

ATTACHMENT 11

LANDFILL

MODULE C3

FORM EQP 5111 MODULE C3 USE AND MANAGEMENT OF LANDFILL

This section provides information regarding use and management of the Landfill at the Dow Corning Corporation (Dow Corning) Midland Site as required by Part 111, Hazardous Waste Management, of Michigan's Department of Environmental Quality Act, 1994 PA 451, as amended (Act 451) *under Rules R299.9504, R299.9505, R299.9519, R299.9522 which incorporates 40 CFR 270.21* by reference. This description provides information on the landfill located at the Dow Corning Facility.

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C3.A LANDFILL INFORMATION [MAC R 299.9504(8), 299.9505, 299.9619 – 299.9622; 40 CFR 270.21; Part 264, Subpart N]

The landfill is located in the 800 and 1000 Blocks of the facility (see facility layout map in Appendix A1-1 and Module A1, General Description). The landfill was constructed in the late 1940's to early 1950's and is therefore not subject to the requirements of 40 CFR 264.301(c) regarding design criteria for new landfills.

C3.A.1 List of Wastes [40 CFR 270.21(a)]

This landfill has been permitted for disposal of wastes exhibiting the characteristic of toxicity for lead (D008). Renewal of authorization to receive characteristic D008 wastes is not requested since Dow Corning currently has no plans to dispose of any hazardous wastes in the landfill. If such disposal were to be resumed, the facility would first obtain approval from the Department of Natural Resources and Environment (DNRE). No wastes containing free liquids are disposed in the landfill and no lead contaminated (D008) hazardous wastes have been placed in the landfill since 1985.

Solid wastes not regulated as hazardous wastes under RCRA which may be disposed in the landfill include: RCRA-empty containers; containers of non regulated gloves, rags, pieces of metal and glass and other debris; column packing; cleaned process equipment; asbestos; construction debris; solidified silicone sealants, rubber and gums; solidified polysiloxane gels; nonhazardous contaminated dirt; and used office furniture.

C3.B Liner System Exemption Requests

C3.B.1 Exemption Based on Existing Portion [40 CFR 270.21(b)(1), 264.301(a)]

This landfill was constructed prior to January 29, 1992 and has had no horizontal expansions since that date. The landfill is therefore exempt from the requirements of 40 CFR 264.301(c) for use of a double synthetic liner and leak detection system.

C3.B.2 Exemption Based on Alternative Design [40 CFR 270.21(b), 264.301(d)]

Appendix C3-1, "Landfill Equivalency Program, provides an "Equivalency Program" developed in cooperation with DNRE in 1982 to establish the safety and efficacy of the liner system in the existing landfill and its functional equivalency to liners meeting the requirements then in effect under the former Act 64, Rule 419(4) and 419(f).

C3.C Liner System [40 CFR 270.21(b)(1), 264.301(a) and (c), MAC R 299.9620]

The landfill has a liner that was designed, constructed, and installed to prevent any migration of hazardous wastes or hazardous waste constituents to surrounding soil, groundwater, or surface waters during the active life and closure period of the landfill. This section describes how the liner is constructed to achieve this.

C3.C.1 Liner System Description [40 CFR 270.21(b)(1), 264.301(a) & (b)]

Underlying the landfill is a natural clay strata with a minimum thickness of 25 feet. See Module B3, Hydrogeologic Report, and Appendix C3-1, "Landfill Equivalency Program", for detailed information on the location, thickness, and permeability of this natural clay layer.

A "ground truth" boring sample (Sample C-6, see Module B3, Hydrogeologic Report), taken through 25 feet of depth at the approximate center of the landfill, showed the following profile of the landfill floor:

Thickness of Unit (ft.)	Type of Soil	Permeability (cm/sec)
15	Clay (CL)	3×10^{-8}
1	Sandy clay (SM)	4.1×10^{-5}
4	Clayey-silt (ML)	1.5×10^{-7}
5	Clay-silt (CL)	1.2×10^{-6}

Resistivity studies showed that the clay base is uniform, continuous, and homogeneous. The conclusion of the equivalency report was that the existing clay base provides protection to human health and the environment equivalent to the requirements in effect at the time under the former Act 64, Rule 419(4) and 419(f).

A clay curtain wall surrounding the landfill was constructed in 1980 according to Act 64 standards to prevent horizontal migration of hazardous wastes, hazardous constituents, and landfill leachate. The construction of the curtain wall is shown on the drawing (Y1-31900) included in Appendix C3-4. The clay used for the curtain wall had an average permeability of 1.6×10^{-8} cm/sec. and was compacted to an average of 94% of its maximum density, based on the modified Proctor test. The walls were installed in one-foot lifts with a minimum lateral thickness of six feet, and were keyed into the natural clay base to prevent contaminant migration through the joints. The construction quality assurance report and field test results are provided in Appendix C3-2.

At final closure of the landfill, a cover of natural clay will be installed and keyed to the curtain wall to complete the encapsulation of the landfill contents. See Module A11, Closure and Postclosure Plans, for details of cover construction and installation.

C3.C(2) Resistance of Liner System to Loads and Wastes [40 CFR 270.21(b)(1), 264.301(a)(1)(i)]

In 1982, as part of the Landfill Equivalency Program, soil boring analysis was performed to determine the extent of contaminant migration through the landfill base after 30 years of unregulated operation. At that time, contamination was found to have penetrated only six inches into the underlying clay liner, indicating excellent resistance by the clay to chemical attack and permeation.

Resistance to hydraulic pressures from groundwater and runoff is provided by the leachate collection system within the landfill and the interceptor sewer on the outside of the curtain wall. Both systems serve to remove water which could otherwise exert pressures on the landfill base and curtain wall and are constructed of materials capable of withstanding the pressures and chemicals encountered in this application (see information in Appendix C3-3).

The collected liquids are drained to the wastewater sewer for treatment at Dow Chemical. Drawings of the landfill leachate collection system, the interceptor sewer system, and the connections to the wastewater sewer system are provided in Appendices C3-5 through C3-8.

C3.C(3) Liner System Coverage [40 CFR 270.21(b)(1), 264.301(a)(1)(iii)]

The natural clay base underlies the entire landfill area, which is also surrounded entirely by the clay curtain wall. No surrounding earth is likely to be in contact with waste or leachate.

C3.D Leachate Collection and Removal System [40 CFR 264.301(a)(2), MAC R 299.9619(4)]

See Appendix C3-4 (Drawing Y1-23606), for information on the design and construction of the leachate collection system. The leachate collection system is inspected weekly and after every major storm to ensure leachate flow is unobstructed, and maintenance is performed as necessary to remove obstructions.

C3.E Control of Run-on and Runoff

Systems for control of run-on and runoff are discussed in Appendix C3-5, "Run-on and Runoff Capture Systems, Capacity Evaluation".

C3.F Landfill Operations

Construction of Lifts

The landfill is currently permitted for a total disposal volume of 453 acre-feet of wastes. The active cells are located in the 1000 Block portion of the facility; see Appendix C3-4 (Drawing Y1-116550). The landfill was developed in phases, with placement of wastes taking place only to the active cells to reduce exposure of wastes, erosion, and accumulation of precipitation. Wastes are added to the active cell in 10-foot deep lifts over a 6-inch layer of sand to provide drainage for leachate. Once a lift is completed, if it will be exposed for longer than three months before construction of the next lift, it is covered with a one foot layer of compacted earth.

Placement of Wastes

Materials to be placed in the landfill are transported to the landfill by Dow Corning employees or by contractors under the direction of Dow Corning employees. All materials to be placed in the landfill are required to first be approved by designated facility personnel and to have this approval noted on a waste materials approval tag. All materials placed in the landfill are recorded in the landfill log, which is maintained in the waste tracking computer database, and this information is kept as part of the facility operating record.

Laboratory testing is conducted if a material cannot be adequately characterized as to its acceptability for disposal in the landfill based on information provided by the plant department or operations that generated the waste. The laboratory tests may include chemical analysis, Toxicity Characteristic Leachate Procedure (TCLP), the paint filter test for

free liquids, or other such testing or analysis as necessary to evaluate acceptability of the waste for land disposal.

Daily Cover

As each lift is filled, soil is mixed with the wastes in order to form a physically stable mixture. If the disposed waste is susceptible to wind dispersal it is covered daily with a minimum of six inches of soil or other approved cover material that is nontoxic, non-putrescible, and provides sufficient stability to prevent blowing of landfilled material. Treated, solidified polysiloxane gels will not be used for daily cover unless approved by the Department of Natural Resources and Environment (DNRE). Containerized wastes and other inert materials placed in the landfill are covered so that no more than 1,000 square feet of top surface remains exposed at any time. Materials used for cover may be soils from on-site construction projects and may consist of topsoil, sand, gravel, or similar porous materials to allow precipitation to permeate to the leachate collection system; clay is not used for daily cover.

Inspection

The facility hazardous waste landfill is inspected daily for the following items:

- Active cells: Minimum of 6 inches daily cover maintained.
- Active cells: Maximum of 1,000 square feet of exposed waste at any time
- Sidewalls: No gaps, no material leaking from cells.

The results of these inspections are recorded on inspection log sheets, examples of which are provided in Appendix A5-1 of this application. Dow Corning may in the future record this same information in electronic format.

C3.G Surveying and Recordkeeping [40 CFR 264.309]

Dow Corning maintains a record of wastes placed in the landfill and their location with respect to permanently surveyed benchmarks. An annual survey of the landfill is performed for the purpose of determining the amount of available disposal volume remaining. The results of this survey are submitted to DNRE in a written report.

C3.H Special Requirements for Ignitable or Reactive Wastes [40 CFR 264.312]

Ignitable or reactive wastes are not disposed in the landfill.

C3.I Special Requirements for Incompatible Wastes [40 CFR 624.313]

Incompatible wastes are not disposed in the landfill.

C3.J Special Requirements for Bulk and Containerized Liquids [40 CFR 264.314]

Bulk or containerized wastes containing free liquids are not disposed in the landfill. To determine whether a waste contains free liquids, U.S. EPA Method 9095, the "Paint Filter Test", as described in "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods" (SW-846) is used.

If a waste containing free liquid, other than a lab pack, is to be disposed in the landfill it is first either decanted or otherwise drained of all free-standing liquid, or all free liquid has been absorbed or solidified using a sorbent or solidifying agent which is not biodegradable. These activities are generally carried out by the production building or other Dow Corning location that generates the waste. Decanting and the addition of adsorbents or solidification agents may also be carried out at the 800 Block facility, at either the 804 Building truck wash slab or in the 809 container storage building. Since only non-RCRA regulated materials are landfilled, the hazards associated with these operations are minimal and will not cause release of hazardous constituents to the environment.

C3.K Special Requirements for Containers [40 CFR 264.315]

Except for lab packs and very small containers such as ampoules, containers to be placed in the landfill are either crushed, shredded, or similarly reduced in volume to the maximum practical extent, or they must be at least 90% full.

C3.L Special Requirements for Lab Packs [40 CFR 264.316]

Small containers with free liquids may be placed in the landfill if they meet all of the following conditions:

1. They do not contain hazardous wastes.
2. They are overpacked within a metal open-head container not larger than 100 gallon capacity and meeting all applicable requirements of U.S. DOT packaging specifications.
3. The inner containers are tightly closed and also meet U.S. DOT requirements for inner packagings for the type of material contained.
4. The inner containers are packed in absorbent material which is not biodegradable, which is of sufficient quantity to absorb all free liquids in all the inner containers, and which will not react with the wastes.
5. All the wastes in all the inner containers in one overpack are chemically compatible with each other.

