

Postclosure care exit evaluation guidance

Solid Waste Permit Program

This guidance summarizes Minnesota Pollution Control Agency's (MPCA) evaluation process for permitted solid waste landfills to exit the postclosure care (PCC) period. This guidance also promotes managing a landfill during the design and operating phases in ways that reduce the activities and duration of the PCC period. All landfill owners and operators are encouraged to actively review monitoring data and landfill conditions throughout the PCC period so timely actions can be taken to ensure the facility can meet the conditions required to exit PCC within the PCC period. Early planning, iterative actions based on site conditions, and coordination with MPCA staff can help facilitate successful achievement of the goals.

Closure process

When a facility stops accepting waste, the permittee must initiate the prescribed closure procedures, as outlined/contained in their approved closure plan or closure document, within 30 days [Minn. R. 7035.2635]. Prior to closure, the facility must post a notice of closure and publish a notice of closure in a local newspaper. After final cover construction, the facility must complete a final survey, file a notification in the real property records for the facility, and submit the certification of closure to the MPCA. The MPCA will then issue a Closure Document (CD) containing the postclosure care requirements, including any monitoring, testing, reporting, site maintenance requirements, and the length of the postclosure care period [Minn. R. 7001.3055].

Purpose of postclosure care

Minnesota rules mandate a postclosure care period of at least 20 years [Minn. R. 7035.2655]. For mixed municipal solid waste landfills, the minimum postclosure care period is 30 years [EPA, August 4, 1993, and Minn. Stat. § 116.07, subd. 4h]. During this time, maintenance and monitoring are conducted to ensure that the landfill is protective of human health and the environment and is trending toward a state where further active operations are no longer necessary. The MPCA may reevaluate and modify the duration of the CD during the postclosure care period. The facility may also request that the CD be modified if conditions no longer reflect activities necessary according to the approved postclosure care plan or if additional actions need to be taken to ensure the facility is able to exit postclosure care. Landfills nearing the end of the postclosure care period should be evaluated to assess whether they pose a threat to human health and the environment after postclosure care ends and to determine if ongoing active measures are necessary beyond the PCC period. This guidance reviews the criteria and associated review process for assessing facilities approaching the end of the postclosure care period specified in their CD.

Although this general guidance is written around mixed municipal solid waste landfill requirements, all landfills are required to be protective of human health and the environment. The Solid Waste Management Facility General Technical Requirements apply to demolition, industrial, municipal solid waste (MSW) combustor ash in addition to mixed municipal solid waste landfills. Therefore, owners and operators should follow a similar process as outlined in closure performance standard [Minn. R. 7035.2625, subp. 2] and postclosure use of the property [Minn. R. 7035.2655]. All landfill owners and operators can expect to work with the MPCA in addressing issues related to ending postclosure care.

Review process

If a facility proposes to exit postclosure care, then a postclosure care summary report should be submitted 18 months prior to the end of the postclosure care period as specified in the CD. The report should include information to satisfy each of the data needs and demonstrate achievement of the goals outlined below. The evaluation must determine that the landfill does not pose a threat to human health or the environment at current and potential future points of exposure and no longer requires active maintenance of landfill control and monitoring equipment. See the Postclosure care summary report checklist for a Solid Waste Landfill (w-sw3-51) for additional information.

Landfill owners and operators are responsible for providing the site-specific data necessary for the MPCA to make a determination whether to modify the CD to extend the postclosure care period. Data collection efforts are detailed in the CD and modified through amendments to the CD or approval of recommendations in annual reports. The MPCA and the landfill owner or operator should participate in discussions about available data, record of adhering to the postclosure care plan requirements, current and future land use, and the evaluation process throughout the postclosure care period specified in the CD. The MPCA encourages landfill owners and operators to engage early with the MPCA to identify the site-specific issues that will be considered when determining a landfill's current or possible future impact on human health and the environment.

A landfill owner or operator or the MPCA may propose a controlled stepdown process of specific operations to assess the long-term effects prior to the end of the postclosure care period. For example, the landfill owner may propose turning off the leachate collection system to evaluate how much head develops on the liner or reducing the operation of an active gas collection system to determine the effect of gas migration at perimeter probes. Prior to commencing any stepdown, the landfill owner or operator must propose a monitoring strategy and obtain approval from the MPCA. Facilities that go through the stepdown process may be best positioned to demonstrate that the postclosure care period should end.

Evaluation components

To complete the evaluation process for exiting PCC described in the criteria in Minn. R. 7035.2655, subp. 1(B), the MPCA will primarily review the performance of the four components outlined below. Generally, to exit postclosure care a landfill should require no active operations, such as monitoring, and leachate or gas generation should have reached stability and not require active intervention. Not meeting these goals may mean that to protect human health and the environment, other measures or controls may need to be implemented and extension of the PCC period through modification of the CD may be necessary. Not all components will be applicable to each facility. The primary evaluation components are the following:

- Landfill cover system
- Leachate management system
- Gas management system
- Environmental monitoring

Goals and data needs

The following sections define the goals and data needs for evaluation of each component. Typically, it will be useful to start collecting relevant data and information early in the postclosure care period and collect enough to limit uncertainty about site conditions and any contamination.

1. Landfill cover system

Goal

- Achieve long-term stability with adequate performance for rejection and management of precipitation

Data Needs

- Survey data demonstrating limited settlement through routine surveys over a period of time
- Documentation of regular inspections and maintenance
 - Surface water management controls / erosion
 - Slope stability
 - Leachate seeps
 - Vegetation quality and type
 - Compliance with other permits (e.g., stormwater)

2. Leachate management system

Goal

- Successful implementation of passive leachate management system

Data Needs

- Trends in leachate generation rates over postclosure period
- Trends in leachate quality to show passive management is appropriate
- Proposed future leachate management strategy
- Confirmation that no active treatment is required for discharge.

3. Gas management system

Goal

- Successful implementation of passive gas management system including control of horizontal migration

Data Needs

- Trends from routine monitoring of gas wells/vents and perimeter gas probes
- Landfill gas migration monitoring summary
 - Data trends and location of any nearby occupied structures and monitoring points including gas measurements less than the lower explosive limit (LEL) at the property boundary and less than 25% of the LEL in and around facility structures or any other on-site monitoring point [Minn. R. 7035.2815, subp. 11]
- Status of any air permits
 - Any existing and new permits required for passive gas management

4. Environmental monitoring

Goal

- Data below established regulatory thresholds as detailed in the CD at the compliance boundary

Data Needs

- Comprehensive data over the postclosure period to characterize potential releases and any associated risks
- Status of any monitoring assessing known releases or associated corrective actions
- Trends in environmental data
- Identification of potential receptors

The components for demolition solid waste landfills, MSW combustor ash landfills, and industrial solid waste landfills may be different than mixed municipal solid waste landfills. Therefore, the documentation required to end postclosure care at these other types of landfills may not include all of the same information required above. However, the MPCA will work with landfill owners during preparation of the CD to determine appropriate data collection efforts that will be needed in the PCC period to support the PCC exit evaluation.

Additional considerations

The MPCA will evaluate the data above and may also consider relevant site-specific conditions for potential points of exposure and potential receptors. Even though a facility may be located away from residential or business communities at the time of closure, landfills may not remain isolated from encroaching development, and new exposure routes or emerging contaminants may be identified. Consequently, the MPCA needs to assess whether contaminant releases at the facility may potentially impact current and/or future receptors. Potential considerations may include, but are not limited, to:

- Site characteristics including type of wastes, type of cover and liner (if applicable), distance between base of landfill and groundwater, site-specific geology/hydrogeology, site access (restricted or public), and uncertainty in the site conceptual model.
- Fate and transport properties of observed contaminants including groundwater velocities, retardation (sorption and desorption), natural attenuation properties, potential for vapor migration, and a plume stability evaluation, if applicable.
- Potential receptors including current and potential drinking water receptors, proximity to drinking water supply management areas, proximity to occupied structures (explosive gas), proximity to ecological receptors, proposed future land use (on-site and adjacent), and potential land use restrictions.
- Proposed institutional controls (ICs) including any mechanisms that restrict use or require specific activities for the protection of human health and the environment. Environmental covenants, easements, or other ICs may allow a landfill to meet some of the evaluation component goals. However, they are to be considered as part of a balanced, practical approach that relies on both engineered and non-engineered remedies, not as a sole remedy. If additional information related to risk considerations is submitted, it should be supported with data and discussion. Discussions with the MPCA staff to support a risk-based approach should be completed before submitting the PCC evaluation report. Uncertainty about site conditions make it likely the PCC period would need to be extended. Ultimately, the data and additional considerations, as documented in the associated postclosure care summary report, should demonstrate that the landfill does not pose a threat to human health or the environment at current and potential future points of exposure.

Modifications to extend period

The commissioner will ultimately make a case-by-case determination on whether to modify a closure document to extend the post closure care period based on the criteria referenced in Minn. R. 7035.2655, subp 1(B). If the postclosure evaluation report shows that the landfill has the potential to adversely affect human health and the environment requires active efforts from the owner to manage landfill releases, such as gasses or leachate, it is more likely that the postclosure care period will need to be extended to satisfy those criteria. If the duration of the postclosure care period is extended, it will be implemented through a modified CD, which will include a new end date for the postclosure care period and potentially describe additional requirements. Modifications may extend the duration of the postclosure care period for a period of 5 to 20 additional years.

In some cases, submittal of the PCC summary report may not be necessary. If all required annual and monitoring reports have been submitted, and it is agreed to by all parties that a modification to extend the PCC period will be necessary, then the MPCA may modify the CD with an extended PCC period.

Reaching the end of postclosure care

If the MPCA determines postclosure care will not be extended, then the landfill owner and operator will receive a letter documenting the end of the postclosure care period, closing the closure document, and ending any requirements related to any active management of engineered systems, environmental monitoring, and reporting. The letter will describe the cover maintenance, inspection of passive controls, and the requirement to refrain from disturbing the integrity of final covers, liners, or any other components of any containment system for as long as the waste remains in place.

Applicable Minnesota Rules

Minn. R. 7035.0300, subp. 82, DEFINITIONS, [Postclosure; postclosure care](#).

Minn. R. 7035.2625, [CLOSURE](#).

Minn. R. 7035.2635, [CLOSURE PROCEDURES](#).

Minn. R. 7035.2645, [POSTCLOSURE](#).

Minn. R. 7035.2655, [POSTCLOSURE CARE AND USE OF PROPERTY](#).

References

ITRC, Evaluating, Optimizing, or Ending Post-Closure Care at Municipal Solid Waste Landfills Based on Site-Specific Data Evaluations, September 2006. <https://www.itrcweb.org/Guidance/GetDocument?documentID=4>

Ohio Environmental Protection Agency, Process for Ending Post-Closure Care at Solid Waste Landfills, February 2020

National Waste and Recycling Association (NWRA), Position Statement, Performance-Based Approaches to Evaluate the Termination of Landfill Post-Closure Care Requirements, December 2018

https://wasterecycling.org/wp-content/uploads/2020/11/PCC_Position_Statement_-_FIN.pdf

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State of Washington, Department of Ecology, Preparing for Termination of Post-Closure Activities at Landfills Closed Under Chapter 173-304 WAC, February 2011.

<https://apps.ecology.wa.gov/publications/documents/1107006.pdf>

U.S. EPA, Guidelines for Evaluating Post-Closure Care Period for Hazardous Waste Disposal Facilities under Subtitle C of RCRA. <https://www.epa.gov/hwpermitting/guidelines-evaluating-and-adjusting-post-closure-care-period-hazardous-waste-disposal>

U.S. EPA, Memorandum, Final Full Determination of Minnesota's Municipal Solid Waste Permit Program, William E. Muno, Director Waste Management Division, August 4, 1993.

A Citizen's Guide to Understanding Institutional Controls at Superfund, Brownfields, Federal Facilities, Underground Storage Tank, and Resource Conservation and Recovery Act Cleanups.

https://www.epa.gov/sites/default/files/documents/ic_ctzns_guide.pdf

Guidelines for Natural Attenuation of Chlorinated Solvents in Groundwater,

<https://www.pca.state.mn.us/sites/default/files/c-s4-05.pdf>