FORM EQP 5111 ATTACHMENT MODULE A11
CLOSURE AND POSTCLOSURE CARE PLANS

This document is an attachment to the Michigan Department of Environment, Great Lakes, and Energy's (EGLE) *Instructions for Completing Form EQP 5111, Operating License Application Form for Hazardous Waste Treatment, Storage, and Disposal Facilities.* See Form EQP 5111 for details on how to use this attachment.

The administrative rules promulgated pursuant to Part 111, Hazardous Waste Management, of Michigan's Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, (Act 451), R 299.9613 and Title 40 of the Code of Federal Regulations (CFR), Part 264, Subpart G, establishes requirements for the closure and, if necessary, postclosure care of hazardous waste management facilities. All references to 40 CFR citations specified herein are adopted by reference in R 299.11003. This license application module addresses requirements for the proper closure and, if necessary, postclosure care of the hazardous waste management units and the hazardous waste management facility for the Dow Silicones Corporation Facility in Midland, Michigan. The information provided in this Module was used to prepare the closure and postclosure care cost estimate provided in Module A12, "Closure and Postclosure Care Cost Estimates."

This Module is organized as follows:

List of Appendices

A11.A CLOSURE PLAN

A11.A.1 Closure Performance Standard

[R 299.9613 and 40 CFR §264.111]

This Closure Plan is designed to ensure that the facility will be closed in a manner that achieves the following:

a. Minimizes the need for further maintenance; and

b. Controls, minimizes, or eliminates, to the extent necessary to protect human health and the environment, postclosure escape of hazardous wastes, hazardous constituents, leachate, contaminated runoff, or hazardous waste decomposition byproducts to the groundwater, surface water, or atmosphere; and, as applicable

c. Complies with the unit-specific closure requirements for each of the following units:

(Check as appropriate)

☒ Use and management of containers	R 299.9614 and 40 CFR §264.178
☒ Tank systems	R 299.9615 and 40 CFR §264.197
☐ Surface impoundments	R 299.9616 and 40 CFR §264.228
☐ Waste piles	R 299.9617 and 40 CFR §264.258
☐ Land treatment[a]	R 299.9618 and 40 CFR §264.280
☒ Landfill	R 299.9619 and 40 CFR §264.310

☐ Incinerators	R 299.9620 and 40 CFR §264.351
☐ Drip pads[b]	R 299.9621 and 40 CFR §264.575
☐ Miscellaneous units	R 299.9623 and 40 CFR §§264.601-603
☐ Hazardous waste munitions and explosive storage[b]	R 299.9637 and 40 CFR §264.1202
☐ Boilers and industrial furnaces	R 299.9808 and 40 CFR §266.102(e)(11)

[a] Not included in the module
[b] *Not yet included in 40 CFR §264.111; therefore not considered*

This Closure Plan is for Dow Silicones Corporation (DSC's) licensed hazardous waste facility in the 800 Block of the Midland site and the hazardous waste landfill located in the 800 and 1000 Blocks of the Midland site. This plan identifies all steps necessary to close each hazardous waste management unit at this facility at the end of its active life. DSC does not plan to partially close any of the hazardous waste management units which are regulated at this facility. Also included is a description of the post-closure care to be provided for the hazardous waste landfill after closure of that unit is completed. Unit-specific closure procedures are discussed in Section A11.A.5 of this module for each unit type indicated above.

A11.A.2 Unit-Specific Information

[R 299.9613 and 40 CFR §§264.112(b)(3) and (6)]

Table A11.A.1 Hazardous Waste Management Units Information

The following table identifies each hazardous waste management unit at the DSC facility subject to the closure requirements of this hazardous waste management facility operating license. The table also includes: each unit's maximum licensed hazardous waste inventory, a list of the waste codes managed in the unit, the anticipated date of closure (if known), and the estimated duration of closure activities once closure begins. Unit-specific methods for closure and detailed schedules are discussed in Section A11.A.5 of this module.

Unit Designation	Maximum Inventory (Include Units)	Waste Codes of Hazardous Wastes Managed	Scheduled Closure Date	Estimated Duration of Closure
801 Container Storage Area	85,000-gallons – No hazardous materials are stored in this building.	N/A	N/A	180 Days
809 Container Storage Area	85,000-gallons	See Table A2-1 in Module A2 (Chemical and Physical Analyses)	N/A	180 Days
806 Tank Storage Area	60,000-gallons	See Table A2-1 in Module A2 (Chemical and Physical Analyses)	N/A	180 Days

Landfill	No hazardous waste disposal currently occurs in the landfill. Non-regulated wastes staged at the landfill for disposal will be placed in the active cell prior to closure or removed for shipment off-site.	See Table A2-1 in Module A2 (Chemical and Physical Analyses)	N/A	180 Days

A11.A.3 Schedule of Final Facility Closure
[R 299.9613 and 40 CFR §264.112(b)(6)]

The Dow Silicones facility:

(Check as appropriate)

☐ Anticipates completing final closure of the entire facility by *[insert estimated date]*

☒ Has not determined when the facility will close and does not anticipate completing final closure of the entire facility prior to expiration of the facility's hazardous waste operating license.

Detailed Closure Schedule for Facility Closure: A detailed breakdown showing the closure schedule with the anticipated time of completions for each activity is provided in Appendix A11-1.

A11.A.4 Notification and Time Allowed for Closure
[R 299.9613 and 40 CFR §§264.112(d)(2) and 264.113(a) and (b)]

Final closure activities will be initiated within 90 days of receipt of the final volume of hazardous wastes and completed within 180 days of receipt of the final volume of waste. The tasks and estimated time required for closure shall follow the schedule specified in Section 11A.3. The Director will be notified by DSC facility 60 days before final closure begins. Final closure will be certified by both DSC facility and an independent, qualified, registered professional engineer of the state of Michigan.

A11.A.4(a) Extensions for Closure Time
[R 299.9613 and 40 CFR §264.113(a) and (b)]

In the event that an extension for closure for the facility or any unit is necessary, the DSC facility will request an extension in accordance with the requirements of 40 CFR §264.113(a).

A11.A.5 Unit-Specific Closure Procedures

Unit-specific closure procedures are provided for each unit identified in Section A11.A.2 of this module.

This section provides closure procedures for each Unit:

- Container storage area;
- Tank systems; and
- Landfill.

The two container storage areas, the tank system and related structures are all located on the landfill. Above-ground container storage and tank system structures will be decontaminated and removed. The foundations will be decontaminated and left in place for incorporation into the landfill when closed. The tanks and container storage areas have secondary containment. Releases to soil, if known, from these regulated units and releases that would be contained in the secondary containment systems may be tracked and reported as necessary. Soil sampling may be necessary to close these structures in the event a release to soil occurs or impacted soils are observed when the structures are removed.

For the hazardous waste disposal units that were historically closed, all required notices as required Under 40 CFR 264.119 were filed with the US EPA Region V and/or EGLE. The file notice dates and the agency to which the notices were submitted to are provided in Module B9, Solid Waste Management Unit (SWMU) Information, Table B9-1 (Summary of SWMUs).

A11.A.5(a) Closure of Container Storage Areas
[R 299.9614 and 40 CFR §264.178]

This section describes the procedures for closure of *801 and 809 Container Storage Areas*. The general closure requirement and specific closure procedures are discussed below.

The 809 Building is used for storage of hazardous wastes in containers and will undergo closure as required at the end of its active service life, as described in this section. Post-closure care is not required for this unit because all hazardous wastes will be removed, and all contaminated structures and equipment will be removed or decontaminated during closure. The 801 Building is only used for non-RCRA regulated wastes but will be closed at the same time and in the same manner as the 809 Building.

This Closure Plan will ensure that the 801 and 809 Building container storage areas will not require further maintenance after closure and that there will be no releases from this area of hazardous waste, hazardous constituents, leachate, contaminated run-off, or hazardous waste decomposition products to the soil, groundwater, surface waters or atmosphere after closure has been completed.

The licensed storage capacity for 801 and 809 Buildings is 85,000 gallons of hazardous wastes. For purposes of closure calculations, it is assumed that this is stored as:

1,518 drums X 55 gal. each =	83,500 gallons
300 lab packs X 5 gal. each =	1,500 gallons
Total: 1,818 containers =	85,000 gallons

A. General Closure Requirement

Prior to closure, these units will stop accepting wastes. At closure, all hazardous waste and hazardous waste residues will be removed from the containment system. Remaining containers, liners, and bases containing or contaminated with hazardous waste or hazardous waste residues will be decontaminated or removed for proper disposal.

B. Specific Closure Procedures

Specific procedures for inventory management, unit inspection, decontamination, sampling and analysis, and additional waste management are discussed below.

1. Inventory and Remedial Waste Management Procedures

At closure of these units, liquid hazardous wastes in containers will be transferred to the appropriate hazardous waste storage tanks prior to shipment off-site, or directly to bulk tank trucks for shipment to off-site licensed treatment and disposal facilities. Those liquids that cannot be transferred for bulk shipment, and any solid hazardous wastes, will be shipped off-site in containers for treatment and/or disposal at licensed facilities.

2. Unit Inspection Procedures

With proper containment for any releases and an established spill response program (Module A7), it is unlikely that the containment area will be contaminated at the time of closure. After removal of all wastes in containers, the steel siding and frame will be disassembled, and the components visually inspected for any signs of contamination by hazardous waste or hazardous waste constituents. After removal of the steel building components, the remaining concrete slab and foundation will be visually inspected for signs of release, contamination by hazardous waste or hazardous waste constituents, cracks in concrete and/or stained soil. If visual evidence of contamination exists, soil sampling may be required as discussed below. After cleaning, the concrete foundation and floor will remain in place and will be covered with the landfill final cover.

3. Decontamination Procedures

The 801 and 809 Buildings are constructed of steel siding on a steel frame, anchored to a concrete slab. The buildings are not insulated, are open on one side, and contain no fixed equipment.

- *Decontamination procedures*

  After removal of all wastes in containers, the steel siding and frame will be disassembled, and the components visually inspected for any signs of contamination by hazardous waste or hazardous waste constituents. Although contamination of the steel building components is unlikely, if any is detected, the contaminated portions will be decontaminated using high pressure water, or steam, or other cleaning method as appropriate to the type and extent of contamination. The steel will then be recycled or disposed.

After removal of the steel building components, the remaining concrete slab and foundation will be visually inspected for signs of contamination by hazardous waste or hazardous waste constituents. All exposed concrete will be decontaminated by high pressure water blasting, steam cleaning, or scarifying, or a combination of these, in order to remove as much as possible any visible evidence of contamination. After cleaning, the concrete foundation and floor will remain in place and will be covered with the landfill final cover.

All secondary containment for container storage areas at this facility including the spill pond and conveyance structures will be decontaminated by high pressure water blasting, steam cleaning, or scarifying, or a combination of these, in order to remove as much as possible any visible evidence of contamination. All secondary containment including spill pond and conveyance structures will be visually inspected for any signs of contamination by hazardous waste or hazardous waste constituents, cracks in concrete and/or stained soil. After decontamination, if visual evidence of contamination exists, soil sampling may be required as discussed below.

- *Measures to ensure decontaminated liquids (if applicable) do not migrate to surface soils or surface waters*

  The rinse water will be collected and placed into drums after each rinse for disposal at a licensed facility off-site. No rinse water will be discharged to the facility's wastewater sewer system.

- *Criteria for determining whether decontamination is complete*

  High pressure triple-rinsing using soap and/or sodium hydroxide solution, steam cleaning, or scarifying, or a combination of these and visual inspection shall be performed to verify that all contamination has been removed.

- *Decontamination of clean-up materials and equipment*

  High pressure triple rinsing and visual inspection to verify that all contamination has been removed are adequate for solid surfaces like tanks, piping, and coated-concrete containment systems. All wastes, and water and debris resulting from cleaning of the concrete secondary containment floor, will be properly disposed in accordance with all applicable regulations. Building components and any equipment removed will be decontaminated or properly disposed. It is not planned that there will be any soils removed during closure.

4. Sampling and Analysis Procedures

Contaminated soils associated with the container storage and tank storage areas are not expected because these areas have both primary and secondary containment. If there is a release to soil or if impacted soil is observed, soils will be sampled in the potentially impacted area. The number, depth and locations of the samples will be consistent with the conditions of the release and EGLE guidance. The samples will be analyzed for parameters in accordance with RRD Operational Memorandum No. 2, Attachment 1 using SW-846 methods that commensurate with the release and all waste materials stored in the unit over time. Soils that

are hazardous will be managed and disposed of properly. Soils that are not hazardous may be stabilized and left in place for incorporation into the landfill upon closure.

5. Additional Waste Management Procedures

Concrete and other rinseates which cannot be decontaminated will be disposed of at a licensed waste disposal facility. It is not expected that any soil will be removed during closure. If impacted soils are found, soil that is hazardous will be managed and disposed of at an off-site location. Soil that is not hazardous may be incorporated into the landfill or managed and disposed of at an off-site location.

A11.A.5(b) Closure of Tank Systems

[R 299.9615 and 40 CFR §264.197]

This section describes the procedures for closure of *806 Tank Storage Area*. The general closure requirement and specific closure procedures are discussed below.

The 806 Tank Storage Area is used for storage of hazardous wastes in tanks and for loading and unloading of bulk waste shipments and will undergo closure as required at the end of its active service life, as described in this section. This hazardous waste management unit contains six storage tanks, each with a working storage capacity of 10,000 gallons. The maximum inventory of hazardous waste for this unit is therefore 60,000 gallons.

A. General Closure Requirement

At closure of the tank system, the DSC facility will remove or decontaminate all waste residues, contaminated containment system components (liners, etc.), and structures and equipment contaminated with waste, and manage them as hazardous waste, unless 40 CFR §264.3(d) applies. If there is indication of impacted soil, the soil will be evaluated consistent with agency guidelines. Soils that are not hazardous may be incorporated into the landfill. Soils that are hazardous will be managed and disposed of properly at another facility.

B. Specific Closure Procedures

Specific procedures for inventory management, unit inspection, decontamination, sampling and analysis, and additional waste management are discussed below.

1. Inventory and Remedial Waste Management Procedures

At the time of closure of this hazardous waste management unit, the six (6) 10,000 gallon storage tanks and ancillary equipment will be emptied of hazardous wastes, cleaned of all waste residues, dismantled, and removed for scrap or disposal. Detailed procedures are described in this section.

The contents of the six (6) 10,000 gallon hazardous waste storage tanks will be pumped to bulk tank trailers for shipment off-site to licensed treatment, storage, and disposal facilities.

2. Unit Inspection Procedures

With proper containment for any releases and an established spill response program located in Module A7 (Evacuation Plan), it is unlikely that the containment area will be contaminated at the time of closure.

At the time of closure, the tanks and containment structures (including spill pond and conveyance structures) will be inspected for residues. Any remaining residues adhering to the interior of the tank and/or containment structures will be removed by high-pressure water blasting, which has been found to be very effective in cleaning these tanks, or by steam cleaning, if necessary. The containment structures will also be visually inspected for any signs of contamination by hazardous waste or hazardous waste constituents, cracks in concrete and/or stained soil. After decontamination, if visual evidence of contamination exists, soil sampling may be required as discussed below. The tanks and ancillary equipment will then be dismantled and removed for scrap or disposal.

3. Decontamination Procedures

- *List of equipment and structures to be decontaminated*

Storage tanks and associated secondary containment structures.

- *Decontamination procedures*

Tank Decontamination

After pumping out as much liquid waste as possible, the remaining sludges will be removed and placed in containers or bulk tankers for shipment to off-site facilities, as follows:

a. Waste Solvent Tanks, #19781, 19782, 19783 and 19786

Based on this facility's experience with periodic tank cleanouts, it is estimated that no more than 2,000 pounds of sludge will remain in each of the waste solvent storage tanks. Most of this material will be removed using a vacuum tank truck and/or by a tank cleaning crew entering the tank. Any remaining residues adhering to the interior of the tank will be removed by high-pressure water blasting, which has been found to be very effective in cleaning these tanks, or by steam cleaning, if necessary. The contaminated water generated by this process will be collected for proper disposal.

b. Waste Methoxysilane Tank, #19784

Based on previous experience in cleaning this tank, it is estimated that no more than 2,000 lbs. of sludges will remain after pumping out the contents. Methoxysilanes are moderately water-reactive, so after emptying, this tank and ancillary piping will be rinsed with compatible organic solvent that is low in water content. The rinse solution will be pumped or vacuumed out and disposed at a licensed facility off-site. Any remaining residues will consist primarily of reacted polymers and will have little or no reactivity to water, so further cleanout measures will use high pressure water and/or steam. All contaminated water will be collected for proper disposal.

c. Waste IPA/Siloxane Tank, #19785

Based on previous experience with cleaning the waste IPA/siloxane storage tank, it is estimated that no more than 2,000 lbs., of sludge will remain in the tank after pumping out the liquid contents. The IPA/Siloxane tank will be cleaned in the same manner as waste solvent and waste methoxysilane tanks.

Most of this material will be removed using a vacuum tank truck and/or by a tank cleaning crew entering the tank. Any remaining residues adhering to the interior of the tank will be removed by high-pressure water blasting, which has been found to be very effective in cleaning these tanks, or by steam cleaning, if necessary. The contaminated water generated by this process will be collected for proper disposal.

Ancillary Equipment

a. Piping and Pumps

Piping, pumps, valves, and any other ancillary equipment used to contain or convey hazardous wastes in the tank farm will be decontaminated by first rinsing with either water or solvent, as appropriate to the type of wastes previously contained, followed by final rinses with water. If necessary, equipment may be steam cleaned to remove any remaining residues. After cleaning, the equipment will be dismantled and if additional residues are discovered, more cleaning performed.

b. Tank Vents, Controls, and Gauges

All tank vents, controls, gauges, and any other ancillary equipment that has not been in direct contact with hazardous wastes during normal operations will be removed, disassembled, and inspected for contamination. These items will be decontaminated as needed, using solvent or water washes or steam cleaning to remove any residues that might be found.

Concrete

After decontamination and removal of the storage tanks and ancillary equipment, the secondary containment structures including the spill pond and conveyance structures at the tank farm will be decontaminated by pressure washing with water and/or steam as necessary to remove as much as possible all visible signs of contamination. These will also be visually inspected for any signs of contamination by hazardous waste or

hazardous waste constituents, cracks in concrete and/or stained soil. After decontamination, if visual evidence of contamination exists, soil sampling may be required as discussed below.

Heavy construction equipment will be used to knock down the tank farm dike walls. Since the 806 tank farm is located on top of the hazardous waste landfill, all concrete will remain in place after closure and will be capped by the landfill final cover.

Soils

Because all tank storage and transfer operations have been provided with secondary containment, and because the entire area will be capped with the landfill final cover, removal of soil will not be necessary and is not planned.

- *Measures to ensure decontaminated liquids (if applicable) do not migrate to surface soils or surface waters*

  The rinse water will be collected and placed into drums after each rinse for disposal at a licensed facility off-site. No rinse water will be discharged to the facility's wastewater sewer system.

- *Criteria for determining whether decontamination is complete*

  High pressure triple rinsing using soap and/or sodium hydroxide solution and visual inspection shall be performed to verify that all contamination has been removed.

- *Decontamination of clean-up materials and equipment*

  Tanks

  After emptying and decontamination, the six (6) hazardous waste storage tanks will be disconnected from ancillary equipment, demounted from their foundations, dismantled to the extent possible, and cut into sections to prepare them for eventual disposal or recycling as scrap metal. If, at any time during this process, additional residues of hazardous wastes are discovered, further decontamination will be performed using solvent or water washes and/or steam, as necessary to ensure thorough decontamination.

  All contaminated solvent rinses will be disposed or recycled at licensed off-site hazardous waste facilities. Contaminated water will be tested and will either be shipped off-site to licensed facilities for treatment or disposal or, if the water is found to contain less than 250 ppm Total Organic Carbon (TOC) and less than 1000 ppm Total Oxygen Demand (TOD) it will be disposed in the wastewater sewer, which flows to Dow Chemical's NPDES permitted wastewater treatment plant. Contaminated solids, including rags, absorbents, and personal protective equipment will be shipped off-site for proper disposal.

Ancillary Equipment

After decontamination, all piping will be dismantled and visually inspected for any sign of residues. If any remaining contamination is observed, further cleaning will be performed using solvent or water washes and/or steam, as necessary to ensure thorough decontamination. All contaminated cleanup materials will be disposed or recycled at off-site licensed facilities. After decontamination is completed, the piping will be cut into sections and properly disposed or recycled as scrap metal.

Pumps, valves, tank vents, gauges and other ancillary equipment that may potentially be usable will be inspected to ensure complete decontamination, and then a determination made as to whether each item can be reused elsewhere in the plant. If the item may be usable and it is cost-effective to reuse it, it will be rebuilt, reconditioned, or otherwise prepared as needed. If it is not reusable, the item will be recycled as scrap or properly disposed.

4. Sampling and Analysis Procedures

Contaminated soils associated with ancillary equipment are not expected but will be identified and managed as described for the container storage area.

5. Additional Waste Management Procedures

All waste and materials will be decontaminated as part of the Closure activities. There are no additional waste management procedures

A11.A.5(c) Closure of Surface Impoundments
[R 299.9616 and 40 CFR §264.228(a)(1) and (2)]

DSC does not store or treat hazardous wastes in surface impoundments at this facility. Therefore, this section is not applicable.

A11.A.5(d) Closure of Waste Piles
[R 299.9617 and 40 CFR §264.258]

DSC does not store or treat hazardous wastes in waste piles at this facility. Therefore, this section is not applicable.

A11.A.5(e) Closure of Landfills
[R 299.9619 and 40 CFR §264.310(a)]

This section describes the procedures for closure of *Landfill*. The general closure requirement and specific closure procedures are discussed below.

A. General Closure Requirement

At the final closure of the landfill, DSC will cover the landfill with a final cover designed and constructed to:

1. Provide long-term minimization of migration of liquids through the closed landfill;
2. Function with minimum maintenance;
3. Promote drainage and minimize erosion or abrasion of the cover;
4. Accommodate settling and subsidence so that the cover's integrity is maintained; and
5. Have a permeability less than or equal to the permeability of any bottom liner system or natural subsoil present.

At the final closure of the landfill or upon closure of any cell, DSC will cover the landfill with a final cover consistent with the specifications is R299.9619.

Because the hazardous waste storage facility and its support structures were constructed on top of the inactive portion of the landfill, these structures will be removed prior to final closure of the landfill. Decontaminated or uncontaminated demolition debris may be disposed in the landfill prior to closure. The Closure Plan will ensure that the amount of maintenance required for the landfill after closure is minimized, and that post-closure releases of hazardous waste, hazardous constituents, leachate, contaminated run-off, or hazardous waste decomposition products to the soil, groundwater, surface waters or atmosphere will be prevented or minimized to the extent necessary to protect human health and the environment, after closure has been completed. Collection of landfill leachate for treatment, and groundwater monitoring are provided to ensure protection of groundwater and surface waters. Operation of the Site Interceptor System, described in detail in Module B2 (Corrective Action), further ensures that no contamination will migrate off-site. The SIS will be operated until concentrations in water collected by the SIS are less than or equal to applicable Part 201 criteria or until a system that provided a similar degree of protection for adjacent properties is functioning.

DSC does not currently use the landfill for disposal of hazardous wastes and does not anticipate doing so prior to closure. If DSC should wish to resume disposal of hazardous wastes in the landfill, prior approval will be sought from EGLE and the Closure Plan will be amended to reflect this change. Until such time, no hazardous wastes are staged for disposal at the landfill, so there is no inventory of hazardous wastes to be removed during closure.

Non-RCRA regulated wastes staged at the landfill for disposal will be placed in the active cell prior to closure, in accordance with normal landfill operating procedures, or removed for shipment off-site. There is no process equipment and no structures associated with the operation of the active portion of the landfill, so there are none to be removed or decontaminated. Removal of other hazardous waste management units located on inactive portions of the landfill has been described in previous portions of this Closure Plan. Removal of other structures and equipment is described below. Non-hazardous soils present at the landfill may be incorporated into the landfill and capped with the final cover.

After final closure, DSC will comply with all postclosure requirements contained in R 299.9613 and 40 CFR §264.117, including maintenance and monitoring throughout the postclosure care period.

B. Specific Closure Procedures

The final landfill cover design, the construction quality assurance program for installing the final landfill cover, and plat of survey are presented below.

1. Landfill Cover Design

This section describes how the landfill will be closed and how the final cover will be constructed. Final closure of the landfill will control leachate migration by minimizing production of leachate, and by maintaining the existing leachate collection system. Groundwater monitoring in the area of the closed landfill during the post-closure period will evaluate if all leachate is being effectively collected and treated. All leachate is discharged to the licensed wastewater treatment facility at Dow Chemical for proper treatment.

COVER DESIGN

The cover system that will be installed at closure is designed to:

- Provide effective, long term minimization of liquid migration through the closed landfill;
- Promote drainage and minimize erosion and abrasion of the cover;
- Ensure that any settling and subsidence do not impair the integrity of the cover; and
- Satisfy regulatory requirements for permeability.

The construction of the cover system will begin after the final volume of waste has been placed in the active cell and covered. Maximum permitted final grades of the landfill are shown on drawing Y1-36615 in Appendix A11-5; however, closure may be established below the maximum grades as long as the maximum slope is greater than 4% and less than 4 horizontal :1 vertical. A final closure grading plan will be submitted for approval prior to closure activities. The landfill will then be surveyed, monitored for settlement, and repaired as necessary to provide a stable base for the cover system. A cover consistent with requirements of Rule 299.9619(6)(a) will be placed over the landfill.

A layer of low permeability clay, three feet (90 centimeters) thick, will then be applied over the entire top area of the landfill. The hydraulic conductivity of this clay layer after compaction will be less than or equal to 1.0×10^{-7} cm/sec. The hydraulic conductivity of the clay used in constructing the cover will also be less than or equal to that of the native clay used in constructing the liner of the landfill. Appendix A11-2, Native Clay Test Results, lists the test results of native clays available on site for use in constructing the cover, showing that the clays tested meet or exceed the requirements of MAC R 299.9620(3).

Alternatively, a geosynthetic clay liner (GCL) may be used as a full or partial replacement for the recompacted clay layer. A demonstration of the equivalency of the GCL will be submitted for approval along with the final closure grading plan. A reinforced GCL will be used in areas where the slope is greater than 10 percent.
A smooth 60 mil very low-density polyethylene (VLDPE) membrane will be installed over the recompacted clay and/or GCL, on the top section of the cover, and a textured (both sides) 60 mil VLDPE liner, or equivalent, will be installed over the recompacted clay and/or GCL on the 25% sloping bank at the sides of the landfill. Linear Low-Density Polyethylene (LLDPE) is considered a current equivalent of VLDPE. These synthetic membranes will protect the clay cap from moisture variation and further decrease permeability of the cover.

Over the synthetic membrane, a drainage layer will be installed. The drainage layer will consist of at least 30 cm of sand, topped with an eight ounce, non-woven, needle-punched filter fabric, or a geocomposite drainage layer. A demonstration of the equivalency of the geocomposite drainage layer will be submitted for approval along with the final closure grading plan. The vegetative layer will consist of at least six inches of vegetative support soil topped with at least 15 cm of topsoil, for a total of 60 cm of soil and drainage layer over the Flexible Liner Membrane (FLM). After installation, the topsoil will be planted with shallow rooted grasses to reduce erosion.

COVER CONSTRUCTION

Construction of the landfill final cover will be carried out in accordance with the plan detailed in Appendix A11-3, Construction Specifications for Installation of Compacted Cover System, and Appendix A11-4, Technical Specifications for FLM and Filter Fabric. See also Appendix A11-5 for drawings detailing the construction and contours of the final cover and Appendix A11-6 for technical calculations

COVER MAINTENANCE

The final cover will require only minimum maintenance to ensure its integrity. It will be covered with topsoil and seeded with grass to minimize erosion; it is not intended that the grass will be mowed; however, the side slopes will be constructed to a slope of no greater than one foot rise in four feet of run, to meet MIOSHA mowing specifications.

DRAINAGE AND EROSION PROVISIONS

The final top cover will be constructed with a minimum slope of 4 to promote drainage and eliminate ponding to minimize the hydraulic head on the cap. Drainage of precipitation from the top cover and slopes will run off into the perimeter drainage ditches, which are designed to adequately contain the runoff from a one hour, 25-year rainfall.

The perimeter drainage ditches flow to catch basins connected to the site storm sewer system and then to the site's storm water retention pond from which water may be discharged either to the wastewater sewer, for treatment if necessary, or to Lingle Drain for discharge to surface waters. To prevent contamination of surface waters, whenever storm water has been accumulated in the retention pond it is tested before discharge. See Appendix A11-6, Details of Landfill Final Cover and drawing (Y1-36625) in Appendix A11-5, for details of the drainage of the final cover and surrounding ditches.

Erosion of the final cover is minimized by seeding with grass, as described previously.

SETTLEMENT AND SUBSIDENCE

Recompacted clay cap will be constructed in lifts of no greater than 25 cm thickness, loose measure prior to compacting, and each lift will be systematically compacted to 90% of the clay's maximum density, as determined by the Modified Proctor Test (ASTM D-1557). During post-closure the cover system will be inspected regularly, as described in A11.B of this section, and any observed settlement will be promptly repaired.

2. Construction Quality Assurance (CQA) Program

See Appendix A11-7 for the Construction Quality Control/Quality Assurance Procedures for Landfill Clay Final Cover and the Quality Assurance Manual for Final Cap Geosynthetic Liner System Installation

3. Plat of Survey

No later than the submission of the certification of closure for the landfill, DSC will submit to the Midland County Department of Planning, and to the Chief of the Waste Management Division, a survey plat indicating the locations and dimensions of the landfill cells with respected to permanently surveyed benchmarks. This plat will also contain a note, prominently displayed, which states the owner's or operator's obligation to restrict disturbance of the closed landfill cells, in accordance with applicable regulations in 40 CFR 264, Subpart G.

A11.A.5(f) Closure of Incinerators
[R 299.9620 and 40 CFR §264.351]

DSC does not treat hazardous wastes in incinerators at this facility. Therefore, this section is not applicable.

A11.A.5(g) Closure of Miscellaneous Units
[R 299.9623 and 40 CFR §§264.601 through 264. 603]

DSC does not have miscellaneous units at this facility. Therefore, this section is not applicable.

A11.A.5(h) Closure of Boilers and Industrial Furnaces (BIF)
[R 299.9808 and 40 CFR §266.102(e)(11)]

DSC does not have boilers and industrial furnaces at this facility. Therefore, this section is not applicable.

A11.A.5(i) Other Closure Activities
[R 299.9504(1)(c), R 299.9508(1)(b), and R 299.9613(1) and 40 CFR §§270.14(b)(13) and 264.112(b)(5)}

A final round of sampling will be completed to verify that the regulated units meet relevant standards. No other closure activities are anticipated.

A11.A.6 Certification of Closure
[R 299.9613]

Within 60 days of completion of closure DSC will submit to the Director, by registered mail, a certification that the hazardous waste management unit or facility, as applicable, has been closed in accordance with the specifications in the approved closure plan. The certification will be signed by DSC and by an independent registered professional engineer. Documentation supporting the independent registered engineer's certification will be furnished to the Director in accordance with R 299.9613(3), including:

1. The results of all sampling and analysis;
2. Sampling and analysis procedures;
3. A map showing the location where samples were obtained;
4. Any statistical evaluations of sampling data;
5. A summary of waste types and quantities removed from the site and the destination of these wastes; and
6. If soil has been excavated, the final depth and elevation of the excavation and a description of the fill material used.

The certification wording will be as follows:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to be the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

The DSC facility will maintain financial assurance for closure until the Director releases the DSC facility from the financial assurance requirements for closure under R 299.9703.

A11.A.7 Postclosure Notices Filed

[R 299.9504(1)(c) and R 299.9508(1)(b) and 40 CFR §270.14(b)(14)]

DSC will provide documentation that the postclosure notices required under 40 CFR §264.119 have been filed for hazardous waste disposal units that have been closed at the facility. These notices include the following:

Record of Wastes Disposed [40 CFR 270.14(b)(14), 264.119(a), MAC R 299.9613(1)]

Within 60 days after certification of closure of the hazardous waste landfill, DSC will submit to the Midland County Department of Planning and the Director of the EGLE, a record of the type, location, and quantity of hazardous wastes disposed of within each landfill cell.

Within 60 days of certification of closure of the hazardous waste landfill, DSC will record a notation on the deed to the facility property, or on some other instrument which would be normally examined during title search, notifying any potential future purchaser of the property that:

- The property has been used to manage hazardous wastes; and

- The use of the property is restricted under the provisions of 40 CFR Subpart G regulations; and
- The survey plat and record of the type, location, and quantity of hazardous wastes disposed of within each cell of the landfill have been filed with the Midland County Department of Planning and the Director of EGLE.

DSC will submit a certification, signed by an authorized representative, that the notation described above has been recorded, with a copy of the notation to accompany the certification.

Modification of Post-Closure Permit [40 CFR 270.14(b)(14), 264.119(c), MAC R 299.9613(1)]

If DSC chooses to remove from the landfill any hazardous wastes, hazardous waste residues, the landfill liner, or any contaminated soils, a modification will be requested to the Post-Closure Plan in accordance with all applicable requirements, including those at 40 CFR 124, 270, and 264.117(c).

Certification of Completion of Post-Closure Care [40 CFR 270.14(b)(14), 264.120, MAC R 299.9613(5)]

The post-closure care period for the hazardous waste landfill will be 30 years after the closure of the hazardous waste landfill. Within 60 days after completion of the established post-closure care period for the hazardous waste landfill, DSC will submit to the Director of EGLE, by registered mail, a certification that the post-closure care period for the landfill was performed in accordance with the specifications in the approved Post-Closure Plan. This certification will be signed by an authorized representative of DSC and an independent, registered, professional engineer. Documentation supporting the professional engineer's certification will be supplied to the Director of EGLE upon request until he releases DSC from the final assurance requirements for post-closure care.

A11.B POSTCLOSURE PLAN

[R 299.9613 and 40 CFR §264.118]

A11.B.1 Applicability

(Check as appropriate)

☐ **Not applicable**: Hazardous waste will not be left behind at closure. A survey plat, postclosure care, postclosure certifications, and other notices are not required.

☒ **Applicable**:

☐ Contingent plan
☒ Landfill unit

A11.B.2 Postclosure Care Objectives

The DSC facility will complete the activities listed in Table A.11.B.1 in order to achieve the following:

1. Maintain the integrity and effectiveness of the final cover, including making repairs to the cap as necessary to correct the effects of settling, subsidence, erosion, or other events;
2. Operate the leachate collection and removal system until leachate is no longer generated by landfill or concentrations of constituents in the leachate are less than applicable Part 201 criteria;
3. Maintain and monitor the leak detection system in accordance with R 299.9613 and 40 CFR §§264.301(c)(3)(iv) and (4) and 264.303(c), and comply with all other applicable leak detection system requirements of this part. 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© for use of a double synthetic liner and leak detection system;
4. Maintain and monitor the groundwater monitoring system and comply with all other applicable requirements of R 299.9612 and 40 CFR, Part 264, Subpart F;
5. Prevent run-on and run-off from eroding or otherwise damaging the final cover; and
6. Protect and maintain surveyed benchmarks used in complying with R 299.9613 and 40 CFR §264.309.

A11.B.3 Postclosure Care Period Point of Contact

The planned monitoring and maintenance activities and the associated frequencies are designed to ensure the integrity of the cap and final cover system and the proper functioning of the monitoring system for each unit listed in Table A11.B.1.

Because closure of the landfill is not planned, the contact person or office for the post-closure care period will not be designated at this time. Prior to closure of the landfill, at the time of the filing of the notification of closure and final, updated closure plan, the contact person or office for post-closure care will be designated.

A11.B.4 Postclosure Care Activities

Table A11.B.1 Postclosure Monitoring and Maintenance

The following table identifies, for each unit requiring postclosure care, planned monitoring and maintenance activities and the frequency at which these activities will be performed.

Unit	Planned Monitoring Activities	Frequency	Planned Maintenance Activities	Frequency
Landfill, 806 Tank Farm, 801 & 809 Container Storage Areas	Groundwater Monitoring	Semiannual	As Needed (see Module A11, Section A11.B.4)	As Needed
Landfill	Leachate Monitoring	Quarterly	As Needed (see Module A11, Section A11.B.4)	As Needed

Lingle Drain upstream & downstream from the regulated unit	Surface Water Monitoring	Annual for minimum of five years	As Needed (see Module A11, Section A11.B.4)	As Needed
Landfill	Landfill Cover Inspection	Twice each year for the first 3-5 years	As Needed (see Module A11, Section A11.B.4)	As Needed
Drainage Ditch	Perimeter Drainage Ditch Inspection	Quarterly	As Needed (see Module A11, Section A11.B.4)	As Needed

Planned Monitoring Activities [40 CFR 270.14(b)(13), 264.118(b)(1), MAC R 299.9613(1)]

Post-closure monitoring of the landfill will be carried out by sampling a series of groundwater monitoring wells, the leachate collection system, and Lingle Drain, which is the nearest surface water. Monitoring plans for each are described below. The condition of the landfill final cover and perimeter drainage ditches will also be monitored by inspection, as described below.

1. **Groundwater Monitoring**

   The purpose of the groundwater monitoring program is to detect the migration of hazardous waste or hazardous waste constituents from materials disposed in the landfill so that actions can be taken to halt the release. Parameters chosen for monitoring are based on knowledge of the types of wastes previously disposed in the landfill and/or present in the landfill leachate. The current monitoring program is described in Module B5, “Environmental Monitoring Programs”, of this license application. Post-closure groundwater monitoring will be a continuation of the monitoring program, with appropriate revisions. Groundwater monitoring wells and equipment will be maintained during the post-closure care period.

2. **Leachate Monitoring**

   The purpose of the leachate monitoring program is to detect changes in concentrations of hazardous waste or hazardous waste constituents in the leachate before those wastes or constituents can reach groundwater, so that appropriate remedial action can be taken. The groundwater monitoring program is described in Module B5, “Environmental Monitoring Programs”, of this license application. Post-closure leachate monitoring will be a continuation of the current monitoring program with appropriate revisions. The leachate collection system and sampling points will be maintained during the post-closure care period.

3. **Surface Water Monitoring**

   The purpose of the surface water monitoring program is to detect the migration of hazardous waste or hazardous waste constituents from the landfill to the nearest surface

water, so that appropriate remedial action can be taken. The surface water monitoring program is described in Module B5, “Environmental Monitoring Programs”, of this license application. Post-closure monitoring will be a continuation of the monitoring program with appropriate revisions.

4. Landfill Final Cover Inspection

The condition of the final cover will be inspected twice each year for the first 3-5 years of the post-closure period. If the cover and sidewalls are well maintained and show good stability, and the volume of leachate collected is reduced by 80-90% from average volumes collected prior to closure, then a proposal will be submitted to EGLE for approval requesting the inspection frequency be reduced to once each year. The inspection frequency change will not be implemented until approval is received by EGLE. Detailed inspection procedures are described in Appendix A11-8. Survey benchmarks used in establishing monitoring well and landfill elevations will also be maintained during the post-closure care period. DSC maintains a record of wastes placed in the landfill and their location with respect to permanently surveyed benchmarks in accordance with 40 CFR 264.309 & 310, as described in Module C3, Use and Management of Landfill, Section C3.G.

5. Perimeter Drainage Ditch

The perimeter drainage ditches are used to control run-on and runoff of water at the landfill. In order to ensure proper functioning, the drainage ditches will be inspected quarterly for any potential drainage problems, such as ditch erosion or blockage. Detailed inspection procedures are described in Appendix A11-8.

Planned Maintenance Activities [40 CFR 270.14(b)(13), 264.118(b)(2), MAC R 299.9613(1)]

Maintenance activities in the post-closure period will be performed as needed, based on the results of monitoring and inspection activities described above. Expected maintenance activities are described below.

Landfill Cover Maintenance [40 CFR 270.14(b)(13), 264.118(b)(2)(i), MAC R 299.9613(1)]

Based on the results of the landfill final cover, sidewall and perimeter ditch inspections, as described in Appendix A11-8, repairs will be made as needed during the post-closure care period to maintain the integrity of the closed unit. Maintenance activities may include seeding and mulching, erosion repair, cleaning of ditches and catch basins and the use of erosion control mats on the landfill sidewalls, if needed.

Monitoring Equipment Maintenance [40 CFR 270.14(b)(13), 264.118(b)(2)(ii), MAC R 299.9613(1)]

Routine maintenance for this system will include cleaning of the leachate collection pipes and manholes. Repairs to leachate piping, the flow measuring system, and manholes will be performed as needed, based on observations made during sampling and at regular landfill inspections.

Shallow and deep groundwater monitoring wells will be maintained throughout the post-closure care period to permit continued monitoring as required. The Waste Management Division will be notified if any wells must be replaced due to damage. Survey benchmarks used in establishing monitoring well and landfill elevations will also be maintained during the post-closure care period.

A11.B.5 Postclosure Care Plan Amendment

[R 299.9613 and 40 CFR §264.118(d)]

The Postclosure Care Plan will be amended whenever:

1. Changes in the operations or facility design will affect closure and postclosure care; or
2. There is a change in the expected year of closure, if applicable; or
3. Unexpected events during closure require a modification to the plan; or
4. The monitoring is ineffective or inefficient.

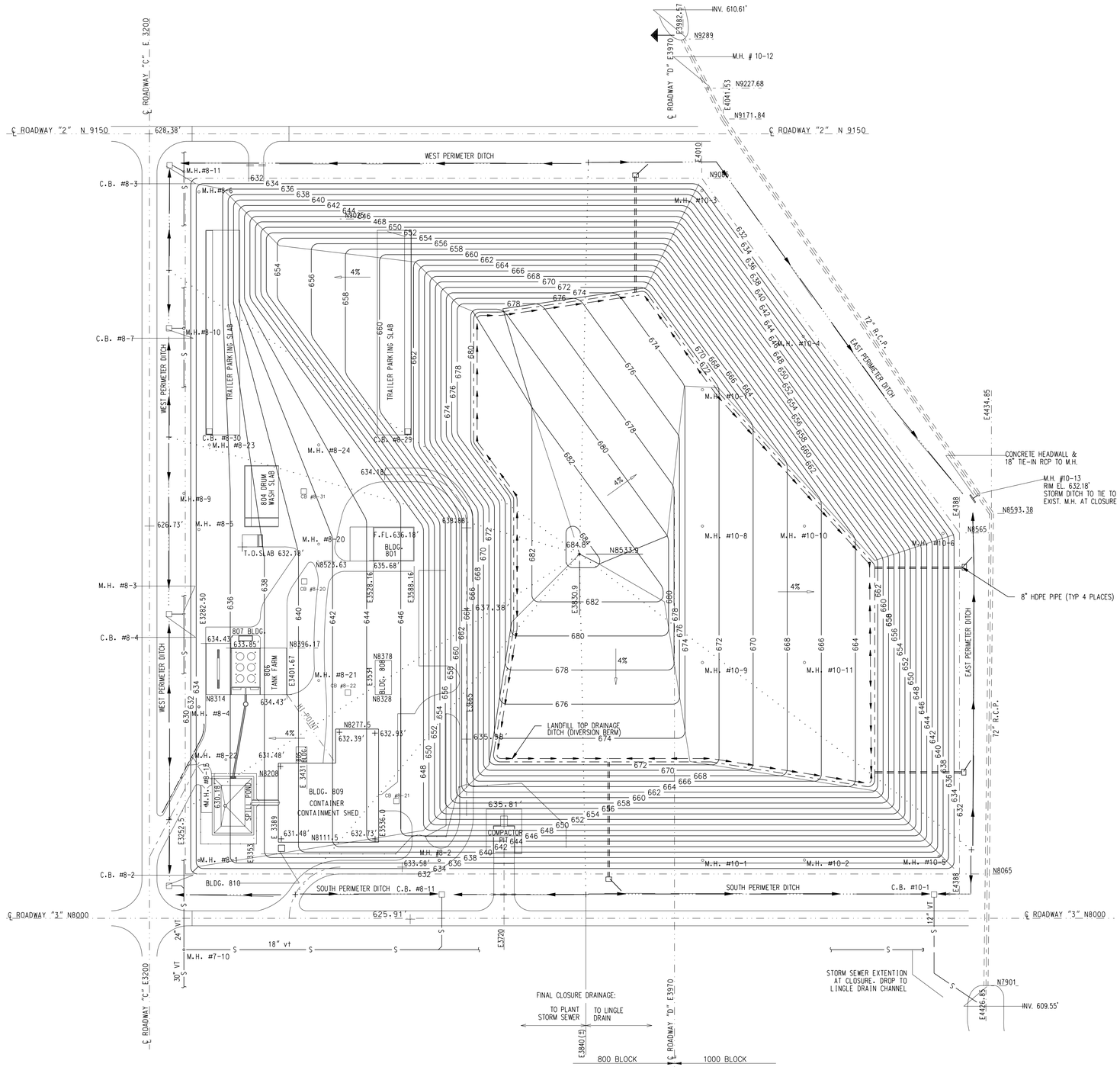
A11.B.6 Certification of Postclosure

[R 299.9613]

Within 60 days of completion of postclosure care DSC will submit to the Director, by registered mail, a certification that postclosure care for the hazardous waste management unit or facility, as applicable, has been completed in accordance with the specifications in the approved postclosure plan. The certification will be signed by the owner/operator of Dow Silicones and by an independent registered professional engineer. Documentation supporting the independent registered engineer's certification will be furnished to the Director in accordance with R 299.9613(5). The DSC facility will maintain financial assurance for postclosure until the Director releases the DSC facility from the financial assurance requirements for postclosure under R 299.9703 and 40 CFR §264.143(i).

The certification must be worded as follows:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to be the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.



NOTES:

1. FINAL CONTOURS ARE BASED ON:
   A. TOTAL FILL VOLUME AT OR VERY CLOSE TO MAXIMUM LANDFILL VOLUME AS SPECIFIED IN LANDFILL CLOSURE PLAN DATED 5 – 1988.
   B. SIDE SLOPE = 4:1
      PLATEAU SLOPE = 4% MINIMUM
2. CONTOURS REPRESENT ELEVATION OF A CLOSURE CAP. ACTUAL ELEVATION OF FILL MATERIAL WILL BE 5.0' LOWER.

LAST GENERAL UPDATE: 04JAN2010

CADD

MARK	LOC.	REVISIONS	BY	DATE	APP
A	GEN	ADDED DRAINAGE DITCH & DRAINAGE PIPES	MCC	9-7-90	PC
B	GEN	UPDATED FINAL CLOSURE STORM DRAINAGE SYSTEM	RJF	25FEB93	PC
C	K-3	REVISED NOTE 2.	JKL	20NOV95	PC
D	GEN	UPDATED DRAWING	JAM	06NOV09	SFH
E	GEN	AECOM PERIMETER DITCH AND DIVERSION BERM FEATURES	DRB	09MAY11	TCR
F					
G					
H					
J					

DESIGNED BY: P. CHMELAR	DATE 5-11-90
DRAWN BY: M.C. CARPENTER, W.A. KIBBE & ASSOC	DATE 5-11-90
TECHNICAL APPROVAL: M.J. BUSH	DATE 5-25-90
APPROVED FOR ISSUE: M.L. MARCHIONE	DATE 5-25-90

REFERENCES

NUMBER	TITLE
Y1-36614	LANDFILL EXISTING TOPOGRAPHY
Y1-36619	LANDFILL SECTIONS
Y1-36620	LANDFILL SECTIONS

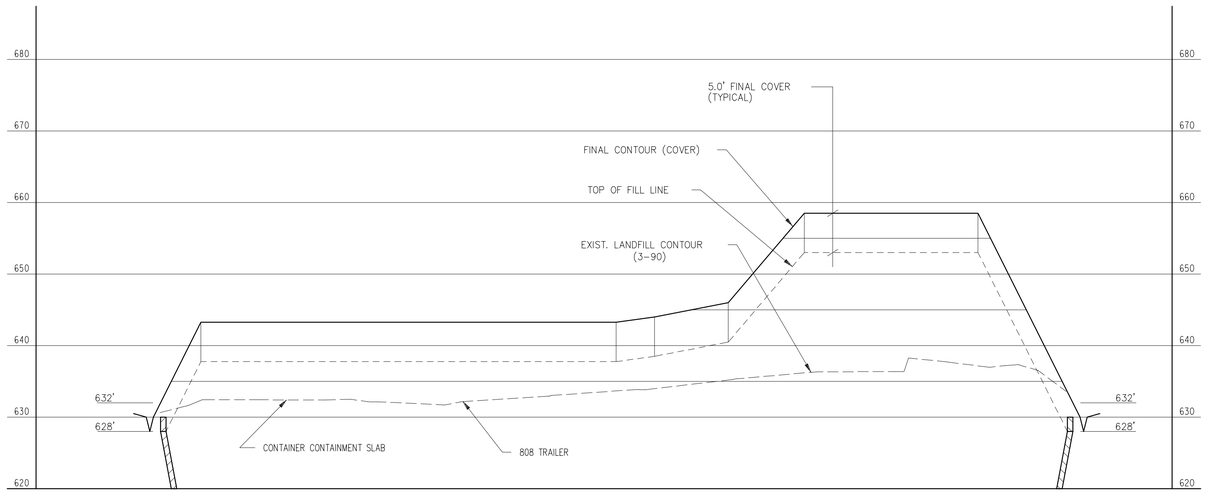
DOW CORNING CORPORATION

MIDLAND PLANT — 800 / 1000 BLOCK

CLOSURE PLAN FOR
HAZARDOUS WASTE LANDFILL
FINAL TOPOGRAPHY

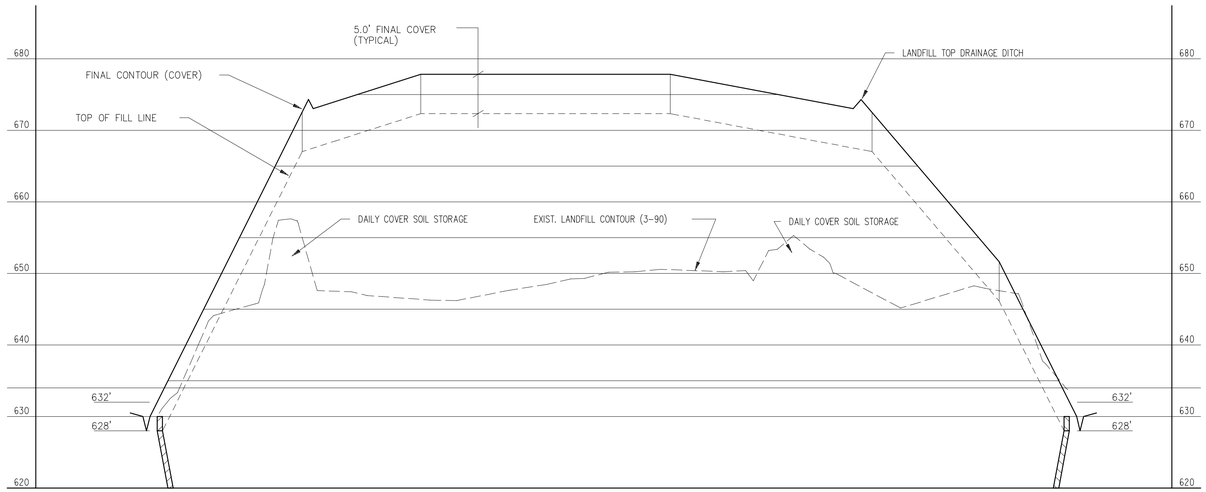
PWSS INFORMATION	ENGRG. DISC.	DWG. TYPE
	CA TOPO	PLAN

SCALE	INCH FOOT	DRAWING NUMBER	REVISION
	1" = 80'	Y1-36615	D



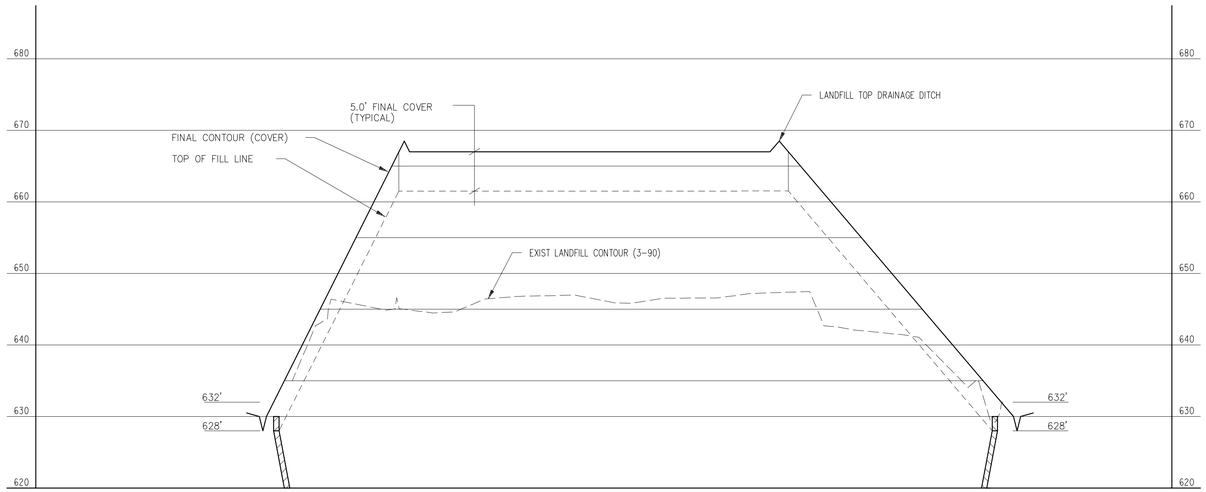
NORTH-SOUTH SECTION AT E3500 (LOOKING WEST)

SCALE: VERT. 1"=10'
HORZ. 1"=80'



NORTH-SOUTH SECTION AT E3970 (LOOKING WEST)

SCALE: VERT. 1"=10'
HORZ. 1"=80'



NORTH-SOUTH SECTION AT E4160 (LOOKING WEST)

SCALE: VERT. 1"=10'
HORZ. 1"=80'

LAST GENERAL UPDATE: 04JAN2010

CADD

MARK	LOC.	REVISIONS	BY	DATE	APP
A	GEN	ADDED DRAINAGE DITCH	MCC	9-18-90	PC
B	GEN	ADDED ALTERNATIVE COVER SYSTEM OUTLINE	RJF	26FEB93	PC
C	GEN	REVISED FINAL COVER COMPOSITION	RJF	270CT93	PC

DESIGNED BY: P. CHMELAR	DATE 5-18-90	
DRAWN BY: R.T.P. W.-T./EDMANDS	DATE 5-18-90	
TECHNICAL APPROVAL: M.J.BUSH	DATE 5-25-90	
APPROVED FOR ISSUE: M.L.MARCHIONE	DATE 5-25-90	

REFERENCES

NUMBER	TITLE
Y1-36614	LANDFILL EXISTING TOPOGRAPHY
Y1-36615	LANDFILL TOPOGRAPHY
Y1-36619	LANDFILL SECTIONS

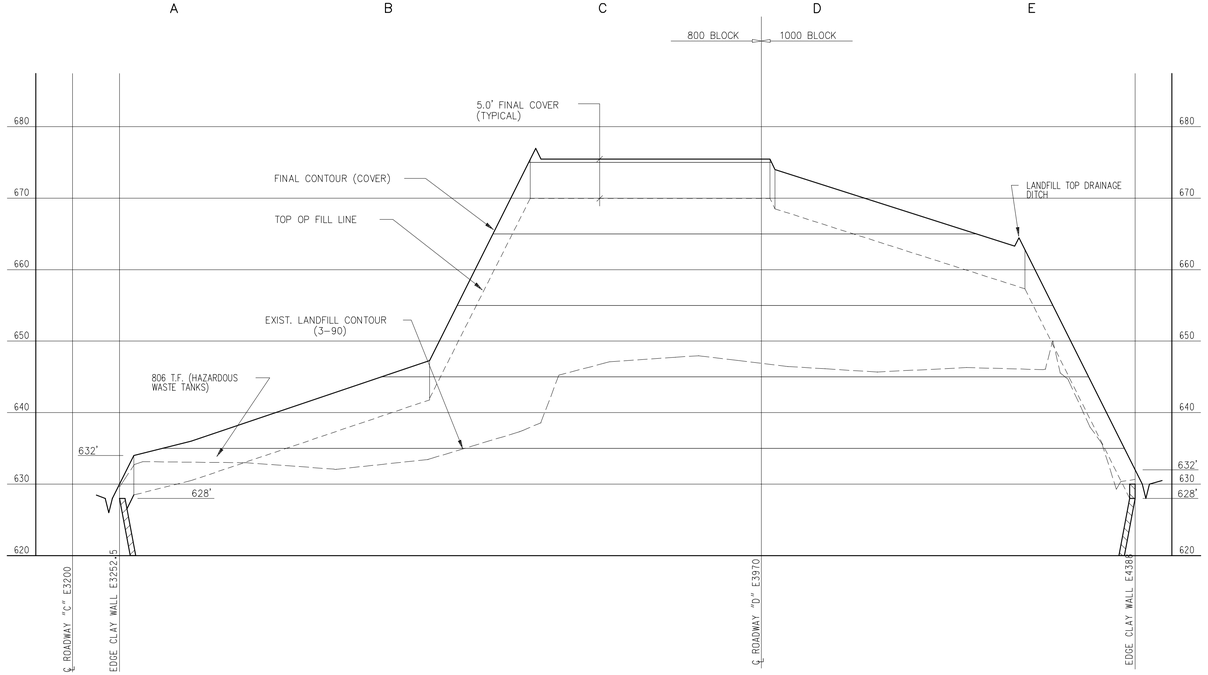
PMSS INFOR-MATION	ENGRG. DISC.	DWG. TYPE
	CA TOPO	SECTION

DOW CORNING CORPORATION

MIDLAND PLANT 800 / 1000 BLOCK

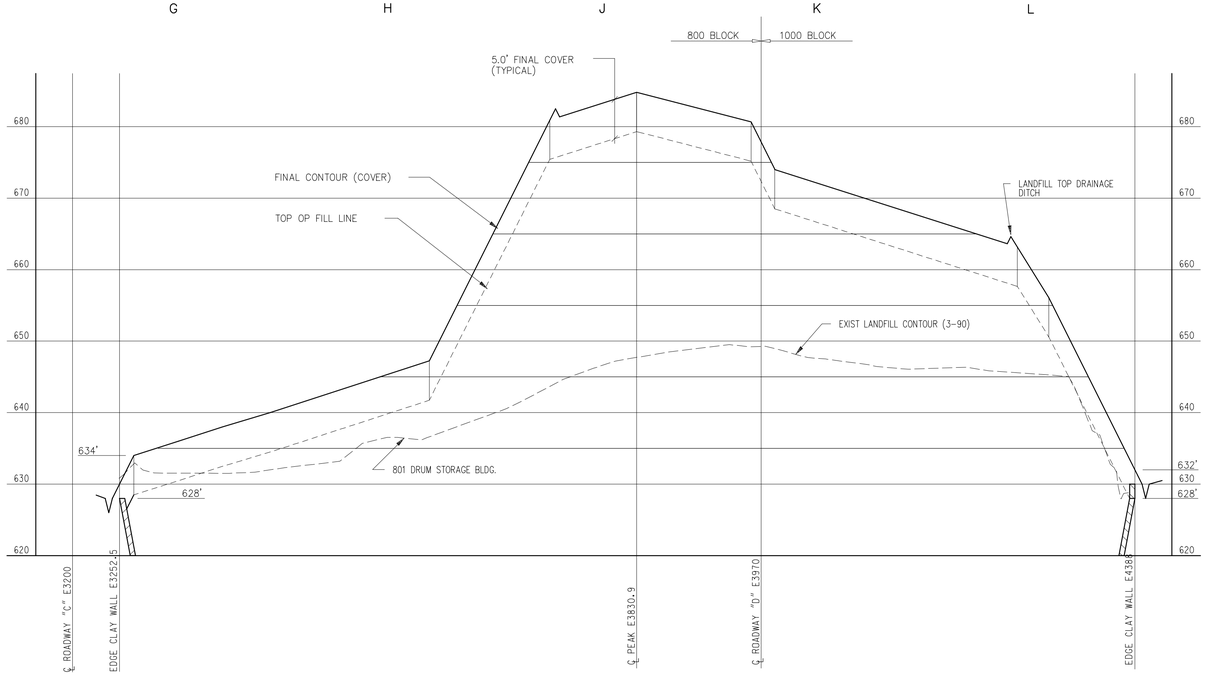
CLOSURE PLAN FOR
HAZARDOUS WASTE LANDFILL
FINAL TOPOGRAPHY - NORTH-SOUTH SECTIONS

SCALE	INCH	FOOT	DRAWING NUMBER	REVISION
	1" = 80'		Y1-36620	C



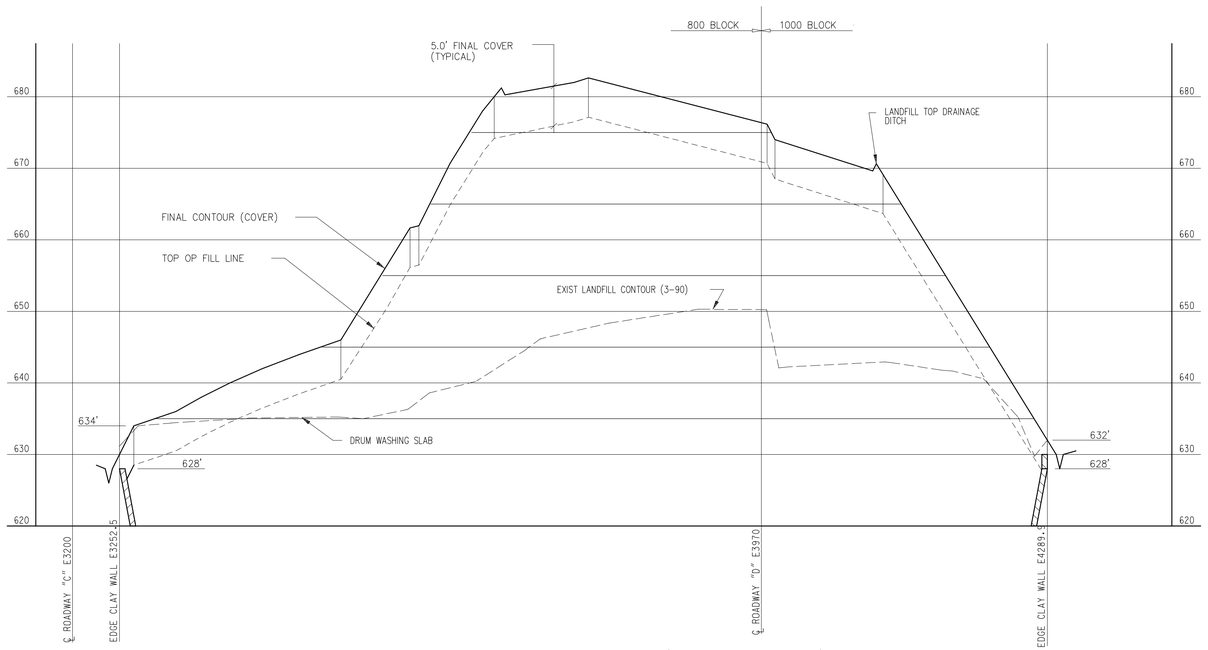
EAST–WEST SECTION AT N8300 (LOOKING NORTH)

SCALE: VERT. 1"=10'
HORZ. 1"=80'



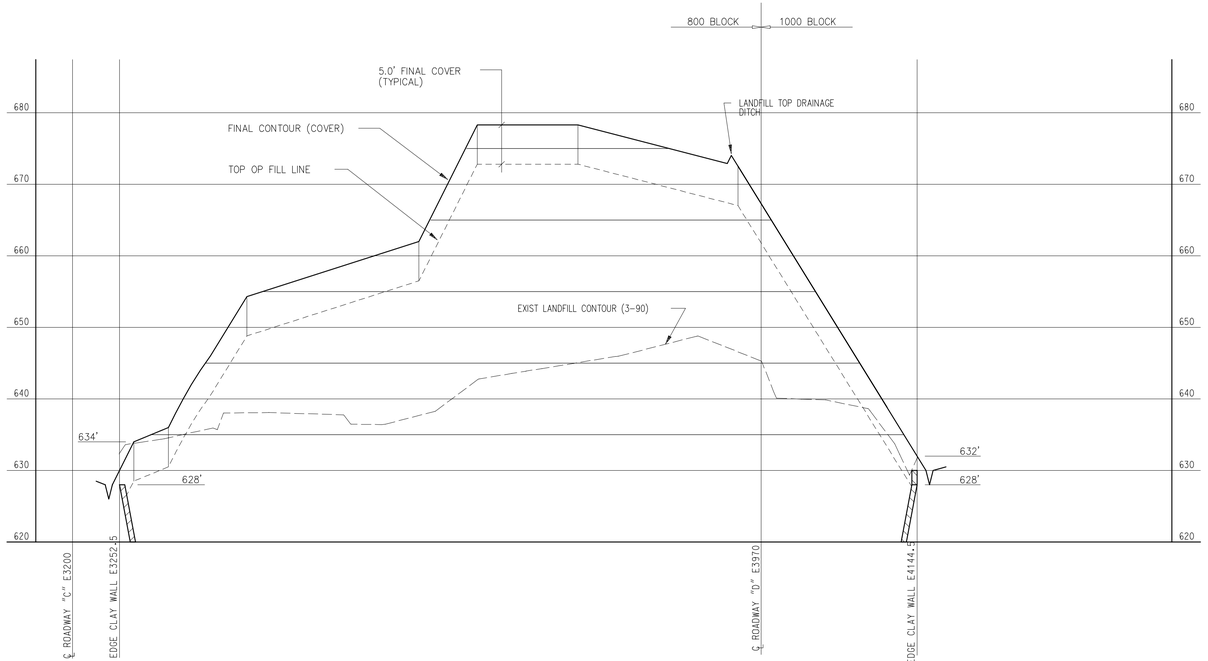
EAST–WEST SECTION AT N8533.9 (THROUGH PEAK)

SCALE: VERT. 1"=10'
HORZ. 1"=80'



EAST–WEST SECTION AT N8700 (LOOKING NORTH)

SCALE: VERT. 1"=10'
HORZ. 1"=80'



EAST–WEST SECTION AT N8900 (LOOKING NORTH)

SCALE: VERT. 1"=10'
HORZ. 1"=80'

LAST GENERAL UPDATE: 04JAN2010

CADD

MARK	LOC.	REVISIONS	BY	DATE	APP
A	GEN	ADDED DRAINAGE DITCH	MCC	9-18-90	PC
B	GEN	ADDED ALTERNATE COVER SYSTEM OUTLINE	RJF	26FEB93	PC
C	GEN	REVISED FINAL COVER COMPOSITION	RJF	27OCT93	PC

DESIGNED BY: P. CHMELAR	DATE 5-18-90
DRAWN BY: R.T.P. W.-T./EDMANDS	DATE 5-18-90
TECHNICAL APPROVAL: M.J. BUSH	DATE 5-25-90
APPROVED FOR ISSUE: M.L. MARCHIONE	DATE 5-25-90

REFERENCES

NUMBER	TITLE
Y1-36614	LANDFILL EXISTING TOPOGRAPHY
Y1-36615	LANDFILL TOPOGRAPHY
Y1-36620	LANDFILL SECTIONS

PMSS INFORMATION	ENGRG. DISC.	DWG. TYPE
	CA TOPO	SECTION

DOW CORNING CORPORATION

MIDLAND PLANT — 800 / 1000 BLOCK

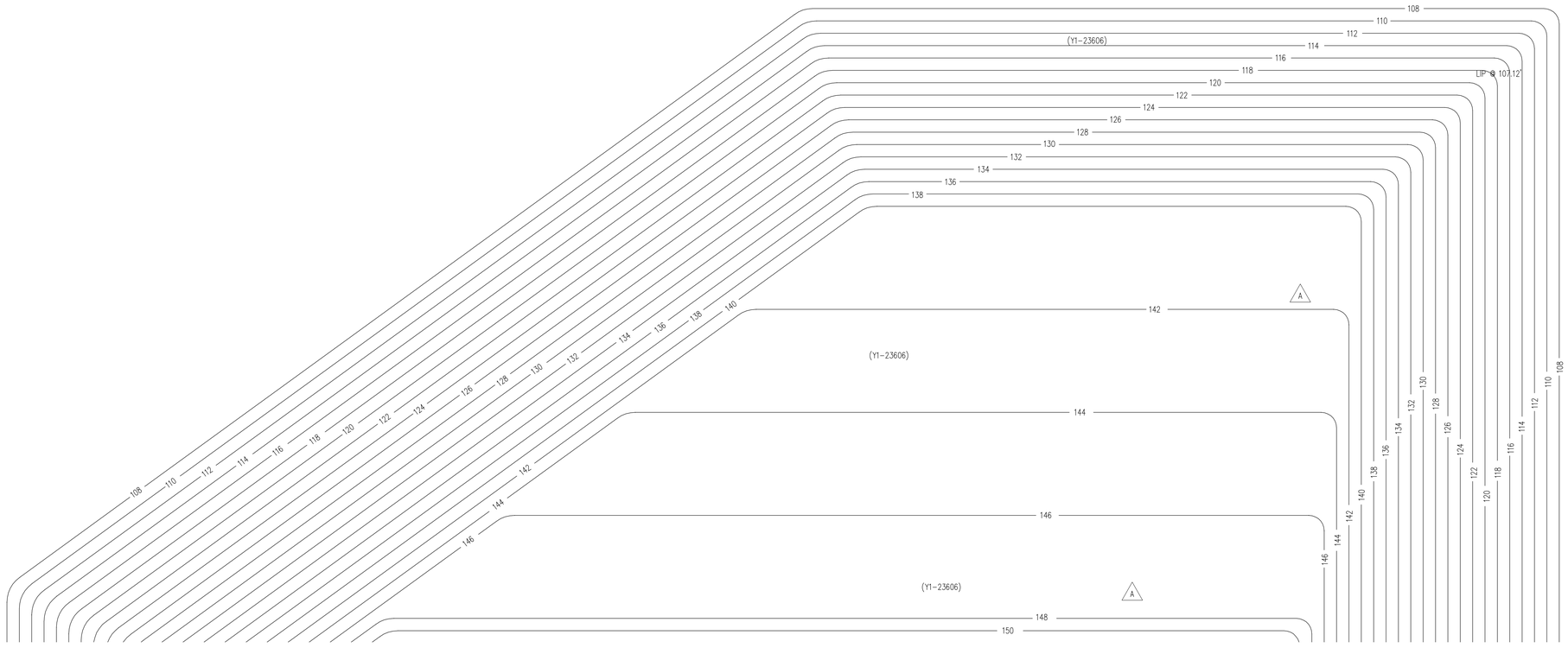
CLOSURE PLAN FOR
HAZARDOUS WASTE LANDFILL
FINAL TOPOGRAPHY – EAST–WEST SECTIONS

SCALE	INCH FOOT	DRAWING NUMBER	REVISION
	1" = 80'	Y1-36619	C

NOTES:

1. THIS DRAWING REPRESENTS CURRENT SURFACE DRAINAGE IN 1000 BLOCK LANDFILL AREA SHOWING ACTIVE CATCH BASINS, CURRENT LANDFILL CELL AND PROJECTED FINAL CLOSURE CONTOURS BASED ON NATURAL CLAY COVER CLOSURE SYSTEM, AS SHOWN ON DWG. Y1-36615 - CLOSURE PLAN FINAL TOPOGRAPHY.

2. 4% SLOPE CHANGE IS NOT SHOWN ON THIS FIGURE. PRIOR TO CLOSURE, THIS DRAWING WILL BE UPDATED AND SUBMITTED FOR APPROVAL.



LAST GENERAL UPDATE: 04JAN2010

CADD

MARK	LOC.	REVISIONS	BY	DATE	APP
A	GEN	ADJUST ELEVATION ON C.B. #10-3 AND M.H. #10-9	RJF	23NOV92	PC
B	GEN	ADDED NOTE AND REFERENCE DWG.	RJF	02MAR93	PC
C	GEN	ADDED CHEM. SEWER LATERALS TO 800 BLOCK	RJF	12MAY93	NSD
D	GEN	GENERAL REVISIONS TO DATE	RJF	19APR94	NSD

DESIGNED BY: P. Chmelar	DATE 27FEB92
DRAWN BY: R.J. Fortier	DATE 30MAR92
TECHNICAL APPROVAL: P. Chmelar	DATE 31MAR92
APPROVED FOR ISSUE: M.J. Bush	DATE 31MAR92

REFERENCES

NUMBER	TITLE
Y1-33071	UNDERGROUND-NORTHEAST SECTION
Y1-33072	UNDERGROUND-SOUTHEAST SECTION
Y1-29958	UNDERGROUND-SOUTHWEST SECTION
Y1-33070	UNDERGROUND-NORTHWEST SECTION
Y1-86195	1000 BLOCK DRAINAGE
Y1-23606	LEACHATE COLLECTION SYSTEM

PMSS INFOR-MATION	ENGRG. DISC.	DWG. TYPE
	CA TOPO	PLAN

DOW CORNING CORPORATION

MIDLAND — 1000 BLOCK

LANDFILL CONTOURS

FINAL CLOSURE PLAN

SCALE	INCH	FOOT	DRAWING NUMBER	REVISION
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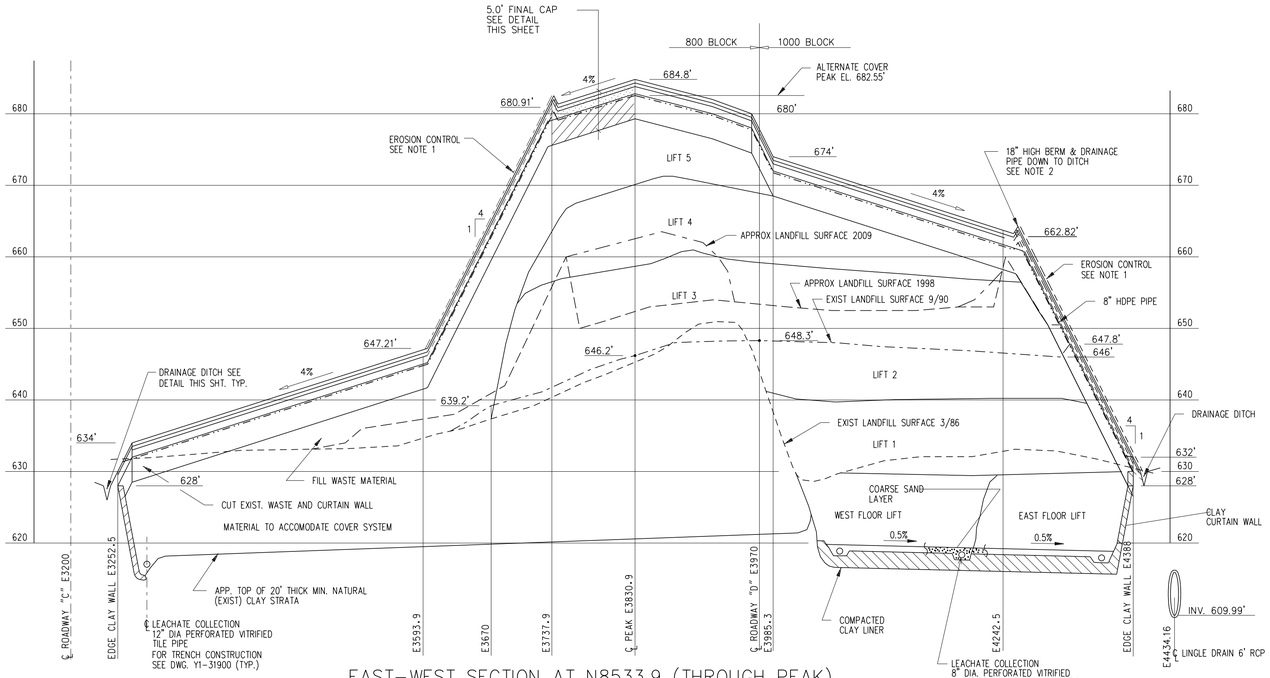
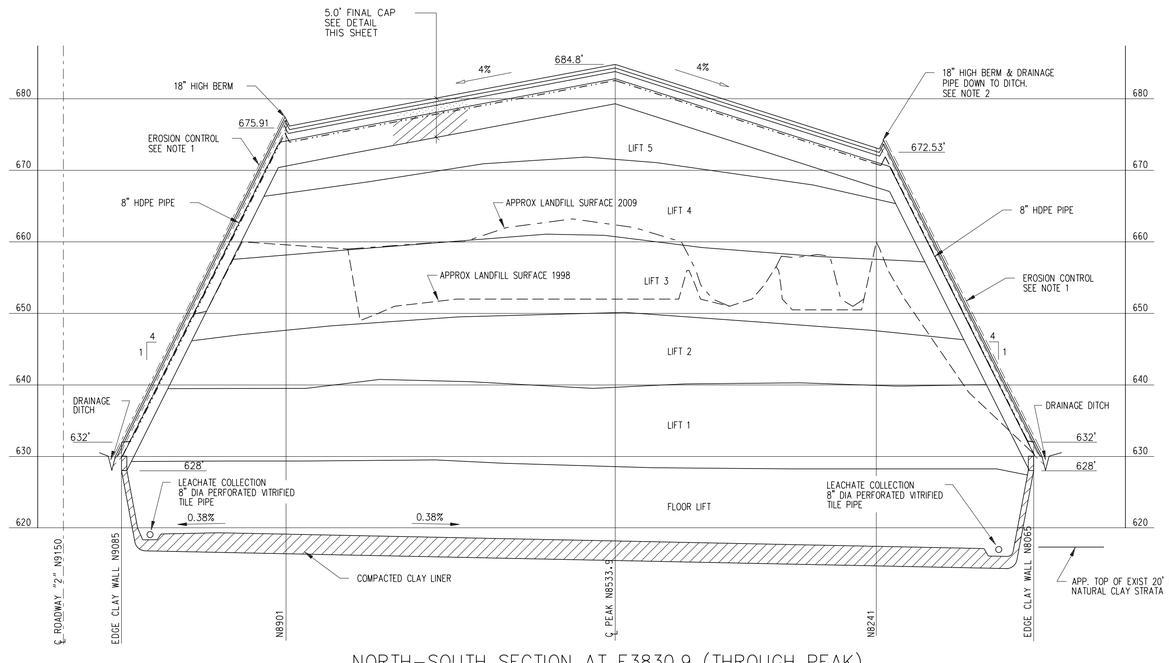
RF=Y1-34600 RF=Y1-36659 RF=Y1-36661



EAST–WEST SECTION AT N8533.9 (THROUGH PEAK)

SCALE: VERT. 1"=10'
HORZ. 1"=80'

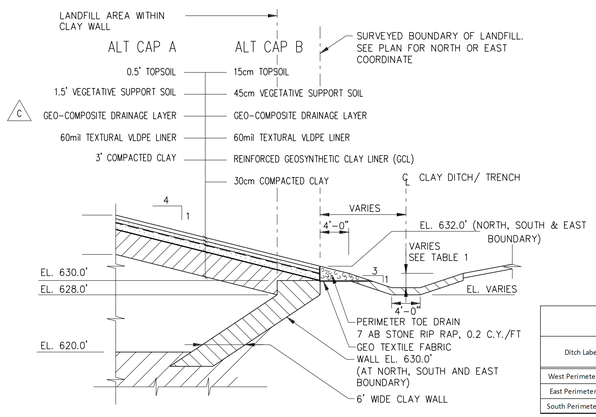
LOOKING NORTH



NORTH–SOUTH SECTION AT E3830.9 (THROUGH PEAK)

SCALE: VERT. 1"=10'
HORZ. 1"=80'

LOOKING EAST



NOTE
TOP OF CLAY WALL AT WEST BOUNDARY
IS AT ELEVATION 628.0' TOP OF
FINISHED COVER AT THIS SIDE IS 630.0'

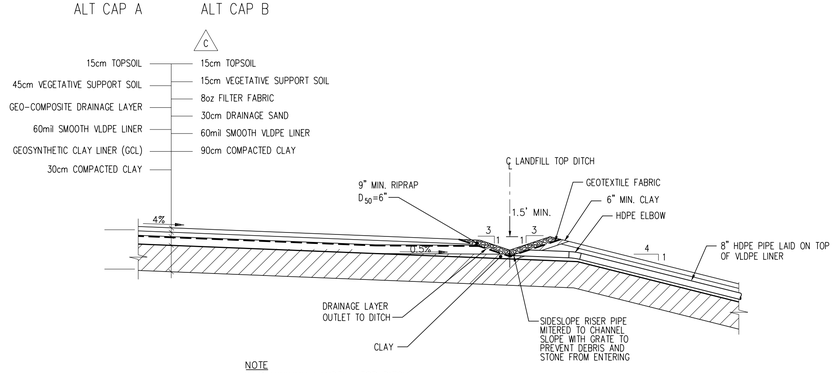
TYPICAL
LANDFILL PERIMETER

△D LANDFILL PERIMETER DITCH DETAIL
SCALE: 1" = 10'-0"

Table 1
Perimeter Ditch Schedule

Ditch Label	Depth	Minimum Slope (%)	Bottom Width (ft)	Ditch Side Slopes (H:V)	Lining
West Perimeter Ditch	2.00	0.50	4.00	3:1	Grass
East Perimeter Ditch	2.25	0.50	4.00	3:1	Grass
South Perimeter Ditch	2.50	0.25	4.00	3:1	Grass

FINAL CAP COMPOSITION DETAIL



NOTE
0.5% MINIMUM LANDFILL TOP DITCH
(DIVERSION BERM) SLOPE.

△D △A LANDFILL TOP DRAINAGE
SCALE: NTS

NOTES:

1. EROSION CONTROL AND SLOPE STABILIZATION WILL BE ACHIEVED BY VARIOUS NATURAL (DECAYING) AND PERMAMENT (PLASTIC) EROSION PRODUCTS SUCH AS EXCELSIOR MATS AND PLASTIC MATS ALLOWING GRASS GROWTH AND PREVENTING SOIL WASHOUT, AT LONG 4:1 SLOPES. SIMILAR SYSTEM WILL BE USED AT STEEP SECTIONS AND BANKS OF DITCH.
2. DRAINAGE OF LANDFILL TOP WILL BE ACHIEVED BY PLASTIC PIPES BURIED IN COVER MATERIAL RUNNING FROM TOP BERM TO DRAINAGE DITCH. USE USBR TYPE VI BAFFLE WALL ENERGY DISSIPATOR AT PIPE DISCHARGE AND LIGHTER STONE EROSION PROTECTION AT BERM PIPE INLET.

△D

DATE LAST GENERAL UPDATE: 04JAN2010

CADD

MARK	LOC.	REVISIONS	BY	DATE	APP
A	GEN	ADDED LIFTS, NOTES, DRAINAGE DETAILS	MCC	7SEP90	PC
B	GEN	ADDED ALTERNATE COVER SYSTEM OUTLINE & DETAILS	RJF	26FEB93	PC
C	GEN	REVISED COVER SYSTEM COMPOSITION	RJF	27OCT93	PC
D	GEN	ACCOM MODIFIED DETAILS AND NOTE 2	DRB	09MAY11	TCR

DESIGNED BY: P. CHMELAR	DATE 5-31-90	REFERENCES
DRAWN BY: M.C. CARPENTER, W.A. KIBBE & ASSOC	DATE 5-31-90	NUMBER: Y1-36615 TITLE: LANDFILL FINAL TOPOGRAPHY
TECHNICAL APPROVAL: M.J. BUSH	DATE 5-31-90	
APPROVED FOR ISSUE: M.L. MARCHIONE	DATE 5-31-90	

PMSS INFOR-MATION	ENGRG. DISC.	DWG. TYPE
	CA TOPO	SECTION

DOW CORNING CORPORATION

MIDLAND PLANT 800 / 1000 BLOCK

CLOSURE PLAN FOR
HAZARDOUS WASTE LANDFILL
FINAL TOPOGRAPHY–PEAK SECTIONS & DITCH DETAIL

SCALE	INCH FOOT	DRAWING NUMBER	REVISION
	1" = 80'	Y1-36625	C