 MSWLF 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 fluction, block sliding, and rock fall.

(5) "Karst terranes" means areas where karst topography, with its characteristic surface and subterranean features, is developed as the result of dissolution of limestone, dolomite, or other soluble rock. Characteristic physiographic features present in karst terranes include, but are not limited to, sinkholes, sinking streams, caves, large springs, and blind valleys.

#### 258.16. CLOSURE OF EXISTING MSWLFs

a. Existing MSWLF units that cannot make the demonstration specified in 258.10.a. pertaining to airports, 258.11.a. pertaining to floodplains, or 258.15.a. pertaining to unstable areas, must close by October 9, 1996, in accordance with 258.60. of this part and conduct post-closure activities in accordance with 258.61. of this part.

b. The deadline for closure required by paragraph (a) of this section may be extended up to two (2) years if the owner or operator demonstrates to the Department that:

- (1) There is no available alternative disposal capacity;
- (2) There is no immediate threat to human health and the environment.

#### 258.17. HYDROGEOLOGIC CONSIDERATIONS

a. New MSWLF units and expansions of existing MSWLF units, except MSWLF disposal units designed and permitted prior to the effective date of these regulations, should be located in areas that can be demonstrated to have the characteristics listed below (258.17.a.(1), a.(2), a.(3), and a.(4)). The inability of a site to meet full compliance with these criteria may not necessarily make the site unsuitable, but the applicant has the burden to demonstrate to the satisfaction of the Department why variance from the criteria will not compromise protection to human health and the environment. If Department review finds the demonstration to be inadequate, the application may be denied.

(1) That the site is not located in an area where the hydrogeologic conditions allow the migration of groundwater in shallow geologic units, having little potential as an underground source of drinking water, into deeper units. At the disposal area, any release to the uppermost aquifer would remain in the uppermost aquifer until discharge into the perennial stream nearest to the disposal area. The potentiometric head in the shallow portion of the uppermost aquifer should be equal to or lower than the potentiometric head in the deeper portion of the uppermost aquifer (i.e., a lateral or an upward hydraulic gradient should exist);

(2) That a minimum three (3) foot separation of naturally occurring material or an appropriate amount of equivalent engineered material can be maintained between the base of the constructed liner system and the high water table as it exists naturally;

(3) That a minimum ten (10) foot vertical separation of naturally occurring or engineered material can be maintained between the base of the constructed liner and bedrock; provided, however, the nature of the material and sufficient separation exists to provide for installation and operation of an effective groundwater monitoring system. The nature of the material making up this interval is subject to Department approval;

(4) That the unit is not located over an area where a stratum of limestone exhibiting secondary permeability with an average thickness of greater than five (5) feet, lies within fifty (50) feet of the base of the unit;

b. New MSWLF units and expansions of existing MSWLF units, except MSWLF disposal units designed and permitted prior to the effective date of these regulations, are prohibited in areas where the owner or operator cannot demonstrate to the satisfaction of the Department:

(1) That the MSWLF unit is not located in a manner that would result in the destruction of a perennial stream, within two hundred (200) feet of a perennial stream, within that portion of a drainage basin included in a two thousand five hundred (2500) foot radius on the upstream side of a public drinking water supply intake, and within that portion of a drainage basin which is within one thousand (1000) feet of a lake, pond, or

reservoir used as a source of public drinking water supply; and,

(2) That the hydrogeologic properties of the site can be adequately characterized. The characterization shall include, but not be limited to, a detailed description of the geologic units below the site (including mineralogy, sedimentary structures, thickness, continuity, and structure), the hydraulic properties of each geologic unit (including secondary porosity and a discussion of variations noted across the site), hydraulic gradient, hydraulic conductivity, and direction and rate of groundwater flow within the uppermost aquifer system and all interconnected aquifers and confining units using a groundwater flow net. In addition, the relationship between the units below the site to locally and regionally recognized geologic and hydrogeologic units must be described.

c. New MSWLF units and expansions of existing MSWLF units shall not be located over class GA groundwater or over the recharge area for Class GA groundwater as designated by the Department, over a sole source aquifer, or over the recharge area for a sole source aquifer as designated by the Department.

d. All MSWLF facilities must demonstrate compliance with the groundwater monitoring requirements under Subpart E.

#### 258.18. BUFFER ZONES

a. New MSWLF units and MSWLF expansions shall meet the following buffer zone requirements:

(1) Shall not be located within one hundred (100) feet of any property line not under control of the owner or operator.

(2) Shall not be located within two hundred (200) feet of any surface water body which holds visible water for greater than six (6) consecutive months, excluding ditches, sediment ponds, and other operational features on the site.

(3) Shall not be located within two hundred (200) feet of any residences, schools, hospitals and recreational park areas, existing at the time of permit application, or unless such features are included in the site design for a planned end-use.

(4) Shall not be located within the following distances from groundwater uses for human consumption that exist at the time of permit application:

(a) less than five hundred (500) feet hydraulically upgradient of the waste disposal unit;

(b) less than seven hundred fifty (750) feet hydraulically sidegradient of the waste disposal unit; or,

(c) any distance directly hydraulically downgradient from the waste disposal unit to the point of discharge for the uppermost aquifer flowing beneath the waste disposal unit.

#### 258.19. [Reserved]

### **SUBPART C - OPERATING CRITERIA**

#### 258.20. PROCEDURES FOR EXCLUDING THE RECEIPT OF HAZARDOUS WASTE AND SPECIAL WASTE

a. Owners or operators of all MSWLF units must implement a program at the facility for detecting and

preventing the disposal of regulated hazardous wastes as defined in the South Carolina Hazardous Waste Management Regulations R.61-79.261 and polychlorinated biphenyls (PCB) wastes as defined in RCRA Part 761. This program must include, at a minimum:

(1) Random inspections of incoming loads unless the owner or operator takes other steps to ensure that incoming loads do not contain regulated hazardous wastes or PCB wastes;

(2) Records of any inspections;

(3) Training of facility personnel to recognize regulated hazardous waste and PCB wastes; and

(4) Notification of the Department if a regulated hazardous waste or PCB waste is discovered at the facility.

b. For purposes of this section, "regulated hazardous waste" means a solid waste that is a hazardous waste, as defined in R.61-79.261.3, that is not excluded from regulation as a hazardous waste under R.61-79.261.4(b) or was not generated by a conditionally exempt small quantity generator as defined in R.61-79.261.5.

c. The owners and operators of all MSWLF units must implement a program at the facility for regulating the receipt of special wastes as described in section 44-96-390 of the South Carolina Solid Waste Policy and Management Act of 1991.

#### 258.21. COVER MATERIAL REQUIREMENTS

a. Except as provided in paragraph (b) of this section, the owners or operators of all MSWLF units must cover disposed solid waste with six (6) inches of earthen material at the end of each operating day, or at more frequent intervals if necessary, to control disease vectors, fires, odors, blowing litter, and scavenging.

b. Alternative materials of an alternative thickness (other than at least six (6) inches of earthen material) may be approved by the Department on a case by case basis if the owner or operator demonstrates that the alternative material and thickness control disease vectors, fires, odors, blowing litter, and scavenging without presenting a threat to human health and the environment.

c. The municipal solid waste disposal facility shall have an adequate quantity of acceptable earth (or approved alternate) cover for routine operations. If the material does not originate on site, the permit application should indicate the calculated volume of material needed for cover, provide assurances that off-site quantities of cover material are available, the location of any earth stockpiles, and any provisions for saving topsoil for use as final cover. The earth cover material shall be easily workable and compactable, shall be free of large objects that would hinder compaction, and shall not contain organic matter conducive to the harborage and/or breeding of vectors or nuisance animals.

d. The Department may grant, with prior notice from the owner or operator, a temporary waiver not to exceed seven (7) days from the requirements of paragraphs a. and b. for emergency situations.

#### 258.22. DISEASE VECTOR CONTROL

a. Owners or operators of all MSWLF units must prevent or control on-site populations of disease vectors using techniques appropriate for the protection of human health and the environment.

b. For purposes of this section, "disease vectors" means any rodents, flies, mosquitoes, or other animals,

including insects, capable of transmitting disease to humans.

#### 258.23. EXPLOSIVE GASES CONTROL

a. Owners or operators of all MSWLF units must ensure that:

(1) The concentration of methane gas generated by the facility does not exceed twenty-five (25) percent of the lower explosive limit for methane in facility structures (excluding gas control or recovery system components); and

(2) The concentration of methane gas does not exceed the lower explosive limit for methane at the facility property boundary.

b. Owners or operators of all MSWLF units must implement a routine methane monitoring program to ensure that the standards of paragraph a. of this section are met.

(1) The type and frequency of monitoring must be determined based on the following factors:

(a) Soil conditions;

(b) The hydrogeologic conditions surrounding the facility;

(c) The hydraulic conditions surrounding the facility; and

(d) The location of facility structures and property boundaries.

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

c. If methane gas levels exceeding the limits specified in paragraph a. of this section are detected, the owner or operator must:

(1) Immediately take all necessary steps to ensure protection of human health and notify the Department;

(2) Within seven (7) 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

(3) Within sixty (60) days of detection, implement a remediation plan for the methane gas releases, place a copy of the plan in the operating record, and notify the Department that the plan has been implemented. The plan shall describe the nature and extent of the problem and the proposed remedy.

d. 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°C and atmospheric pressure.

#### 258.24. AIR CRITERIA

a. Owners or operators of all MSWLFs must ensure that the units do not violate any applicable requirements developed under a State Implementation Plan (SIP) approved or promulgated by the Administrator pursuant to section 110 of the Clean Air Act, as amended.

b. Open burning of solid waste, except for the infrequent burning of agricultural wastes, silvicultural

wastes, landclearing debris, diseased trees, or debris from emergency clean-up operations, all of which require prior Department approval, is prohibited at all MSWLF units.

c. Blowing litter shall be controlled at the MSWLF. The entire MSWLF facility shall be policed as necessary to remove any accumulations of blown litter.

#### 258.25. ACCESS REQUIREMENTS

a. Owners or operators of all MSWLF units must control public access and prevent unauthorized vehicular traffic and illegal dumping of wastes by using artificial barriers, natural barriers, or both, as appropriate to protect human health and the environment.

b. An all-weather access road shall be provided to the site.

c. Salvaging and scavenging shall not be allowed at the working face of a MSWLF at any time.

#### 258.26. RUN-ON/RUN-OFF CONTROL SYSTEMS

a. Owners or operators of all MSWLF units must design, construct, and maintain:

(1) A run-on control system to prevent flow onto the active portion of the landfill during the peak discharge from a 25-year storm;

(2) A run-off control system from the active portion of the landfill to collect and control at least the water volume resulting from a 24-hour, 25-year storm.

b. Run-off from the active portion of the landfill unit must be handled in accordance with 258.27.a. of this part.

#### 258.27. SURFACE WATER REQUIREMENTS

a. MSWLF units shall not:

(1) Cause a discharge of pollutants into waters of the United States, including wetlands, that violates any requirements of the Clean Water Act, including, but not limited to, the National Pollutant Discharge Elimination System (NPDES) requirements, pursuant to section 402.

(2) Cause the discharge of a nonpoint source of pollution to waters of the United States, including wetlands, that violates any requirement of an area-wide or State-wide water quality management plan that has been approved under section 208 or 319 of the Clean Water Act, as amended.

#### 258.28. LIQUIDS RESTRICTIONS

a. Bulk or noncontainerized liquid waste may not be placed in MSWLF units unless:

(1) the waste is household waste other than septic waste, or

(2) The waste is leachate or gas condensate derived from the MSWLF unit and the MSWLF unit, whether it is a new or existing MSWLF or lateral expansion, is designed with a liner and leachate collection system as described in 258.40 of this regulation. Leachate or gas condensate may only be disposed of in the MSWLF unit on a temporary basis not to exceed ninety (90) days with Departmental approval to allow for

leachate and gas condensate management during emergency situations.

b. Containers holding liquid waste may not be placed in a MSWLF unit unless:

- (1) The container is a small container similar in size to that normally found in household waste;
- (2) The container is designed to hold liquids for use other than storage; or
- (3) The waste is household waste.

c. For purposes of this section:

(1) "Liquid waste" means any waste material that is determined to contain "free liquids" as defined by Method 9095 (Paint Filter Liquids Test), as described in "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods" (EPA Pub. No. SW-846).

(2) "Gas condensate" means the liquid generated as a result of gas recovery process(es) at the MSWLF unit.

#### 258.29. RECORDKEEPING REQUIREMENTS

a. The owner or operator of a MSWLF unit must record and retain near the facility in an operating record or in an alternative location approved by the Department the following information as it becomes available:

- (1) Any location restriction demonstration required under Subpart B of this part;
- (2) Inspection records, training procedures, and notification procedures required in 258.20. of this part;
- (3) Gas monitoring results from monitoring and any remediation plans required by 258.23. of this part;
- (4) Any demonstration, certification, finding, monitoring, testing, or analytical data required by Subpart E of this part;
- (5) Closure and post-closure care plans, updates to the closure and post-closure care plans, and any monitoring, testing, or analytical data as required by 258.60. and 258.61. of this part;
- (6) Any cost estimates and financial assurance documentation required by Subpart G of this part; and
- (7) The results of any environmental monitoring or testing performed in accordance with this regulation or the operating permit for the facility.

b. The owner/operator must notify the Department when the documents from paragraph (a) of this section have been placed or added to the operating record, and all information contained in the operating record must be furnished upon request to the Department or be made available at all reasonable times for inspection by the Department.

c. The owner/operator of a MSWLF unit must record in an operating record, information concerning the source or type (e.g. residential route, commercial, industrial, transfer station identity, special); weight (tons); county and State of origin of each load of waste delivered to the facility. A summary of this information must be submitted to the Department no later than October 15 of each year, for the previous fiscal year, on a form approved by the Department.

d. The Department can set alternative schedules for recordkeeping and notification requirements as specified in paragraphs a. and b. of this section, except for the notification requirements in 258.10.b. and 258.55.i.(1)(d).

#### 258.30. SCALE INSTALLATION

a. Each owner or operator of a municipal solid waste landfill shall install and/or maintain scales capable of accurately determining the weight of incoming waste streams. Existing facilities which can demonstrate a legitimate financial hardship may be exempted from the requirement to install scales, and use a volumetric equivalent of five hundred (500) pounds per cubic yard for estimating tonnages.

#### 258.31. EQUIPMENT

a. The following equipment may be required to ensure adequate operation of the MSWLF:

(1) Equipment or adequate contractual arrangements for equipment sufficient for excavating, earth moving, spreading, compacting and covering operations;

(2) Sufficient reserve equipment, or arrangements to provide alternate equipment within twenty-four (24) hours following equipment breakdown; and,

(3) Equipment to extinguish fires or arrangements to provide for fire protection.

#### 258.32. SUPERVISION AND INSPECTION

a. Supervision of the operation of the MSWLF shall be the responsibility of a qualified individual who has experience in the operation of a MSWLF, and has completed operator training courses as required by code section 44-96-460.

b. Routine inspection and evaluation of landfill operations will be made by a representative of the Department. A notice of any deficiencies, together with any recommendations for their correction, will be provided to the owner or local government responsible for the operation of the MSWLF.

c. Inspection of the completed MSWLF shall be made by a representative of the Department. Any necessary corrective work shall be performed before the landfill project is accepted as completed.

#### 258.33. LEACHATE HANDLING AGREEMENT

a. Either a legal document (contract, local permit, etc.) certifying acceptance of leachate by the operator of a wastewater treatment facility for the discharge of leachate to that facility, or a state pollutant discharge elimination system permit shall be obtained prior to initial receipt of waste at the facility.

#### 258.34. LEACHATE CONTROL

a. The owner or operator of the MSWLF unit shall use its best efforts to ensure that the leachate head above the liner system does not exceed one (1) foot, except for brief periods not to exceed one (1) week, due to circumstances beyond the immediate control of the owner or operator.

258.35. - 258.39. [Reserved]



## SUBPART D -- DESIGN CRITERIA

### 258.40. DESIGN CRITERIA

a. New MSWLF units and lateral expansions shall be constructed:

(1) In accordance with a design approved by the Department. The design must ensure that the concentration values listed in Table 1 of this section will not be exceeded in the uppermost aquifer at the relevant point of compliance, as specified by the Department under paragraph (i) of this section, or

(2) With a composite liner, as defined in paragraph b. of this section and a leachate collection system that is designed and constructed to maintain less than a one (1) foot depth of leachate over the liner, except in sumps.

b. For purposes of this section, "composite liner" means a system consisting of two (2) components; the upper component must consist of a minimum 30-mil flexible membrane liner (FML), and the lower component must consist of at least a two (2) foot layer of compacted soil with a hydraulic conductivity of no more than  $1 \times 10^{-7}$  cm/sec. FML components consisting of High Density Polyethylene (HDPE) shall be at least 60-mil thick. The FML component must be installed in direct and uniform contact with the compacted soil component.

c. The leachate collection and removal system shall be designed and built to operate without clogging during the operational life of the site and post-closure maintenance period.

d. Filter layers shall be designed to prevent the migration of fine soil particles into a coarser grained material, and allow water or gases to freely enter a drainage medium (pipe or drainage blanket) without clogging.

e. The total thickness of the drainage and protective layers above the liner material shall be a minimum of two (2) feet thick, and shall be composed of material with a minimum hydraulic conductivity of  $1 \times 10^{-4}$  cm/sec.

f. All material used in the leachate collection and removal system of the landfill shall be designed to ensure that the hydraulic leachate head on the liner system does not exceed one (1) foot as a result of a 24-hour, 25-year storm event during the active life and post-closure period of the landfill facility.

g. A foundation analysis shall be performed to determine the structural integrity of the subgrade to support the horizontal and vertical stresses and overlying facility components.

(1) The constructed landfill subgrade material shall minimize organic material and consist of on-site soils or select fill as approved by the Department.

(2) The landfill subgrade shall be graded in accordance with the requirements of the approved engineering plans, reports and specifications. The material shall be sufficiently dry and structurally sound to ensure that the first lift and all succeeding lifts of soil as an addition, if used, placed over the landfill subgrade can adequately be compacted to the design requirements.

h. When approving a design that complies with paragraph a.(1) of this section, the Department shall consider at least the following factors:

(1) The hydrogeologic characteristics of the facility and surrounding land;

(2) The climatic factors of the area; and

(3) The volume and physical and chemical characteristics of the leachate.

i. The relevant point of compliance specified by the Department shall be no more than one hundred fifty (150) feet from the waste management unit boundary and shall be located on land owned by the owner of the MSWLF unit. In determining the relevant point of compliance, the Department shall consider at least the following factors:

(1) The hydrogeologic characteristics of the facility and surrounding land;

(2) The volume and physical and chemical characteristics of the leachate;

(3) The quantity, quality, and direction of flow of groundwater;

(4) The proximity and withdrawal rate of the groundwater users;

(5) The availability of alternative drinking water supplies;

(6) The existing quality of the groundwater, including other sources of contamination and their cumulative impacts on the groundwater and whether groundwater is currently used or reasonably expected to be used for drinking water;

(7) Public health, safety, and welfare effects; and

(8) Practicable capability of the owner or operator.

j. One permanent survey benchmark of known elevation measured from a U.S. Geological Survey benchmark shall be established and maintained at the site. This benchmark will be the reference point for establishing horizontal and vertical elevation control.

k. A separation of three (3) feet shall be maintained between the base of the constructed liner system and the high water table.

l. The soil component of the liner system shall conform with the following:

(1) The soil component of the liner system shall be placed on a slope of no less than two (2) percent to promote positive drainage across the liner surface and at a maximum slope not greater than thirty-three (33) percent to facilitate construction.

(2) Compaction shall be performed by properly controlling the moisture content, lift thickness and other necessary details to obtain satisfactory results.

m. The flexible membrane liner material shall demonstrate a chemical and physical resistance to waste placement or leachate generated by the landfill. Documentation shall be submitted to ensure chemical compatibility of the geomembrane liner material chosen, or in absence of the appropriate documentation, chemical compatibility testing will be performed using a test method acceptable to the Department. Flexible membrane liners shall be installed in accordance with the requirements of the approved engineering plans, report, specifications and manufacturer's recommendations.

n. All storm water ditches should have a minimum slope of .5% or a minimum permissible non-silting velocity of two (2) feet per second. When it is not possible to achieve minimum slopes and/or velocities, alternative system design and maintenance which ensures proper run-on and run-off control may be approved by the Department.

o. For landfill expansions adjacent to existing MSWLFs, the Department may approve encroachment upon the existing landfill's side slopes only if a leachate barrier system is designed and constructed to eliminate leachate migration into the existing landfill. The expansion area shall be constructed in compliance with all applicable sections of this regulation.

p. A construction certification report shall be submitted to the Department within forty-five (45) days after the completion of landfill construction by an engineer other than the design engineer, registered in the state of South Carolina. This report shall include at a minimum, the information prepared in accordance with the application requirements. In addition, the construction certification report shall contain as-built drawings prepared and sealed by a land surveyor registered in South Carolina noting any deviations from the approved engineering plans. The construction certification report must include a comprehensive narrative by the engineer.

q. The Department may, on a case by case basis, approve other landfill designs, provided there is adequate information to demonstrate that the proposed design meets or exceeds the environmental and public health protection standards outlined in Subparts B, D and E of this regulation.

## **SUBPART E -- GROUNDWATER MONITORING AND CORRECTIVE ACTION**

### **258.50. APPLICABILITY**

a. The requirements in this part apply to all MSWLF units, except as provided in paragraph b. of this section.

b. Groundwater monitoring requirements under 258.51. through 258.55. of this regulation may be modified by the Department for a 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 258.2.) during the active life of the unit and the post-closure care period. This demonstration must be certified by a qualified groundwater scientist and approved by the Department, 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 environment.

c. Owners and operators of MSWLF units must comply with the groundwater monitoring requirements of this part according to the following schedule:

(1) All existing MSWLF units and lateral expansions must be in compliance with the groundwater monitoring requirements specified in 258.51. - 258.55. by October 9, 1994;

(2) New MSWLF units must be in compliance with the groundwater monitoring requirements specified in 258.51. - 258.55. before waste can be placed in the unit.

d. The Department may specify an alternative schedule for the owners or operators of existing MSWLF

units to comply with the groundwater monitoring requirements specified in 258.51. - 258.55. The following factors should be considered in determining potential risk:

- (1) Proximity of human and environmental receptors;
- (2) Design of the MSWLF unit;
- (3) Age of the MSWLF unit;
- (4) The size of the MSWLF unit;
- (5) Types and quantities of wastes disposed including sewage sludge; and
- (6) Resource value of the underlying aquifer, including:
  - (a) Current and future uses;
  - (b) Proximity and withdrawal rate of users; and
  - (c) Groundwater quality and quantity.

e. Once established at a MSWLF unit, groundwater monitoring shall be conducted throughout the active life and post-closure care period of that MSWLF unit as specified in 258.61.

f. For the purposes of this subpart, a qualified groundwater scientist is a scientist or engineer who has received a baccalaureate or post-graduate degree in the natural sciences or engineering and has sufficient training and experience in groundwater hydrology and related fields as may be demonstrated by State registration, professional Certifications, or completion of accredited university programs that enable that individual to make sound professional judgements regarding groundwater monitoring, contaminant fate and transport, and corrective action.

g. The Department may establish alternative schedules for demonstrating compliance with the various sections of this Subpart on a case by case basis, provided sufficient technical rationale is provided to the Department to justify the alternate compliance schedule.

#### 258.51 GROUNDWATER MONITORING SYSTEMS

a. A groundwater monitoring system must be installed that consists of a sufficient number of wells, installed at appropriate locations and depths, to yield representative groundwater samples from the uppermost aquifer (as defined in 258.2.) that:

(1) Represent 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 where:

(a) Hydrogeologic conditions do not allow the owner or operator to determine what wells are hydraulically upgradient; or

(b) Sampling at other wells will provide an indication of background groundwater quality that is as representative or more representative than that provided by the upgradient wells; and

(2) Represent the quality of groundwater passing the relevant point of compliance approved by the Department under 258.40.i. The downgradient monitoring system must be installed between the relevant point of compliance specified by the Department under 258.40.i. and the actual disposal area, and shall ensure detection of any groundwater contamination in the uppermost aquifer. When physical obstacles preclude installation of groundwater monitoring wells at the relevant point of compliance at existing units, the downgradient monitoring system may be installed at the closest practicable distance hydraulically downgradient from the relevant point of compliance specified by the Department under 258.40.i. that ensure detection of groundwater contamination in the uppermost aquifer.

b. The Department may approve a multi-unit groundwater monitoring system instead of separate groundwater monitoring systems for each MSWLF unit when the facility has several units, provided the multi-unit groundwater monitoring system meets the requirement of 258.51.a. 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. Monitoring wells must be approved by the Department and constructed, at a minimum, to the standards established in the South Carolina Well Standards and Regulations R. 61-71.11.

(1) The owner or operator must notify the Department that the design, installation, development, and decommission of any monitoring wells, piezometers and other measurement, sampling, and analytical devices documentation has been placed in the operating record; and

(2) The monitoring wells, piezometers, and other measurement, sampling, and analytical devices must be operated and maintained so that they perform to design specifications throughout the life of the monitoring program.

d. The number, spacing, and depths of monitoring systems shall be:

(1) Determined based upon site-specific technical information that must include thorough characterization of:

(a) Aquifer thickness, groundwater flow rate, groundwater flow direction including seasonal and temporal fluctuations in groundwater flow, the information required by 258.17.; and

(b) Saturated and unsaturated geologic units and fill materials overlying the uppermost aquifer, materials comprising the uppermost aquifer, and materials comprising the confining unit defining the lower boundary of the uppermost aquifer; including, but not limited to: thicknesses, stratigraphy, lithology, hydraulic conductivities, porosities and effective porosities.

(2) Certified by a qualified groundwater scientist and approved by the Department. Within fourteen (14) days of this certification, the owner or operator must notify the Department that the certification has been

placed in the operating record.  
258.52. [Reserved]

### 258.53. GROUNDWATER SAMPLING AND ANALYSIS REQUIREMENTS

a. The groundwater monitoring program must include consistent sampling and analysis procedures that are designed to ensure monitoring results that provide an accurate representation of groundwater quality at the background and downgradient wells installed in compliance with 258.51.a. of this part. The owner or operator must submit to the Department for review and approval, the sampling and analysis procedures and protocols to be used at the facility. After approval by the Department, documentation must be placed in the operating record and the program must include procedures and techniques for:

- (1) Sample collection;
- (2) Sample preservation and shipment;
- (3) Analytical procedures;
- (4) Chain of custody control; and
- (5) Quality assurance and quality control.

b. The groundwater monitoring program must include sampling and analytical methods that are appropriate for groundwater sampling and that accurately measure hazardous constituents and other monitoring parameters in groundwater samples. Detection limits for those parameters that have a Maximum Contaminant Level (MCL) that has been promulgated under section 1412 of the Safe Drinking Water Act (codified) under 40 CFR part 141, shall be, at a minimum, below the established MCL. Groundwater samples shall not be field-filtered prior to laboratory analysis.

c. The sampling procedures and frequency must be protective of human health and the environment.

d. Groundwater elevations must be measured in each well prior to purging, each time groundwater is sampled. The owner or operator must determine the rate and direction of groundwater flow each time groundwater is sampled. Groundwater elevations in wells which monitor the same waste management area must be measured on the same day to avoid temporal variations in groundwater flow which could preclude an accurate determination of groundwater flow rate and direction.

e. The owner or operator must establish background groundwater quality in a hydraulically upgradient or background well(s) for each of the metals or constituents required in the particular groundwater monitoring program that applies to the MSWLF unit, as determined under 258.54.a., or 258.55.a. of this part. Background groundwater quality may be established at wells that are not located hydraulically upgradient from the MSWLF unit if it meets the requirements of 258.51.a.(1). In order to establish background groundwater quality in a reasonable period of time, pursuant to 258.53.i(1) and 258.53.i(2), the owner or operator must collect and analyze a minimum of four (4) independent groundwater samples from each compliance and each background well prior to the end of the first year of operation. The Department may, on a case by case basis, approve an alternate subset of wells to be sampled for the establishment of background groundwater quality. The alternate subset of wells will consist of a minimum of Four (4) wells, or the total number of wells monitoring the unit, whichever is least, and will include all background well(s). This sampling and analysis must be accomplished in a manner consistent with the requirements of 258.53.f. Pursuant to 258.51.a(1), the above samples must represent the quality of background groundwater that has not been affected by leakage from a unit.

f. The number of samples collected to establish groundwater quality data must be consistent with the appropriate statistical procedures determined pursuant to paragraph g. of this section. The sampling procedures shall be those specified under 258.54.b. for detection monitoring, 258.55.b. and d. for assessment monitoring, and 258.56.b. of corrective action.

g. The owner or operator must specify in the operating record one of the following statistical methods to be used in evaluating groundwater monitoring data for each metal or other hazardous constituent requiring statistical analysis. The statistical test chosen shall be conducted for each parameter in each well, every time samples are collected.

(1) A parametric analysis of variance (ANOVA) followed by multiple comparisons procedures to identify statistically significant evidence of contamination. The method must include estimation and testing of the contrasts between each compliance well's mean and the background mean levels for each constituent.

(2) An analysis of variance (ANOVA) based on ranks followed by multiple comparisons procedures to identify statistically significant evidence of contamination. The method must include estimation and testing of the contrasts between each compliance well's median and the background median levels for each constituent.

(3) A tolerance or prediction interval procedure in which an interval for each constituent is established from the distribution of the background data, and the level of each constituent in each compliance well is compared to the upper tolerance or prediction limit.

(4) A control chart approach that gives control limits for each constituent.

(5) Another statistical test method that meets the performance standards of 258.53.h. The owner or operator must place a justification for this alternative in the operating record and obtain approval from the Department for the use of this alternative test. The justification must demonstrate that the alternative method meets the performance standards of 258.53.h.

h. Any statistical method chosen under 258.53.g. shall comply with the following performance standards, as appropriate:

(1) The statistical method used to evaluate groundwater monitoring data shall be appropriate for the distribution of chemical parameters or hazardous constituents. If the distribution of the chemical parameters or hazardous constituents is shown by the owner or operator to be inappropriate for a normal theory test, then the data should be transformed or a distribution-free theory test should be used. If the distributions for the constituents differ, more than one statistical method may be needed.

(2) If an individual well comparison procedure is used to compare an individual compliance well constituent concentration with background constituent concentrations or a ground-water protection standard, the test shall be done at a Type I error level no less than 0.01 for each testing period. If a multiple comparisons procedure is used, the Type I experiment wise error rate for each testing period shall be no less than 0.05; however, the Type I error of no less than 0.01 for individual well comparisons must be maintained. This performance standard does not apply to tolerance intervals, prediction intervals, or control charts.

(3) If a control chart approach is used to evaluate groundwater monitoring data, the specific type of control chart and its associated parameter values shall be protective of human health and the environment. The parameters shall be determined after considering the number of samples in the background data base, the data distribution, and the range of the concentration values for each constituent of concern.

(4) If a tolerance interval or a predictional interval is used to evaluate groundwater monitoring data, the levels of confidence and, for tolerance intervals, the percentage of the population that the interval must contain, shall be protective of human health and the environment. These parameters shall be determined after considering the number of samples in the background data base, the data distribution, and the range of the concentration values for each constituent of concern.

(5) The statistical method shall account for data below the limit of detection with one or more statistical procedures that are protective of human health and the environment. Any practical quantitation limit (pql) that is used in the statistical method shall be the lowest concentration level that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions that are available to the facility.

(6) If necessary, the statistical method shall include procedures to control or correct for seasonal and spatial variability as well as temporal correlation in the data.

i. The owner or operator must determine whether or not there is a statistically significant increase over background values for each parameter or constituent required in the particular groundwater monitoring program that applies to the MSWLF unit, as determined under 258.54.a. or 258.55.a. of this part.

(1) In determining whether a statistically significant increase has occurred, the owner or operator must compare the groundwater quality of each parameter or constituent at each monitoring well designated pursuant to 258.51.a.(2) to the background value of that constituent, according to the statistical procedures and performance standards specified under paragraphs g. and h. of this section.

(2) Within a reasonable period of time after completing sampling and analysis, the owner or operator must determine whether there has been a statistically significant increase over background for each metal or other hazardous constituent requiring statistical analysis at each monitoring well.

#### 258.54. DETECTION MONITORING PROGRAM

a. Detection monitoring is required at MSWLF units at all groundwater monitoring wells defined under 258.51.a.(1) and a.(2) of this part. At a minimum, a detection monitoring program must include the monitoring for the constituents listed in appendix I of this part.

(1) The Department may delete any of the appendix I monitoring parameters for a MSWLF unit if it can be shown that the deleted constituent(s) are not reasonably expected to be contained in or derived from the waste contained in the unit.

b. The monitoring frequency for all constituents listed in appendix I to this part shall be at least semiannual during the active life of the facility (including closure) and the post-closure period. At least one sample from each well (background and downgradient) must be collected and analyzed during each sampling event.

c. The Department may specify an appropriate alternative frequency for repeated sampling and analysis for appendix I constituents during the active life (including closure) and the post-closure care period. The alternative frequency during the active life (including closure) shall be no less than semiannual. The alternative frequency shall be based on consideration of the following factors:

(1) Lithology of the aquifer and unsaturated zone;



- (2) Hydraulic conductivity of the aquifer and unsaturated zone;
- (3) Groundwater flow rates;
- (4) Minimum distance between upgradient edge of the MSWLF unit and downgradient monitoring well screen (minimum distance of travel); and
- (5) Resource value of the aquifer.

d. If the owner or operator determines, pursuant to 258.53.g. of this part, that there is a statistically significant increase over background for one or more of the metals listed in appendix I to this part, or above the MCL or pql, as applicable, for any volatile organic compound (VOC) listed in appendix I at any monitoring well at the boundary specified under 258.51.a.(2), the owner or operator:

- (1) Must, within fourteen (14) days of this finding, notify the Department;
- (2) Must, within fourteen (14) days of this finding, place a notice in the operating record indicating which constituents have shown statistically significant changes from background levels;
- (3) Must, within thirty (30) days of this finding, resample the monitoring well(s) in question for appendix I to determine the validity of the data; and
- (4) If the data are validated by resampling, must establish an assessment monitoring program meeting the requirements of 258.55. of this part within ninety (90) days except as provided for in paragraph (d)(5) of this section.
- (5) The owner/operator may demonstrate that a source other than a MSWLF unit caused the contamination or that the statistically significant increase (SSI) resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. A report documenting this demonstration must be certified by a qualified groundwater scientist and approved by the Department and be placed in the operating record. If a successful demonstration is made and documented, the owner or operator may continue detection monitoring as specified in this section. If, after ninety (90) days, a successful demonstration is not made, the owner or operator must initiate an assessment monitoring program as required in 258.55.

e. The owner/operator shall submit to the Department on or before the anniversary date of issuance of the permit, an annual report containing all of the analytical and statistical analysis performed at the site for the previous year as a result of the requirements of Subpart E. The annual report shall contain the following:

- (1) the results of all analytical testing performed at the site during the previous year, and any applicable data concerning sampling and analysis of monitoring wells at the site;
- (2) a determination of the technical sufficiency of the monitoring well network in detecting a release from the facility as required by 258.51.;
- (3) the determination of groundwater elevations, groundwater flow directions and groundwater flow rates as specified in 258.53.d. Groundwater flow directions shall be based upon interpretation of a potentiometric map prepared utilizing the groundwater elevations measured at the site; and,
- (4) a summary of the results of the statistical analysis performed in accordance with 258.53.g. and 258.53.h.

f. The results of all chemical analysis of groundwater samples taken during routine monitoring shall be submitted to the Department within sixty (60) days of sample collection. On sampling events where an annual report is to be submitted to the Department, the annual report shall satisfy this requirement.

#### 258.55. ASSESSMENT MONITORING PROGRAM

a. Assessment monitoring is required whenever a statistically significant increase over background has been detected and validated, in accordance with 258.54.d, for one or more of the metals listed in appendix I, or above the MCL or pql, as applicable, for any volatile organic compound (VOC) listed in appendix I, unless a successful demonstration has been made in accordance with section 258.54.d.(5).

b. Within ninety (90) days of triggering an assessment monitoring program, and annually thereafter, the owner or operator must sample and analyze the groundwater for all constituents identified in appendix II of this part. A minimum of one sample from each downgradient well must be collected and analyzed during each sampling event. For any constituent detected in the downgradient wells as the result of the complete appendix II analysis, a minimum of four (4) independent samples from each well (background and downgradient) must be collected and analyzed to establish background for the new constituents.

c. The Department may approve an appropriate subset of wells to be sampled and analyzed for appendix II constituents during assessment monitoring, provided the owner/operator provides sufficient technical rationale for the subset of wells. The Department may delete any of the appendix II monitoring parameters for a MSWLF unit if it can be shown that the removed constituents are not reasonably expected to be in or derived from the waste contained in the unit.

d. The Department may allow an appropriate alternate frequency for repeated sampling and analysis for the full set of appendix II constituents required by 258.55.b. of this part, during the active life (including closure) and post-closure care of the unit considering the following factors:

- (1) Lithology of the aquifer and unsaturated zone;
- (2) Hydraulic conductivity of the aquifer and unsaturated zone;
- (3) Groundwater flow rates;
- (4) Minimum distance between upgradient edge of the MSWLF unit and downgradient monitoring well screen (minimum distance of travel);
- (5) Resource value of the aquifer; and
- (6) Nature (fate and transport) of any constituents detected in response to this section.

e. After obtaining the results from the initial or subsequent sampling events required in paragraph b. of this section, the owner or operator must:

(1) Within fourteen (14) days, place a notice in the operating record identifying the appendix II constituents that have been detected and notify the Department that this notice has been placed in the operating record;

(2) Within ninety (90) days, and on at least a semiannual basis thereafter, resample all wells specified by 258.51.a. to this part, conduct analyses for all constituents in appendix I to this part and for those constituents in appendix II to this part that are detected in response to paragraph (b) of this section, and record their concentrations in the facility operating record. At least one sample from each well (background and

downgradient) must be collected and analyzed during these sampling events.

(3) Establish background concentrations for any constituents detected pursuant to paragraphs b., c., d. or e.(2) of this section; and

(4) Establish groundwater protection standards for all constituents detected pursuant to paragraph b. or e. of this section. The groundwater protection standards shall be established in accordance with paragraphs j. or k. of this section.

f. The Department may specify an alternative monitoring frequency during the active life (including closure) and the post closure period for the constituents referred to in this paragraph. The alternative frequency for appendix II constituents during the active life (including closure) shall be no less than annual. The alternative frequency shall be based on consideration of the factors specified in paragraph (d) of this section;

g. If the concentrations of all appendix II constituents are shown to be at or below background values, using the statistical procedures in 258.53.g., for two consecutive sampling events, the owner or operator may request approval from the Department to return to detection monitoring.

h. If the concentrations of any appendix II constituents are above background values, but all concentrations are below the groundwater protection standard established under paragraphs j. or k. of this section, using the statistical procedures in 258.53.g., the owner or operator must continue assessment monitoring in accordance with this section.

i. If one or more appendix II constituents are detected at or above the groundwater protection standard established under paragraphs j. or k. of this section in any sampling event, the owner or operator must, within fourteen (14) days of this finding, place a notice in the operating record identifying the appendix II constituents that have exceeded the groundwater protection standard and notify the Department and all appropriate local government officials that the notice has been placed in the operating record. The owner or operator also:

(1)(a) Must submit to the Department within sixty (60) days of this finding, a groundwater quality assessment plan for characterizing the nature and extent of the release.

(b) Upon approval of the groundwater quality assessment plan, must characterize the nature and extent of the release by installing additional monitoring wells as necessary;

(c) Must install at least one additional monitoring well at the facility boundary in the direction of contaminant migration and sample this well in accordance with 258.55.d.(2);

(d) Must notify all persons who own the land or reside on the land that directly overlies any part of the plume of contamination if contaminants have migrated off-site if indicated by sampling of wells in accordance with 258.55.i.(1); and

(e) Must initiate an assessment of corrective measures as required by 255.56. of this part within ninety (90) days; or

(2) May demonstrate that a source other than a MSWLF unit caused the contamination, or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. A report documenting this demonstration must be certified by a qualified groundwater scientist and approved by the Department and placed in the operating record. If a successful demonstration is made the owner or

operator must continue monitoring in accordance with the assessment monitoring program pursuant to 258.55., and may return to detection monitoring if the appendix II constituents are at or below background as specified in 258.55.g. Until a successful demonstration is made, the owner or operator must comply with 258.55.i. including initiating an assessment of corrective measures.

j. The owner or operator must establish a groundwater protection standard for each appendix II constituent detected in the groundwater. The groundwater protection standard shall be:

(1) For constituents for which a maximum contaminant level (MCL) has been promulgated under section 1412 of the Safe Drinking Water Act (codified) under 40 CFR part 141, 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 258.51.a.(1); or

(3) For constituents for which the background level is higher than the MCL identified under subparagraph j.(1) of this section or health based levels identified under 258.55.k.(1), the background concentration.

k. The Department may establish an alternative groundwater protection standard for 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 Federal Environmental Protection Agency (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 subpart, systemic toxicants include toxic chemicals that cause effects other than cancer or mutation.

l. In establishing groundwater protection standards under paragraph (k) of this section, the Department may consider the following:

(1) Multiple contaminants in the groundwater;

(2) Exposure threats to sensitive environmental receptors; and

(3) Other site-specific exposure or potential exposure to groundwater.

#### 258.56. ASSESSMENT OF CORRECTIVE MEASURES

a. Within ninety (90) days of finding that any of the constituents listed in appendix II have been detected at a level exceeding the groundwater protection standards defined under 258.55.j. or k. of this part, the owner or operator must initiate an assessment of corrective measures. Such an assessment must be completed within

a reasonable period of time, not to exceed one hundred eighty (180) days.

b. The owner or operator must continue to monitor in accordance with the assessment monitoring program as specified in 258.55.

c. The assessment shall include an analysis of the effectiveness of potential corrective measures in meeting all of the requirements and objectives of the remedy as described under 258.57., addressing at least the following:

(1) The performance, reliability, ease of implementation, and potential impacts of appropriate potential remedies, including safety impacts, cross-media impacts, and control of exposure to any residual contamination;

(2) The time required to begin and complete the remedy;

(3) The costs of remedy implementation; and

(4) The institutional requirements such as Department or local permit requirements or other environmental or public health requirements that may substantially affect implementation of the remedy(s).

d. The owner or operator must discuss the results of the corrective measures assessment, prior to the selection of remedy, in a public meeting with interested and affected parties.

#### 258.57. SELECTION OF REMEDY

a. Based on the results of the corrective measures assessment conducted under 258.56, the owner or operator must select a remedy that, at a minimum, meets the standards listed in paragraph (b) of this section. The owner or operator must notify the Department, within fourteen (14) days of selecting a remedy, and submit a report to the Department for review and approval that describes the selected remedy and how it meets the standards in paragraph (b) of this section.

b. Remedies must:

(1) Be protective of human health and the environment;

(2) Attain the groundwater protection standard as specified pursuant to 258.55(j) or (k);

(3) Control the source(s) of releases so as to reduce or eliminate, to the maximum extent practicable, further releases of appendix II constituents into the environment that may pose a threat to human health or the environment; and

(4) Comply with standards for management of wastes as specified in 258.58.d.

c. In selecting a remedy that meets the standards of 258.57.b., the owner or operator shall consider the following evaluation factors:

(1) The long- and short-term effectiveness and protectiveness of the potential remedy(s), along with the degree of certainty that the remedy will prove successful based on consideration of the following:

(a) Magnitude of reduction of existing risks;

(b) Magnitude of residual risks in terms of likelihood of further releases due to waste remaining following implementation of a remedy;

(c) The type and degree of long-term management required, including monitoring, operation, and maintenance;

(d) Short-term risks that might be posed to the community, workers, or the environment during implementation of such a remedy, including potential threats to human health and the environment associated with excavation, transportation, and redispersion or containment;

(e) Time until full protection is achieved;

(f) Potential for exposure of humans and environmental receptors to remaining wastes, considering the potential threat to human health and the environment associated with excavation, transportation, redispersion, or containment;

(g) Long-term reliability of the engineering and institutional controls; and

(h) Potential need for replacement of the remedy.

(2) The effectiveness of the remedy in controlling the source to reduce further releases based on consideration of the following factors:

(a) The extent to which containment practices will reduce further releases;

(b) The extent to which treatment technologies may be used.

(3) The ease or difficulty of implementing a potential remedy(s) based on consideration of the following types of factors:

(a) Degree of difficulty associated with constructing the technology;

(b) Expected operational reliability of the technologies;

(c) Need to coordinate with and obtain necessary approvals and permits from other agencies;

(d) Availability of necessary equipment and specialists; and

(e) Available capacity and location of needed treatment, storage, and disposal services.

(4) The degree to which community concerns are addressed by a potential remedy(s).

d. The owner or operator shall specify as part of the selected remedy a schedule(s) for initiating and completing remedial activities. Such a schedule must require the initiation of remedial activities within a reasonable period of time taking into consideration the factors set forth in paragraphs d. (1-8). The owner or operator must consider the following factors in determining the schedule of remedial activities:

(1) Extent and nature of contamination;

(2) Practical capabilities of remedial technologies in achieving compliance with groundwater protection standards established under 258.55.j. or k. and other objectives of the remedy;

(3) Availability of treatment or disposal capacity for wastes managed during implementation of the remedy;

(4) Desirability of utilizing technologies that are not currently available, but which may offer significant advantages over already available technologies in terms of effectiveness, reliability, safety, or ability to achieve remedial objectives;

(5) Potential risks to human health and the environment from exposure to contamination prior to completion of the remedy;

(6) Resource value of the aquifer including:

(a) Current and future uses;

(b) Proximity and withdrawal rate of users;

(c) Groundwater quantity and quality;

(d) The potential damage to wildlife, crops, vegetation, and physical structures caused by exposure to waste constituent;

(e) The hydrogeologic characteristic of the facility and surrounding land;

(f) Groundwater removal and treatment costs; and

(g) The cost and availability of alternative water supplies.

(7) Practicable capability of the owner or operator.

(8) Other relevant factors.

e. The Department may determine that remediation of a release of an appendix II constituent from a MSWLF unit is not necessary if the owner or operator demonstrates to the Department that:

(1) The groundwater is additionally contaminated by substances that have originated from a source other than a MSWLF unit and those substances are present in concentrations such that cleanup of the release from the MSWLF unit would provide no significant reduction in risk to actual or potential receptors; or

(2) The constituent(s) is present in groundwater that:

(a) Is not currently or reasonably expected to be a source of drinking water; and

(b) Is not hydraulically connected with waters to which the hazardous constituents are migrating or are likely to migrate in a concentration(s) that would exceed the groundwater protection standards established under 258.55.j. or k.; or

(3) Remediation of the release(s) is technically impracticable; or

(4) Remediation results in unacceptable cross-media impacts.

f. A determination by the Department pursuant to paragraph (e) of this section shall not affect the authority of the Department to require the owner or operator to undertake source control measures or other measures that may be necessary to eliminate or minimize further releases to the groundwater, to prevent exposure to the groundwater, or to remediate the groundwater to concentrations that are technically practicable and significantly reduce threats to human health or the environment.

#### 258.58. IMPLEMENTATION OF THE CORRECTIVE ACTION PROGRAM

a. Based on the schedule established under 258.57.d. for initiation and completion of remedial activities the owner/operator must:

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

(a) At a minimum, meet the requirements of an assessment monitoring program under 258.55.;

(b) Indicate the effectiveness of the corrective action remedy; and

(c) Demonstrate compliance with groundwater protection standard pursuant to paragraph (e) of this section.

(2) Implement the corrective action remedy selected under 258.57.; 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 pursuant to 258.57. The following factors must be considered by an owner or operator in determining whether 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 258.57.b. are not being achieved through the remedy selected. In such cases, the owner or operator must implement other methods or techniques that could practicably achieve compliance with the requirements, unless the owner or operator makes the determination under 258.58.c.

c. If the owner or operator determines that compliance with requirements under 258.57.b. cannot be



practically achieved with any currently available methods, the owner or operator must:

(1) Obtain certification of a qualified groundwater scientist and approval by the Department that compliance with requirements under 258.57.b. cannot be practically achieved with any currently available methods;

(2) Implement alternate measures to control exposure of humans or the environment to residual contamination, as necessary to protect human health and the environment; and

(3) Implement alternate measures for control of the sources of contamination, or for removal or decontamination of equipment, units, devices, or structures that are:

(a) Technically practicable; and

(b) Consistent with the overall objective of the remedy.

(4) Notify the Department within fourteen (14) days that a report justifying the alternative measures prior to implementing the alternative measures has been placed in the operating record.

d. All solid wastes that are managed pursuant to a remedy required under 258.57., or an interim measure required under 258.58.a.(3), shall be managed in a manner:

(1) That is protective of human health and the environment; and

(2) That complies with applicable RCRA requirements.

e. Remedies selected pursuant to 258.57. shall be considered complete when:

(1) The owner or operator complies with the groundwater protection standards established under 258.55.j. or k. at all points within the plume of contamination that lie beyond the groundwater monitoring well system established under 258.51.a.

(2) Compliance with the groundwater protection standards established under 258.55.j. or k. has been achieved by demonstrating that concentrations of appendix II constituents have not exceeded the groundwater protection standard(s) for a period of three (3) consecutive years using the statistical procedures and performance standards in 258.53.g. and h. The Department may specify an alternative length of time during which the owner or operator must demonstrate that concentrations of appendix II constituents have not exceeded the groundwater protection standard(s) taking into consideration:

(a) Extent and concentration of the release(s);

(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.

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

f. Upon completion of the remedy, the owner or operator must notify the Department within fourteen (14)

days that a certification that the remedy has been completed in compliance with the requirements of 258.58.e. has been placed in the operating record. The certification must be signed by the owner or operator and by a qualified groundwater scientist and approved by the Department.

g. When, upon completion of the certification, the owner or operator determines that the corrective action remedy has been completed in accordance with the requirements under paragraph (e) of this section, the owner or operator shall be released from the requirements for financial assurance for corrective action under 258.73.

258.59. [Reserved]

## **SUBPART F -- CLOSURE AND POST-CLOSURE CARE**

### **258.60. CLOSURE CRITERIA**

a. Owners or operators of all MSWLF units must install a final cover system that is designed to minimize infiltration and erosion. The final cover system must be designed and constructed to:

(1) have a permeability less than or equal to the permeability of any bottom liner system or natural subsoils present, or a permeability no greater than  $1 \times 10^{-5}$  cm/sec, whichever is less, and

(2) minimize infiltration through the closed MSWLF by the use of an infiltration layer that contains a minimum eighteen (18) inches of earthen material, and

(3) minimize erosion of the final cover by the use of an erosion layer that contains a minimum one (1) foot of earthen material that is capable of sustaining native plant growth.

b. The Department may approve an alternative final cover design that includes:

(1) An infiltration layer that achieves an equivalent reduction in infiltration as the infiltration layer specified in paragraphs a.(1) and a.(2) of this section, and

(2) An erosion layer that provides equivalent protection from wind and water erosion as the erosion layer specified in a.(3) of this section.

c. The owner or operator must prepare a written closure plan that describes the steps necessary to close all MSWLF units at any point during their active life in accordance with the cover design requirements in 258.60.a. or b., as applicable. The closure plan, at a minimum, must include the following information:

(1) A description of the final cover, designed in accordance with 258.60.a. and the methods and procedures to be used to install the cover;

(2) An estimate of the largest area of the MSWLF unit ever requiring a final cover as required under 258.60.a. at any time during the active life;

(3) An estimate of the maximum inventory of wastes ever on-site over the active life of the landfill facility; and

(4) A schedule for completing all activities necessary to satisfy the closure criteria in 258.60.

d. The owner or operator must notify the Department that a closure plan has been prepared and placed in

the operating record no later than the effective date of this part, or prior to permit issuance, whichever is later. The closure plan must be updated if any changes occur at the facility which require a deviation from the approved closure plan.

e. Prior to beginning closure of each MSWLF unit as specified in 258.60.f., an owner or operator must notify the Department that a notice of the intent to close the unit has been placed in the operating record.

f. The owner or operator must begin closure activities of each MSWLF unit no later than thirty (30) days after the date on which the MSWLF unit receives the known final receipt of wastes or, if the MSWLF unit has remaining capacity and there is a reasonable likelihood that the MSWLF unit will receive additional wastes, no later than one year after the most recent receipt of wastes. Extensions beyond the one-year deadline for beginning closure may be granted by the Department if the owner or operator demonstrates that the MSWLF unit has the capacity to receive additional wastes and the owner or operator has taken and will continue to take all steps necessary to prevent threats to human health and the environment from the unclosed MSWLF unit.

g. The owner or operator of all MSWLF units must complete closure activities of each MSWLF unit in accordance with the closure plan within one hundred eighty (180) days following the beginning of closure as specified in section 258.60.f. Extensions of the closure period may be granted by the Department if the owner or operator demonstrates that closure will, of necessity, take longer than one hundred eighty (180) days and they have taken and will continue to take all steps to prevent threats to human health and the environment from the unclosed MSWLF unit.

h. Following closure of each MSWLF unit, the owner or operator must notify the Department that a certification, signed by a South Carolina registered professional engineer other than the design engineer, verifying that closure has been completed in accordance with the closure plan, has been placed in the operating record.

i. Following closure of all MSWLF units, the owner or operator must record a notation on the deed to the landfill facility property, or some other instrument that is normally examined during title search, and notify the Department that the notation has been recorded and a copy has been placed in the operating record.

(1) The notation on the deed must in perpetuity notify any potential purchaser of the property that:

(a) The land has been used as a landfill facility; and

(b) Its use is restricted under 258.61.c.(3).

j. The owner or operator may request permission from the Department to remove the notation from the deed if all wastes are removed from the facility.

k. All facilities constructed with liner systems in accordance with this regulation shall install a final cover system which consists, of at a minimum:

(1) a gas management layer or layers, or other gas management design, as necessary;

(2) eighteen (18) inches of soil with a maximum permeability of  $1 \times 10^{-5}$  centimeters per second, and capable of providing a suitable foundation for the flexible membrane liner specified in 258.60.k.(3);

(3) a 20-mil flexible membrane liner with a maximum permeability equal to or less than the bottom liner system, if HDPE is used as the FML, then a sixty (60) mil thickness is required;

(4) a drainage layer; and,

(5) a minimum of two (2) feet of soil capable of supporting native vegetation.

l. All MSWLF's closed utilizing a flexible membrane cover system shall be constructed to preclude precipitation migration into the landfill. All flexible membrane cover systems shall be constructed in accordance with the requirements of the approved engineering plans, reports, specifications and manufacturer's recommendations.

m. The erosion layer shall be designed to maintain vegetative growth over the landfill.

n. The final cover system shall be placed on a slope of no less than two (2) percent to promote positive drainage across the cover system surface and at a maximum slope not greater than thirty-three (33) percent to facilitate construction and prevent erosion.

o. The Department may, on a case by case basis, approve other landfill closure designs, provided there is adequate information to demonstrate that the proposed design meets or exceeds the environmental and public health protection standards outlined in Subparts B, D and E of this regulation.

#### 258.61. POST-CLOSURE CARE REQUIREMENTS

a. Following closure of each MSWLF unit, the owner or operator must conduct post-closure care. Post-closure care must be conducted for a minimum thirty (30) years, except as provided under paragraph b. of this section, and consist of at least the following:

(1) Maintaining the integrity and effectiveness of any final cover, including making repairs to the cover as necessary to correct the effects of settlement, subsidence, erosion, or other events, and preventing run-on and run-off from eroding or otherwise damaging the final cover;

(2) Maintaining and operating the leachate collection system in accordance with the requirements in 258.40., if applicable. The Department may allow the owner or operator to stop managing leachate if the owner or operator demonstrates to the Department's satisfaction that leachate no longer poses a threat to human health and the environment;

(3) Monitoring the groundwater in accordance with the requirements of subpart E of this part and maintaining the groundwater monitoring system, if applicable; and

(4) Maintaining and operating the gas monitoring system in accordance with the requirements of 258.23.

b. The length of the post-closure care period may be:

(1) Increased by the Department if the Department determines that the lengthened period is necessary to protect human health and the environment.

(2) Decreased by the Department if the owner or operator can provide technical rationale that the decreased post-closure care period is sufficient to protect human health and the environment.

c. The owner or operator of all MSWLF units must prepare a written post-closure plan that includes, at a minimum, the following information:

(1) A description of the monitoring and maintenance activities required in 258.61.(a) for each MSWLF unit, and the frequency at which these activities will be performed;

(2) Name, address, and telephone number of the person or office to contact about the facility during the post-closure period; and

(3) A description of the planned uses of the property during the post-closure period. Post-closure use of the property shall not disturb the integrity of the final cover, liner(s), or any other components of the containment system, or the function of the monitoring systems unless necessary to comply with the requirements in Part 258. The Department may approve any other disturbance of the containment system if the owner or operator demonstrates that disturbance of the final cover, liner or other component of the containment system, including any removal of waste, will not increase the potential threat to human health or the environment.

d. The owner or operator must notify the Department that a post-closure plan has been prepared and placed in the operating record no later than the effective date of this regulation, October 9, 1993, or prior to permit issuance, whichever is later. The post-closure plan must be updated if any changes occur at the facility which require a deviation from the approved post-closure plan.

e. Following completion of the post-closure care period for each MSWLF unit, the owner or operator must notify the Department that a certification, signed by a South Carolina registered professional engineer other than the design engineer, verifying that post-closure care has been completed in accordance with the post-closure plan, has been placed in the operating record.

258.62. - 258.69. [Reserved]

## **SUBPART G -- FINANCIAL ASSURANCE CRITERIA**

### **258.70. APPLICABILITY AND EFFECTIVE DATE**

a. The requirements of this section apply to owners and operators of all MSWLF units, except owners or operators who are State or Federal government entities whose debts and liabilities are the debts and liabilities of a State or the United States.

b. The requirements of this section are effective April 9, 1994.

### **258.71. FINANCIAL ASSURANCE FOR CLOSURE**

a. The owner or operator must have a detailed written estimate, in current dollars, of the cost of hiring a third party to close the largest area of all MSWLF units ever requiring a final cover as required under 258.60 at any time during the active life in accordance with the closure plan. The owner or operator must notify the Department that the estimate has been placed in the operating record.

(1) The cost estimate must equal the cost of closing the largest area of all MSWLF units ever requiring a final cover at any time during the active life when the extent and manner of its operation would make closure the most expensive, as indicated by its closure plan (see 258.60.c.(2) of this part).

(2) During the active life of the MSWLF unit, the owner or operator must annually adjust the closure cost estimate for inflation.

(3) The owner or operator must increase the closure cost estimate and the amount of financial assurance provided under paragraph b. of this section if changes to the closure plan or MSWLF unit conditions increase the maximum cost of closure at any time during the remaining active life.

(4) The owner or operator may reduce the closure cost estimate and the amount of financial assurance provided under paragraph b. of this section if the cost estimate exceeds the maximum cost of closure at any time during the remaining life of the MSWLF unit. The owner or operator must notify the Department that the justification for the reduction of the closure cost estimate and the amount of financial assurance has been placed in the operating record.

b. The owner or operator of each MSWLF unit must establish financial assurance for closure of the MSWLF unit in compliance with 258.74. The owner or operator must provide continuous coverage for closure until released from financial assurance requirements by demonstrating compliance with 258.60.h. and i.

#### 258.72. FINANCIAL ASSURANCE FOR POST-CLOSURE CARE

a. The owner or operator must have a detailed written estimate, in current dollars, of the cost of hiring a third party to conduct post-closure care for the MSWLF unit in compliance with the post-closure plan developed under 258.61. of this part. The post-closure cost estimate used to demonstrate financial assurance in paragraph b. of this section must account for the total costs of conducting post-closure care, including annual and periodic costs as described in the post-closure plan over the entire post-closure care period. The owner or operator must notify the Department that the estimate has been placed in the operating record.

(1) The cost estimate for post-closure care must be based on the most expensive costs of post-closure care during the post-closure care period.

(2) During the active life of the MSWLF unit and during the post-closure care period, the owner or operator must annually adjust the post-closure cost estimate for inflation.

(3) The owner or operator must increase the post-closure care cost estimate and the amount of financial assurance provided under paragraph b. of this section if changes in the post-closure plan or MSWLF unit conditions increase the maximum costs of post-closure care.

(4) The owner or operator may reduce the post-closure cost estimate and the amount of financial assurance provided under paragraph b. of this section if the cost estimate exceeds the maximum costs of post-closure care remaining over the post-closure care period. The owner or operator must notify the Department that the justification for the reduction of the post-closure cost estimate and the amount of financial assurance has been placed in the operating record.

b. The owner or operator of each MSWLF unit must establish, in a manner in accordance with 258.74., financial assurance for the costs of post-closure care as required under 258.61. of this part. The owner or operator must provide continuous coverage for post-closure care until released from financial assurance requirements for post-closure care by demonstrating compliance with 258.61.e..

#### 258.73. FINANCIAL ASSURANCE FOR CORRECTIVE ACTION

a. An owner or operator of a MSWLF unit required to undertake a corrective action program under 258.58. of this part must have a detailed written estimate, in current dollars, of the cost of hiring a third party to perform the corrective action in accordance with the program required under 258.58. of this part. The corrective action cost estimate must account for the total costs of corrective action activities as described in

the corrective action plan for the entire corrective action period. The owner or operator must notify the Department that the estimate has been placed in the operating record.

(1) The owner or operator must annually adjust the estimate for inflation until the corrective action program is completed in accordance with 258.58.f. of this part.

(2) The owner or operator must increase the corrective action cost estimate and the amount of financial assurance provided under paragraph (b) of this section if changes in the corrective action program or MSWLF unit conditions increase the maximum costs of corrective action.

(3) The owner or operator may reduce the amount of the corrective action cost estimate and the amount of financial assurance provided under paragraph b. of this section if the cost estimate exceeds the maximum remaining costs of corrective action. The owner or operator must notify the Department that the justification for the reduction of the corrective action cost estimate and the amount of financial assurance has been placed in the operating record.

b. The owner or operator of each MSWLF unit required to undertake a corrective action program under 258.58. of this part must establish, in a manner in accordance with 258.74., financial assurance for the most recent corrective action program. The owner or operator must provide continuous coverage for corrective action until released from financial assurance requirements for corrective action by demonstrating compliance with 258.58.f. and g.

#### 258.74. ALLOWABLE MECHANISMS

The mechanisms used to demonstrate financial assurance under this section must ensure that the funds necessary to meet the costs of closure, post-closure care, and corrective action for known releases will be available whenever they are needed. Owners and operators must choose from the options specified in paragraphs a. through j. of this section.

##### a. Trust Fund.

(1) An owner or operator may satisfy the requirements of this section by establishing a trust fund which conforms to the requirements of this paragraph. The trustee must be an entity which has the authority to act as a trustee and whose trust operations are regulated and examined by a Federal or State agency. A copy of the trust agreement must be placed in the facility's operating record.

(2) Payments into the trust fund must be made annually by the owner or operator over the term of the initial permit or over the remaining life of the MSWLF unit, whichever is shorter, in the case of a trust fund for closure or post-closure care, or over one-half of the estimated length of the corrective action program in the case of corrective action for known releases. This period is referred to as the pay-in period.

(3) For a trust fund used to demonstrate financial assurance for closure and post-closure care, the first payment into the fund must be at least equal to the current cost estimate for closure or post-closure care, except as provided in paragraph (j) of this section, divided by the number of years in the pay-in period as defined in paragraph (a)(2) of this section. The amount of subsequent payments must be determined by the following formula:

$$\text{Next Payment} = \frac{\text{CE}-\text{CV}}{\text{Y}}$$

where CE is the current cost estimate for closure or post-closure care (updated for inflation or other changes), CV is the current value of the trust fund, and Y is the number of years remaining in the pay-in period.

(4) For a trust fund used to demonstrate financial assurance for corrective action, the first payment into the trust fund must be at least equal to one-half of the current cost estimate for corrective action, except as provided in paragraph j. of this section, divided by the number of years in the corrective action pay-in period as defined in paragraph a.(2) of this section. The amount of subsequent payments must be determined by the following formula:

$$\text{Next Payment} = \frac{\text{RB}-\text{CV}}{\text{Y}}$$

where RB is the most recent estimate of the required trust fund balance for corrective action (i.e., the total costs that will be incurred during the second half of the corrective action period), CV is the current value of the trust fund, and Y is the number of years remaining on the pay-in period.

(5) The initial payment into the trust fund must be made before the initial receipt of waste or before the effective date of this section (April 9, 1994), whichever is later, in the case of closure and post-closure care, or no later than one hundred twenty (120) days after the corrective action remedy has been selected in accordance with the requirements of 258.58.

(6) If the owner or operator establishes a trust fund after having used one or more alternate mechanisms specified in this section, the initial payment into the trust fund must be at least the amount that the fund would contain if the trust fund were established initially and annual payments made according to the specifications of this paragraph and 270.74.a. of this section, as applicable.

(7) The owner or operator, or other person authorized to conduct closure, post-closure care, or corrective action activities may request reimbursement from the trustee for these expenditures. Requests for reimbursement will be granted by the trustee only if sufficient funds are remaining in the trust fund to cover the remaining costs of closure, post-closure care, or corrective action, and if justification and documentation of the cost is placed in the operating record. The owner or operator must notify the Department that the documentation of the justification for reimbursement has been placed in the operating record and that reimbursement has been received.

(8) The trust fund may be terminated by the owner or operator only if the owner or operator substitutes alternate financial assurance as specified in this section or if he is no longer required to demonstrate financial responsibility in accordance with the requirements of 258.71.b., 258.72.b., or 258.73.b.

b. Surety Bond Guaranteeing Payment or Performance.

(1) An owner or operator may demonstrate financial assurance for closure or post-closure care by obtaining a payment or performance surety bond which conforms to the requirements of this paragraph. An owner or operator may demonstrate financial assurance for corrective action by obtaining a performance bond which conforms to the requirements of this paragraph. The bond must be effective before the initial receipt of waste or before the effective date of this section, (April 9, 1994), whichever is later, in the case of closure and post-closure care, or no later than one hundred twenty (120) days after the corrective action remedy has been selected in accordance with the requirements of 258.58. The owner or operator must notify the Department that a copy of the bond has been placed in the operating record. The surety company issuing the bond must, at a minimum, be among those listed as acceptable sureties on Federal bonds in Circular 570 of the U.S. Department of the Treasury.

(2) The penal sum of the bond must be in an amount at least equal to the current closure, post-closure care or corrective action cost estimate, whichever is applicable, except as provided in 258.74.k.



(3) Under the terms of the bond, the surety will become liable on the bond obligation when the owner or operator fails to perform as guaranteed by the bond.

(4) The owner or operator must establish a standby trust fund. The standby trust fund must meet the requirements of 258.74.a. except the requirements for initial payment and subsequent annual payments specified in 258.74.a.(2), (3), (4) and (5).

(5) Payments made under the terms of the bond will be deposited by the surety directly into the standby trust fund. Payments from the trust fund must be approved by the trustee.

(6) Under the terms of the bond, the surety may cancel the bond by sending notice of cancellation by certified mail to the owner and operator and to the Department 120 days in advance of cancellation. If the surety cancels the bond, the owner or operator must obtain alternate financial assurance as specified in this section.

(7) The owner or operator may cancel the bond only if alternate financial assurance is substituted as specified in this section or if the owner or operator is no longer required to demonstrate financial responsibility in accordance with 258.71.b., 258.72.b. or 258.73.b.

c. Letter of Credit.

(1) An owner or operator may satisfy the requirements of this section by obtaining an irrevocable standby letter of credit which conforms to the requirements of this paragraph. The letter of credit must be effective before the initial receipt of waste or before the effective date of this section, (April 9, 1994), whichever is later, in the case of closure and post-closure care, or no later than 120 days after the corrective action remedy has been selected in accordance with the requirements of 258.58. The owner or operator must notify the Department that a copy of the letter of credit has been placed in the operating record. The issuing institution must be an entity which has the authority to issue letters of credit and whose letter-of-credit operations are regulated and examined by a Federal or State agency.

(2) A letter from the owner or operator referring to the letter of credit by number, issuing institution, and date, and providing the following information: name, and address of the facility, and the amount of funds assured, must be included with the letter of credit in the operating record.

(3) The letter of credit must be irrevocable and issued for a period of at least one (1) year in an amount at least equal to the current cost estimate for closure, post-closure care or corrective action, whichever is applicable, except as provided in 258.74.k. The letter of credit must provide that the expiration date will be automatically extended for a period of at least one year unless the issuing institution has canceled the letter of credit by sending notice of cancellation by certified mail to the owner and operator and to the Department one hundred twenty (120) days in advance of cancellation. If the letter of credit is canceled by the issuing institution, the owner or operator must obtain alternate financial assurance.

(4) The owner or operator may cancel the letter of credit only if alternate financial assurance is substituted as specified in this section or if the owner or operator is released from the requirements of this section in accordance with 258.71.b., 258.72.b. or 258.73.b.

d. Insurance.

(1) An owner or operator may demonstrate financial assurance for closure and post-closure care by obtaining insurance which conforms to the requirements of this paragraph. The insurance must be effective

before the initial receipt of waste or before the effective date of this section, (April 9, 1994), whichever is later. At a minimum, the insurer must be licensed to transact the business of insurance, or eligible to provide insurance as an excess or surplus lines insurer, in one or more States. The owner or operator must notify the Department that a copy of the insurance policy has been placed in the operating record.

(2) The closure or post-closure care insurance policy must guarantee that funds will be available to close the MSWLF unit whenever final closure occurs or to provide post-closure care for the MSWLF unit whenever the post-closure care period begins, whichever is applicable. The policy must also guarantee that once closure or post-closure care begins, the insurer will be responsible for the paying out of funds to the owner or operator or other person authorized to conduct closure or post-closure care, up to an amount equal to the face amount of the policy.

(3) The insurance policy must be issued for a face amount at least equal to the current cost estimate for closure or post-closure care, whichever is applicable, except as provided in 258.74.k. The term "face amount" means the total amount the insurer is obligated to pay under the policy. Actual payments by the insurer will not change the face amount, although the insurer's future liability will be lowered by the amount of the payments.

(4) An owner or operator, or any other person authorized to conduct closure or post-closure care, may receive reimbursements for closure or post-closure expenditures, whichever is applicable. Requests for reimbursement will be granted by the insurer only if the remaining value of the policy is sufficient to cover the remaining costs of closure or post-closure care, and if justification and documentation of the cost is placed in the operating record. The owner or operator must notify the Department that the documentation of the justification for reimbursement has been placed in the operating record and that reimbursement has been received.

(5) Each policy must contain a provision allowing assignment of the policy to a successor owner or operator. Such assignment may be conditional upon consent of the insurer, provided that such consent is not unreasonably refused.

(6) The insurance policy must provide that the insurer may not cancel, terminate or fail to renew the policy except for failure to pay the premium. The automatic renewal of the policy must, at a minimum, provide the insured with the option of renewal at the face amount of the expiring policy. If there is a failure to pay the premium, the insurer may cancel the policy by sending notice of cancellation by certified mail to the owner and operator and to the Department one hundred twenty (120) days in advance of cancellation. If the insurer cancels the policy, the owner or operator must obtain alternate financial assurance as specified in this section.

(7) For insurance policies providing coverage for post-closure care, commencing on the date that liability to make payments pursuant to the policy accrues, the insurer will thereafter annually increase the face amount of the policy. Such increase must be equivalent to the face amount of the policy, less any payments made, multiplied by an amount equivalent to eighty-five (85) percent of the most recent investment rate or of the equivalent coupon-issue yield announced by the U.S. Treasury for 26-week Treasury securities.

(8) The owner or operator may cancel the insurance policy only if alternate financial assurance is substituted as specified in this section or if the owner or operator is no longer required to demonstrate financial responsibility in accordance with the requirements of 258.71.b., 258.72.b. or 258.73.b.

e. Corporate Financial Test.

[reserved]

f. Local Government Financial Test.

[reserved]

g. Corporate Guarantee.

[Reserved]

h. Local Government Guarantee.

[Reserved]

i. State Approved Mechanism. An owner or operator may satisfy the requirements of this section by obtaining any other mechanism that meets the criteria specified in 258.74.1., and that is approved by the Department.

j. State Assumption of Responsibility. If the Department either assumes legal responsibility for an owner or operator's compliance with the closure, post-closure care and/or corrective action requirements of this part, or assures that the funds will be available from State sources to cover the requirements, the owner or operator will be in compliance with the requirements of this section. Any State assumption of responsibility must meet the criteria specified in 258.74.1.

k. Use of Multiple Financial Mechanisms. An owner or operator may satisfy the requirements of this section by establishing more than one financial mechanism per facility. The mechanisms must be as specified in paragraphs a., b., c., d., e., f., g., h., i. and j. of this section, except that it is the combination of mechanisms, rather than the single mechanism, which must provide financial assurance for an amount at least equal to the current cost estimate for closure, post-closure care or corrective action, whichever is applicable. The financial test and a guarantee provided by a corporate parent, sibling, or grandparent may not be combined if the financial statements of the two firms are consolidated.

l. The language of the mechanisms listed in paragraphs a., b., c., d., e., f., g., h., i. and j. of this section must ensure that the instruments satisfy the following criteria:

(1) The financial assurance mechanisms must ensure that the amount of funds assured is sufficient to cover the costs of closure, post-closure care, and corrective action for known releases when needed;

(2) The financial assurance mechanisms must ensure that funds will be available in a timely fashion when needed;

(3) The financial assurance mechanisms must be obtained by the owner or operator by the effective date of these requirements or prior to the initial receipt of solid waste, whichever is later, in the case of closure and post-closure care, and no later than one hundred twenty (120) days after the corrective action remedy has been selected in accordance with the requirements of 258.58., until the owner or operator is released from the financial assurance requirements under 258.71., 258.72. and 258.73.

(4) The financial assurance mechanisms must be legally valid, binding, and enforceable under State and Federal law.

258.75. - 258.79. [Reserved]

## **SUBPART H**

## 258.80. PERMIT APPLICATION REQUIREMENTS

a. Applications for a permit to construct and operate a new MSWLF, or a lateral expansion of an existing MSWLF shall contain at a minimum the following:

- (1) A Landfill Siting Study.
- (2) A Disclosure Statement.
- (3) A Document Demonstrating compliance with applicable Solid Waste Management Plans.
- (4) A completed Permit Application Form.

b. Upon receipt of written notice from the Department to the applicant that the issues contained in 258.80.a. have been satisfactorily addressed, and the site is determined to be suitable for the intended purpose, the following information shall be submitted to the Department.

- (1) Notification of initiation of the facility issues negotiation process.
- (2) Engineering Drawings that set forth the proposed landfill location, property boundaries, adjacent land uses and construction details.
- (3) Operation Plans that describe how the landfill will fulfill the requirements of protecting human health and the environment.
- (4) A Landscape Plan prepared to address adequate seeding or screening of the site.
- (5) An Engineering Report comprehensively describing the existing site conditions and an analysis of the landfill, including closure and post-closure criteria.
- (6) A Quality Assurance/Quality Control Report prepared in accordance with all standardly accepted QA/QC practices.
- (7) An Operation and Maintenance Report prepared to demonstrate how the landfill will meet all the operational requirements.
- (8) A Contingency Plan.
- (9) A Groundwater Monitoring Plan.
- (10) A Closure Plan.
- (11) A Post-Closure Care Plan.

c. The permit application package required by 258.80.b. shall be submitted by and signed and stamped by a professional engineer duly licensed to practice in the state of South Carolina. All individual drawings and plans shall be signed and stamped separately by the professional engineer.

## 258.81. LANDFILL SITING STUDY

a. All new MSWLF's and lateral expansions of existing MSWLF's shall complete a landfill siting

investigation, which shall contain at a minimum, the following steps:

(1) A preliminary hydrogeologic characterization report on the site, which contains readily available information on the regional, local, and site hydrogeology and groundwater use. The preliminary hydrogeologic characterization report shall be used to eliminate hydrogeologically unsuitable sites, and to determine if site conditions warrant further investigation.

(2) Pending approval of the preliminary hydrogeologic characterization report, a work plan detailing the site specific hydrogeologic investigations to be performed at the site shall be submitted to the Department for review and approval.

(3) Upon approval of the work plan specified in 258.81.a.(2), a site hydrogeologic characterization report shall be prepared and submitted to the Department detailing the findings of the site specific investigations. During review by the Department of the suitability of the site based on the site hydrogeologic characterization report, the permit applicant may proceed with site design, and submittal of a groundwater monitoring plan as specified in 258.93. Approval of the site will be required before the Department will comment on engineering plans associated with the construction of the facility.

b. The landfill siting investigation shall ensure that the proposed landfill location complies with sections 258.11. through 258.15. and section 258.17.

#### 258.82. DISCLOSURE STATEMENT

a. Upon notification of the Department of the intent to site a municipal solid waste landfill, the applicant shall submit a disclosure statement as outlined in section 44-96-300 of the 1976 Code of Laws. The Department may accept one disclosure statement for multiple facility permit applicants. This section shall not apply if the applicant is a local government or a region comprised of local governments. The disclosure statement shall contain the following information with regard to the applicant and his responsible parties:

(1) the full name, business address, and social security number of all responsible parties;

(2) a description of the experience and credentials, including any past or present permits or licenses for the collection, transportation, treatment, storage, or disposal of solid waste issued to or held by the applicant within the past five (5) years;

(3) a listing and explanation of all convictions by final judgement of a responsible party in a state or federal court, whether under appeal or not, of a crime of moral turpitude punishable by a fine of five thousand dollars (\$5,000.00) or more or imprisonment for one year or more, or both, within five (5) years immediately preceding the date of the submission of the permit application.

(4) a listing and explanation of all convictions by final judgement of a responsible party in a state or federal court, whether under appeal or not, of a criminal or civil offense involving a violation of an environmental law punishable by a fine of five thousand dollars (\$5,000.00) or more or imprisonment for one year or more, or both, in a state or federal court within five (5) years of the date of submission of the permit application;

(5) a listing and explanation of the instances in which a disposal facility permit held by the applicant was revoked by final judgement in a state or federal court, whether under appeal or not, within five (5) years of the date of submission of the permit application; and

(6) a listing and explanation of all adjudications of the applicant for having been in contempt of any

valid court order enforcing any federal environmental law or any state environmental law relative to the activity for which the permit is being sought, within five (5) years of the date of submission of the permit application.

#### 258.83. COMPLIANCE WITH SOLID WASTE MANAGEMENT PLANS

a. The permit applicant shall demonstrate compliance with the State Solid Waste Management Plan in effect at the time of submittal of the demonstration to the Department.

b. The permit applicant shall demonstrate compliance with the County or Regional Solid Waste Management Plan in effect at the time of submittal of the demonstration to the Department, and shall:

(1) describe the existing conditions in the area covered by the county or regional plan, including characterization of the solid waste stream by quantity, composition, and give the basis for determination; describe the existing collection practices; and identify other solid waste management facilities in the area covered by the county or regional plan, describing current operating practices, expected life and any pending litigation relating to those facilities;

(2) describe the projected solid waste stream over the landfill's life, including a discussion of the present and projected population in the area covered by the county or regional plan, where applicable;

#### 258.84. PERMIT APPLICATION FORM

a. The permit applicant shall submit a completed permit application, on a form provided by the Department, as a part of the permit application package specified in 258.80. The permit application form may not require any information not specifically required by these regulations.

#### 258.85. FACILITY ISSUES NEGOTIATION PROCESS

a. The permit applicant shall submit to the Department concurrent with or prior to submittal of the information required in 258.80.b., demonstration and documentation that the facility issues negotiation process has been initiated in accordance with section 44-96-470 of the 1976 Code of Laws.

b. Upon completion of the facility issues negotiation process, the facilitator shall provide to the Department a summary of the results of the negotiations within fourteen (14) days of the certification of the facilitator's final report of resolution of the host local government as required by Section 44-96-470 (O) of the Solid Waste Policy and Management Act of 1991.

#### 258.86. ENGINEERING DRAWINGS

a. The engineering drawings must contain the following:

(1) A vicinity plan or map that must show the area within one mile of the property boundaries of the landfill in terms of: the existing and proposed zoning and land uses within that area at the time of permit application; and residences, public and private water supply wells, known aquifers, and surface waters (with quality classifications), access roads, bridges, railroads, airports, historic sites, and other existing and proposed man-made or natural features relating to the facility.

(2) Site plans that must show: the landfill's property boundaries, as certified by an individual licensed to practice land surveying in the State of South Carolina, off-site and on-site utilities (such as, electric, gas, water, storm, and sanitary sewer systems) and right-of-ways, easements; the names and addresses of abutting property owners; the location of soil borings, excavations, test pits, gas venting structures, wells, piezometers,

environmental and facility monitoring points and devices, (with each identified with a permanent marking system, and horizontal and vertical location shown, as measured from the ground surface and top of well casing), benchmarks and permanent survey markers, and on-site buildings and appurtenances, fences, gates, roads, parking areas, drainage culverts, and signs; the delineation of the total landfill area including planned staged development of the landfill's construction and operation, and the lateral limits of any previously filled areas; the location and identification of the sources of cover materials; the location and identification of special waste handling areas; and site topography with five (5) feet minimum contour intervals, and any other relevant information.

(3) Detailed plans of the landfill must clearly show in plan and cross sectional views the following: the original, undeveloped site topography before excavation or placement of solid waste; the existing site topography, if different including the location and approximate thickness and nature of any existing solid waste; the high groundwater table; geologic units; known and interpolated bedrock elevations; the proposed limits of excavation and waste placement; the location and placement of each liner system and of each leachate collection system, locating and showing all critical grades and elevations of the collection pipe inverts and drainage envelopes, manholes, cleanouts, valves, sumps, other devices as needed to divert or collect surface water run-on or run-off; the final elevations and grades of the landfill; groundwater monitoring, leachate storage, treatment and disposal systems including the collection network, sedimentation ponds and any treatment, pre-treatment, or storage facilities; roadway sections, dimensions, slopes and profile; the building locations and appurtenances.

#### 258.87. OPERATIONAL PLAN

a. The project's operational plan shall be presented in a manner sufficiently clear and comprehensive for use by the landfill's operator during the life of the landfill; and depict in plan and cross-sectional views the fill progression with respect to site life; and contain:

(1) A description of the site's preparation and fill progression for the life of the site in terms of method, depth, location and sequence.

(2) a method of elevation control for the operator including the location and description of the permanent surveying benchmark at the site; and

(3) a fill progression discussion describing the placement and compacted thickness of daily, intermediate and final cover.

#### 258.88. LANDSCAPE PLAN

a. A landfill's landscape plan must:

(1) identify and locate existing vegetation to be retained and proposed vegetation to be used for cover, screening, and other purposes;

(2) provide a seeding and planting schedule, including the identification of the rationale for the seed mixture choice and fertilization and procedures for seed application, mulching, and maintenance; and

(3) describe the planting plan and schedule which identifies plants to be used consistent with future use proposals.

#### 258.89. ENGINEERING REPORT

a. An engineering report containing a description of the existing site conditions and an analysis of the proposed landfill must be submitted. The report shall:

(1) specify the filling rate (in tons per day) of the landfill for which approval is being sought, describing the number, types, and specifications of all necessary machinery and equipment needed to effectively operate the landfill at the prescribed filling rate;

(2) contain a detailed description of all construction phases, including, but not limited to, the liner system, leachate collection system, and final cover system, and;

(3) contain a site analysis of the proposed action including:

(a) the location of the closest population centers;

(b) a description of the primary transportation systems and routes of waste being transported to the landfill (ie., highways, airports, railways, etc.);

(c) An analysis of the existing topography, surface water and subsurface geological conditions;

(d) a description of the materials and construction methods for the placement of: each monitoring well, all gas venting systems, each liner and leachate collection and removal system, leachate storage, treatment, and disposal systems, and cover systems. This description also must include a discussion of provisions to be taken to prevent frost action upon each liner system in areas where refuse has not been placed;

(e) an estimate of the expected quantity of leachate to be generated, including:

(i) an annual water budget, estimating leachate generation quantities must be prepared for periods of time of initial operation and application of intermediate cover and following facility closure. At a minimum, the following factors must be considered in the preparation of the precipitation infiltration into the landfill: average monthly temperature, average monthly precipitation, evaporation, evapotranspiration which should consider the vegetation type and root zone depth, surface/cover soil conditions and their relation to precipitation runoff which must account for the surface conditions and soil moisture holding capacity and all other sources of moisture contribution to the landfill;

(ii) liner and leachate collection system efficiencies must be calculated using an appropriate analytical or numerical assessment. The factors to be considered in the calculation of collection system efficiency must include, as a minimum, the saturated hydraulic conductivity of the liner, the liner thickness, the saturated hydraulic conductivity of the leachate collection system, the leachate collection system porosity, the base slope of the liner and leachate collection and removal system interface, the maximum flow distance across the liner and leachate collection and removal system interface to the nearest leachate collection pipe, the estimated leachate generation quantity as computed in accordance with the requirements of the preceding subparagraph; and

(iii) information gained from the collection efficiency calculations required in the preceding two subparagraphs must be used to predict the static head of leachate on the liners, volume of leachate to be collected, and the volume of leachate that may permeate through the entire liner system on a monthly basis. This assessment must also address the amount of leachate expected to be found in the leachate collection and removal system in gallons per acre per day;

(f) the design of the leachate storage facility must be based upon the leachate generation



calculation. The design capacity for the leachate storage facility must be based on the proposed leachate disposal method which must allow sufficient lead time for either:

(i) development of a separate set of engineering reports, plans and specifications for the construction and operation of a leachate treatment facility on-site and to obtain approval of this document before any discharge from the leachate storage facility; or

(ii) development of a plan to handle leachate destined for off-site treatment at a wastewater treatment facility, including a legal document (contract, local permit, etc.) certifying acceptance of leachate from the operator of the wastewater treatment facility with all conditions stipulated by the operator of the wastewater treatment facility and all such stipulations addressed in the operations plan, and to ensure that the amount of leachate stored on-site is not in excess of the storage capacity available;

(g) a description of the contingency plan for the construction phase that must describe procedures for responding to construction deficiencies resulting from circumstances including, but not limited to, inclement weather, defective materials or construction inconsistent with specifications as demonstrated by quality control testing. The plan must provide a description of the criteria to be utilized in evaluating deficiencies, and selecting and implementing corrective actions;

(h) discuss the closure and post-closure maintenance and operation of the landfill which must include, but not be limited to:

(i) a closure design consistent with the requirements contained in this regulation.

(ii) A post-closure water quality monitoring program consistent with requirements contained in this regulation.

(iii) An operation and closure plan for the leachate collection, treatment, and storage facilities consistent with the requirements of this regulation.

(iv) A discussion of the future use of the site including the specific proposed or alternative uses. Future uses must conform to the landscape plan, required by this regulation and must not adversely affect the final cover system;

(i) include appendices demonstrating compliance with pertinent local laws and regulation pertaining to air, land, noise, and water pollution, and other supporting data, including literature citations.

#### 258.90. QUALITY ASSURANCE/QUALITY CONTROL REPORT

a. The project's Quality Assurance (QA) and Quality Control (QC) report shall address the construction requirements set forth in this document for each phase of construction, this plan must include, but not be limited to:

(1) a delineation of the QA and QC management organization, including the chain of command of the QA and QC inspectors and contractors;

(2) a description of the required level of experience and training for the contractor, his crew, and QA/QC inspectors for every major phase of construction in sufficient detail to demonstrate that the installation methods and procedures required in this document will be properly implemented; and

(3) a description of the QA and QC testing protocols for every major phase of construction, including,

but is not limited to, the base liner system, leachate collection system, and final cover system, which must include at a minimum: the frequency of inspection, field testing, sampling for laboratory testing, the sampling and field testing procedures and equipment to be utilized, the calibration of field testing equipment, the frequency of performance audits, the sampling size, the soils or geotechnical laboratory to be used, the laboratory procedures to be utilized, the calibration of laboratory equipment and QA/QC of laboratory procedures, the limits for test failure and a description of the corrective procedures to be used upon test failure.

#### 258.91. OPERATION AND MAINTENANCE REPORT

a. The operation and maintenance report for the landfill must include, at a minimum, the following:

(1) A description of the project's personnel requirements, stating personnel responsibilities and duties including discussions for training and lines of authority at the landfill;

(2) a description of all machinery and equipment to be used at the landfill, their authorized uses, and safety features;

(3) a description of the operational controls, including but not limited to signs, hours and days of operation, landfill usage rules and regulations, and traffic flow controls;

(4) a characterization of the anticipated amount of solid waste to be received per day, specifying the quantities received in tons per day, the fill progression of the landfill, and the method of solid waste placement and compaction, and the anticipated in-place density;

(5) a description of the landfill's solid waste receiving process for all solid waste, including inspection of incoming loads, identification of any waste streams to be excluded, and those wastes to receive special handling, or to require treatment before receipt;

(6) a description of the cover material management plan, specifying the types of cover material (daily, intermediate, and final) identifying the quantities required and sources for each cover material by type including the method of cover material placement, compaction, and the anticipated density;

(7) a description of the project's gas monitoring program that must discuss explosive gas generation at the landfill and the controls used to ensure that gas generated at the landfill will not create a hazard to health, safety, or property;

(8) a description of how winter and inclement weather operations will be conducted; and

(9) if applicable, a description of the operation of a convenience station at the landfill for smaller private vehicles to unload refuse at an area other than the landfill's working face.

#### 258.92. CONTINGENCY PLAN

a. The contingency plan must discuss an organized, planned and coordinated, technically and financially feasible course of action to be taken in responding to contingencies during the construction and/or operation of a landfill. The plan must address, at a minimum, actions to be taken with respect to personnel and user safety; on-site personal injury; fires; explosive landfill gases detected on site; dust; litter; odor; noise; equipment breakdown; unusual traffic conditions; vectors; disposition of unapproved wastes; receipt of unauthorized wastes; releases of hazardous or toxic materials; groundwater and surface water contamination which may include public water supply contamination as a result of an accidental spill; and the occurrence of the leachate storage facility being at or above capacity. The contingency plan must specify the procedures to

be used in response to: tank and surface impoundment spills or leakage, including removal of the waste and repair of such structures, and the event that the approved leachate treatment facility cannot accept leachate from the landfill for an indefinite period of time.

#### 258.93. GROUNDWATER MONITORING PLAN

a. Upon obtaining approval of the investigations performed to satisfy section 258.81., a groundwater monitoring plan shall be submitted to the Department for review and approval. The groundwater monitoring plan shall detail the activities to be performed to ensure compliance with the requirements of 258.51. (Groundwater Monitoring), 258.53. (Groundwater Sampling and Analysis Requirements), and 258.54. (Detection Monitoring).

#### 258.94. CLOSURE PLAN

a. A closure plan shall be included in the permit application that details the activities that will be performed to satisfy the requirements of section 258.60.

#### 258.95. POST-CLOSURE CARE PLAN

a. A post-closure care plan shall be included in the permit application that details the activities that will be performed to satisfy the requirements of section 258.61.

258.96. - 258.99. [Reserved]

### **SUBPART I**

#### 258.100. VIOLATIONS AND PENALTIES

a. A violation of this regulation subjects the owner of the municipal solid waste landfill to the issuance of a Department order, or to a civil or criminal enforcement action by the Attorney General's office. In addition, the Department may impose reasonable civil penalties not to exceed ten thousand dollars (\$10,000.00) for each day of violation of the provisions of this regulation, including any order, permit or standard. After exhaustion of administrative remedies, a person against whom a civil penalty is evoked by the Department may appeal the decision of the Department or Board to the court of common pleas.

258.101. - 258.109. [Reserved]

### **SUBPART J**

#### 258.110. FEES

[Reserved]

258.111. - 258.119. [Reserved]

### **SUBPART K**

#### 258.120. TONNAGE LIMITS

a. The Department shall prior to issuance of a permit for a new or expanded facility, determine an allowable rate of disposal based on the facilities design capacity, expected operational life, and the area to be served by the facility as outlined in the demonstration of need as required by Code Section 44-96-290. Any

landfill permit issued shall include an allowable rate of disposal on a tons per year basis. The tonnage limit may be altered based upon population changes in the area to be served, or for special circumstances due to Acts of God.

258.121. - 258.129. [Reserved]

## **SUBPART L**

### 258.130. PERMIT CONDITIONS AND PERMIT REVIEW

a. Applications for permits shall be provided by the Department and shall be submitted with sufficient detail to support a judgement that operation of the disposal system will not violate the Acts or regulations of the State of South Carolina. The application shall be signed by the owner and operator of the MSWLF. The approved application and associated plans and drawings shall be an enforceable part of the permit.

b. The Department shall review the permit for each MSWLF at least once every five (5) years, unless otherwise specified by the Department.

(1) If, upon review, the Department finds that material or substantial violations of the permit demonstrate the permittee's disregard for, or inability to comply with applicable laws, regulations, or requirements and would make continuation of this permit not in the best interests of human health and safety or the environment, the Department may, after a hearing, amend or revoke the permit, as appropriate and necessary. When a permit is reviewed, the Department shall include additional limitations, standards, or conditions when the technical limitations, standards, or regulations on which the original permit was based have been changed by statute or amended by regulation.

(2) The Department may amend or attach conditions to a permit when:

(a) There is a significant change in the manner and scope of operation which may require new or additional permit conditions or safeguards to protect human health and safety and the environment;

(b) The investigation has shown the need for additional equipment, construction, procedures, and testing to ensure the protection of human health and safety and the environment; and,

(c) The amendment is necessary to meet changes in applicable regulatory requirements.

c. Any permits issued pursuant to this regulation will not be valid after a period of twelve (12) months of the date of issuance if construction of the facility has not begun by the end of this period.

258.131. - 258.139. [Reserved]

## **SUBPART M**

### 258.140. TRANSFER OF OWNERSHIP

a. The Department may, upon written request, transfer a permit to a new owner or operator where no other change in the permit is necessary. The proposed new owner of a permitted MSWLF shall, at least forty-five (45) days prior to the scheduled change in ownership, provide:

(1) Documentation of the new owner's name and address.

(2) Documentation of the name and address of the party responsible for the operation and maintainance of the MSWLF, if different from the owner.

(3) A written agreement signed by both parties indicating the intent to change ownership or operating responsibility of the facility. The agreement must contain a specific date for the transfer of permit responsibility.

(4) Documentation indicating that the MSWLF will be operated in accordance with the existing permit in effect at the time of transfer.

(5) Documentation of financial assurance as required by Regulation 61-107.258., Subpart G. The old owner shall maintain financial assurance responsibilities until the new owner can demonstrate satisfactory compliance with Regulation 61-107.258., Subpart G.

(6) A Disclosure Statement as required by Regulation 61-107.258., Subpart H.

b. Upon approval of all items required by Section 258.140.a., the Department shall transfer the permit from the original owner of the MSWLF, to the new owner.

c. A request for a permit modification must be submitted with the transfer of ownership request, if the MSWLF will not be operated in accordance with the approved plans. The permit modification must be in accordance with all provisions of this regulation.

d. The new owner must submit legal documentation of the transfer of ownership of the MSWLF within fifteen (15) days of the actual transfer.

258.141. - 258.149. [Reserved]

## **SUBPART N**

258.150. SEVERABILITY

a. Should any section, paragraph, sentence, clause or phrase of this regulation be declared unconstitutional or invalid for any reason, the remainder of this regulation shall not be affected thereby.

258.151. - 258.159. [Reserved]

## **SUBPART O**

258.160. APPEALS

a. An Appeal from denial of a permit shall be deemed a "contested case" as defined in S.C. Code Ann. 123-310 (2).

258.161. - 258.169. [Reserved]

**TABLE 1**

<b>Chemical</b>	<b>MCL (mg/l)</b>
Arsenic	0.05
Barium	2.0
Benzene	0.005
Cadmium	0.005
Carbon tetrachloride	0.005
Chromium (hexavalent)	0.1
2,4-Dichlorophenoxy acetic acid	0.07
1,4-Dichlorobenzene	0.075
1,2-Dichloroethane	0.005
1,1-Dichloroethylene	0.007
Endrin	0.002
Fluoride	4
Lindane	0.0002
Lead <sup>1</sup>	0.015
Mercury	0.002
Methoxychlor	0.04
Nitrate	10
Selenium	0.05
Silver <sup>2</sup>	0.1
Toxaphene	0.003
1,1,1-Trichloroethane	0.2
Trichloroethylene	0.005
2,4,5-Trichlorophenoxy acetic acid	0.05
Vinyl Chloride	0.002

<sup>1</sup> Action Level

<sup>2</sup> Secondary Limit

## Appendix I

Common Name	CAS RN
pH	
Specific Conductance	
Antimony	Total
Arsenic	Total
Barium	Total
Beryllium	Total
Cadmium	Total
Chromium	Total
Cobalt	Total
Copper	Total
Lead	Total
Nickel	Total
Selenium	Total
Silver	Total
Thallium	Total
Vanadium	Total
Zinc	Total
Acetone	67-64-1
Acrylonitrile	107-13-1
Benzene	71-43-2
Bromochloromethane	74-97-5
Bromodichloromethane	75-27-4
cis-1,3-Dichloropropene	10061-01-5
trans-1,3-Dichloropropene	10061-02-6
Ethylbenzene	100-41-4
Bromoform	75-25-2
2-Butanone (Methyl ethyl ketone)	78-93-3
Carbon disulfide	75-15-0
Carbon tetrachloride	56-23-5
Chlorobenzene	108-90-7
Chloroethane	75-00-3
Chloroform	67-66-3
Dibromochloromethane	124-48-1
1,2-Dibromoethane	106-93-4
o-Dichlorobenzene	95-50-1
p-Dichlorobenzene	106-46-7
trans-1,4-Dichloro-2-butene	110-57-6
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8
1,1-Dichloroethane	75-34-3
1,2-Dichloroethane	107-06-2
1,2-Dichloropropane	78-87-5
2-Hexanone	591-78-6
Iodomethane	74-88-4
Methylene chloride	75-09-2
Methyl bromide	74-83-9
Methyl chloride	74-87-3
Methylene bromide	74-95-3

<b>Common Name</b>	<b>CAS RN</b>
4-Methyl-2-pentanone	108-10-1
1,1-Dichloroethene	75-35-4
trans-1,2-Dichloroethene	156-60-5
cis-1,2-Dichloroethene	156-59-2
Styrene	100-42-5
1,1,1,2-Tetrachloroethane	630-20-6
1,1,2,2-Tetrachloroethane	79-34-5
Tetrachloroethylene	127-18-4
Toluene	108-88-3
1,1,1-Trichloroethane	71-55-6
1,1,2-Trichloroethane	79-00-5
Trichloroethene	79-01-6
Trichlorofluoromethane	75-69-4
1,2,3-Trichloropropane	96-18-4
Vinyl acetate	108-05-4
Vinyl chloride	75-01-4
Xylene	1330-20-7



## Appendix II

Common Name	CAS RN
Acenaphthene	83-32-9
Acenaphthylene	208-96-8
Acetone	67-64-1
Acetonitrile; Methyl Cyanide	75-05-8
Acetophenone	98-86-2
2-Acetylaminofluorene; 2AAF	53-96-3
Acrolein	107-02-8
Acrylonitrile	107-13-1
Aldrin	309-00-2
Allyl chloride	107-05-1
a-Aminobiphenyl	92-67-1
Anthracene	120-12-7
Antimony	Total
Arsenic	Total
Barium	Total
Benzene	71-43-2
Benzo[a]anthracene; Benzanthracene	56-55-3
Benzo[b]fluoranthene	205-99-2
Benzo[k]fluoranthene	207-08-9
Benzo[ghi]perylene	191-24-2
Benzo[a]pyrene	50-32-8
benzyl alcohol	100-51-6
Beryllium	Total
alpha-BHC	319-84-6
beta-BHC	319-85-7
delta-BHC	319-86-8
gamma-BHC; Lindane	58-89-9
Bis(2-chloroethoxy)methane	111-91-1
Bis(2-chloroethyl) ether; Dichloroethyl ether	111-44-4
Bis(2-chloro-1-methylethyl) ether	108-60-1
Bis(2-ethylhexyl) phthalate	117-81-7
Bromochloromethane; Chlorobromomethane	74-97-5
Bromodichloromethane; Dibromochloromethane	75-27-4
Bromoform	75-25-2
4-Bromophenyl phenyl ether	101-55-3
Butyl benzyl phthalate	85-68-7
Cadmium	Total
Carbon disulfide	75-15-0
Carbon tetrachloride	56-23-5
Chlordane	All
p-Chloroaniline	106-47-8
Chlorobenzene	108-90-7
Chlorobenzilate	510-15-6
p-Chloro-m-cresol	59-50-7
Chloroethane; Ethyl chloride	75-00-3
Chloroform	67-66-3
2-Chloronaphthalene	91-58-7
2-Chlorophenol	95-57-8

<b>Common Name</b>	<b>CAS RN</b>
4-Chlorophenyl phenyl ether	7005-72-3
Chloroprene	126-99-8
Chromium	Total
Chrysene	218-01-9
Cobalt	Total
Copper	Total
m-Cresol	108-39-4
o-Cresol	95-48-7
p-Cresol	106-44-5
Cyanide	57-12-5
2,4-D; 2,4-Dichlorophenoxyacetic acid	94-75-7
4,4-DDD	72-54-8
4,4-DDE	72-55-9
4,4-DDT	50-29-3
Diallate	2303-16-4
Dibenz[a,h]anthracene	53-70-3
Dibenzofuran	132-64-9
Dibromochloromethane	124-48-1
1,2-Dibromo-3-chloropropane; DBCP	96-12-8
1,2-Dibromoethane	106-93-4
D-n-butyl phthalate	84-74-2
o-Dichlorobenzene	95-50-1
m-Dichlorobenzene	541-73-1
p-Dichlorobenzene	106-46-7
3,3-Dichlorobenzidine	91-94-1
trans-1,4-Dichloro-2-butene	110-57-6
Dichlorodifluoromethane; CFC 12	75-71-8
1,1-Dichloroethane	75-34-3
1,2-Dichloroethane	107-06-2
1,1-Dichloroethylene	75-35-4
cis-1,2-Dichloroethylene	156-59-2
trans-1,2-Dichloroethylene	156-60-5
2,4-Dichlorophenol	120-83-2
2,6-Dichlorophenol	87-65-0
1,2-Dichloropropane	78-87-5
1,3-Dichloropropane	142-28-9
2,2-Dichloropropane	594-20-7
1,1-Dichloropropene	563-58-6
cis-1,3-Dichloropropene	10061-01-5
trans-1,3-Dichloropropene	10061-02-6
Dieldrin	60-57-1
Diethyl phthalate	84-66-2
0,0-Diethyl 0-2-pyrazinyl phosphorothioate; Thionazin	297-97-2
Dimethoate	60-51-5
p-(Dimethylamino)azobenzene	60-11-7
7,12-Dimethylbenz[a]anthracene	57-97-6
3,3-Dimethylbenzidine	119-93-7
2,4-Dimethylphenol;m-Xylenol	105-67-9
Dimethyl phthalate	131-11-3

<b>Common Name</b>	<b>CAS RN</b>
m-Dinitrobenzene	99-65-0
4,6-Dinitro-o-cresol	534-52-1
2,4-Dinitrophenol	51-28-5
2,4-Dinitrotoluene	121-14-2
2,6-Dinitrotoluene	606-20-2
Dinoseb; DNBP	88-85-7
Di-n-octyl phthalate	117-84-0
Diphenylamine	122-39-4
Disulfoton	298-04-4
Endosulfan I	959-98-8
Endosulfan II	33213-65-9
Endosulfan sulfate	1031-07-8
Endrin	72-20-8
Endrin aldehyde	7421-93-4
Ethylbenzene	100-41-4
Ethyl methacrylate	97-63-2
Ethyl methanesulfonate	62-50-0
Famphur	52-85-7
Fluoranthene	206-44-0
Fluorene	86-73-7
Heptachlor	76-44-8
Heptachlor epoxide	1024-57-3
Hexachlorobenzene	118-74-1
Hexachlorobutadiene	87-68-3
Hexachlorocyclopentadiene	77-47-4
Hexachloroethane	67-72-1
Hexachloropropene	1888-71-7
2-Hexanone; Methyl butyl ketone	591-78-6
Indeno(1,2,3-cd)pyrene	193-39-5
Isobutyl alcohol	78-83-1
Isodrin	465-73-6
Isophorone	78-59-1
Isosafrole	120-58-1
Kepone	143-50-0
Lead	Total
Mercury	Total
Methacrylonitrile	126-98-7
Methapyrilene	91-80-5
Methoxychlor	72-43-5
Methyl bromide	74-83-9
Methyl chloride	74-87-3
3-Methylcholanthrene	56-49-5
Methyl ethyl ketone; MEK	78-93-3
Methyl iodide	74-88-4
Methyl methacrylate	80-62-6
Methyl methanesulfonate	66-27-3
2-Methylnaphthalene	91-57-6
Methyl parathion	298-00-0
4-Methyl-2-pentanone	108-10-1
Methylene bromide	74-95-3

<b>Common Name</b>	<b>CAS RN</b>
Methylene chloride	75-09-2
Naphthalene	91-20-3
1,4-Naphthoquinone	130-15-4
1-Naphthylamine	134-32-7
2-Naphthylamine	91-59-8
Nickel	Total
o-Nitroaniline	88-74-4
m-Nitroaniline	99-09-2
p-Nitroaniline	100-01-6
Nitrobenzene	98-95-3
o-Nitrophenol	88-75-5
p-Nitrophenol	100-02-7
N-Nitrosodi-n-butylamine	924-16-3
N-Nitrosodiethylamine	55-18-5
N-Nitrosodimethylamine	62-75-9
N-Nitrosodiphenylamine	86-30-6
N-Nitrosodipropylamine	621-64-7
N-Nitrosomethylethylamine	10595-95-6
N-Nitrosopiperidine	100-75-4
N-Nitrosopyrrolidine	930-55-2
5-Nitro-o-toluidine	99-55-8
Parathion	56-38-2
Pentachlorobenzene	608-93-5
Pentachloronitrobenzene	82-68-8
Pentachlorophenol	87-86-5
Phenacetin	62-44-2
Phenanthrene	85-01-8
Phenol	108-95-2
p-Phenylenediamine	106-50-3
Phorate	298-02-2
Polychlorinated biphenyls PCB's	1336-36-3
Pronamide	23950-58-5
Propionitrile	107-12-0
Pyrene	129-00-0
Safrole	94-59-1
Selenium	Total
Silver	Total
Silvex: 2,4,5-TP	93-72-1
Styrene	100-42-5
Sulfide	18496-25-8
2,4,5-T; 2,4,5-Trichlorophenoxyacetic acid	93-76-5
1,2,4,5-Tetrachlorobenzene	95-94-3
1,1,1,2-Tetrachlorethane	630-20-6
1,1,2,2-Tetrachloroethane	79-34-5
Tetrachloroethylene	127-18-4
2,3,4,6-Tetrachlorophenol	58-90-2
Thallium	Total
Tin	Total
Toluene	108-88-3

<b>Common Name</b>	<b>CAS RN</b>
o-Toluidine	95-53-4
Toxaphene	8001-35-2
1,2,4-Trichlorobenzene	120-82-1
1,1,1-Trichloroethane	71-55-6
1,1,2 Trichloroethane	79-00-5
Trichloroethylene	79-01-6
Trichlorofluoromethane; CFC-11	75-69-4
2,4,5-Trichlorophenol	95-95-4
2,4,6-Trichlorophenol	88-06-2
1,2,3-Trichloropropane	96-18-4
0,0,0-Triethyl phosphorothioate	126-68-1
sym-Trinitrobenzene	99-35-4
Vanadium	Total
Vinyl acetate	108-05-4
Vinyl chloride	75-01-4
Xylene (total)	See Note 1
Zinc	Total

Note 1: Includes o-xylene (96-47-6), m-xylene (108-38-3), p-xylene (106-42-3), and unspecified xylenes (1330-20-7).