CA

66264.301 Design and Operating Requirements

(a)

Any landfill that is not covered by subsection (c) of this section or 66265.301(a) of this chapter shall have a liner system for all portions of the landfill (except for existing portions). The liner system shall have: (1) a liner that is designed, constructed, and installed to prevent any migration of wastes out of the landfill to the adjacent subsurface soil or ground water or surface water at anytime during the active life (including the closure period) and during post-closure care period of the landfill. The liner shall be constructed of materials that prevent wastes from passing into the liner during the active life of the facility. The liner shall be: (A) constructed of materials that have appropriate chemical properties and sufficient strength and thickness to prevent failure due to pressure gradients (including static head and external hydrogeologic forces), physical contact with the waste or leachate to which they are exposed, climatic conditions, the stress of installation, and the stress of daily operation; (B) placed upon a foundation or base capable of providing support to the liner and resistance to pressure gradients above and below the liner to prevent failure of the liner due to settlement, compression, or uplift; and (C) installed to cover all surrounding earth likely to be in contact with the waste or leachate; and (2) a leachate collection and removal system immediately above the liner that is designed, constructed, maintained, and operated to collect and remove leachate from the landfill. The Department will

specify design and operating conditions in the permit to ensure that the leachate depth over the liner does not exceed 30 cm (one foot). The leachate collection and removal system shall be: (A) constructed of materials that are: 1. chemically resistant to the waste managed in the landfill and the leachate expected to be generated; and 2. of sufficient strength and thickness to prevent collapse under the pressures exerted by overlying wastes, waste cover materials, and by any equipment used at the landfill; and (B) designed and operated to function without clogging through the scheduled closure and post-closure period of the landfill.

(1)

a liner that is designed, constructed, and installed to prevent any migration of wastes out of the landfill to the adjacent subsurface soil or ground water or surface water at anytime during the active life (including the closure period) and during post-closure care period of the landfill. The liner shall be constructed of materials that prevent wastes from passing into the liner during the active life of the facility. The liner shall be: (A) constructed of materials that have appropriate chemical properties and sufficient strength and thickness to prevent failure due to pressure gradients (including static head and external hydrogeologic forces), physical contact with the waste or leachate to which they are exposed, climatic conditions, the stress of installation, and the stress of daily operation; (B) placed upon a foundation or base capable of providing support to the liner and resistance to pressure gradients above and below the liner to prevent failure of the liner due to settlement, compression, or uplift; and (C) installed to cover all surrounding earth likely to be in contact with the waste or leachate; and

(A)

constructed of materials that have appropriate chemical properties and sufficient strength and thickness to prevent failure due to pressure gradients (including static head and external

hydrogeologic forces), physical contact with the waste or leachate to which they are exposed, climatic conditions, the stress of installation, and the stress of daily operation;

(B)

placed upon a foundation or base capable of providing support to the liner and resistance to pressure gradients above and below the liner to prevent failure of the liner due to settlement, compression, or uplift; and

(C)

installed to cover all surrounding earth likely to be in contact with the waste or leachate; and

(2)

a leachate collection and removal system immediately above the liner that is designed, constructed, maintained, and operated to collect and remove leachate from the landfill. The Department will specify design and operating conditions in the permit to ensure that the leachate depth over the liner does not exceed 30 cm (one foot). The leachate collection and removal system shall be: (A) constructed of materials that are: 1. chemically resistant to the waste managed in the landfill and the leachate expected to be generated; and 2. of sufficient strength and thickness to prevent collapse under the pressures exerted by overlying wastes, waste cover materials, and by any equipment used at the landfill; and (B) designed and operated to function without clogging through the scheduled closure and post-closure period of the landfill.

(A)

constructed of materials that are: 1. chemically resistant to the waste managed in the landfill and the leachate expected to be generated; and 2. of sufficient strength and thickness to prevent collapse under the pressures exerted by overlying wastes, waste cover materials, and by any equipment used at the landfill; and

1.

chemically resistant to the waste managed in the landfill and the leachate expected to be generated;

and

2.

of sufficient strength and thickness to prevent collapse under the pressures exerted by overlying wastes, waste cover materials, and by any equipment used at the landfill; and

(B)

designed and operated to function without clogging through the scheduled closure and post-closure period of the landfill.

(b)

The owner or operator shall be exempted from the requirements of paragraph (a) of this section if the Department finds, based on a demonstration by the owner or operator, that alternative design and operating practices, together with location characteristics, will prevent the migration of any hazardous constituents of concern (see section 66264.93) into the ground water or surface water at any future time. In deciding whether to grant an exemption, the Department will consider: (1) the nature and quantity of the wastes; (2) the proposed alternative design and operation; (3) the hydrogeologic setting of the facility, including the attenuative capacity and thickness of the liners and soils present between the landfill and ground water or surface water; (4) all other factors which would influence the quality and mobility of the leachate produced and the potential for it to migrate to ground water or surface water; and (5) the potential for lateral migration of hazardous constituents which could present a threat to public health or the environment;

(1)

the nature and quantity of the wastes;

(2)

the proposed alternative design and operation;

(3)

the hydrogeologic setting of the facility, including the attenuative capacity and thickness of the liners and soils present between the landfill and ground water or surface water;

(4)

all other factors which would influence the quality and mobility of the leachate produced and the potential for it to migrate to ground water or surface water; and

(5)

the potential for lateral migration of hazardous constituents which could present a threat to public health or the environment;

(c)

The owner or operator of each new landfill unit on which construction commences after January 29, 1992, each lateral expansion of a landfill unit on which construction commences after July 29, 1992, and each replacement of an existing landfill unit that is to commence reuse after July 29, 1992 shall install, two or more liners and a leachate collection and removal system above and between such liners. The requirements of this subsection shall not apply to landfill units receiving only non-RCRA hazardous waste until February 18, 1996. "Construction commences" is as defined in section 66260.10 of this chapter under "existing facility". (1) (A) The liner system shall include: 1. A top liner designed and constructed of materials (e.g., a geomembrane) to prevent the migration of hazardous constituents into such liner during the active life and post-closure care period; and 2. A composite bottom liner, consisting of at least two components. The upper component shall be designed and constructed of materials (e.g., a geomembrane) to prevent the migration of hazardous constituents into this component during the active life and post-closure care period. The lower

component shall be designed and constructed of materials to minimize the migration of hazardous constituents if a breach in the upper component were to occur. The lower component shall be constructed of at least 3 feet (91 cm) of compacted soil material with a hydraulic conductivity of no more than 1x10-7 cm/sec. (B) The liners shall comply with subsections (a)(1)(A), (B), and (C) of this section. (2) The leachate collection and removal system immediately above the top liner shall be designed, constructed, operated, and maintained to collect and remove leachate from the landfill during the active life and post-closure care period. The Department will specify design and operating conditions in the permit to ensure that the leachate depth over the liner does not exceed 1 foot (30 cm). The leachate collection and removal system shall comply with subsections (c)(3)(C) and (D) of this section. (3) The leachate collection and removal system between the liners, and immediately above the bottom composite liner in the case of multiple leachate collection and removal systems, is also a leak detection system. This leak detection system shall be capable of detecting, collecting, and removing leaks of hazardous constituents at the earliest practicable time through all areas of the top liner likely to be exposed to waste or leachate during the active life and post-closure care period. The requirements for a leak detection system in this subsection are satisfied by installation of a system that is, at a minimum: (A) Constructed with a bottom slope of one percent or more; (B) Constructed of granular drainage materials with a hydraulic conductivity of 1x10-2 cm/sec or more and a thickness of 1 foot (30.5 cm) or more; or constructed of synthetic or geonet drainage materials with a transmissivity of 3x10-5 m2 /sec or more. In cases where the leak detection system is composed of coarse granular material, there shall be a suitable interface (e.g., geotextile) between the leak detection system and any flexible membrane liner, as needed to prevent the

coarse grains from causing a puncture in the flexible membrane liner under the high stress conditions caused by the overlying waste; (C) Constructed of materials that are chemically resistant to the waste managed in the landfill and the leachate expected to be generated, and of sufficient strength and thickness to prevent collapse under the pressures exerted by overlying wastes, waste cover materials, and equipment used at the landfill; (D) Designed and operated to minimize clogging during the active life and post-closure care period; and (E) Constructed with sumps and liquid removal methods (e.g., pumps) of sufficient size to collect and remove liquids from the sump and prevent liquids from backing up into the drainage layer. Each unit shall have its own sump(s). The design of each sump and removal system shall provide a method for measuring and recording the volume of liquids present in the sump and of liquids removed. (4) The owner or operator shall collect and remove pumpable liquids in the leak detection system sumps to minimize the head on the bottom liner. (5) The liner system shall be designed, constructed and operated to ensure that leak detection system shall be a minimum of 5 feet above the highest anticipated elevation of groundwater.

(1)

(A) The liner system shall include: 1. A top liner designed and constructed of materials (e.g., a geomembrane) to prevent the migration of hazardous constituents into such liner during the active life and post-closure care period; and 2. A composite bottom liner, consisting of at least two components. The upper component shall be designed and constructed of materials (e.g., a geomembrane) to prevent the migration of hazardous constituents into this component during the active life and post-closure care period. The lower component shall be designed and constructed of materials to minimize the migration of hazardous constituents if a breach in the upper component

were to occur. The lower component shall be constructed of at least 3 feet (91 cm) of compacted soil material with a hydraulic conductivity of no more than 1x10-7 cm/sec. (B) The liners shall comply with subsections (a)(1)(A), (B), and (C) of this section.

(A)

The liner system shall include: 1. A top liner designed and constructed of materials (e.g., a geomembrane) to prevent the migration of hazardous constituents into such liner during the active life and post-closure care period; and 2. A composite bottom liner, consisting of at least two components. The upper component shall be designed and constructed of materials (e.g., a geomembrane) to prevent the migration of hazardous constituents into this component during the active life and post-closure care period. The lower component shall be designed and constructed of materials to minimize the migration of hazardous constituents if a breach in the upper component were to occur. The lower component shall be constructed of at least 3 feet (91 cm) of compacted soil material with a hydraulic conductivity of no more than 1x10-7 cm/sec.

1.

A top liner designed and constructed of materials (e.g., a geomembrane) to prevent the migration of hazardous constituents into such liner during the active life and post-closure care period; and

2.

A composite bottom liner, consisting of at least two components. The upper component shall be designed and constructed of materials (e.g., a geomembrane) to prevent the migration of hazardous constituents into this component during the active life and post-closure care period. The lower component shall be designed and constructed of materials to minimize the migration of hazardous constituents if a breach in the upper component were to occur. The lower component shall be constructed of at least 3 feet (91 cm) of compacted soil material with a hydraulic conductivity of no more than 1x10-7 cm/sec.

(B)

The liners shall comply with subsections (a)(1)(A), (B), and (C) of this section.

(2)

The leachate collection and removal system immediately above the top liner shall be designed, constructed, operated, and maintained to collect and remove leachate from the landfill during the active life and post-closure care period. The Department will specify design and operating conditions in the permit to ensure that the leachate depth over the liner does not exceed 1 foot (30 cm). The leachate collection and removal system shall comply with subsections (c)(3)(C) and (D) of this section.

(3)

The leachate collection and removal system between the liners, and immediately above the bottom composite liner in the case of multiple leachate collection and removal systems, is also a leak detection system. This leak detection system shall be capable of detecting, collecting, and removing leaks of hazardous constituents at the earliest practicable time through all areas of the top liner likely to be exposed to waste or leachate during the active life and post-closure care period. The requirements for a leak detection system in this subsection are satisfied by installation of a system that is, at a minimum: (A) Constructed with a bottom slope of one percent or more; (B) Constructed of granular drainage materials with a hydraulic conductivity of 1x10-2 cm/sec or more and a thickness of 1 foot (30.5 cm) or more; or constructed of synthetic or geonet drainage materials with a transmissivity of 3x10-5 m2 /sec or more. In cases where the leak detection system is composed of coarse granular material, there shall be a suitable interface (e.g., geotextile) between the leak detection system and any flexible membrane liner, as needed to prevent the coarse grains from causing a puncture in the flexible membrane liner under the high stress conditions caused by the overlying waste; (C) Constructed of materials that are chemically resistant to the waste managed in the landfill and the leachate expected to be generated, and of

sufficient strength and thickness to prevent collapse under the pressures exerted by overlying wastes, waste cover materials, and equipment used at the landfill; (D) Designed and operated to minimize clogging during the active life and post-closure care period; and (E) Constructed with sumps and liquid removal methods (e.g., pumps) of sufficient size to collect and remove liquids from the sump and prevent liquids from backing up into the drainage layer. Each unit shall have its own sump(s). The design of each sump and removal system shall provide a method for measuring and recording the volume of liquids present in the sump and of liquids removed.

(A)

Constructed with a bottom slope of one percent or more;

(B)

Constructed of granular drainage materials with a hydraulic conductivity of 1x10-2 cm/sec or more and a thickness of 1 foot (30.5 cm) or more; or constructed of synthetic or geonet drainage materials with a transmissivity of 3x10-5 m2 /sec or more. In cases where the leak detection system is composed of coarse granular material, there shall be a suitable interface (e.g., geotextile) between the leak detection system and any flexible membrane liner, as needed to prevent the coarse grains from causing a puncture in the flexible membrane liner under the high stress conditions caused by the overlying waste;

(C)

Constructed of materials that are chemically resistant to the waste managed in the landfill and the leachate expected to be generated, and of sufficient strength and thickness to prevent collapse under the pressures exerted by overlying wastes, waste cover materials, and equipment used at the landfill;

(D)

Designed and operated to minimize clogging during the active life and post-closure care period; and

(E)

Constructed with sumps and liquid removal methods (e.g., pumps) of sufficient size to collect and remove liquids from the sump and prevent liquids from backing up into the drainage layer. Each unit shall have its own sump(s). The design of each sump and removal system shall provide a method for measuring and recording the volume of liquids present in the sump and of liquids removed.

(4)

The owner or operator shall collect and remove pumpable liquids in the leak detection system sumps to minimize the head on the bottom liner.

(5)

The liner system shall be designed, constructed and operated to ensure that leak detection system shall be a minimum of 5 feet above the highest anticipated elevation of groundwater.

(d)

The Department may approve alternative design or operating practices to those specified in paragraph (c) of this section if the owner or operator demonstrates to the Department that such design and operating practices, together with location characteristics: (1) Will prevent the migration of any hazardous constituent into the ground water at least as effectively as the liners and leachate collection and removal systems specified in paragraph (c) of this section; and (2) Will allow detection of leaks of hazardous constituents through the top liner at least as effectively.

(1)

Will prevent the migration of any hazardous constituent into the ground water at least as effectively as the liners and leachate collection and removal systems specified in paragraph (c) of this section; and

(2)

Will allow detection of leaks of hazardous constituents through the top liner at least as effectively.

(e)

The double liner requirement set forth in subsection (c) of this section shall be waived by the Department for any monofill, if: (1) the monofill contains only hazardous wastes from foundry furnace emission controls or metal casting molding sand, and such wastes do not contain constituents which would render the wastes hazardous for reasons other than exceeding the soluble threshold limit concentration as described in section 66261.24(a)(2) for non-RCRA hazardous wastes or the characteristic of toxicity as set forth in section 66261.24(a)(1) for wastes with hazardous wastes numbers D004 through D017 for RCRA hazardous wastes; and (2) (A) 1. The monofill has at least one liner for which there is no evidence that such liner is leaking; 2. the monofill is located more than one-quarter mile from an underground source of drinking water as that term is defined in section 66260.10; and 3. the monofill is in compliance with generally applicable groundwater monitoring requirements for facilities with hazardous waste facility permits; or (B) the owner or operator demonstrates to the satisfaction of the Department, that the monofill is located, designed and operated so as to assure that there will be no migration of any hazardous constituent into ground water, surface water, or surrounding soils at any future time.

(1)

the monofill contains only hazardous wastes from foundry furnace emission controls or metal casting molding sand, and such wastes do not contain constituents which would render the wastes hazardous for reasons other than exceeding the soluble threshold

limit concentration as described in section 66261.24(a)(2) for non-RCRA hazardous wastes or the characteristic of toxicity as set forth in section 66261.24(a)(1) for wastes with hazardous wastes numbers D004 through D017 for RCRA hazardous wastes; and

(2)

(A) 1. The monofill has at least one liner for which there is no evidence that such liner is leaking; 2. the monofill is located more than one-quarter mile from an underground source of drinking water as that term is defined in section 66260.10; and 3. the monofill is in compliance with generally applicable groundwater monitoring requirements for facilities with hazardous waste facility permits; or (B) the owner or operator demonstrates to the satisfaction of the Department, that the monofill is located, designed and operated so as to assure that there will be no migration of any hazardous constituent into ground water, surface water, or surrounding soils at any future time.

(A)

1. The monofill has at least one liner for which there is no evidence that such liner is leaking; 2. the monofill is located more than one-quarter mile from an underground source of drinking water as that term is defined in section 66260.10; and 3. the monofill is in compliance with generally applicable groundwater monitoring requirements for facilities with hazardous waste facility permits; or

1.

The monofill has at least one liner for which there is no evidence that such liner is leaking;

2.

the monofill is located more than one-quarter mile from an underground source of drinking water as that term is defined in section 66260.10; and

3.

the monofill is in compliance with generally applicable groundwater monitoring requirements for facilities with hazardous waste facility permits; or

(B)

the owner or operator demonstrates to the satisfaction of the Department, that the monofill is located, designed and operated so as to assure that there will be no migration of any hazardous constituent into ground water, surface water, or surrounding soils at any future time.

(f)

The owner or operator shall design, construct, operate, and maintain a run-on control system capable of preventing flow onto the active portion of the landfill during peak discharge from at least a 25-year storm.

(g)

The owner or operator shall design, construct, operate, and maintain a run-off management system to collect and control at least the water volume resulting from a 24-hour, 25-year storm.

(h)

Collection and holding facilities (e.g., tanks or basins) associated with run-on and run-off control systems shall be emptied or otherwise managed expeditiously after storms to maintain design capacity of the system.

(i)

If the landfill contains any particulate matter which may be subject to wind dispersal, the owner or operator shall cover or otherwise manage the landfill to control wind dispersal.

(j)

The Department shall specify in the permit all design and operating practices that are necessary to ensure that the requirements of this section are satisfied.

(k)

The landfill shall be designed, constructed, operated and maintained to enable the facility to meet the closure and post-closure requirements of section 66264.310.

(l)

The owner or operator of any replacement landfill unit is exempt from subsection (c) of this section if: (1) The existing unit was constructed in compliance with the design standards of 42 USC section 6924(o)(1)(A)(i) and 42 USC section 6924(o)(5); and (2) There is reason to believe that the liner is functioning as designed.

(1)

The existing unit was constructed in compliance with the design standards of 42 USC section 6924(o)(1)(A)(i) and 42 USC section 6924(o)(5); and

(2)

There is reason to believe that the liner is functioning as designed.