CLOSURE PLAN FOR EXISTING CCR UNIT
40 CFR 257.102 (b)

SITE INFORMATION

Site Name / Address	DTE Energy Sibley Quarry Landfill / 801 Fort Street, Trenton, MI		
Owner Name / Address	DTE Electric Company / One Energy Plaza, Detroit, MI 48226		
CCR Unit	Landfill	Final Cover Type	Clayey Soil Cover
Reason for Initiating Closure	Known final receipt of waste	Closure Method	Close In-Place

CLOSURE PLAN DESCRIPTION

(b)(1)(i) – Narrative description of how the CCR unit will be closed in accordance with this section.	The CCR material at the Landfill will be closed in-place. The final cover will be sloped to promote drainage and the stormwater runoff will be discharged through the existing NPDES permitted outfall. Closure operations will involve: (i) regrade fill to create acceptable grades for closure and (ii) install final cover. The existing quarry bedrock side walls which laterally contain the CCR material will remain intact and the final cover system will tie-in to these features. In accordance with 257.102(b)(3), this initial written closure plan will be amended to provide additional details after the final engineering design for the grading and cover system is completed. This initial closure plan reflects the best information available to date.
(b)(1)(iii) – If closure of the CCR unit will be accomplished by leaving CCR in place, a description of the final cover system and methods and procedures used to install the final cover.	The final cover system will be installed in direct contact with graded CCR or fill to achieve final subgrade elevations and will include: 1) A minimum 24" of compacted earthen material (infiltration layer) with a permeability of no greater than $1x10^{-7}$ cm/sec, which is less than the permeability of the natural subsoils present at the site (approximately $2x10^{-5}$ cm/sec) and meets the more stringent Michigan requirements for an infiltration layer; 2) 6" of soil capable of sustaining native plant growth (erosion layer); and 3) planted with native grasses. The final cover slope will be a minimum of 2% and will be graded to convey stormwater runoff to discharge through the existing NPDES permitted outfall. CCR material will be placed and regraded as fill to bring the grade up to the design slopes. Earthen material for the infiltration layer will be placed, graded, and compacted to meet the thickness and permeability as discussed above. Earthen material will be placed to create a 6" soil erosion layer that will sustain native plant growth. The final cover surface will be seeded and vegetated.

(b)(1)(iii) – How the final cover system will achieve the performance standards in 257.102(d).	
(d)(1)(i) Control, minimize or eliminate, to the maximum extent feasible, post-closure infiltration of liquids into the waste and releases of CCR, leachate, or contaminated run-off to the ground or surface waters or to the atmosphere.	The permeability of the final cover will be equal to or less than $1x10^{-7}$ cm/sec and will be graded with a minimum 2% slope.
(d)(1)(ii) – Preclude the probability of future impoundment of water, sediment, or slurry.	The unit is and will continue to be dewatered via pumping from the sump at the base of the Quarry, thus maintaining water level below the limits of CCR and final cover. The final cover will be installed with a minimum 2% slope. Benches will have a maximum width of 300', as needed across the unit.
(d)(1)(iii) – Include measures that provide for major slope stability to prevent the sloughing or movement of the final cover system during the closure and post-closure care period.	The final cover will have a minimum 2% slope. Final slope of the cover will meet the stability requirements to prevent sloughing or movement of the final cover system using geotechnical analysis.
(d)(1)(iv) – Minimize the need for further maintenance of the CCR unit.	The final cover will be vegetated to minimize erosion and maintenance.
(d)(1)(v) – Be completed in the shortest amount of time consistent with recognized and generally accepted good engineering practices.	Closure design and construction phasing will be developed in a manner so as to complete closure in the shortest amount of time consistent with recognized and generally accepted good engineering practices.
(d)(2)(i) – Free liquids must be eliminated by removing liquid wastes or solidifying the remaining wastes and waste residue.	The unit is and will continue to be dewatered via pumping from the sump at the base of the Quarry, thus maintaining water level below the limits of CCR and final cover.
(d)(2)(ii) – Remaining wastes must be stabilized sufficiently to support the final cover system.	Dewatering and regrading of existing in-place CCR will sufficiently stabilize the waste such that the final cover will be supported.
(d)(3) – A final cover system must be installed to minimize infiltration and erosion, and at minimum, meets the requirements of (d)(3)(i).	The final cover will consist of a minimum 24" infiltration layer with a permeability of no greater than $1x10^{-7}$ cm/sec. Erosion will be minimized with an erosion layer no less than 6" of earthen material capable of sustaining native plant growth. The final cover surface will be seeded and vegetated.
(d)(3)(i) – The design of the final cover system must be included in the written closure plan.	Minimum final cover system design requirements are included herein. When the final design of the final cover system is completed, the written closure plan will be amended to include the detailed final design.
(d)(3)(i)(A) – The permeability of the final cover system must be less than or equal to the permeability of any bottom liner system or natural subsoils present, or a permeability no greater than $1x10^{-5}$ cm/sec, whichever is less.	The permeability of the final cover will be no greater than $1x10^{-7}$ cm/sec. This will be verified during construction per the construction quality assurance plan to be developed in conjunction with the detailed amended closure plan.
(d)(3)(i)(B) – The infiltration of liquids through the closed CCR unit must be minimized by the use of an infiltration layer than contains a minimum of 18 inches of earthen material.	The final cover will include a minimum 24" of compacted earthen material with a permeability no greater than $1x10^{-7}$ cm/sec (infiltration layer).
(d)(3)(i)(C) – The erosion of the final cover system must be minimized by the use of an erosion layer that contains a minimum of six inches of earthen material that is capable of sustaining native plant growth.	The final cover will include a minimum 6" of a soil erosion layer that is capable of sustaining native plant growth (erosion layer). The final cover will be seeded and vegetated.
(d)(3)(i)(D) – The disruption of the integrity of the final cover system must be minimized through a design that accommodates settling and subsidence.	The final cover will be installed with a minimum 2% slope and will incorporate calculated settlement as well as differential settling and subsidence.

INVENTORY AND AREA ESTIMATES

(b)(1)(iv) – Estimate of the maximum inventory of CCR ever on-site over the active life of the CCR unit	19,155,000 cubic yards
(b)(1)(v) – Estimate of the largest area of the CCR unit ever requiring a final cover	182 acres

CLOSURE SCHEDULE

(b)(1)(vi) – Schedule for completing all activities necessary to satisfy the closure criteria in this section, including an estimate of the year in which all closure activities for the CCR unit will be completed. The schedule should provide sufficient information to describe the sequential steps that will be taken to close the CCR unit, including major milestones …and the estimated timeframes to complete each step or phase of CCR unit closure.

The milestone and the associated timeframes are initial estimates. Some of the activities associated with the milestones will overlap. Amendments to the milestones and timeframes will be made as more information becomes available.

Initial Written Closure Plan Placed in Operating Record	October 17, 2016
Agency coordination and permit acquisition • Coordinating with state agencies for compliance • Acquiring state permits	 2021 (estimated) 2022 (estimated)
Mobilization	2023 (estimated)
Installation of final cover	6 months (estimated timeframe) 2023 (estimated completion milestone)
Estimate of Year in which all closure activities will be completed	2023

Certification by qualified professional engineer appended to this plan.

Certification Statement 40 CFR § 257.102(b)(4) – Initial Written Closure Plan for a CCR Landfill

CCR Unit: DTE Energy Sibley Quarry Landfill

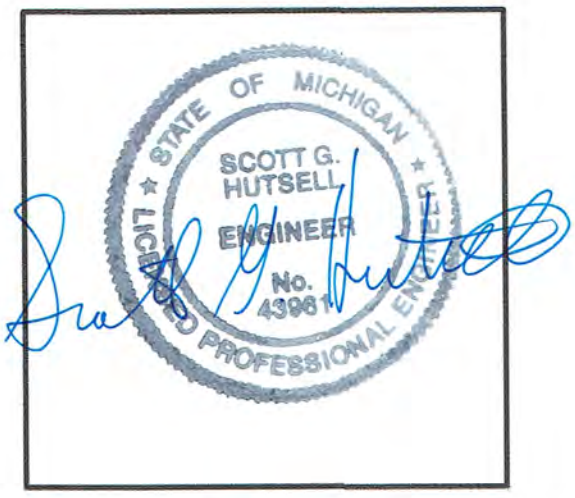
I, Scott G. Hutsell, being a Registered Professional Engineer in good standing in the State of Michigan, do hereby certify, to the best of my knowledge, information, and belief, that the information contained in this certification has been prepared in accordance with the accepted practice of engineering. I certify, for the above-referenced CCR Unit, that the information contained in the initial written closure plan dated October 17, 2016 meets the requirements of 40 CFR § 257.102.

Scott G. Hutsell

Printed Name

10/17/16

Date



Certification Statement 40 CFR § 257.102(d)(3)(iii) – Design of the Final Cover System for Closure of CCR Landfill

CCR Unit: DTE Energy Sibley Quarry Landfill

I, Scott G. Hutsell, being a Registered Professional Engineer in good standing in the State of Michigan, do hereby certify, to the best of my knowledge, information, and belief, that the information contained in this certification has been prepared in accordance with the accepted practice of engineering. I certify, for the above-referenced CCR Unit, that the design of the final cover system as included in the initial written closure plan dated October 17, 2016 meets the requirements of 40 CFR § 257.102.

Scott G. Hutsell

Printed Name

10/17/16

Date