WASTE AND MATERIALS MANAGEMENT PROGRAM
GUIDANCE FOR COMMENT

GUIDANCE DOCUMENT TITLE AND NUMBER

Long-Term Care Responsibility for Old Closed Landfills: Guidance for Owners (WA-2048)

PROGRAM/BUREAU

Waste and Materials Management

GENERAL TOPIC

Guidance for owners of old closed landfills to help owners understand their landfill monitoring and maintenance responsibilities (i.e., long-term care responsibilities).

FINAL DATE FOR COMMENTS

May 16, 2025

PUBLIC CONTACT FOR GUIDANCE

Jackie Marciulionis, P.G., jacqueline.marciulionis@wisconsin.gov

Long-Term Care Responsibility for Old Closed Landfills: Guidance for Owners

PUB-WA-2048 2025

Waste & Materials Management
P. O. Box 7921
Madison, WI 53707-7921

Summary: Closed landfills are a long-term liability due to their potential to impact the environment. In the state of Wisconsin, property owners, including municipalities, are responsible for monitoring and maintaining landfills located on property they own. This obligation does not terminate unless the property is transferred to another person*. Property owners are responsible for the costs to cleanup environmental contamination caused by a landfill located on their property. Therefore, property owners must be aware of the condition of landfills located on property they own. This includes the condition of monitoring devices used to monitor the landfills.

* In accordance with s. 289.46, Wis. Stats. See, s. 289.41(1m)(c), Wis. Stats. and s. NR 520.05(1), Wis. Adm. Code.

Purpose and Audience: This guidance provides a summary of monitoring and maintenance required at landfills. It is intended for owners of private and municipal landfills that were closed prior to 1994 and who may not be aware of their long-term care responsibilities. It is **not** intended for landfill owners that have regular contact with the Wisconsin Department of Natural Resources (DNR), although the monitoring and maintenance responsibilities outlined hereinafter apply to all landfills. If you are unsure if your landfill falls into the category this document is intended for, contact DNR staff assigned to the county your landfill is within (See Attachment 1, Frequently Asked Question [FAQ] 1).

Landfill Monitoring and Maintenance Quick Reference

Landfill Cover Maintenance Requirements

(s. NR 506.08, Wis. Adm. Code)

- Maintain clay and/or soil covering waste by preventing and repairing erosion
- Maintain vegetation established at the time of closure (e.g., healthy grasses and no woody vegetation)
- Maintain landfill cover surface grades to allow storm water to flow off the cover instead of pond (e.g., no ponding water)

Landfill Monitoring and Device Maintenance Requirements

(ch. NR 507, Wis. Adm. Code)

- Conduct monitoring in accordance with plan approved by the DNR and submit results
- Maintain condition of monitoring devices so they function properly and do not become a conduit for contaminants
- Protect monitoring devices from damage
- Lock and label monitoring devices

Property Access and Use Requirements

(ss. NR 506.08 and 506.085, Wis. Adm. Code, s. 289.46(2) Wis. Stats.)

- Restrict access by the use of gates, fencing or other appropriate means, unless final use allows access
- Prevent activities that are prohibited on the landfill cover including (1) agriculture, (2) development (e.g., homes, buildings, trails, etc.), (3) excavation of landfill cover or waste materials
- Prevent any activies on the landfill property that interfere with the closed landfill

Landfill owners can use the compliance checklist on the following page to check for compliance with the above requirements at their landfills. Additional details regarding the requirements and recommendations for addressing issues are provided in Attachment 1. The DNR recommends owners conduct inspections of their landfills at least annually to ensure they are properly maintained. Attachment 1 also provides the answers to FAQs.

Compliance Checklist for Landfill Owners

Directions: Circle the answer to each question below. If your circled answer is in the "Action Needed" column, complete the recommended action.

Landfill Name and License No.:			
Date of Inspection:	**Name of Inspector:**		
Compliance Item	**No Action Needed**	**Action Needed**	**Recommended Action**
Landfill Cover			
Is waste exposed?	**No**	**Yes**	Cover waste and reseed. Consult P.E.
Is healthy grass growing on all parts of the cover?	**Yes**	**No**	Revegetate with grass
Are agricultural crops growing on the cover?	**No**	**Yes**	Remove crops and revegetate with grass
Is yellowing or dead vegetation present on the cover?	**No**	**Yes**	Cover with topsoil and reseed. Consult P.E. if area does not revegetate.
Is woody vegetation growing on top and/or side slopes?	**No**	**Yes**	Remove woody vegetation
Are animal burrows present on the cover?	**No**	**Yes**	Deter animal, fill burrow, and revegetate
Is water ponded on the cover?	**No**	**Yes**	Regrade depressed area to shed storm water. Cover area with topsoil and revegetate.
Has erosion occurred on the cover?	**No**	**Yes**	Repair and revegetate
Monitoring Devices			
Is sampling being conducted in accordance with approval?	**Yes**	**No**	Resume monitoring in accordance with approval
Are there any devices present that are not being monitored?	**No**	**Yes**	Check that well is not required to be monitored per approval. If not, abandon as soon as possible. Consult drilling contractor.
Are all monitoring devices locked?	**Yes**	**No**	Add locks to devices missing locks
Do all devices have metal outer protective casings?	**Yes**	**No**	Add metal protective casing. Consult drilling contractor
Are outer metal protective casings on all wells stable (i.e., do not wobble)?	**Yes**	**No**	Repair surface seal and reset protective casing. Consult drilling contractor.
Are any of the surface seals for the monitoring devices heaved out of ground?	**No**	**Yes**	Repair seal and resurvey top of casing. Consult drilling contractor.
Are any of the monitoring devices damaged?	**No**	**Yes**	Repair device and add features to prevent damage in future
Property Access and Unauthorized Uses			
Is there a locked gate or other feature that prevents access to the landfill?	**Yes**	**No**	Add gate or other features at entrance to deter access (unless final use is open to public)
Is there a sign posted at the entrance that identifies the landfill as a closed landfill and includes no trespassing language?	**Yes**	**No**	Post sign on entrance gate or near landfill (see frequently asked questions section for examples)
Is there evidence of unauthorized access (such as ATV trails or illegal dumping)	**No**	**Yes**	Take steps to deter trespassing
Are there any structures or other features developed on landfill cover?	**No**	**Yes**	Consult DNR staff assigned to landfill
Notes: P.E. = Professional engineer. Services can be obtained from an environmental consulting company.			

Attachment 1:
Long-Term Care Responsibility for Old Closed Landfills: Additional Information

Contents

1 Introduction

This guidance is a reference for owners of property that includes a landfill to understand the monitoring and maintenance requirements for landfills they own and to aid in achieving and maintaining compliance with those requirements. Landfills need to be maintained to ensure the landfill does not cause a threat to human health and the environment. This document provides information on **landfill cover maintenance** (Section 2), **monitoring requirements** (Section 3)**, monitoring device maintenance** (Section 4), **property access and unauthorized land uses** (Section 5), and **checking for non-compliance** (Section 6). In addition, it contains the answers to **frequently asked questions (FAQs)** (Section 7).

When waste is no longer accepted at a landfill, the landfill is required to be closed in accordance with plans approved by the DNR and s. NR 506.08, Wis. Adm. Code. Furthermore, the landfill cover is required to be maintained in accordance with the conditions that were required at the time of closure. Environmental monitoring (e.g., groundwater, gas, etc.) may also be required at the landfill in accordance with approved plans per s. NR 507.19, Wis. Adm. Code. The devices used for monitoring are required to be maintained per various sections in ch. NR 507, Wis. Adm. Code.

This guidance is specifically intended for owners of landfills that were closed before 1994, which is prior to the onset of requirements for landfills to be designed with engineering features to control leachate and gas generated by landfills. The landfills this guidance is intended for may have passive gas extraction systems, but do not have engineered features, such as compacted clay[1]/composite liners, compacted clay[1]/composite covers, stormwater control features, leachate collection systems and active gas extraction systems. Landfills within this category are unlined and were typically closed and covered in substantial accordance with NR 506.08(3), Wis. Adm. Code, which requires 2 feet of clay soils and 6-inches of topsoil. However, some landfills may have a closure/abandonment plan approved by the DNR, which includes a cover design that differs from the requirements in s. NR 506.08(3), Wis. Adm. Code. Some landfills may have also been closed before ch. NR 506, Wis. Adm. Code, closure requirements were promulgated. If you are unsure if this guidance is intended for the type of landfill you own, contact DNR staff assigned to the county your landfill is within (See FAQ 22).

Definitions

Leachate is water or other liquid that has come in contact with waste, usually either from within the waste itself or by percolating through the waste, or it is condensate from gases generated by solid waste.

Composite liners and covers consist of a layer of geomembrane (plastic sheet), which is a very low permeability synthetic barrier, over a layer of compacted clay[1].

Storm water is water resulting from melting snow or rainfall.

Although this guidance is intended for landfills that were closed before 1994, the landfill monitoring and maintenance responsibilities described in this document apply to all landfills. Property owners are responsible for monitoring and maintaining landfills located on property they own, regardless of when the landfill was closed, whether there was an approved closure plan for the landfill, and whether they were responsible for operating or placing waste in the landfill. This obligation does not terminate unless the property is transferred to another person in accordance with s. 289.46, Wis. Stats. See s. 289.41(1m)(c), Wis. Stats. and s. NR 520.05(1), Wis. Adm. Code. Property owners are responsible for the costs to cleanup environmental contamination caused by a landfill located on property they own.

[1] Compacted to specific engineering specifications.

2 Landfill Cover Maintenance

An improperly maintained landfill can cause contamination of water and other natural resources. When it snows and rains, water may enter the landfill through the cover where it moves through the waste and becomes leachate. Leachate may pick up contaminants from the waste, such as heavy metals and man-made compounds. Leachate can flow downward, enter groundwater and impact drinking water supplies. Leachate can also seep out through the landfill cover, flow into surface waters, and impact people and wildlife. While contaminant levels in leachate generally tend to decrease over time (as more and more contaminants in the waste are leached out and organic wastes biodegrade), elevated levels of contaminants can remain a concern for many decades after landfill closure.

To reduce the risk of contamination of water and other natural resources, landfill owners are required to maintain the landfill cover and vegetation that were required at the time of closure. The cover requirements are specified in plans approved by the DNR and **ss. NR 506.08(3) and (4), Wis. Adm. Code**. To ensure the required landfill cover is maintained, the DNR recommends owners conduct routine inspections to prevent the following issues from developing:

- Waste exposure caused by:
  - Erosion of cover soils resulting from steep slopes and flow of storm water onto and off the cover
  - Animal burrowing
- Improper or poor vegetation on the cover, including:
  - Crops
  - Yellowing/dead or sparse vegetation
  - Trees or woody vegetation growing in the waste areas and on side slopes
- Ponding water on the cover caused by improper grading/sloping of cover soils that causes storm water to pond on the surface rather than divert away from the center of the landfill and away from the waste

Code Citations

Section NR 506.08(3) Closure:

- *The entire area previously used for disposal purposes shall be covered with at least 2 feet of compacted earth…*
- *The final grades shall be sloped adequately to allow storm water runoff.*
- *The final slopes of the landfill shall be greater than 5%, but may not exceed 4 horizontal to one vertical…*
- *Storm water run-on shall be diverted around all areas used for solid waste disposal to limit the potential for erosion of the cover soils and increased infiltration.*
- *The finished surface of the disposal area shall be covered with a minimum of 6 inches of topsoil.*

Section NR 506.08(4) Establishment of Vegetation:

- *Owner or operator shall complete seeding, fertilizing and mulching of the finished surface.*
- *Seed mixtures and sowing rates shall be those specified for right–of–ways in accordance with section 630, Wisconsin department of transportation standard specifications for highway and structure construction.*

Recommended practices for addressing each of the conditions listed above are outlined in the following subsections.

Approved Plans (e.g., closure/abandonment):

- Landfills may have approved plans with requirements that differ from ss. NR 506.08(3) and (4) for final cover construction and vegetation establishment.
- Where approved plans and code conflict, approved plans are to be followed.

Preventing Waste Exposure

Ensuring the cover soils remain intact is necessary to ensure waste does not become exposed. This is done by taking steps to prevent erosion of the soil/clay cover and other disturbances that may reduce the integrity of the cover.

Preventing Erosion of Soil Cover

Section NR 506.08(a) and (d), Wis. Adm. Code, requires the entire area previously used for waste disposal to be covered with at least 2 feet of compacted earth and 6-inches of topsoil, unless otherwise approved in writing. The landfill owner is required to ensure the soil cover layers are maintained by preventing erosion and repairing areas that have eroded.

Photo 1: *Gully type erosion on landfill cover.*

Erosion occurs when water or wind carries the soils away. Limiting the flow of water over the waste area is an important step for minimizing erosion. For this reason, s. NR 506.08 (b), Wis. Adm. Code, requires storm water that flows towards a landfill cover to be diverted around the landfill.

Vegetation is also important for minimizing erosion as discussed in the next subsection, but the slope of the final cover can also influence erosion potential. Steeper slopes are more vulnerable to erosion, particularly when storm water from an intense rainstorm or snow meltwater flows over the surface. For this reason, cover slopes are not to exceed a four horizontal to one vertical slope per s. NR 506.08(c), Wis. Adm. Code.

Erosion on a landfill cover must be repaired to ensure the cover soils stay intact. Repairs may require regrading and/or placement of additional soil over the eroded areas and revegetating. Photos 1 and 2 provide examples of landfill covers that have erosional areas that need repair.

The DNR recommends the following to repair erosion and keep soil covers intact:

- Repair areas of erosion as they become apparent.
- Repair "rill" type erosion (i.e., small, concentrated channels on the landfill surface that are no more than a few inches deep) by raking out the rills and reseeding.
- Repair deeper erosion gullies by adding soil, changing cover soil grades, and reestablishing vegetation.
- Maintain healthy vegetative cover (see next section)

Photo 2: *Erosion on side slope of a landfill cover.*

Animal Burrowing

Animal burrowing can damage the soil cover, expose waste and provide a direct pathway for storm water to infiltrate into the waste. Animal burrows must be repaired in order to maintain the soil cover required in s. NR 506.08(3)(a), Wis. Adm. Code. Photos 3 and 4 show examples of animal burrows that have developed on landfill covers.

The DNR recommends the following if an animal burrow is found on the landfill cover:

- Trap/Relocate the occupant and fill in the burrow with soil. Do not use sandy or gravelly soil because they will not limit water infiltration and may prevent grass from growing.
- Consider adding peppermint oil, hot sauce, jalapeño peppers, red pepper flakes, or the urine of a predator animal to the soil fill. A mixture of castor oil, liquid dish soap, and water may also deter some burrowing animals.

Photo 3: *Animal borrow hole on landfill cover.3*

Photo 4: *Animal borrow hole on landfill cover.*

Vegetative Cover

Maintaining a Healthy Vegetative Cover

Good grass cover prevents soil erosion by water or wind because the roots bind soil particles together. Unchecked erosion will wash away and destroy cover vegetation and soil, which can expose waste, allow storm water to infiltrate waste, and cause increased leachate generation.

The DNR recommends the following to maintain the vegetative cover:

- Repair all eroded areas as soon as practical (see previous section).
- Reseed areas of sparse grass growth or amend them with manure, fertilizer, or another nutrient-rich source to promote vigorous growth.

Section NR 506.08(4), Wis. Adm. Code, requires landfill covers to be seeded with a grassy seed mixture. Landfill owners are required to maintain the landfill's grassy vegetative cover. Seed mixtures used are required to be those used in highway right-of-ways, unless otherwise approved by the DNR. Alternative seed mixtures may have been specified in the closure plan and approved or can be used with the DNR's approval. The seed type selected need to be compatible with both native vegetation and the final use. Photos 5 and 6 show examples of landfill covers with healthy vegetative covers that meet the code requirements. Photos 7 and 8 show examples of landfill covers with poor or improper vegetation.

Photo 5: *Example of healthy vegetation on landfill cover.*

Photo 6: *Example of healthy vegetation on landfill cover.*

Photo 7: *Example of sparse vegetation on landfill cover.*

Photo 8: *Example of landfill cover planted with crops, which is improper vegetation on landfill cover.*

Preventing and Removing Woody Vegetation

Section NR 506.08(4), Wis. Adm. Code, requires landfill covers to be seeded with a grassy seed mixture. Woody vegetation, such as trees and shrubs, does not fall within the specified seed mixture. Tree growth is not allowed on landfill covers because shallow cover soils will not support trees as they mature, making them susceptible to being blown over. Fallen or uprooted trees will damage the cover soils and can expose waste. The roots of trees and other woody vegetation also provide a preferential pathway for storm water to infiltrate into the waste, which can increase leachate generation. Photos 9 and 10 provide examples of landfill covers with woody vegetation that needs to be removed.

The DNR recommends the following practices to address woody vegetation on and around a landfill:

- Mow the landfill cover at a frequency needed to prevent woody vegetation from establishing (e.g., every 1 to 3 years).
  - Plan to mow in any time after the first frost (roughly mid-October) through mid-April to avoid impacts to nesting birds and pollinators.
  - Vary the mowing pattern to avoid creating ruts and erosion problems.
- If woody vegetation has developed on a landfill cover, cut that woody vegetation to ground surface and remove from the cover.
- Cut back trees and brush that are encroaching on the landfill.
- Remove trees that have fallen onto the landfill.

Photo 9: *Woody vegetation on landfill cover.*

Photo 10: *Woody vegetation on landfill cover.*

Preventing Yellowing/Dead or Sparse Vegetation

Yellowing (stressed), dead or sparse vegetation on a landfill cover can be a sign that there is not enough topsoil or nutrient-rich material to support healthy vegetation. In these cases, the areas of sparse grass growth should be reseeded or amended with manure, fertilizer, or another nutrient-rich source to promote vigorous growth as discussed in the previous subsection.

Yellowing or dead vegetation can also be a sign of gas migration from the landfill. As organic wastes in a landfill age, they decompose and generate methane and other gases. Gas production can continue for decades after a landfill closes. Methane gas migration through cover soils will cause vegetation to yellow (become stressed) or die (Photo 11), and is particularly dangerous because, at certain concentrations, it can explode or otherwise fuel a fire. Methane gas will migrate along the path of least resistance and can be present in the ground at a significant distance from the landfill.

If gas migration from the landfill becomes an issue, the DNR may require the landfill owner to install gas monitoring devices, to prepare and submit gas sampling and analysis programs and to monitor for gas migration, per s. NR 507.22, Wis. Adm. Code. A remediation plan may be required if gas concentrations are explosive.

The DNR recommends the following practices if stressed, dead, or sparse vegetation is observed on the landfill cover:

- Placing topsoil over the area and reseeding the area to see if vegetation can be established and maintained.
- If vegetation continues to die, contact a professional engineer to evaluate options for controlling gas migration.

Photo 11: *Example of yellowing vegetation that may be due to gas migration.*

Answers to frequently asked questions regarding vegetation on a landfill cover are provided in Section 7.

Landfill Surface Grades

Section NR 506.08, Wis. Adm. Code, requires the final grades of the landfill to be sloped to allow run off of storm water and prevent water from ponding on the cover. Landfill owners are required to maintain those surface grades. Waste can settle over time and form depressions on the landfill surface that allow water to pond. Wetland vegetation may establish in ponded water if left for long periods of time (e.g., cattails). In addition, ponded water can increase the potential for infiltration of storm water into waste and cause increased leachate generation. When settling occurs, the cover surface must be regraded. Photos 12 and 13 show examples of landfill covers with uneven surfaces and ponding that need regrading.

The DNR recommends the following practices when settling on the landfill cover is observed:

- Fill depressions with clean soil to restore positive drainage, then reseed and mulch to reestablish grass cover.

Photo 12: *Example of uneven landfill surface that needs regrading if water begins to accumulate in the lower area.*

Photo 13*: Example of landfill surface with ponding water.*

3 Monitoring Requirements

Some landfills have monitoring devices, which may include groundwater monitoring wells, gas probes, and passive gas vents (Photos 14 through 17). These devices are required to be maintained and monitored by the landfill owner in accordance with ch. NR 507, Wis. Adm. Code. Monitoring requirements can be found in written approvals issued by the DNR that are specific to each landfill, typically referred to as a monitoring plan or closure plan approval. In some cases, monitoring programs have been modified by the DNR and revised requirements are specified in a newer approval. To determine monitoring requirements for a landfill, the DNR reviews all the approvals for the landfill, not just the most recent. Monitoring requirements specified in approvals remain in effect until a later approval specifically supersedes a previous approval or condition of approval, which means some monitoring requirements may be found in multiple approvals. Landfill owners are required to conduct monitoring in accordance with DNR approvals unless an alternative schedule or termination of monitoring is approved in writing by the DNR.

Not all closed landfills in the state of Wisconsin have monitoring requirements. Monitoring requirements are approved by the DNR and, in most cases, were established in the mid-1980s and early 1990s when groundwater monitoring at landfills became a requirement or when landfills were closing.

It is the landfill owner's responsibility to ensure all required samples and measurements are collected from the monitoring devices in accordance with the schedules and parameters specified in the landfill approvals.

Chapter NR 507, Wis. Adm. Code, contains minimum requirements for proper sample collection from groundwater monitoring wells. The DNR also has online resources including the Groundwater Sampling Desk Reference and a Groundwater Sampling Field Manual (publications DG-037 96 and DG-038 96, respectively), available on the DNR website, which describe the procedures for sampling that need to be followed. Groundwater sampling should be done by those who are trained and experienced in the proper procedures to ensure that the samples provide an accurate representation of groundwater quality around the landfill.

Alternative Sampling Procedures:
Conditions in approvals for the landfill may specify sampling procedures or sampling procedures may be outlined in documents approved by the DNR (e.g., Sampling and Analysis Plans). Approval conditions and approved procedures supersede requirements specified in code and in guidance documents.

Landfill owners must identify if there are monitoring devices (e.g., groundwater monitoring wells, gas probes, etc.), at the landfill that are not being sampled. If devices are not being sampled but are required to be sampled in accordance with a monitoring approval, sample collection needs to resume at the device per the approval. If a monitoring device is no longer used for monitoring and is not required to be sampled per the landfill approvals, that device needs to be abandoned in accordance with s. NR 141.25, Wis. Adm. Code, and documented in accordance with s. NR 507.14, Wis. Adm. Code. This requirement does not apply to gas venting devices, which may or may not have monitoring requirements. The purpose of gas vents is to allow gas to vent through the cover so it does not accumulate at dangerous levels. Gas vents need to remain in place until the DNR approves their removal. Contact the DNR staff assigned to your landfill if you have questions about the type of monitoring device at your landfill or the abandonment requirements.

Code Citations

s. NR 141.25(1)(b), Wis. Adm. Code:
Groundwater monitoring wells shall be properly abandoned within 60 days after the well is no longer used.

s. NR 507.14, Wis. Adm. Code:
Documentation of the abandonment of any monitoring device is required to be submitted to the DNR within 60 days after abandonment.

Answers to frequently asked questions regarding landfill monitoring are provided in Section 7.

***Photo 14**: Groundwater monitoring well.*

***Photo 15**: Gas vent.*

***Photo 16**: Gas probe.*

***Photo 17**: Gas vent.*

4 Monitoring Device Maintenance

A damaged monitoring device can become a conduit for storm water to enter the well and contaminate groundwater; therefore, landfill owners must ensure all monitoring devices remain in good condition. It is more expensive to replace damaged monitoring devices than to maintain them. Monitoring devices are required to be maintained in accordance with s. NR 507.04, s. NR 507.13, and ch. NR 141, Wis. Adm. Code. Table 2.1 provides a summary of practices required to maintain monitoring device compliance and Photos 18 through 21 show examples of monitoring devices that need attention.

Table 2.1: Monitoring Device Requirements

	Requirement
Inspect (507. 13)	**Landfill owner is required to inspect all monitoring devices at least annually.**
	Sampling personnel are required to inspect all monitoring devices each time the device is sampled, or a water level elevation is measured. ➢ *It is the landfill owner's responsibility to ensure their sampling personnel is conducting this task.* ➢ *See DNR publication Inspecting Monitoring Wells at Landfills (WA-1796) for additional guidance*
Protect (NR 507.04(3))	**All monitoring devices are required to be locked to prevent contaminants from entering the monitoring device.** ➢ *A person should not be able to remove or open the cover on a groundwater monitoring well/gas probe outer metal protective casing while locked.* ➢ *Passive gas vents do not typically have covers and do not need to be locked.*
	Groundwater monitoring wells and gas probes are required to have outer protective metal casings.
	The surface seal on groundwater monitoring wells and gas probes are required to be in good condition. ➢ *Evaluate the surface seal condition by checking the stability of the outer protective metal casing. An unstable or loose protective casing indicates the surface seal may not be in good condition and may need to be repaired or replaced.* ➢ *Surface seals may heave out of the ground due to frost over time. If a surface seal has heaved out of the ground surface, the seal needs to be replaced or repairs need to be made to reseal the well.* ➢ *Contact a drilling contractor or environmental consultant to evaluate options for addressing surface seal issues.*
	All devices are required to be protected as necessary. ➢ *Ensure measures or features are put in place to prevent damage to monitoring devices.* ➢ *The DNR may require additional protective devices such as a ring of brightly colored posts around any monitoring device.*
Label (NR 507.04(4))	**All monitoring devices are required to be clearly and permanently labeled on the outside of the monitoring device. Label must include the monitoring well ID (e.g., MW-1) and 3-digit identification number assigned to each well by the DNR, referred to as the GEMS Point ID (e.g., 003).** ➢ For groundwater monitoring wells and gas probes, the label is required to be on the outside of the outer protective metal casing.
Repair (NR 507.13)	**Monitoring devices that are damaged, provide a conduit to the subsurface (e.g., heaved surface seal, loose protective casing) or otherwise fail to function properly (e.g., consistently dry) are required to be repaired, if possible. If the device cannot be repaired, it needs to be properly abandoned and replaced.** ➢ *Contact a drilling contractor or environmental consultant for options.*
Abandonment and Documentation (NR 141.25(1)(b) and NR 507.14)	**Monitoring devices that are no longer being used to gather information on geologic or groundwater properties need to be abandoned (excludes passive gas vents).** ➢ *Code requires proper abandonment within 60 days after its use has been discontinued.* ➢ *Contact a licensed well driller and/or environmental consultant for abandonment.*
	Documentation of the abandonment is required to be supplied to the DNR within 60 days of the abandonment on forms supplied by the DNR. ➢ *The required abandonment documentation forms include a well/drillhole/borehole abandonment form (Form 3300-005) for each well abandoned and an updated Groundwater monitoring well information form (Form 4400-089).* ➢ *Groundwater forms are located on the DNR website.*

Answers to frequently asked questions regarding landfill monitoring device maintenance are provided in Section 7.

***Photo 18**: Groundwater monitoring well that needs a metal outer protective casing installed.*

***Photo 19**: Groundwater monitoring well with concrete surface seal that has heaved out of the ground due to frost.*

***Photo 20**: Lid on outer metal protective casing that can be opened even with a lock installed.*

***Photo 21:** Groundwater monitoring well that cannot be locked because the inner well casing has raised above the top of the outer metal protective casing.*

5 Property Access and Unauthorized Uses

Closed landfills are often sought after for building construction, planting crops, hunting, all-terrain vehicle (ATV) trails, illegal waste disposal or dumping, and other unauthorized uses. Section NR 506.085, Wis. Adm. Code, states '**the following activities are prohibited** at solid waste disposal facilities which are no longer in operation unless specifically approved by the DNR in writing:

(1) Use of the waste disposal area for agricultural purposes.

(2) Establishment or construction of any buildings over the waste disposal area.

(3) Excavation of the final cover or any waste materials.'

Additionally, s. 289.46(2), Wis. Stats. states, "any person having or acquiring rights of ownership in land where a solid or hazardous waste disposal facility was previously operated may not undertake any activities on the land which interfere with the closed facility causing a significant threat to public health, safety or welfare."

Access to the landfill is required to be restricted in accordance with ss. NR 506.07(e) and NR 506.08(2), Wis. Adm. Code, which can be done using gates or other appropriate means. To ensure unauthorized uses of the landfill cover do not occur, the DNR recommends the following:

- Restrict access with gates across entrances and exits (make sure gates are closed when no one is at the landfill) or large boulders, tree logs, or other creative barriers at entry points around the property and/or at the edge of a landfill.
- Check the condition and effectiveness of access control measures during inspections and improve them, if necessary.
- Post weather resistant signs identifying the site as a closed landfill with landfill name, license number, and include no trespassing language or list allowed public uses.
- Ensure no structures, including roadways and trails, are built on the landfill.
- Remove any object penetrating the landfill cover, such as posts for signs or bird houses.
- Remove illegal waste dumped on the property or at the entrance and take preventive measures, such as using a camera to identify people dumping waste.

Code Citations for Restricting Access

s. NR 506.07(e), Wis. Adm. Code: *Access to the landfill shall be restricted through the use of fencing, natural barriers or other methods approved in writing by the department.*

s. NR 506.08(2), Wis. Adm. Code: *Within 10 days after ceasing to accept solid waste, the owner or operator shall restrict access by the use of gates, fencing or other appropriate means to insure against further use of the landfill.*

Note development of some types of features (e.g., dog parks, walking paths, solar fields) on landfills has been approved by the DNR. The DNR recommends discussing any potential future uses or development ideas for the landfill and surrounding property with staff assigned to your landfill to determine what approval is needed before proceeding. See the frequently asked questions section of this document for further information.

Answers to frequently asked questions regarding property access and unauthorized uses of a landfill are provided in Section 7.

6 Checking for Non-Compliance

DNR staff in the Waste and Materials Management Program will periodically contact landfill owners to schedule an inspection at closed landfills; however, many years may occur between inspections. In the meantime, it is the landfill owner's responsibility to ensure compliance with Wisconsin Administrative Code and approvals is maintained. Landfill owners can use the **Compliance Checklist for Landfill Owners** at the beginning of this document as an aid to check for compliance at their landfills. The DNR encourages landfill owners to complete this checklist on an annual basis (at a minimum) to identify potential issues and address any areas identified as 'action needed.' The DNR also recommends the landfill owner keep a copy of the completed checklists and documentation of any 'landfill repairs' for their records.

When DNR staff conduct an inspection, they will check the condition of the landfill cover and monitoring devices and complete an inspection report. If conditions are inadequate, the DNR may begin the stepped enforcement process by issuing a notice of non-compliance for the items observed. In a notice of non-compliance, the DNR will request actions be taken to address the non-compliance items within a specified time period.

7 Frequently Asked Questions

List of Frequently Asked Questions (click on each question below to go directly to the response):

Topic	Question
Help	1. Who can help me if I'm unsure what to do about a particular situation at my landfill?
Vegetative Cover	2. Is there an option to keep large trees in place that have established on the landfill cover? 3. Can I apply stump killer to woody vegetation that keeps growing after it has been cut to ground surface? 4. Can I grow crops on my landfill cover instead of grasses? Other types of vegetation (e.g., prairie grasses)?
Environmental Monitoring	5. My landfill's long-term care period is coming to an end. Do I need to keep monitoring my landfill? 6. When can I stop monitoring? Can I reduce monitoring? 7. What do I do if I have stopped monitoring and I do not know if I'm still required to monitor or know my monitoring requirements? 8. Why do some landfills not have monitoring requirements?
Monitoring Devices	9. How can I label my monitoring devices? 10. What do I do if a monitoring device associated with my landfill becomes damaged? 11. Do I need approval to replace a monitoring device? 12. Do I need to let the DNR know if I replace a well or make repairs to a device?
Property Access and Unauthorized Use	13. What is the recommended language for signs posted at the entrance to a closed landfill? What is the required sign size? 14. Can a private well be drilled near or through a landfill? 15. Can a structure or other features be built on the landfill or adjacent to the landfill? 16. Can I have a mowed, gravel, or wood chipped recreation path on top of the landfill cover?
Other	17. Are there funds available for long-term monitoring and maintenance? 18. Can I sell my landfill? Do I need the DNR's approval to sell my landfill or portions of the landfill property? 19. What are the risks of selling land around the landfill? 20. What are the risks of developing close to a landfill? 21. What will my responsibilities be if I purchase a landfill or become a co-owner of a landfill? 22. What does a leachate seep look like and what do I do If I observe one at my landfill?

1 Who can help me if I am unsure what to do about a particular situation at my landfill?

Contact DNR staff assigned to your landfill or an environmental consultant. DNR staff are located in different regions of the state and assigned to cover specific counties. There is a hydrogeologist and engineer assigned to your landfill. You can find the staff assigned to your landfill by using the staff directory on the DNR website and searching by a subject of 'landfill' and by the county your landfill is located within. A list of environmental consultants can also be obtained on the DNR website by searching for "Environmental Services Contractor List."

2 Is there an option to keep large trees in place that have established on the landfill cover?

Generally, the DNR does not approve of trees growing on the final cover and their presence indicates lack of maintenance. However, the DNR may consider a request to allow a tree that has already established to stay in place. The DNR will consider the potential risks the tree presents to the landfill and final cover integrity and the overall risk to the environment. If the DNR approves a tree to stay, the DNR may require special monitoring on a routine schedule by the landfill owner to check that the tree remains healthy. Landfill owners are responsible for repairing the cap if a tree falls and damages the cover or exposes waste. If you are interested in obtaining approval to keep trees in place, contact the DNR staff assigned to your landfill.

3 Can I apply stump killer to woody vegetation that keeps growing after it has been cut to ground surface?

These chemicals can be used to help control growth of woody vegetation, but they should be used following label directions and sparingly so as not to adversely impact groundwater.

4 Can I grow crops on my landfill cover instead of grasses? Other types of vegetation (e.g., prairie vegetation)?

Section NR 506.085, Wis. Adm. Code, prohibits use of waste disposal areas for agricultural purposes unless specifically approved by the DNR in writing. Certain prairie vegetation (those with shallower root systems) has been approved on the cover of some landfills. DNR approval is required for vegetation other than the approved grasses. If you are interested in obtaining approval for other types of vegetation, contact the DNR staff assigned to your landfill (See FAQ 1).

5 My landfill's long-term care period is coming to an end. Do I need to keep monitoring my landfill?

In Wisconsin, the long-term care and maintenance responsibilities of a landfill owner never end. Some landfills had a 20-, 30- or 40-year owner financial responsibility (OFR) period. This OFR period was the period of time after landfill closure for which the landfill owner was required to maintain proof of owner financial responsibility. See, s. 289.41(1m)(b), Wis. Stats. However, actual long-term care and maintenance responsibilities for a landfill are in perpetuity in accordance with ss. 289.41(1m)(c) and 289.46, Wis. Stats. If a landfill is required to be monitored, the monitoring must continue, even if the OFR period has ended, until the DNR approves termination of monitoring in writing.

6 When can I stop monitoring? Can I reduce monitoring?

Monitoring must be carried out in accordance with the approved monitoring requirements issued by the DNR for the landfill. However, there may be opportunities to reduce monitoring frequency, eliminate substances monitored for, or eliminate individual wells or monitoring points. The DNR has the ability to modify monitoring requirements in writing if a landfill owner submits a written request for a modification to the DNR. The request needs to explain why the proposed change in the monitoring requirements is warranted. These modifications require the DNR to ensure the proposed modification changes are protective of human health and the environment. A modification of monitoring can include termination. However, the DNR has rarely approved termination of monitoring at a landfill because it is difficult to demonstrate how absence of monitoring solid waste is protective of human health and the environment.

The DNR's guidance document *Reducing or Terminating Groundwater Monitoring at Solid Waste Landfills (WA-1013)* is available for landfill owners who want to modify the monitoring program at a solid waste landfill. It describes how a request should be prepared and submitted and how the DNR will review the request. Requests for modification to the groundwater monitoring program are required to be submitted to the DNR under the certification of a

professional geologist and requests to modify gas monitoring are required to be certified under a professional engineer.

7 What do I do if I have stopped monitoring and I do not know if I'm still required to monitor or know my monitoring requirements?

Contact the DNR staff assigned to your landfill. The assigned DNR staff can help you determine your monitoring requirements and help you get back on track with your required monitoring (See FAQ 1).

8 Why do some landfills not have monitoring requirements?

Landfills that operated and were closed before 1980 generally do not have monitoring requirements. The reason for this is because monitoring requirements at landfills came about and evolved over time as the rules and regulations for landfills evolved. As scientists, society, and the DNR learned more about the existing and potential impacts landfills have on the environment, and on groundwater quality in particular, rules were developed to require groundwater monitoring in an effort to become more protective to human health and the environment. In addition, the science on how to design and install quality monitoring devices and effectively collect meaningful data developed, which helped to provide the collective understanding of the impact landfills have on the environment. During the 1980s and into the 1990s the rules changed significantly and included monitoring requirements for landfills operating at the time. Also, when the federal Resource Conservation and Recovery Act (RCRA) Subtitle D requirements were adopted into the federal rules by the Environmental Protection Agency (EPA) in the early 1990s, many small municipal and private solid waste landfills closed because they were not able to meet the Subtitle D requirements. Many of the closure requirements for these landfills included some monitoring requirements because, by that time, there was a strong understanding of the risk landfills pose to groundwater quality, especially by landfills that are not lined.

9 How can I label my monitoring devices?

The monitoring device ID can be written on the outside of the device with a paint pen or the device can be more permanently labeled (e.g., embossed) with a placard or tag affixed to the well. Below are examples of labels on monitoring devices:



Photos 22, 23, and 24: *Examples of labels on monitoring devices.*

10 What do I do if a monitoring device associated with my landfill becomes damaged?

Per s. NR 507.13, Wis. Adm. Code, a landfill owner is required to notify the DNR if there is damage to a monitoring device, if a device provides a conduit to the subsurface, or if a device otherwise fails to function properly. The notification needs to occur within 10 days after the issue is discovered and can be provided to DNR staff assigned to the landfill via email (See FAQ 1). If the monitoring device is required to be monitored per the approved monitoring plan, the device needs to be repaired, if possible, or properly abandoned and replaced within 60 days.

11 Do I need approval to replace a monitoring device?

A monitoring device can be replaced within 10 feet of the original device without DNR approval as long as the device is installed at the same elevation and has the same screened interval as the original device. See response to the previous question for requirements to notify the DNR when a monitoring device needs to be replaced. The device must be given the same name with an 'R' added to the end per s. NR 507.13, Wis. Adm. Code, to designate it as a replacement device (e.g., MW-25R, B-4R, GP-5R). The DNR will issue a new point ID number for the replacement device. When a monitoring device is replaced, the owner must provide documentation for the new device to the DNR within 60 days after the device has been installed per s. NR 507.14, Wis. Adm. Code. The documentation shall include forms specified in s. NR 507.14(5), Wis. Adm. Code. For monitoring device replacement, the forms that are required are:

- Groundwater monitoring well and point information form (4400-089)
- Monitoring well construction form (4400-113A) (documentation for new or replacement device)
- Monitoring well development form (4400-113B) (documentation for new or replacement groundwater monitoring wells)
- Well/drillhole/borehole abandonment (form 3300-005) (documentation for groundwater monitoring well or gas probe abandonment/filling)
- Soil boring log information form (4400-122) (documentation for new or replacement device)

Electronic copies of these forms can be found on the DNR website. Please contact the staff assigned to your landfill if you need information to complete the form (e.g., Facility ID number [FID] not known, DNR Point ID) (See FAQ 1). All applicable fields on these forms must be completed. Note the Wisconsin Unique Well Number (WUWN) for the replacement groundwater monitoring well is supplied by the driller at the time a well is installed.

12 Do I need to let the DNR know if I replace a device or make repairs to a device?

As stated for the response to the previous question, documentation of abandonment and installation of a monitoring device needs to be provided to the DNR within 60 days after the device has been abandoned/installed. The required documentation provides notification that a device has been replaced.

If a device has been repaired, notifying the DNR is recommended. In addition, if the device has heaved and the repairs require adjustments to the device that changes the height of the device, the elevation of the top of the casing (e.g., inner PVC pipe) should be resurveyed to ensure the correct elevations based on depths to water and bottom of the well measured in the field can be calculated. The new survey information should be provided on an updated groundwater monitoring well and point information form (4400-089). Furthermore, it is beneficial for the top of casing of monitoring devices to be periodically resurveyed since heaving of wells can occur subtly over time.

13 What is the recommended language for signs posted at the entrance to a closed landfill? What is the required sign size?

Recommended language for the sign is:

Closed Landfill
[Landfill Name]
DNR License No. [####]
Penalty for Unauthorized Use or Illegal Dumping
– or –
No Trespassing or Illegal Dumping

Wisconsin Administrative Code does not specify a size for signage. The size and text coloring can be anything the landfill owner chooses, provided the text is legible. Most sites have used a 2-foot by 3-foot sign, but sign sizes have varied. Below are examples of signs posted at landfills:

Photos 25, 26, 27, 28, 29, and 30: *Example signs.*

14 Can a private well be drilled near or through a landfill?

Chapter NR 812, Wis. Adm. Code, requires a water supply well to be located at least 1,200 feet away from the limits of waste of a landfill. However, the DNR does have the authority to approve a variance to that set-back distance. The variance allows a well to be constructed less than 1,200 feet from the limits of waste when the DNR determines the well design will have protection that is comparable to a well that meets the setback through some other means such as a deeper well casing. The DNR does not approve the installation of water supply wells through a landfill because of the risk it presents to human health and the environment.

Any person wishing to construct a well located less than 1,200 feet from a landfill's limits of waste must submit a well variance application to the DNR's Drinking Water and Groundwater Program and receive the variance approval prior to well construction. Submittal of a well variance application does not guarantee approval. Typically, the property owner's contracted well driller will submit a well variance application to the DNR on behalf of the property owner. All well drillers and pump installers that install or work on a water supply well are required to be licensed by the state of Wisconsin. In addition, ch. NR 812, Wis. Adm. Code, requires that abandonment or filling and sealing of a water supply well be completed by a licensed well driller or licensed pump installer.

15 Can a structure or other features be built on the landfill or adjacent to the landfill?

Structures or other features cannot be built on a landfill without prior DNR approval. In addition, construction on the landfill property but outside the limits of waste also requires approval depending on what is proposed for construction and where it is located. There may be opportunities to construct open air structures, structures with

engineered features to mitigate potential gas migration concerns, or other features (e.g., dog parks, sports fields, solar fields, walking trails, etc.) with prior DNR approval. The process for obtaining approval to develop on a landfill is described in several DNR guidance documents (RR-683, RR-684, RR-685), which can be found on the DNR website (Development on Landfills). The DNR recommends discussing proposed plans for any development both within and outside the limits of waste with the staff assigned to your landfill to determine whether the proposed feature is approvable before submitting an application to develop on a landfill.

16 Can I have a mowed, gravel, or wood chipped recreation path on top of the landfill cover?

This is considered developing on a landfill cover and may need approval by the DNR. A main concern with recreational paths or trails is that repeated use may cause damage to the cover overtime. Depending on the intended use of the paths, the DNR may require a maintenance plan for the path. Contact the DNR staff assigned to your landfill for more information prior to implementing these changes.

17 Are there funds available for long-term monitoring and maintenance?

If long-term care funds were set aside for the landfill in an account held by the DNR, you may request reimbursement of those funds from the DNR. However, most landfills this guidance is intended for do not have such funds. There are no other funds available at this time.

18 Can I sell my landfill? Do I need the DNR's approval to sell my landfill or portions of the landfill property?

There are no restrictions against selling a landfill. However, the new owner must maintain the landfill in accordance with Wisconsin Administrative Code and the approved plans for the landfill and may be required to apply to the DNR for a license. In cases where the transference of the license is required, responsibility for the landfill does not transfer to the new owner of the property until they have been issued a license by the DNR. The original owner remains responsible for the landfill regardless of property ownership. Contact DNR staff assigned to your landfill to determine if there is a requirement to transfer the license.

If you plan to subdivide the property, s. NR 506.07(1)(q), Wis. Adm. Code, requires a minimum separation distance of 20 feet between the limits of waste and the adjacent property boundary, so at least 20 feet of property around the landfill must be maintained. Subdividing a landfill property in accordance with NR 506.07(1)(q), Wis. Adm. Code does not need DNR approval. However, the property cannot be subdivided in a way that divides the landfill where waste is present (i.e., splits the waste area into two or more parcels). If the deed of the property includes a requirement to note the presence of a landfill on the property, then the deed to each of the subdivided properties must be revised to reflect the new property boundaries and a deed notification indicating the land has been used as a landfill must be included. Copies of the revised deeds must be provided to the DNR.

19 What are the risks of selling land around the landfill?

Landfill owners are responsible for addressing gas migration and groundwater contamination from landfills they own. Reducing the distance between the limits of waste and property boundary increases the likelihood that gas and groundwater contamination will migrate off the landfill property. Once gas or groundwater contamination migrates off the landfill property, the landfill owner may be required to take action to remediate, depending on concentrations and receptors (e.g., structures built adjacent to the landfill and associated private water supply wells). Note, s. NR 506.07 (1) (q), Wis. Adm. Code, requires a minimum separation distance of 20 feet between the limits of waste and the adjacent property boundary; however, the DNR recommends maintaining an additional buffer around the limits of waste and to keep monitoring devices within the same parcel as the landfill. If the property is subdivided such that any monitoring well becomes located on a different parcel than the landfill property, the monitoring requirements at that well would not change and the landfill owner is still responsible for maintaining the well. Having monitoring wells on a different property may create complications with accessing the monitoring wells. Establishing an easement, or access agreement, to access monitoring devices may help prevent access problems.

20 What are the risks of developing close to a landfill?

Gas migration is common from older unlined landfills. Methane gas will migrate along the path of least resistance and can be present in the ground at a significant distance from the landfill. Methane presents a risk to buildings, particularly enclosed buildings, because it can explode or otherwise fuel a fire at certain concentrations. Methane also causes asphyxiation when present at higher concentrations. Gasses from man-made organic compounds (referred to as volatile organic compounds or VOCs) and hydrogen sulfide is also produced from waste decomposition and present both explosion and health-related concerns. Gas alarms may be needed to monitor for gas levels in buildings. Engineering controls may also need to be installed to prevent gas from accumulating in structures adjacent to landfills.

Groundwater contamination from leachate produced by the landfill may also present a risk to private water supply wells that are used to supply water to developments adjacent to a landfill.

The DNR's guidance document *Development At Historic Fill Sites And Licensed Landfills: Considerations And Potential Problems (RR-685)* provides additional information on the risks of developing on or near a landfill.

21 What will my responsibilities be if I purchase a landfill or become a co-owner of a landfill?

The monitoring and maintenance responsibilities transfer to the new property owner in accordance with s. 289.46, Wis. Stats. In addition, the property transfer may require transfer of a license. Contact DNR staff assigned to your landfill for steps on how to complete a license transfer.

If you purchase property with a landfill on it, or any portion of a landfill on it, you will be responsible for maintaining the portion of the landfill you own and all associated monitoring devices for monitoring. Environmental monitoring needs to be completed by someone who is trained and knowledgeable to perform the monitoring. Landfill owners typically hire an environmental consulting firm that has staff who are educated and trained on how to properly collect samples and take measurements. The cost of environmental monitoring depends on the number of devices and substances that need to be monitored. A list of environmental consultants is available on the DNR website by searching for "Environmental Services Contractor List." Costs for sampling can be obtained by contacting a contractor for an estimate.

22 What does a leachate seep look like and what do I do if I observe one at my landfill?

Leachate seeps are liquid that comes out of a landfill side slope or at the base (or toe) of the landfill. The liquid is usually orange or rust-colored, but can be other colors depending on the waste type. A leachate seep creates a potential hazard and must be addressed immediately. Report the seep to the DNR through the spills hotline **(1-800-943-0003)** or by notifying the DNR staff assigned to your landfill. Actions for addressing may include:

Photos 31: *Leachate seep on side slope of landfill.*

- Covering the seep location with fine-grained soil, such as silt or clay, and observe the area at least once a day for several weeks to see if the soil contains the seep.
- Removing the stained soil under the guidance of a professional engineer and disposing of it at an authorized solid waste disposal facility. Stained soil should be stockpiled on plastic tarps and covered with additional tarps (or placed directly in soil roll off containers that are covered when waste is not being added or removed) until analytical testing is complete, and the soil is accepted for disposal at a licensed landfill.
- Determining and eliminating the source if the seep reoccurs over time.
- Contacting a professional engineer for consultation on how to address the seep.

Contact DNRWasteMaterials@wisconsin.gov for further information.

Disclaimer: This document is intended solely as guidance and does not contain any mandatory requirements except where requirements found in statute or administrative rule are referenced. Any regulatory decisions made by the Department of Natural Resources in any matter addressed by this guidance will be made by applying the governing statutes and administrative rules to the relevant facts.

Equal Opportunity Employer and Americans with Disabilities Act Statement: The Wisconsin Department of Natural Resources provides equal opportunity in its employment, programs, services, and functions under an Affirmative Action Plan. If you have any questions, please write to Chief, Public Civil Rights, Office of Civil Rights, U.S. Department of the Interior, 1849 C. Street, NW, Washington, D.C. 20240.

This publication is available in alternative format (large print, Braille, etc.) upon request. Please call 608-266-2111 for more information. Note: If you need technical assistance or more information, call the Accessibility Coordinator at 608-267-7490 / TTY Access via relay – 711.