



January 7, 2026

Nathan Coller
Sr. Hydrogeologist
Wisconsin Department of Natural Resources
810 W. Maple Street
Spooner, WI 54801-1255

Re: Timberline Trail Recycling & Disposal Facility
Feasibility Report Addendum No. 1 – Proposed Northern Expansion No. 2
Weyerhaeuser, Wisconsin
WDNR License No. 03455 FID No. 855040230

Dear Mr. Coller,

On behalf of Waste Management of Wisconsin, Inc. (WMWI), Cornerstone Environmental Group - a Tetra Tech Company (Tetra Tech) is pleased to submit to the Wisconsin Department of Natural Resources (WDNR) Addendum No. 1 to the Feasibility Report and Plan Set (FR) for the proposed Northern Expansion No. 2 of the Timberline Trail Recycling and Disposal Facility (TTRDF). Addendum No. 1 to the FR was prepared in accordance with Wisconsin Administration Code NR 512. At your request, one (1) hard copy will be shipped via UPS to your office and an electronic copy of Addendum No. 1 to the FR has been uploaded to the WDNR provided Box.com account for your review. Additional copies of Addendum No. 1 to the FR have been distributed according to the attached distribution list.

WMWI is requesting that the WDNR review and approve the FR. To facilitate the WDNR's review, we are available to meet with you to discuss the contents of the FR and Addendum No. 1. Please feel free to call Teri Daigle at (630) 410-7231 with any questions regarding the FR and Addendum No. 1.

Please send the WDNR's review fee invoice to Waste Management of Wisconsin, Inc.

Delivery receipts for the transmittal of Addendum No. 1 to the FR to the municipalities and the library will be forwarded to the WDNR upon their return to Tetra Tech.

Sincerely,

CORNERSTONE ENVIRONMENTAL GROUP, LLC – A TETRA TECH COMPANY

A handwritten signature in blue ink that reads 'Teri Daigle'.

Teri Daigle
Sr. Project Manager

Enclosure: Addendum No. 1 to the Feasibility Report – Timberline Trail RDF - Northern Expansion No. 2

cc: Per the attached distribution list

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Northern Expansion No. 2 – Feasibility Report Addendum No. 1
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Feasibility Report – Addendum No. 1

Timberline Trail Recycling & Disposal Facility Northern Expansion No. 2

January 2026

209-4261078

PREPARED FOR

Waste Management of Wisconsin, Inc.
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REPORT CERTIFICATION

**Feasibility Report Addendum No. 1
Timberline Trail RDF – Northern Expansion No. 2
Weyerhaeuser, Wisconsin**

I, Lucas R. Specketer, hereby certify that I am a licensed professional geologist in the State of Wisconsin in accordance with the requirements of ch. GHSS 2, Wis. Adm. Code; that the preparation of this document has not involved any unprofessional conduct as detailed in ch. GHSS 5, Wis. Adm. Code; and that, to the best of my knowledge, all information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 500 to 538, Wis. Adm. Code.



Lucas R. Specketer, P.G.
Wisconsin P.G. No. G-1400

I, Cody Lee Daigle, hereby certify that I am a licensed professional engineer in the State of Wisconsin in accordance with the requirements of ch. A-E 4, Wis. Adm. Code; that this document has been prepared in accordance with the Rules of Professional Conduct in ch. A-E 8, Wis. Adm. Code; and that, to the best of my knowledge, all information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 500 to 538, Wis. Adm. Code.



Cody Lee Daigle, P.E.
Wisconsin P.E. No. 46222-6

TABLE OF CONTENTS

1.0 BACKGROUND1

2.0 RESPONSES TO THE WDNR’S COMMENTS2

 2.1 PART A. INFORMATION NEEDED TO COMPLETE THE FEASIBILITY REPORT2

 2.2 PART B. ADDITIONAL INFORMATION REQUIRED FOR A FEASIBILITY DETERMINATION 12

3.0 RECOMMENDATION 14

4.0 LIMITATIONS..... 15

APPENDICES

- Appendix A1: Correspondence
- Appendix B1: Revised Tables
- Appendix C1: Leachate Treatment Letters
- Appendix D1: Compliance Letter
- Appendix E1: Pipe Strength Calculation
- Appendix F1: Alternative Final Cover Calculations
- Appendix G1: Farmland Classification Map

1.0 BACKGROUND

Waste Management of Wisconsin, Inc. (WMWI) submitted a Feasibility Report (FR) to the Wisconsin Department of Natural Resources (WDNR) dated August 19, 2025 for a proposed Northern Expansion No. 2 of the existing Timberline Trail Recycling and Disposal Facility (TTRDF). The FR included information required to determine the feasibility for the proposed Northern Expansion No. 2 of the TTRDF (WDNR License No. 3455, FID No. 855040230). Following the initial review of the FR, the WDNR issued an Incompleteness Determination of the FR to WMWI dated November 10, 2025 (Appendix A1). The WDNR letter contained comments in two separate sections – Parts A and B.

This Addendum contains responses that address the seven items in Part A – Information Required to Complete the Feasibility Report, so that the WDNR can deem the Feasibility Report Complete and continue with their review of the Feasibility Report for the proposed Northern Expansion No. 2. Additionally, this Addendum contains responses to the seven items in Part B – Additional Information Required for a Feasibility Determination.

2.0 RESPONSES TO THE WDNR'S COMMENTS

The WDNR's Letter of Incompleteness dated November 10, 2025 (Appendix A1) is divided into two parts: Part A contains a list and explanation of the items needed to determine completeness of the FR in accordance with Chapter 289 of the statutes, and chs. 500, 504, 507 and 512, Wis. Adm. Code; Part B is a description of additional information required for a feasibility determination.

2.1 PART A. INFORMATION NEEDED TO COMPLETE THE FEASIBILITY REPORT

1. **General submittal requirements [s. NR 512.05, Wis. Adm. Code]:** *The feasibility report must address all department review comments on the initial site report (ISR). The department's ISR opinion states that feasibility report must provide an assessment of the wetland functional values and discuss the significance of the proposed impacts to the wetland functional values. The discussion should focus on possible secondary impacts to the shrub-carr wetland named W-2 (2021) located immediately north of the proposed expansion.*

Response:

The October 1, 2021 Assured Wetland Delineation Report by Heartland Ecological Group, states wetland W-2 is a depressionnal shrub carr / sedge meadow wetland that is an isolated wetland surrounded by agricultural fields. Heartland also noted wetland W-2 showed evidence indicating it has already been impacted by the surrounding agricultural practices. The January 5, 2022 letter from the US Army Corps of Engineers (USACE) stated wetland W-2 is hydrologically isolated and does not support an ecological connection. A summary of wetland W-2 was provided on page 13 of the 2021 Assured Wetland Delineation Report and the "Wetland Determination Data Form" for sampling point P5 (located within W-2) was provided in Appendix C of the 2021 Assured Wetland Delineation Report.

The 2021 Assured Wetland Delineation Report by Heartland Ecological Group and the 2022 USACE letter were provided in Appendix D of the 2025 FR.

As stated in Section 1.4 of the 2025 FR (in response to WDNR Comment 3 from the November 15, 2022 ISR Opinion Letter), there will be no direct impacts to wetland W-2 as the proposed Northern Expansion No. 2 limits of waste were adjusted to avoid wetland W-2. As such, an assessment of the functional values was not performed because no direct impacts are anticipated and secondary impacts are negligible.

Possible secondary impacts (a.k.a., indirect impacts) to wetland W-2 due to the proposed Northern Expansion No. 2 are negligible but could include siltation from runoff of soil during nearby construction activities. The contributing watershed area to wetland W-2 will not be significantly impacted by the proposed Northern Expansion No. 2. Only a very small area (approximately 3,845 sq. ft. of the total 5.7 acres watershed) of the pre-development watershed area will be redirected away from wetland W-2 post-development. This equates to approximately 1.5 percent of the W-2 watershed. Figures Q1 and Q2 provided in Appendix Q of the 2025 FR illustrate pre- and post-development watershed areas. A minimum 50-foot buffer has been provided between wetland W-2 and the limits of construction (proposed northern perimeter berm) for the proposed Northern Expansion No. 2. Providing a buffer as well as implementing best management practices (BMPs) during construction such as installing silt fences or straw bales

between the wetland and construction areas, means there are no measurable impacts anticipated to wetland W-2.

2. **Site-specific geotechnical information [s. NR 512.09, Wis. Adm. Code]:** The feasibility report must include the following information:

- a. *Section NR 512.09 (1) (b), Wis. Adm. Code: For soil borings required as part of the geotechnical investigation, provide a table (or a revised Table 5-1) to include the soil boring depth below the sub-base grade. For those borings outside the footprint the applicable sub-base grade is the elevation of the bottom of the proposed base liner nearest the borehole. If proposing the liner option under s. NR 504.065, Wis. Adm. Code, the bottom of the proposed base liner is the bottom of the 1-foot prepared soil sub-base component.*

Response:

Table 5-1 (Soil Boring and Monitoring Well Inventory) has been revised to include the soil boring depth below the subbase grade or nearest subbase grade for each boring and well. An alternative composite landfill liner design, in accordance with NR 504.065, is no longer being proposed for TTRDF. Revised Table 5-1 is provided in Appendix B1 of this Addendum No. 1.

- b. *Section NR 512.09 (2) (d), Wis. Adm. Code: For those wells chosen as part of the geotechnical investigation, provide a table (or a revised Table 5-1) to indicate those wells that are within 300 feet of the proposed limits of waste and indicate those wells that are within 150 feet of proposed waste limits.*

Response:

Table 5-1 (Soil Boring and Monitoring Well Inventory) has been revised to include a new column listing whether each soil boring is located within the limits of waste, within 150-feet of the limits of waste, or within 300-feet of the limits of waste of the proposed Northern Expansion No. 2. Furthermore, a count of the borings, wells and piezometers that meet the NR 512 requirements and their respective distances from the proposed Northern Expansion No. 2 limits of waste have been added below the summary table for reference. Revised Table 5-1 is provided in Appendix B1 of this Addendum No. 1.

- c. *Section NR 512.09 (6), Wis. Adm. Code: additional requirements for landfills with extended leachate collection lines:*

- i. *Identify the soil borings to be used to meet the requirement of s. NR 512.09 (6) (b), Wis. Adm. Code. The alternative geotechnical investigation program (AGIP) request indicated the soil borings that have or will extend 50 feet below the proposed sub-base grades include B120, MW102, MW202A, MW204A and MW206A. However, because the footprint was reduced since the AGIP, soil boring MW206A is outside of the proposed footprint in feasibility.*

Response:

Soil borings B120, MW102, MW202A and MW204A are located within the proposed Northern Expansion No. 2 limits of waste and were each drilled and sampled at least 50 feet below the proposed subbase grades. Revised Table 5-1 provided in Appendix B1 of this Addendum No. 1 lists the approximate boring depth below subbase (feet) for each boring. Soil borings B120 and MW102 are located within the proposed Phase 10 liner area, soil boring MW202A is located within the proposed Phase 11 liner area, and soil boring MW204A is located within the proposed Phase 12 liner area. These four soil

borings meet the NR 512.09(6)(b) requirements. Soil boring MW206A is no longer included since it is outside the proposed limits of waste.

- ii. *Discuss how the requirements of s. NR 512.09 (6) (b) and (c), Wis. Adm. Code, are met using the geotechnical data collected as part of the AGIP.*

Response:

A minimum of one boring in the area of each proposed liner cell was drilled to physically characterize subbase conditions for landfill foundation assessment of stability and settlement and extended a minimum 50 feet below proposed subbase grades (discussed above in response to WDNR comment 2.c.i.). Bedrock was not encountered in the soil borings drilled for the proposed Northern Expansion No. 2.

An exemption was requested in the March 2023 AGIP to omit collection of standard penetration tests (SPTs) during drilling as SPTs cannot be obtained using sonic drilling methods. Sonic drilling was proposed and utilized for the Northern Expansion No. 2 geotechnical investigation program because there is a very dense and extensive till soil unit that limits the effectiveness of hollow-stem auger and split-spoon samplers. Sonic drilling was utilized for the Northern Expansion No. 1 geotechnical investigation program as well for this same reason. The WDNR accepted this exemption request in the June 13, 2023 acceptance letter of the proposed AGIP for the Northern Expansion No. 2.

Four Shelby-tube samples (B-211, B-214, MW-205 and MW-210) were collected from fine-grained soil units and/or from soft or compressible coarse-grained layers and were submitted for geotechnical testing to define parameters used in assessments of stability and settlement of the liner. As explained in an email from the geotechnical laboratory (Soils & Engineering Services, Inc.) provided in Appendix J and discussed in Subsection 5.2.1 of the 2025 FR, three of the samples contained too much sand to successfully analyze the sample and one of the Shelby tubes was too misshapen to successfully extract the sample for consolidation analysis. Since the soil matrix within the samples or tube condition did not allow for the completion of the consolidation tests, no consolidation analyses data was included in Table 5-2 (Summary of Laboratory Soil Testing Results) from the 2025 FR.

The absence of consolidation data within the proposed Northern Expansion No. 2 footprint does not negate the ability to evaluate settlement and stability of the proposed landfill expansion at TTRDF. The underlying soils below the proposed subbase grades are predominantly very dense till and outwash soil units (coarse-grained soils) that do not experience primary consolidation or secondary compression under load. This is supported by the use of sonic drilling methods at TTRDF which is more effective at drilling through and collecting soil samples in these very dense till soils. Other soil units below the proposed subbase grades include weathered till and lacustrine but their presence is relatively limited. At TTRDF, settlement is controlled almost entirely by the coarse-grained glacial till unit which only will exhibit immediate compression settlement. The consolidation settlement of the limited fine-grained weathered till remaining after subbase excavation was estimated based on (1) the assumption that the soil is normally consolidated, (2) published correlations with Atterberg limits and compression indices (generally conservative), and (3) experience with similar materials. As such, the settlement calculations provide a conservative estimate of the TTRDF subgrade settlement without the need for consolidation testing.

A Geotechnical and Stability Evaluation was included in Appendix T-3 of the 2025 FR that utilized available information gathered during the geotechnical investigation. Stability and settlement will be re-evaluated, as necessary, as part of the Plan of Operation for the proposed Northern Expansion No. 2 as well.

3. **Waste and leachate characterization [s. NR 512.12 (1), Wis. Adm. Code]:** *The feasibility report must adequately address the following:*
- a. *Evaluate high volume industrial wastes and other non-municipal wastes that are anticipated to individually constitute more than 5% of the total proposed design capacity. Information provided in the feasibility report evaluates wastes based on tonnage rather than as volume. Provide justification for conversion factors used in calculating tonnage to volume.*

Response:

Table 6-1 (Waste Tonnages and Composition) from the 2025 FR has been revised to include a conversion factor (density in pounds per cubic yard, lb/cy) for each waste category to evaluate waste categories based on a percent volume basis. Conversion factors for each waste category were obtained from Table 4 (Conversion Factors) of NR 520, Wis. Adm. Code. In accordance with Table 4 of NR 520, waste categories without a designated density were assigned the conversion factor of 300 lb/cy. The conversion factors in Table 4 are used by Wisconsin landfills to convert tonnage data to volume that is reported to the WDNR annually.

Based on the percent by volume calculated on the Revised Table 6-1, Waste Category 6 (All Other Solid Waste, Not Hazardous Waste) is the only industrial or non-municipal waste category with greater than 5% by volume (5.9%, on average from 2019 through 2023). Category 6 waste varies widely and includes items such as asbestos, unused off-spec food, RD&D liquid waste and other special wastes not included in other waste categories. Given the variability of this waste category and therefore wide range of densities of this waste, the assumed density of 300 lb/cy is likely overly conservative; ergo, the percent by volume calculated is likely lower than 5%.

Revised Table 6-1 is provided in Appendix B1 of this Addendum No. 1.

- b. *Section 6.1.1 notes that approximately 11% of waste accepted at Timberline Trail Recycling & Disposal Facility (TTRDF) is made up of special and industrial wastes. Table 6-1 documents a total average of about 9.5% of accepted waste as special and industrial, while section 3.0 of the report notes a 10% estimate for special wastes. Please explain the discrepancy between estimates of waste tonnages.*

Response:

The 11% special and industrial waste composition calculated and reported in Section 6.1.1 of the 2025 FR was based on Table 6-1 tonnage data and included waste categories 2, 6, 19, 21, 23, 24, 27 and 33. The cover soil waste categories (19, 21 and 23) should not have been included in the special and industrial waste composition. The construction and demolition (C&D) waste category (25) should have been included. Based upon these corrections, the average percent special and industrial waste composition is 9.5%.

Section 3.0 of the 2025 FR reported 90% for municipal solid waste (MSW) (including C&D waste) and 10% for special waste composition (including industrial waste and contaminated soil). These values are based on Table 6-1 tonnage data as well but waste categories were organized slightly differently than those reported in Section 6.0. MSW and C&D wastes are generally anticipated to be 90% of the waste composition, by weight (85-90% for MSW and 1-2% for C&D). The

remainder of waste is 10% and includes all other waste categories. Anticipated waste types and characteristics listed in Section 3.0 would be more accurate if revised to “MSW and C&D” and “Industrial, Special and Cover Soil” descriptions.

4. **Constraints on landfill development [s. NR 512.13, Wis. Adm. Code]:** *The feasibility report must contain the following information:*

a. *Section NR 512.13 (1), Wis. Adm. Code:*

- i. *Sections 1.4, 7.2 and 10.3.2 indicate a protective area of 50 feet between the boundary of wetland W-2 (2021) and the limits of construction (proposed northern perimeter berm). However, in Appendix D of the feasibility report, the Assured Wetland Delineation Report by Heartland Ecological Group dated October 1, 2021, Table 2 and Section 3.3 identify a protective area of 75 feet for wetland W-2. Please explain the discrepancy between the setback distance mentioned in the Heartland report dated Oct. 1, 2021 and the setback mentioned elsewhere in the feasibility report.*

Response:

The proposed setback between wetland W-2 and the limits of construction for the proposed Northern Expansion No. 2 perimeter berm is 50-feet. A Protective Area as specified in NR 151 is not the same thing as a setback. A Protective Area does not prohibit development within the area, rather these areas stipulate that any proposed impervious surfaces that generate stormwater within these areas have stormwater treatment prior to discharge. There are no impervious surfaces proposed within the Protective Area of wetland W-2.

The October 1, 2021 Assured Wetland Delineation Report by Heartland Ecological Group, states wetland W-2 is a depressionnal shrub carr / sedge meadow wetland that is an isolated wetland surrounded by agricultural fields. Table 2 of the 2021 Assured Wetland Delineation Report lists the potential wetland protective areas per NR 151 for each wetland identified based on Heartland’s professional opinion.

NR 151 covers “Runoff Management” regulations and NR 151.125 specifically covers the protective areas performance standard. According to NR 151.125, the protective area for highly susceptible wetlands is 75 feet and a sedge meadow wetland is considered a highly susceptible wetland.

- ii. *Section 7.5.2 identifies the source of nitrate+nitrite (as nitrogen) in groundwater monitoring well MW-107 and attribute the NR 140 Enforcement Standard exceedance to the temporary storage of commercial fertilizer leaching into groundwater. Please indicate the approximate dates when the fertilizer was stored at and removed from this location. If dates are not known, please indicate the estimated duration when fertilizer was stored at the location. Provide approximate quantity or volume of material stored at and removed from this location.*

Response:

A detailed historical search into the probable source of the nitrate+nitrite exceedances observed in groundwater monitoring well MW107 was performed by WMWI in fall of 2023. The investigation included reviewing aerial and historical photographs, historical reports and interviewing employees. WMWI discovered a map from a 2003 Tier 2 Report for TTRDF showing “fertilizer storage” located along the shoulder of the access road above the North Sedimentation Basin and upslope of MW107. Historical site photographs

in 2003 show pallets of fertilizer stored directly upslope from MW107 from approximately 2003 – 2007. The facility used to use diammonium phosphate fertilizer as part of a process of bioremediating petroleum contaminated soils. The facility no longer adds fertilizer to biopiles and there has been no fertilizer stored on site since 2007. The fertilizer was in sealed plastic bags stacked on pallets but there is the potential that a bag could have been damaged while they were being stored. Based on photographs, it appears there were up to four pallets of fertilizer stored at the location during its use. Four pallets of fertilizer equates to approximately 24,000 pounds of material.

- b. *Section NR 512.13(3), Wis. Adm. Code. Provide an evaluation of the capability of the wastewater treatment plant (WWTP) identified in the feasibility report to treat the anticipated quality and quantity of leachate from TTRDF and the proposed Northern Expansion No. 2. The department would accept a letter from the WWTP that describes whether the WWTP would accept leachate in terms of anticipated quality and quantity from the proposed expansion.*

Response:

WMWI submitted letters to the Rice Lake Utilities, City of Medford and Metropolitan Council Environmental Services (MCES) WWTPs along with Table P-1 (Analytical Data Summary Table – Leachate Sample Point LST-01 (2021-2024)) of the 2025 FR. The letters notified the WWTPs of the proposed Northern Expansion No. 2 and discussed the anticipated leachate quality and quantity. A response letter from each of the WWTPs was requested confirming the provided data was reviewed and a statement confirming the WWTP will consider accepting the quality and quantity (even if partially) of leachate from TTRDF. Copies of these letters are provided in Appendix C1 of this Addendum No. 1. To date, no response letters have been received.

TTRDF has had a long-standing history with Rice Lake Utilities. Leachate from TTRDF has been hauled to Rice Lake Utilities since waste disposal operations began at this Site. Leachate has also been hauled to the City of Medford WWTP for an extended period of time. WMWI expects these relationships with Rice Lake Utilities and the City of Medford will continue, even without formal agreements.

Furthermore, WMWI has an active and current agreement with MCES (Industrial Discharge Permit (Special Discharges) Number 2295) that was provided in Appendix P of the 2025 FR.

5. ***Proposed preliminary design [s. NR 512.14, Wis. Adm. Code]: The feasibility report must contain a proposed preliminary design in accordance with ch. NR 504, Wis. Adm. Code:***

- a. *Section NR 504.065 (4), Wis. Adm. Code. If proposing an alternative liner design, the feasibility report must contain the information to satisfy the requirements of s. NR 504.065, Wis. Adm. Code. The feasibility report must discuss the 1-foot soil sub-base layer component and the plan sheet 26 detail 3 must show the 1-foot soil sub-base component. For proposed alternative liner option, provide a plan sheet showing the sub-base grades, and if necessary, revised geologic cross sections.*

Response:

An alternative liner, in accordance with NR 504.065, is no longer being proposed for the Northern Expansion No. 2 at TTRDF; thus, no drawings are being revised from the 2025 FR plan set.

- b. *Section 1.3 of the feasibility report requests an exemption from s. NR 504.07(4)(a), Wis. Adm. Code, pertaining to the requirements for utilizing geosynthetic clay liner (GCL) in the final cover system design.*

- i. *Based on conversations with the facility, the department believes the exemption request is related to the soil barrier layer soils specifications in s. NR 504.07(4)(a)12., Wis. Adm. Code. If this is correct, the department intends to hold the facility to the minimum soil barrier layer specifications in s. NR 504.07(4)(a)12., Wis. Adm. Code. If the facility wishes to adhere to more stringent soil specification, an exemption is not required to do so. The soil barrier layer soil specifications should be discussed in the feasibility report at this time and can be further outlined in the construction quality assurance plan at a future time.*
- ii. *If the facility is requesting an alternative or specifications that are less stringent to the soil barrier layer depth outlined in s. NR 504.07(4)(a), Wis. Adm. Code, or any subsection thereof, an alternative final cover design needs to be proposed under s. NR 504.073, Wis. Adm. Code.*

Response:

The 2025 FR requested the currently approved soil barrier layer soil requirements be maintained for the remaining open areas and proposed Northern Expansion No. 2 final cover. The currently approved soil barrier layer soil requirements are listed in Condition 15 of the June 7, 2002 Plan of Operation approval issued by the WDNR.

The 2002 approval Condition 15.a. states, “The upper one-foot of the soil barrier layer shall be composed of either a fine-grained or a well graded sandy soil with fines, with a maximum particle diameter less than one inch and meeting the criteria for USCS soil types ML, CL, CH, SM or SC with at least 80% by weight passing the No. 60 screen and a P200 content of 40% or greater.”

The 2002 approval condition is slightly different from the soil barrier layer soil requirements listed in NR 504.07(4)(a)12 and allow on-site soil materials to be used for the lower and upper soil barrier layers. On-site soil which has been previously used for final cover consists of Glacial Till and Loess. Loess has been used as the upper one-foot of barrier soil and Glacial Till has been used as the lower one-foot. On-site soils would not meet the 25% by weight passing the P200 sieve size requirement in NR 504.07(4)(a)12. There were no requirements for the lower one-foot soil barrier layer listed in the 2002 approval letter. However, the Plan of Operation submitted by RMT, Inc. to the WDNR in June 2001 for the Northern Expansion No. 1 incorporated the lower one-foot soil barrier layer with the 6-inch thick grading layer below it so the grading layer is 18-inches thick of general fill soils that meet or exceed the requirements specified in the site’s Construction Quality Assurance (CQA) Plan.

Since the submittal of the 2025 FR, the NR 500 code was updated in September 2025 that includes allowance for an alternative final cover design. Hence, an alternative final cover design is being proposed for the remaining open areas and proposed Northern Expansion No. 2 final cover areas at TTRDF in accordance with NR 504.073 that will continue to allow the use of on-site soils as the soil barrier layer in the final cover system.

The previously approved/proposed alternative final cover system consists of the following (from bottom to top):

- 6-inch grading layer
- 2-foot soil barrier layer (2002 Condition 15a requirements)
- Geosynthetic clay liner (GCL)
- 40-mil LLDPE textured geomembrane

- 6 oz/sy double sided geocomposite
- 2.5-foot rooting zone
- 6-inch topsoil

The following describes the requirements of NR 504.073, the proposed alternative final cover system, the evaluation methodology, the parameters used, and the results. This analysis indicates that the proposed alternative final cover system reduces infiltration compared with the standard cover and satisfies the other requirements in NR 504.073.

In accordance with NR 504.073(1), the proposed alternative final cover design will include the following:

- (a) Grading layer meeting the requirements under NR 504.07(2).
- (b) The permeability of the final cover system shall be no greater than the permeability of the landfill's liner system or 1×10^{-7} cm/sec, whichever is lower.
- (c) The final cover system shall include a layer that achieves an equivalent reduction in infiltration as the layers specified under NR 504.07(4).
- (d) The disruption of the integrity of the final cover system shall be minimized through a design that accommodates settling and subsidence.
- (e) The final cover system shall include an erosion-prevention layer that provides equivalent protection from wind or water erosion as the topsoil layer and vegetation specified under NR 504.07(7) and (8).
- (f) The final cover system shall meet the requirements of NR 504.07(9).

The alternative final cover system must have an equivalent or better reduction in infiltration compared with NR 504.07(4), which specifies the use of a 2-foot clay layer or GCL with a 2-foot barrier soil layer. There are no specific requirements for the underlying soil layer below the GCL in NR 504.073.

Both systems (NR 504.07(4) and NR 504.073) were evaluated based on the leakage estimate suggested by Giroud, et al, which reviews mechanisms and rates of leakage through composite liners, presents analytical and laboratory studies, and draws conclusions for evaluating leakage. The analysis describes two main leakage scenarios – perfect contact (no lateral interface flow) and imperfect contact (allowing lateral flow between geomembrane and soil) – and develops two- and three-dimensional steady-state analytical models, compares numerical and experimental results, and locates best- and worst-case field conditions on leakage-rate graphs to provide guidance for design and assessment of composite liner performance.

The following parameters were used to provide a comparable analysis:

- An average contact coefficient of 0.68 (typical range 0.21 to 1.15)
- Standard hole 1 cm² per acre
- Depth of ponded liquid of 0.25-inch (the thickness of the overlying geocomposite)
- Permeability of 1×10^{-7} cm/s for the clay layer
- Permeability of 5×10^{-9} cm/s for the GCL layer

The construction documents will specify testing on the GCL to confirm the maximum permeability of 5×10^{-9} cm/s. The calculations assumed the permeability of either the clay layer or the GCL dictate the infiltration rate. Since these layers have lower permeability than the underlying soils,

any infiltration would theoretically pass through the underlying layers. Therefore, the results provide an infiltration rate based strictly on these layers and do not account for any layers that would lie below.

The proposed alternative final cover system utilizing GCL had an estimated infiltration of 0.27 gallons/day. The 2-foot clay layer, as specified in NR 504.07(4), had an estimated infiltration of 1.36 gallons/day. These estimates assume that the overlying geocomposite layer is sufficient to handle infiltration from the above soil layers (rooting zone and topsoil).

The proposed alternative final cover system will include two feet of soil below the GCL. This soil will provide the same minimization of disruption to the integrity of the final cover system. In addition, the proposed alternative final cover system includes the prescribed overlying soil (rooting zone), topsoil and vegetation to address erosion.

Based on the alternative final cover requirements, the permeability of the liner system must be less than or equal to 1×10^{-7} cm/s and provide equivalent or better infiltration reduction. The permeability and infiltration of the proposed alternative final cover system using a GCL liner, 5×10^{-9} cm/s and 0.27 gallons/day, respectively, is lower (i.e. more conservative) than the rule requires. Therefore, the proposed use of on-site Loess as the upper one-foot and Glacial Till as the lower one-foot of the soil barrier layer will exceed the requirements of NR 504.073.

The supporting calculations for permeability and infiltration are provided in Appendix F1 of this Addendum No. 1.

6. **Environmental review [s. NR 512.16, Wis. Adm. Code]:** Requires the following information be submitted for determining the need for an environmental impact report.

- a. *Section NR 512.16 (1), Wis. Adm. Code. The listing of the statutory authority as shown in the table in section 10.1.2 of the feasibility report identifies Wisconsin Acts 31 and 93 and 1989 Wisconsin Act 335. Please revise the table to refer to the applicable statute and/or code rather than the legislative acts.*

Response:

The statutory authority table shown in Section 10.01.2 of the 2025 FR has been revised to refer to the applicable statute and/or code rather than the legislative acts. The revised table is provided in Appendix B1 of this Addendum No. 1.

- b. *Section NR 512.16(3)(b), Wis. Adm. Code. Provide a description of the hydraulic (or hydrologic) value of wetlands, specifically wetland W-2 (2021) as identified on Figure 1-2 Existing Conditions in the feasibility report. Regarding the hydrologic value, summarize the quality of the wetland as it relates to its functional values or uses in terms of human use values, animal and plant life habitat, flood protection and stormwater storage, groundwater recharge or discharge through the wetland, shoreland protection and ability to protect water quality.*

Response:

Wetland W-2 is hydrologically isolated from other surface waters. Refer to the first two paragraphs of the response to WDNR Comment 1 for a description and background information on wetland W-2.

Wetland W-2 has no human use value as it is surrounded entirely by agricultural fields. Given that it is a shrub carr / sedge meadow wetland, it likely does support some animal and plant life habitat but given its isolation, relatively small size (1.23 acres) and proximity to larger and connected woodlands, forest and streams, does not play a critical role in sustaining animal and

plant life habitat in the area. Wetland W-2 is isolated, small in size and not within a floodplain so it likely does not provide any significant flood protection or storm water storage. The water table elevations from nearby water table wells range from approximately 1,138 to 1,142 feet above mean sea level while wetland W-2 is located at approximately 1,230 feet above mean sea level, which is approximately 90 feet above the water table. The soil profile description on the “Wetland Determination Data Form” for sampling point P5 (located within W-2) lists “mucky loam/clay” and “silt loam” for upper two feet of soil. The substantial depth to groundwater, the finer-grained soils in the upper two feet of the wetland W-2 and small area indicate wetland W-2 does not provide a source of groundwater recharge or discharge through the wetland. It is not located near a stream or creek and therefore irrelevant in providing shoreland protection benefits. Wetland W-2 may provide some ability to protect water quality; particularly since it receives runoff from the surrounding agricultural practices.

- c. *Section NR 512.16(4)(e), Wis. Adm. Code. Provide supporting documentation that the landfill expansion will not impact Prime Farmland Land as stated in section 10.4.5 of the feasibility report.*

Response:

According to the Natural Resources Conservation Service (NRCS), prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, forestland, or other land, but it is not urban or built-up land or water areas. The soil quality, growing season, and moisture supply are those needed for the soil to economically produce sustained high yields of crops when proper management, including water management, and acceptable farming methods are applied. In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, an acceptable salt and sodium content, and few or no rocks. The water supply is dependable and of adequate quality. Prime farmland is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing season or is protected from flooding. Slope ranges mainly from 0 to 6 percent.

A map was generated using the NRCS web soil survey tool online that shows farmland classifications on the TTRDF property. The soil unit within the proposed Northern Expansion No. 2 footprint is Magnor (Map ID 3456B) that could be prime farmland if drained. The agricultural fields north of the existing TTRDF do not have drain tile or other infrastructure to promote drainage. Hence, the existing agricultural fields are not drained and therefore cannot be classified as prime farmland. The Farmland Classification map and associated legend pages are provided in Appendix G1 of this Addendum No. 1.

7. ***Noncompliance with plans or orders [s. NR 512.19, Wis. Adm. Code]:*** *The feasibility report must identify all other Wisconsin solid or hazardous waste facilities which are owned by Waste Management Holdings, Inc. (WMH), in which the applicant (WMWI) owns or previously owned a 10% or greater legal or equitable interest or a 10% or greater interest in the assets and include a statement indicating whether or not all plan approvals and orders relating to all identified facilities are being complied with.*

Response:

WMWI provided a letter in response to WDNR Comment 7. The November 25, 2025 letter from WMWI is provided in Appendix D1 of this Addendum No. 1.

2.2 PART B. ADDITIONAL INFORMATION REQUIRED FOR A FEASIBILITY DETERMINATION

1. Section 9 states, “Additional soil barrier layer soils may be required from the area north of the currently proposed 29.0-acre horizontal footprint but within the previously reviewed 41-acre horizontal footprint area.”

Please be advised that only the soil borrow area within the currently proposed 29-acre footprint expansion would meet the exemption eligibility of s. NR 504.075 (2) (b), Wis. Adm. Code, regardless of the department’s initial site inspection opinion for the previously proposed 41-acre landfill footprint. The wetland W-2 is in the area north of the currently proposed 29-acre landfill footprint. For use as a soil borrow, this area would be subject to the requirements of s. NR 504.075, Wis. Adm. Code, including meeting the performance standards of s. NR 504.04 (4), Wis. Adm. Code. Written department approval would be required for use as soil barrier layer from this borrow source.

Response:

WMWI acknowledges that only the soil borrow area within the currently proposed 29-acre footprint of the Northern Expansion No. 2 would meet the exemption eligibility of NR 504.075(2)(b). If needed, WMWI will submit a Plan Modification request to pursue additional soil borrow area outside of the proposed Northern Expansion No. 2 footprint area in accordance with NR 504.075 requirements.

2. Section NR 504.06 (5) (c), Wis. Adm. Code, requires the minimum inside diameter of leachate collection pipes to have an inside diameter of 6 inches. Appendix T-1A of the feasibility report includes calculations for settlement of the 6-inch leachate transfer piping. Assumption 2 appears to indicate that the 6-inch value is used as the outer diameter. Clarify whether the 6-inch diameter is used for the outer or inner dimensions of the pipe, and if calculations have been performed with the 6-inch outer, then revise with 6-inch inner diameter.

Response:

The leachate collection pipes within the proposed Northern Expansion No. 2 liner area will be revised from 6-inch to 8-inch SDR 11 HDPE pipe during the development of the Plan of Operation report to meet the new inside diameter of 6-inches requirement per NR 504.06(5)(c). A pipe strength calculation for an 8-inch SDR 11 HDPE pipe (T-1C) is provided in Appendix E1 of this Addendum No. 1 and shows the pipe will maintain its integrity under the anticipated worst-case overburden conditions. Pipe strength calculation T-1C augments the pipe strength calculations previously provided in Appendix T of the 2025 FR. The 8-inch leachate collection pipes will be incorporated in the Plan of Operation report, appendices and plan set for the proposed Northern Expansion No. 2.

3. Section 6.2 of the feasibility report discusses that leachate quality data was obtained from the department’s Groundwater and Environmental Monitoring System (GEMS). In accordance with s. NR 507.26, Wis. Adm. Code, the department will be requiring per- and polyfluoroalkyl substances (PFAS) data be submitted to GEMS for inclusion in the leachate quality analysis for the proposed expansion. Based on a section 6.3 of the feasibility report, the department understands that PFAS sampling in leachate has occurred at this landfill.

Response:

WMWI acknowledges that PFAS regulations are evolving, and the facility will comply with future WDNR requirements.

4. *In an effort to continue monitoring groundwater levels across the site (and to have the wells routinely inspected and not sit idle), the department requests that the semiannual water level measurements at the newly constructed groundwater monitoring wells continue for the duration of the department's review of the proposed Northern Expansion No. 2 and to report the data electronically to the department's GEMS database in accordance with ss. NR 507.18 and NR 507.26 (3), Wis. Adm. Code. Semiannual water level measurements at the new wells can be conducted with the routine detection monitoring for the existing landfill.*

Response:

WMWI will continue collecting water level measurements at the Northern Expansion No. 2 water table wells and piezometers during routine semiannual detection monitoring events at TTRDF. Water level measurements at these wells will continue throughout the duration of the WDNR's review of the proposed Northern Expansion No. 2 and the data will be reported electronically to GEMS.

5. *As a reminder, chemical oxygen demand (COD) is no longer required to be monitored as part of the environmental monitoring plan for the proposed expansion in accordance with the ch. NR 507, Appendix I, Wis. Adm. Code.*

Response:

COD will be removed from the proposed Environmental Monitoring Program for the Northern Expansion No. 2 and will be reflected as such in the Plan of Operation.

6. *Please be aware that revisions/amendments to the Storm Water Pollution Prevention Plan (SWPPP) may be necessary for the proposed expansion. Please contact the storm water specialist, John Eaton, at john.eaton@wisconsin.gov or 715-491-4092.*

Response:

The storm water management system for the proposed Northern Expansion No. 2 will be designed as part of the Plan of Operation. The SWPPP will be updated to incorporate the proposed storm water management system and included with the Plan of Operation.

7. *Please be aware that a new air permit and/or permit revision from the air management program may be necessary for the proposed expansion. Please contact the air management program engineer, John Eide, at john.eide@wisconsin.gov or 715-492-0865.*

Response:

The air pollution control construction permit (Construction Permit No. 24-MIN-260) and operation permit (Operation Permit No. 85504023A-P40) was issued by the WDNR on July 1, 2025. The issued permit incorporated the increased design capacity of the TTRDF and expires on July 1, 2030. A copy of the WDNR letter was provided in Appendix B of the 2025 FR. Further update will not be required.

3.0 RECOMMENDATION

WMWI believes that the responses presented in this Addendum satisfactorily address the additional information requested by the WDNR in their Incompleteness Letter dated November 10, 2025. The contents of this document allow the WDNR to complete the remaining portions of the feasibility review process in a timely manner to issue a completeness determination.

4.0 LIMITATIONS

The work product included in the attached was undertaken in full conformity with generally accepted professional consulting principles and practices and to the fullest extent as allowed by law we expressly disclaim all warranties, express or implied, including warranties of merchantability or fitness for a particular purpose. The work product was completed in full conformity with the contract with our client and this document is solely for the use and reliance of our client (unless previously agreed upon that a third party could rely on the work product) and any reliance on this work product by an unapproved outside party is at such party's risk.

The work product herein (including opinions, conclusions, suggestions, etc.) was prepared based on the situations and circumstances as found at the time, location, scope and goal of our performance and thus should be relied upon and used by our client recognizing these considerations and limitations. Cornerstone Environmental Group, LLC - A Tetra Tech Company shall not be liable for the consequences of any change in environmental standards, practices, or regulations following the completion of our work and there is no warrant to the veracity of information provided by third parties, or the partial utilization of this work product.

APPENDIX A1: CORRESPONDENCE

WDNR Incompleteness Determination for the Feasibility Report for the Timberline Trail Recycling and Disposal Facility Proposed Northern Expansion No. 2, dated 11/10/2025



November 10, 2025

Tina Hultman
WM Timberline Trail Landfill
N4581 Hutchinson Rd
Weyerhaeuser, WI 54895
thultman@wm.com

FID 855040230
Rusk County
SW / Correspondence

Subject: Incompleteness Determination for the Feasibility Report for the Timberline Trail Recycling and Disposal Facility Proposed Northern Expansion No. 2

Dear Ms. Hultman:

The Department of Natural Resources (department) has reviewed for completeness the report entitled “Timberline Trail Recycling & Disposal Facility Feasibility Report Proposed Northern Expansion No. 2” dated August 19, 2025, submitted by Tetra Tech on behalf of Waste Management of Wisconsin, Inc. (WMWI). The department received the report on August 20, 2025. Based on the report review, the department has determined that the feasibility report does not contain the minimum information required by chs. NR 504, NR 507 and NR 512, Wis. Adm. Code, and ch. 289, Wis. Stats. Therefore, the report is not complete.

Part A below lists the items needed to determine the report is complete. Part B below provides comments and information the department wishes to share with you regarding the proposal. In your response, please include the information listed in part A and any additional information to address items listed in part B as an addendum to the feasibility report. This information is intended for use by the public as well as the department in reviewing the proposed project. Be sure to provide a copy of all information submitted to the department to each recipient of the feasibility report as required by s. 289.23 (4), Wis. Stats.

A. The following information must be provided for the department to issue a determination that the feasibility report is complete:

1. **General submittal requirements [s. NR 512.05, Wis. Adm. Code]:** The feasibility report must address all department review comments on the initial site report (ISR). The department’s ISR opinion states that feasibility report must provide an assessment of the wetland functional values and discuss the significance of the proposed impacts to the wetland functional values. The discussion should focus on possible secondary impacts to the shrub-carr wetland named W-2 (2021) located immediately north of the proposed expansion.
2. **Site-specific geotechnical information [s. NR 512.09, Wis. Adm. Code]:** The feasibility report must include the following information:
 - a. Section NR 512.09 (1) (b), Wis. Adm. Code: For soil borings required as part of the geotechnical investigation, provide a table (or a revised Table 5-1) to include the soil boring depth below the sub-base grade. For those borings outside the footprint the applicable sub-base grade is the elevation of the bottom of the proposed base liner nearest the borehole. If proposing the liner option under s. NR 504.065, Wis. Adm. Code, the bottom of the proposed base liner is the bottom of the 1-foot prepared soil sub-base component.

- b. Section NR 512.09 (2) (d), Wis. Adm. Code: For those wells chosen as part of the geotechnical investigation, provide a table (or a revised Table 5-1) to indicate those wells that are within 300 feet of the proposed limits of waste and indicate those wells that are within 150 feet of proposed waste limits.
 - c. Section NR 512.09 (6), Wis. Adm. Code: additional requirements for landfills with extended leachate collection lines:
 - i. Identify the soil borings to be used to meet the requirement of s. NR 512.09 (6) (b), Wis. Adm. Code. The alternative geotechnical investigation program (AGIP) request indicated the soil borings that have or will extend 50 feet below the proposed sub-base grades include B120, MW102, MW202A, MW204A and MW206A. However, because the footprint was reduced since the AGIP, soil boring MW206A is outside of the proposed footprint in feasibility.
 - ii. Discuss how the requirements of s. NR 512.09 (6) (b) and (c), Wis. Adm. Code, are met using the geotechnical data collected as part of the AGIP.
3. **Waste and leachate characterization [s. NR 512.12 (1), Wis. Adm. Code]:** The feasibility report must adequately address the following:
- a. Evaluate high volume industrial wastes and other non-municipal wastes that are anticipated to individually constitute more than 5% of the total proposed design capacity. Information provided in the feasibility report evaluates wastes based on tonnage rather than as volume. Provide justification for conversion factors used in calculating tonnage to volume.
 - b. Section 6.1.1 notes that approximately 11% of waste accepted at Timberline Trail Recycling & Disposal Facility (TTRDF) is made up of special and industrial wastes. Table 6-1 documents a total average of about 9.5% of accepted waste as special and industrial, while section 3.0 of the report notes a 10% estimate for special wastes. Please explain the discrepancy between estimates of waste tonnages.
4. **Constraints on landfill development [s. NR 512.13, Wis. Adm. Code]:** The feasibility report must contain the following information:
- a. Section NR 512.13 (1), Wis. Adm. Code:
 - i. Sections 1.4, 7.2 and 10.3.2 indicate a protective area of 50 feet between the boundary of wetland W-2 (2021) and the limits of construction (proposed northern perimeter berm). However, in Appendix D of the feasibility report, the Assured Wetland Delineation Report by Heartland Ecological Group dated October 1, 2021, Table 2 and Section 3.3 identify a protective area of 75 feet for wetland W-2. Please explain the discrepancy between the setback distance mentioned in the Heartland report dated Oct. 1, 2021 and the setback mentioned elsewhere in the feasibility report.
 - ii. Section 7.5.2 identifies the source of nitrate+nitrite (as nitrogen) in groundwater monitoring well MW-107 and attribute the NR 140 Enforcement Standard exceedance to the temporary storage of commercial fertilizer leaching into groundwater. Please indicate the approximate dates when the fertilizer was stored at and removed from this location. If dates are not known, please indicate the estimated duration when fertilizer was stored at the location. Provide approximate quantity or volume of material stored at and removed from this location.
 - b. Section NR 512.13(3), Wis. Adm. Code. Provide an evaluation of the capability of the wastewater treatment plant (WWTP) identified in the feasibility report to treat the anticipated quality and quantity of leachate from TTRDF and the proposed Northern Expansion No. 2. The

department would accept a letter from the WWTP that describes whether the WWTP would accept leachate in terms of anticipated quality and quantity from the proposed expansion.

5. **Proposed preliminary design [s. NR 512.14, Wis. Adm. Code]:** The feasibility report must contain a proposed preliminary design in accordance with ch. NR 504, Wis. Adm. Code:
 - a. Section NR 504.065 (4), Wis. Adm. Code. If proposing an alternative liner design, the feasibility report must contain the information to satisfy the requirements of s. NR 504.065, Wis. Adm. Code. The feasibility report must discuss the 1-foot soil sub-base layer component and the plan sheet 26 detail 3 must show the 1-foot soil sub-base component. For proposed alternative liner option, provide a plan sheet showing the sub-base grades, and if necessary, revised geologic cross sections.
 - b. Section 1.3 of the feasibility report requests an exemption from s. NR 504.07(4)(a), Wis. Adm. Code, pertaining to the requirements for utilizing geosynthetic clay liner (GCL) in the final cover system design.
 - i. Based on conversations with the facility, the department believes the exemption request is related to the soil barrier layer soils specifications in s. NR 504.07(4)(a)12., Wis. Adm. Code. If this is correct, the department intends to hold the facility to the minimum soil barrier layer specifications in s. NR 504.07(4)(a)12., Wis. Adm. Code. If the facility wishes to adhere to more stringent soil specification, an exemption is not required to do so. The soil barrier layer soil specifications should be discussed in the feasibility report at this time and can be further outlined in the construction quality assurance plan at a future time.
 - ii. If the facility is requesting an alternative or specifications that are less stringent to the soil barrier layer depth outlined in s. NR 504.07(4)(a), Wis. Adm. Code, or any subsection thereof, an alternative final cover design needs to be proposed under s. NR 504.073, Wis. Adm. Code.
6. **Environmental review [s. NR 512.16, Wis. Adm. Code]:** Requires the following information be submitted for determining the need for an environmental impact report.
 - a. Section NR 512.16 (1), Wis. Adm. Code. The listing of the statutory authority as shown in the table in section 10.1.2 of the feasibility report identifies Wisconsin Acts 31 and 93 and 1989 Wisconsin Act 335. Please revise the table to refer to the applicable statute and/or code rather than the legislative acts.
 - b. Section NR 512.16(3)(b), Wis. Adm. Code. Provide a description of the hydraulic (or hydrologic) value of wetlands, specifically wetland W-2 (2021) as identified on Figure 1-2 Existing Conditions in the feasibility report. Regarding the hydrologic value, summarize the quality of the wetland as it relates to its functional values or uses in terms of human use values, animal and plant life habitat, flood protection and stormwater storage, groundwater recharge or discharge through the wetland, shoreland protection and ability to protect water quality.
 - c. Section NR 512.16(4)(e), Wis. Adm. Code. Provide supporting documentation that the landfill expansion will not impact Prime Farmland Land as stated in section 10.4.5 of the feasibility report.
7. **Noncompliance with plans or orders [s. NR 512.19, Wis. Adm. Code]:** The feasibility report must identify all other Wisconsin solid or hazardous waste facilities which are owned by Waste Management Holdings, Inc. (WMH), in which the applicant (WMWI) owns or previously owned a 10% or greater legal or equitable interest or a 10% or greater interest in the assets and include a statement indicating whether or not all plan approvals and orders relating to all identified facilities are being complied with.

B. The department noted the following additional issues with the proposal during its review. Some of the items may affect the department's feasibility determination or plan of operation decision which you may choose to address. Should the department issue decisions favorable to the proposal, these items may result in conditions of either the feasibility determination or plan of operation approval if not addressed.

1. Section 9 states, "Additional soil barrier layer soils may be required from the area north of the currently proposed 29.0-acre horizontal footprint but within the previously reviewed 41-acre horizontal footprint area."

Please be advised that only the soil borrow area within the currently proposed 29-acre footprint expansion would meet the exemption eligibility of s. NR 504.075 (2) (b), Wis. Adm. Code, regardless of the department's initial site inspection opinion for the previously proposed 41-acre landfill footprint. The wetland W-2 is in the area north of the currently proposed 29-acre landfill footprint. For use as a soil borrow, this area would be subject to the requirements of s. NR 504.075, Wis. Adm. Code, including meeting the performance standards of s. NR 504.04 (4), Wis. Adm. Code. Written department approval would be required for use as soil barrier layer from this borrow source.

2. Section NR 504.06 (5) (c), Wis. Adm. Code, requires the minimum inside diameter of leachate collection pipes to have an inside diameter of 6 inches. Appendix T-1A of the feasibility report includes calculations for settlement of the 6-inch leachate transfer piping. Assumption 2 appears to indicate that the 6-inch value is used as the outer diameter. Clarify whether the 6-inch diameter is used for the outer or inner dimensions of the pipe, and if calculations have been performed with the 6-inch outer, then revise with 6-inch inner diameter.
3. Section 6.2 of the feasibility report discusses that leachate quality data was obtained from the department's Groundwater and Environmental Monitoring System (GEMS). In accordance with s. NR 507.26, Wis. Adm. Code, the department will be requiring per- and polyfluoroalkyl substances (PFAS) data be submitted to GEMS for inclusion in the leachate quality analysis for the proposed expansion. Based on a section 6.3 of the feasibility report, the department understands that PFAS sampling in leachate has occurred at this landfill.
4. In an effort to continue monitoring groundwater levels across the site (and to have the wells routinely inspected and not sit idle), the department requests that the semiannual water level measurements at the newly constructed groundwater monitoring wells continue for the duration of the department's review of the proposed Northern Expansion No. 2 and to report the data electronically to the department's GEMS database in accordance with ss. NR 507.18 and NR 507.26 (3), Wis. Adm. Code. Semiannual water level measurements at the new wells can be conducted with the routine detection monitoring for the existing landfill.
5. As a reminder, chemical oxygen demand (COD) is no longer required to be monitored as part of the environmental monitoring plan for the proposed expansion in accordance with the ch. NR 507, Appendix I, Wis. Adm. Code.
6. Please be aware that revisions/amendments to the Storm Water Pollution Prevention Plan (SWPPP) may be necessary for the proposed expansion. Please contact the storm water specialist, John Eaton, at john.eaton@wisconsin.gov or 715-491-4092.
7. Please be aware that a new air permit and/or permit revision from the air management program may be necessary for the proposed expansion. Please contact the air management program engineer, John Eide, at john.eide@wisconsin.gov or 715-492-0865.

This incompleteness determination is not a denial of your proposal but merely indicates that additional information is needed to continue the review. Submittal of this information does not ensure a favorable

feasibility determination, nor does it preclude the department from requiring additional information if continued review indicates it is needed. Upon receipt of the additional information, the department has 60 days to determine whether the feasibility report is complete. Please be advised that if additional review indicates the feasibility report is twice incomplete, the department may require an additional plan review fee as specified in s. [NR 520.04 \(4\) \(d\)](#), Wis. Adm. Code.

Please contact Nathan Collier, Hydrogeologist at 715-635-4048 or nathan.collier@wisconsin.gov or Evan Gruszka, Waste Management Engineer at 715-492-2702 or evan.gruszka@wisconsin.gov if you have any questions about this letter.

Sincerely,



John Morris, Professional Soil Scientist, Regional Supervisor
Northern and West Central Regions
Waste and Materials Management Program

cc: Dan LeClaire (dleclair1@wm.com)
Teri Daigle (teri.daigle@tetrattech.com)
John Eide – DNR (e-copy)
John Eaton – DNR (e-copy)
Joe Lourigan – DNR/WA (e-copy)
Tess Brester – DNR/WA (e-copy)
Evan Gruszka – DNR/WA (e-copy)
Nathan Collier – DNR/WA (e-copy)

APPENDIX B1: REVISED TABLES

Revised Table 5-1 Soil Boring and Monitoring Well Inventory

Revised Table 6-1 Waste Tonnages and Composition (2019-2023)

Revised Table from Section 10.1.2 Statutory Authority Table

Revised Table 5-1
Soil Boring and Monitoring Well Inventory
Timberline Trail RDF - Northern Expansion No. 2 Feasibility Report
WDNR License No. 3455
Township of Stubbs, Rusk County, WI

Boring/Well ID	Approx. Distance from Limits of Waste (ft)	Boring/Well Within 150 ft or 300 ft of Limits of Waste	Approx. Ground Surface Elevation (ft-MSL)	Boring Depth (ft)	Approx. Bottom Boring Elevation (ft-MSL)	Approx. Nearest Subbase Elevation (ft-MSL)	Approx. Boring Depth Below Subbase (ft)	Sample Interval (ft)	Well Bottom Elevation (ft-MSL)	Well Type	Use for FR well (meets NR 512 requirements)	Use for FR boring (meets NR 512 requirements)	Comments
B120	within	within	1229	112	1117	1218	101	continuous	-	-	-	X	
B121	within	within	1225	110	1115	1191	76	continuous	-	-	-	-	supplemental boring info
B122	within	within	1229	115	1114	1189	75	continuous	-	-	-	X	
B123	within	within	1232	120	1112	1186	75	continuous	-	-	-	-	supplemental boring info
B-211	within	within	1232	59	1173	1193	20	continuous	-	-	-	-	
B-212	within	within	1227	69	1158	1186	28	continuous	-	-	-	X	
B-213	within	within	1228	70	1158	1185	27	continuous	-	-	-	X	
B-214	within	within	1230	58	1172	1192	20	continuous	-	-	-	-	
B-215	78	<150 feet	1269	93	1176	1195	19	continuous	-	-	-	-	
B-216	within	within	1229	57	1172	1210	38	continuous	-	-	-	X	
B-217	within	within	1231	67	1164	1205	41	continuous	-	-	-	X	
B-218	158	<300 feet	1232	74	1158	1187	29	continuous	-	-	-	X	
B-219	174	<300 feet	1232	65	1167	1190	23	continuous	-	-	-	-	
B-220	524	-	1232	58	1174	1194	20	continuous	-	-	-	-	See Note 9
B-221	528	-	1239	81	1158	1187	29	continuous	-	-	-	-	See Note 9
B-201X	78	<150 feet	1269	105	1164	1194	30	continuous	-	-	-	X	
B-206X	182	<300 feet	1229	130	1099	1194	95	continuous	-	-	-	X	
MW101	80	<150 feet	1241	99	1128	1184	56	-	1129.8	WT	X	-	
MW101A	80	<150 feet	1241	135	1092	1184	93	continuous	1101.5	P	X	X	
MW102	within	within	1229	115	1114	1190	76	continuous	1129.0	WT	X	X	
MW103	-	-	1231	117	1114	1194	80	continuous	1128.4	WT	-	-	abandoned, replaced by MW-103R
MW-103R	66	<150 feet	1257	129.5	1127.5	1194	67	continuous	1128.4	WT	X	X	
MW104	126	<150 feet	1222	105	1115	1164	49	continuous	1128.2	WT	X	X	
MW105	within	within	1231	105	1126	1170	44	-	1126.3	WT	-	-	abandoned
MW105A	within	within	1231	135	1096	1170	74	continuous	1098.7	P	-	X	abandoned
MW106	120	<150 feet	1220	95	1125	1180	55	-	1126.8	WT	X	-	
MW106A	120	<150 feet	1220	125	1095	1180	85	continuous	1097.9	P	X	X	
MW-201	76	<150 feet	1269	142.5	1126.5	1194	67	-	1126.4	WT	X	-	
MW-201A	80	<150 feet	1269	171	1098	1194	96	continuous	1098.7	P	X	X	
MW-202	within	within	1229	101	1128	1189	61	-	1128.6	WT	X	-	
MW-202A	within	within	1229	130	1099	1189	90	continuous	1099.6	P	X	X	
MW-203	108	<150 feet	1246	112	1134	1186	52	continuous	1135.4	WT	X	X	
MW-204	within	within	1229	100	1129	1198	69	-	1130.6	WT	X	-	
MW-204A	within	within	1230	129	1101	1198	97	continuous	1101.5	P	X	X	
MW-205	76	<150 feet	1248	115	1133	1186	53	continuous	1133.6	WT	X	X	

Revised Table 5-1 (Continued)
Soil Boring and Monitoring Well Inventory
Timberline Trail RDF - Northern Expansion No. 2 Feasibility Report
WDNR License No. 3455
Township of Stubbs, Rusk County, WI

Boring/Well ID	Approx. Distance from Limits of Waste (ft)	Boring/Well Within 150 ft or 300 ft of Limits of Waste	Approx. Ground Surface Elevation (ft-MSL)	Boring Depth (ft)	Approx. Bottom Boring Elevation (ft-MSL)	Approx. Nearest Subbase Elevation (ft-MSL)	Approx. Boring Depth Below Subbase (ft)	Sample Interval (ft)	Well Bottom Elevation (ft-MSL)	Well Type	Use for FR well (meets NR 512 requirements)	Use for FR boring (meets NR 512 requirements)	Comments
MW-206	180	<300 feet	1230	101	1129	1194	65	-	1129.5	WT	X	-	
MW-206A	180	<300 feet	1230	130.3	1099.7	1194	94	-	1099.4	P	X	-	
MW-207	210	<300 feet	1267	139	1128	1195	67	continuous	1128.8	WT	X	X	
MW-208	522	-	1263	133	1130	1195	65	continuous	1130.6	WT	-	-	See Note 9
MW-209	534	-	1235	108	1127	1190	63	continuous	1127.6	WT	-	-	See Note 9
MW-210	444	-	1239	105	1134	1186	52	-	1134.9	WT	-	-	See Note 9
MW-210A	444	-	1239	138	1101	1186	85	continuous	1101.5	P	-	-	See Note 9

Prepared by: LD Checked by: AH/LS
 Revised by: LD Checked by: TD/LS

Legend and Acronyms:

WT	Included in NR 512 count for water table wells
P	Included in NR 512 count for piezometers
B-# / MW-#	Included in NR 512 boring count

bgs = below ground surface

ft - MSL = feet above mean sea level; LOW = Limits of Waste

Total Count # within LOW # <150-ft LOW # <300-ft LOW Required Minimum Total Count (See Note 4)

12	3	7	2	10
6	2	3	1	4
21	10	8	3	20

Notes:

- Boring information included in Appendix H of the 2025 Northern Expansion No. 2 Feasibility Report (FR).
- Well construction information included in Appendix I of the 2025 Northern Expansion No. 2 FR.
- This inventory table includes borings and wells utilized in the AGIP and included on the geological cross sections (Plan Sheets 5-18) of the 2025 FR plan set for the proposed Northern Expansion No. 2.
- See Table 1 (Revised) included in Appendix G of the 2025 FR for NR 512 Minimum Requirements and Comparison of Existing and Proposed Locations that details required number of borings, water supply wells and piezometers.
- Approximate ground surface elevation (ft MSL) is at time boring was drilled.
- Approximate distance from waste (feet) is distance from the proposed Northern Expansion No. 2 limits of waste.
- Groundwater wells MW-101, MW-101A, and MW-104 were extended up to current ground surface elevation.
- This table has been revised as part of Addendum No. 1 to the 2025 FR to include additional information requested by the WDNR in the November 10, 2025 Feasibility Incompleteness Determination letter.
- Boring / well was drilled as part of the Northern Expansion No. 2 geotechnical investigation in 2024 but is now located beyond 300-ft from the proposed 29.0-acres horizontal expansion limits of waste (reduced from 41.7-acres).



**Revised Table 6-1
Waste Tonnages and Composition Summary
Timberline Trail RDF - Northern Expansion No. 2 Feasibility Report
WDNR License No. 3455
Township of Stubbs, Rusk County, WI**

Year	Municipal Waste ^(a)		Industrial and Special Waste										Cover Soil ^(b)						Total Categories 1-33		
	Category 1 Municipal Solid Waste		Category 2 Utility Ash/Sludges		Category 6 All Other SW (Not HW)		Category 24 Exempt Unusable Paper Making Materials		Category 25 Construction & Demolition Waste		Category 27 Waste Generated by a Non-Profit Org		Category 33 Sediments Not Mixed With Other Wastes		Category 19 Fee Exempt Waste Used for Cover Soil		Category 21 High Volume Industrial Used for Daily Cover, etc.			Category 23 Treated Contaminated Soil for Daily Cover	
	(tons)	(%)	(tons)	(%)	(tons)	(%)	(tons)	(%)	(tons)	(%)	(tons)	(%)	(tons)	(%)	(tons)	(%)	(tons)	(%)		(tons)	(%)
2019	87,762	85.2	3,719	3.6	4,924	4.8	1,868	1.8	698	0.7	874	0.8	0	0.0	1,397	1.4	957	0.9	783	0.8	102,982
2020	83,198	86.5	2,974	3.1	4,760	4.9	1,577	1.6	887	0.9	673	0.7	0	0.0	905	0.9	978	1.0	262	0.3	96,213
2021	95,862	89.6	2,578	2.4	4,424	4.1	1,834	1.7	751	0.7	238	0.2	0	0.0	28	0.0	515	0.5	719	0.7	106,949
2022	116,531	89.6	22	0.0	4,705	3.6	1,877	1.4	1,198	0.9	580	0.4	483	0.4	0	0.0	3,291	2.5	1,413	1.1	130,100
2023	127,325	87.7	0	0.0	5,766	4.0	2,072	1.4	2,878	2.0	1,026	0.7	790	0.5	0	0.0	3,404	2.3	1,873	1.3	145,134
Average	102,136	87.7	1,859	1.8	4,916	4.3	1,846	1.6	1,282	1.0	678	0.6	255	0.2	466	0.5	1,829	1.5	1,010	0.8	116,276
Conversion ^(c)	425		1,800		300		300		1,250		300		300		300		300		300		-
	(CY)	(%)	(CY)	(%)	(CY)	(%)	(CY)	(%)	(CY)	(%)	(CY)	(%)	(CY)	(%)	(CY)	(%)	(CY)	(%)	(CY)	(%)	(CY)
Average	480,638	86.1	2,065	0.4	32,772	5.9	12,304	2.2	2,052	0.4	4,521	0.8	1,697	0.3	3,107	0.6	12,193	2.2	6,733	1.2	558,083

Notes:

1. Waste tonnages and categories obtained from the 2019, 2020, 2021, 2022, and 2023 WDNR Waste Tonnage/Capacity Reports (<http://dnr.wi.gov/topic/Landfills/fees.html>).
2. Average waste tonnages are rounded.
3. Percentages are individual waste category tonnages compared to total waste tonnage in Categories 1 - 33.
4. Only categories that have nonzero tonnages in the 2019 - 2023 WDNR Waste Tonnage/Capacity Reports are included on this summary table.
5. This table has been revised as part of Addendum No. 1 to the 2025 Feasibility Report for the proposed Northern Expansion No. 2 to include a conversion factor (density) for calculating volume from tons in order to evaluate waste on a volume basis. The volume (CY) per waste category was calculated by dividing the average tons by the density and applying a unit conversion from pounds to tons (2,000 lb/ton).
6. Category 6 waste varies widely and includes items such as asbestos, unused off-spec food, RD&D liquid waste and other special wastes not included in other waste categories.

Prepared by: AH
Checked by: AC
Revised by: TD
Checked by: CLD

Footnotes:

- (a) Municipal Solid Waste includes residential and commercial waste.
- (b) Other sources of soil used to reach a cover soil ratio of approximately 7 parts waste to 1 part cover soil.
- (c) Conversions for each waste category were obtained from Table 4 (Conversion Factors) of NR 520, Wis. Adm. Code. Conversion units are in pounds per cubic yard.

Acronyms:

SW Solid Waste CY Cubic Yards
HW Hazardous Waste lb Pounds

Revised Statutory Authority Table from Section 10.1.2 of the 2025 FR per WDNR Comment 6.a. of the November 10, 2025 Feasibility Incompleteness Determination letter.

Statue	Statute Authority	General Description
§287.07, Wisconsin State Statutes & NR 544, Wis. Adm. Code	WDNR	Recycling Laws
§289, Wisconsin State Statutes	WDNR	Solid Waste Facilities
NR 103, Wis. Adm. Code	WDNR	Wetlands, Practicable Alternatives Analysis approval, water quality
§289.41, Wisconsin State Statutes, NR 514 & 520, Wis. Adm. Code	WDNR	40-Year Period for Closure and Long-term Care Costs
NR 299, Wis. Adm. Code	WDNR	State Water Quality Certification
§289.28, Wisconsin State Statutes	WDNR	Landfill Needs
NR 445, Wis. Adm. Code	WDNR	Air Construction Permit
NR 500 – 520, Wis. Adm. Code	Bureau of Waste Management, WDNR	Feasibility Report and Plan of Operation Approval
NR 140, Wis. Adm. Code	WDNR	Groundwater Quality
NR 141, Wis. Adm. Code	WDNR	Groundwater Monitoring Well Requirements
NR 216 and NR 151, Wis. Adm. Code	WDNR	Stormwater Discharge Permits and Runoff Management
NR 812, Wis. Adm. Code	WDNR	Drinking water
Sections 401 and 404, Clean Water Act	U.S. Army Corps of Engineers	Water Quality
40CFR §258.71, 258.72	EPA	Financial assurance for closure and post-closure
40CFR §258.10	FAA	Airport Safety
Local	Rusk County and Town of Stubbs	Standing Committee agreement

APPENDIX C1: LEACHATE TREATMENT LETTERS

Letters sent 12/12/2025 to the following WWTPs:

Rice Lake Utilities

City of Medford

Metropolitan Council Environmental Services (MCES)

Please note: The 12/12/2025 letters to each of the WWTPs included Table P-1 of the 2025 FR but only 1 copy of Table P-1 is included in this Appendix C1 in an effort to reduce paper consumption.



December 12, 2025

Wastewater Treatment Plant Manager
Rice Lake Utilities
320 West Coleman Street
Rice Lake, WI 54868

Re: Leachate Treatment Data for the proposed Northern Expansion No. 2
WMWI Timberline Trail Recycling and Disposal Facility (RDF)
Weyerhaeuser, Wisconsin
WDNR License No. 3455, FID No. 855040230

To Whom It May Concern:

On behalf of Waste Management of Wisconsin, Inc. (WMWI), Cornerstone Environmental Group, a Tetra Tech Company, (Tetra Tech) is requesting that the Rice Lake Utilities Wastewater Treatment Plant (Rice Lake WWTP) review current leachate data from the Timberline Trail RDF. Rice Lake WWTP has accepted leachate from Timberline Trail RDF in the past and WMWI would like to continue using it in the future for leachate treatment.

WMWI recently submitted a feasibility report to the Wisconsin Department of Natural Resources (WDNR) for a proposed Northern Expansion No. 2 of the Timberline Trail RDF. In response to this feasibility report, the WDNR is requesting WMWI contact the proposed wastewater treatment plant(s) and provide the anticipated quality and quantity of leachate based on current leachate data.

A summary of leachate quality data at Timberline Trail RDF for 2021 - 2024 (Table P-1) is provided for your review. The waste stream disposed into Timberline Trail RDF will remain the same and therefore, the leachate quality is not anticipated to change, to any significant degree, from what is currently observed.

The quantity of leachate is not anticipated to change significantly from what is currently hauled off site since Timberline Trail RDF will be operated to minimize leachate generation. The actual leachate generated at Timberline Trail RDF in 2024 averaged approximately 15,565 gallons per day. However, leachate is hauled to multiple treatment options. Approximately 15,000 gallons per day (on average) of leachate was hauled to WWTP's in 2025.

Please consider providing a response letter confirming the Rice Lake WWTP has reviewed the provided data and include a statement confirming it will consider accepting the quality and/or quantity (even if partially) of leachate from Timberline Trail RDF. The response letter would not be an agreement or commitment to accept leachate. Your assistance and timely response is appreciated. Please call Tina Hultman (Timberline Trail RDF Manager) at (715) 868-7000 or Teri Daigle (Tetra Tech) at (630) 410-7231 if you have any questions.

Sincerely,

WM TIMBERLINE TRAIL RDF

Wastewater Treatment Plant Manager
December 12, 2025

Tina Hultman
District Manager

Enclosure: Table P-1 – Analytical Data Summary Table – Leachate Sample Point LST-01 (2021-2024)

cc: Dan Leclaire, WMWI
Tyler Field, WMWI
Lee Daigle, Tetra Tech
Teri Daigle, Tetra Tech



December 12, 2025

Wastewater Superintendent
City of Medford
639 S. Second Street
Medford, WI 54451

Re: Leachate Treatment Data for the proposed Northern Expansion No. 2
WMWI Timberline Trail Recycling and Disposal Facility (RDF)
Weyerhaeuser, Wisconsin
WDNR License No. 3455, FID No. 855040230

To Whom It May Concern:

On behalf of Waste Management of Wisconsin, Inc. (WMWI), Cornerstone Environmental Group, a Tetra Tech Company, (Tetra Tech) is requesting that the City of Medford Department of Public Works review current leachate data from the Timberline Trail RDF. The City of Medford's Wastewater Treatment Plant (WWTP) has accepted leachate from Timberline Trail RDF in the past and WMWI would like to continue using it in the future for leachate treatment.

WMWI recently submitted a feasibility report to the Wisconsin Department of Natural Resources (WDNR) for a proposed Northern Expansion No. 2 of the Timberline Trail RDF. In response to this feasibility report, the WDNR is requesting WMWI contact the proposed wastewater treatment plant(s) and provide the anticipated quality and quantity of leachate based on current leachate data.

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Please consider providing a response letter confirming the City of Medford Department of Public Works has reviewed the provided data and include a statement confirming it will consider accepting the quality and/or quantity (even if partially) of leachate from Timberline Trail RDF. The response letter would not be an agreement or commitment to accept leachate. Your assistance and timely response is appreciated. Please call Tina Hultman (Timberline Trail RDF Manager) at (715) 868-7000 or Teri Daigle (Tetra Tech) at (630) 410-7231 if you have any questions.

Sincerely,

WM TIMBERLINE TRAIL RDF

Tetra Tech
8040 Excelsior Drive, Suite 305, Madison, WI 53717
Tel +1.877.294.9070 Fax +1.877.845.1456 | tetratech.com

Wastewater Superintendent
December 12, 2025

Tina Hultman
District Manager

Enclosure: Table P-1 – Analytical Data Summary Table – Leachate Sample Point LST-01 (2021-2024)

cc: Dan Leclaire, WMWI
Tyler Field, WMWI
Teri Daigle, Tetra Tech
Lee Daigle, Tetra Tech



December 12, 2025

Martina Nelson

Industrial Waste & Pollution Prevention Manager
Metropolitan Council Environmental Services
390 Robert Street North
St. Paul, MN 55101

Re: Leachate Treatment Data for the proposed Northern Expansion No. 2
WMWI Timberline Trail Recycling and Disposal Facility (RDF)
Weyerhaeuser, Wisconsin
WDNR License No. 3455, FID No. 855040230

To Whom It May Concern:

On behalf of Waste Management of Wisconsin, Inc. (WMWI), Cornerstone Environmental Group, a Tetra Tech Company, (Tetra Tech) is requesting that the Metropolitan Council Environmental Services (MCES) review current leachate data from the Timberline Trail RDF. The MCES Wastewater Treatment Plant (WWTP) has accepted leachate from Timberline Trail RDF in the past and WMWI would like to continue using it in the future for leachate treatment.

WMWI recently submitted a feasibility report to the Wisconsin Department of Natural Resources (WDNR) for a proposed Northern Expansion No. 2 of the Timberline Trail RDF. In response to this feasibility report, the WDNR is requesting WMWI contact the proposed wastewater treatment plant(s) and provide the anticipated quality and quantity of leachate based on current leachate data.

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Please consider providing a response letter confirming the MCES has reviewed the provided data and include a statement confirming it will consider accepting the quality and/or quantity (even if partially) of leachate from Timberline Trail RDF. The response letter would not be an agreement or commitment to accept leachate. Your assistance and timely response is appreciated. Please call Tina Hultman (Timberline Trail RDF Manager) at (715) 868-7000 or Teri Daigle (Tetra Tech) at (630) 410-7231 if you have any questions.

Sincerely,

WM TIMBERLINE TRAIL RDF

Tetra Tech
8040 Excelsior Drive, Suite 305, Madison, WI 53717
Tel +1.877.294.9070 Fax +1.877.845.1456 | tetratech.com

Industrial Waste & Pollution Prevention Manager
December 12, 2025

Tina Hultman
District Manager

Enclosure: Table P-1 – Analytical Data Summary Table – Leachate Sample Point LST-01 (2021-2024)

cc: Dan Leclaire, WMWI
Tyler Field, WMWI
Lee Daigle, Tetra Tech
Teri Daigle, Tetra Tech



Table P-1
Analytical Data Summary Table - Leachate Sample Point LST-01 (2021-2024)
Timberline Trail RDF - Northern Expansion No. 2 Feasibility Report
WDNR License No. 3455
Township of Stubbs, Rusk County, WI

LST-01	PARAMETERS								
	VOCs								
Date	Bromodichloromethane (µg/L)	Carbon Tetrachloride (µg/L)	1,2-Dichloroethane (µg/L)	Tribromomethane (µg/L)	Dibromochloromethane (µg/L)	Chloroform (µg/L)	Toluene (µg/L)	Benzene (µg/L)	Chlorobenzene (µg/L)
10/05/21	<39.0	<27.0	<21.0	<26.0	<32.0	<34.0	<51	<41.0	<75
01/13/22	<16.0	<11.0	<8.4	<10.0	<13.0	<14.0	<20	<16.0	<30
04/20/22	<7.8	<5.4	<4.2	<5.2	<6.4	<6.8	12 J	<8.2	<15
07/19/22	<7.8	<5.4	<4.2	<5.2	<6.4	<6.8	<10	<8.2	<15
10/18/22	<16.0	<11.0	<8.4	<10.0	<13.0	<14.0	<20	<16.0	<30
01/17/23	<20.0	<14.0	<11.0	<13.0	<16.0	<17.0	<26	<21.0	<38
04/25/23	<20.0	<14.0	<11.0	<13.0	<16.0	<17.0	<26	<21.0	<38
07/20/23	<20.0	<14.0	<11.0	<13.0	<16.0	<17.0	<26	<21.0	<38
10/11/23	<20.0	<14.0	<11.0	<13.0	<16.0	<17.0	<26	<21.0	<38
01/24/24	<20.0	<14.0	<11.0	<13.0	<16.0	<17.0	<26	<21.0	<38
04/18/24	<7.8	<5.4	<4.2	<5.2	<6.4	<6.8	13 J	<8.2	<15
07/16/24	<7.8	<5.4	<4.2	<5.2	<6.4	<6.8	13 J	<8.2	<15
10/03/24	<7.8	<5.4	<4.2	<5.2	<6.4	<6.8	<10	<8.2	<15

*Table notes are provided on the last page of the data summary.



Table P-1
Analytical Data Summary Table - Leachate Sample Point LST-01 (2021-2024)
Timberline Trail RDF - Northern Expansion No. 2 Feasibility Report
WDNR License No. 3455
Township of Stubbs, Rusk County, WI

LST-01	PARAMETERS								
	VOCs								
Date	Chloroethane (µg/L)	Bromomethane (µg/L)	Chloromethane (µg/L)	Dichloromethane (µg/L)	Tetrachloroethylene (µg/L)	Fluorotrichloromethane (µg/L)	1,1-Dichloroethane (µg/L)	1,1-Dichloroethylene (µg/L)	1,1,1-Trichloroethane (µg/L)
10/05/21	<32.0	<69	<35	<44.0	<36.0	<88	<38.0	<29.0	<82
01/13/22	<13.0	<28	<14	<18.0	<14.0	<35	<15.0	<12.0	<33
04/20/22	<6.4	<14	<7	11.0 J	<7.2	<18	<7.6	<5.8	<16
07/19/22	<6.4	<14	<7	<8.8	<7.2	<18	<7.6	<5.8	<16
10/18/22	<13.0	<28	<14	<18.0	<14.0	<35	<15.0	<12.0	<33
01/17/23	<16.0	<35	<18	<22.0	<18.0	<44	<19.0	<15.0	<41
04/25/23	<16.0	<35	<18	<22.0	<18.0	<44	<19.0	<15.0	<41
07/20/23	<16.0	<35	<18	<22.0	<18.0	<44	<19.0	<15.0	<41
10/11/23	<16.0	<35	<18	<22.0	<18.0	<44	<19.0	<15.0	<41
01/24/24	<16.0	<35	<18	<22.0	<18.0	<44	<19.0	<15.0	<41
04/18/24	<6.4	<14	<7	<8.8	<7.2	<18	<7.6	<5.8	<16
07/16/24	<6.4	<14	<7	<8.8	<7.2	<18	<7.6	<5.8	<16
10/03/24	<6.4	<14	<7	<8.8	<7.2	<18	<7.6	<5.8	<16

*Table notes are provided on the last page of the data summary.



Table P-1
Analytical Data Summary Table - Leachate Sample Point LST-01 (2021-2024)
Timberline Trail RDF - Northern Expansion No. 2 Feasibility Report
WDNR License No. 3455
Township of Stubbs, Rusk County, WI

LST-01	PARAMETERS								
	VOCs								
Date	1,1,2-Trichloroethane (µg/L)	O-Dichlorobenzene (µg/L)	1,2-Dichloropropane (µg/L)	Trans-1,2-Dichloroethene (µg/L)	M-Dichlorobenzene (µg/L)	P-Dichlorobenzene (µg/L)	Dichlorodifluoromethane (µg/L)	Naphthalene (µg/L)	Trans-1,3-Dichloropropene (µg/L)
10/05/21	<23.0	<79	<72	<90	<78	<84	<68	<43.0	<37.0
01/13/22	<9.2	<32	<29	<36	<31	<34	<27	<17.0	<15.0
04/20/22	<4.6	<16	<14	<18	<16	<17	<14	<8.6	<7.4
07/19/22	<4.6	<16	<14	<18	<16	<17	<14	<8.6	<7.4
10/18/22	<9.2	<32	<29	<36	<31	<34	<27	<17.0	<15.0
01/17/23	<12.0	<40	<36	<45	<39	<42	<34	<22.0	<19.0
04/25/23	<12.0	<40	<36	<45	<39	<42	<34	<22.0	<19.0
07/20/23	<12.0	<40	<36	<45	<39	<42	<34	<22.0	<19.0
10/11/23	<12.0	<40	<36	<45	<39	<42	<34	<22.0	<19.0
01/24/24	<12.0	<10	<36	<45	<39	<42	<34	<22.0	<19.0
04/18/24	<4.6	<10	<14	<18	<16	<17	<14	8.7 J	<7.4
07/16/24	<4.6	<16	<14	<18	<16	<17	<14	10.0 J	<7.4
10/03/24	<4.6	<16	<14	<18	<16	<17	<14	<8.6	<7.4

*Table notes are provided on the last page of the data summary.



Table P-1
Analytical Data Summary Table - Leachate Sample Point LST-01 (2021-2024)
Timberline Trail RDF - Northern Expansion No. 2 Feasibility Report
WDNR License No. 3455
Township of Stubbs, Rusk County, WI

LST-01	PARAMETERS								
	VOCs								
Date	Cis-1,3-Dichloropropene (µg/L)	1,2-Dibromo-3-Chloropropane (µg/L)	Vinyl Chloride (µg/L)	Trichloroethylene (TCE) (µg/L)	Carbon Disulfide (µg/L)	Cis-1,2-Dichloroethene (µg/L)	Styrene (µg/L)	Dibromomethane (µg/L)	1,2-Dibromoethane(EDB) (µg/L)
10/05/21	<36.0	<39.0	<90	<46.0	<19.0	<81	<73	<41.0	<73.0
01/13/22	<14.0	<16.0	<36	<18.0	<7.6	<32	<29	<16.0	<29.0
04/20/22	<7.2	<7.8	<18	<9.2	<3.8	<16	<15	<8.2	<15.0
07/19/22	<7.2	<7.8	<18	<9.2	<3.8	<16	<15	<8.2	<15.0
10/18/22	<14.0	<16.0	<36	<18.0	<7.6	<32	<29	<16.0	<29.0
01/17/23	<18.0	<20.0	<45	<23.0	<9.5	<41	<37	<21.0	<37.0
04/25/23	<18.0	<20.0	<45	<23.0	<9.5	<41	<37	<21.0	<37.0
07/20/23	<18.0	<20.0	<45	<23.0	<9.5	<41	<37	<21.0	<37.0
10/11/23	<18.0	<20.0	<45	<23.0	<9.5	<41	<37	<21.0	<37.0
01/24/24	<18.0	<20.0	<45	<23.0	<9.5	<41	<37	<21.0	<37.0
04/18/24	<7.2	<7.8	<45	<9.2	<3.8	<16	<15	<8.2	<15.0
07/16/24	<7.2	<7.8	<18	<9.2	<3.8	<16	<15	<8.2	<15.0
10/03/24	<7.2	<7.8	<18	<9.2	<3.8	<16	<15	<8.2	<15.0

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Table P-1
Analytical Data Summary Table - Leachate Sample Point LST-01 (2021-2024)
Timberline Trail RDF - Northern Expansion No. 2 Feasibility Report
WDNR License No. 3455
Township of Stubbs, Rusk County, WI

LST-01	PARAMETERS					
	VOCs					
Date	Methyl Tert-Butyl Ether (MTBE) (µg/L)	Ethylbenzene (µg/L)	Acetone (µg/L)	Methyl Ethyl Ketone (Mek) (µg/L)	Tetrahydrofuran (µg/L)	Xylene, O, M & P- (µg/L)
10/05/21	<16.0	<74.0	1600	1200	830	<66
01/13/22	<6.4	<30.0	3200	2500	1200	<26
04/20/22	<3.2	<15.0	1300	1500	740	21 J
07/19/22	<3.2	<15.0	870	650	490	<13.0
10/18/22	<6.4	<30.0	870	<53	1400	<26.0
01/17/23	<8.0	<37.0	1600	1100	2000	<33.0
04/25/23	<8.0	<37.0	500	<66	630	<33.0
07/20/23	<8.0	<37.0	420 J	<66	720	<33.0
10/11/23	<8.0	<37.0	430 J	<66	560	<33.0
01/24/24	<8.0	<37.0	910	950	880	<33.0
04/18/24	<3.2	<15.0	760	490	790	19 J
07/16/24	<3.2	<15.0	1400	1200	910	17 J
10/03/24	<3.2	<15.0	550	710	770	14 J

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Table P-1
Analytical Data Summary Table - Leachate Sample Point LST-01 (2021-2024)
Timberline Trail RDF - Northern Expansion No. 2 Feasibility Report
WDNR License No. 3455
Township of Stubbs, Rusk County, WI

LST-01	PARAMETERS								
	SVOCs								
DATE	1,2,4-Trichlorobenzene (µg/L)	1-Methylnaphthalene (µg/L)	2,3,4,6-Tetrachlorophenol (µg/L)	2,4,5-Trichlorophenol (µg/L)	2,4,6-Trichlorophenol (µg/L)	2,4-Dichlorophenol (µg/L)	2,4-Dimethylphenol (µg/L)	2,4-Dinitrophenol (µg/L)	2,4-Dinitrotoluene (µg/L)
10/05/21	<44	<73	<32	<48	<61	<51	<50	<220	<45
01/13/22	<220	<370	<160	<240	<310	<260	<250	<1100	<220
04/20/22	<220	<370	<80	<240	<310	<260	<250	<1100	<220
07/19/22	<110	<180	<80	<120	<150	<130	<130	<560	<110
10/18/22	<110	<180	<80	<120	<150	<130	<130	<560	<110
01/17/23	<110	<180	<80	<120	<150	<130	<130	<560	<110
04/25/23	<110	<180	<80	<120	<150	<130	<130	<560	<110
07/20/23	<110	<180	<80	<120	<150	<130	<130	<560	<110
10/11/23	<44	<73	<32	<48	<61	<51	<50	<220	<45
01/24/24	<11	<18	<8	<12	<15	<13	<13	<56	<11
04/18/24	<11	<18	<8	<12	<15	<13	<13	<56	<11
07/16/24	<11	<18	<8	<12	<15	<13	15 J	<56	<11
10/03/24	<22	<37	<16	<24	<31	<26	<25	<110	<22

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Table P-1
Analytical Data Summary Table - Leachate Sample Point LST-01 (2021-2024)
Timberline Trail RDF - Northern Expansion No. 2 Feasibility Report
WDNR License No. 3455
Township of Stubbs, Rusk County, WI

LST-01	PARAMETERS								
	SVOCs								
DATE	2,6-Dinitrotoluene (µg/L)	2-Chloronaphthalene (µg/L)	2-Chlorophenol (µg/L)	2-Methylnaphthalene (µg/L)	2-Nitroaniline (µg/L)	2-Nitrophenol (µg/L)	3,3'-Dichlorobenzidine (µg/L)	3-Nitroaniline (µg/L)	4,6-Dinitro-O-Cresol (µg/L)
10/05/21	<40	<46	<53	<60	<42	<48	<40	<48	<220
01/13/22	<200	<230	<270	<300	<210	<240	<200	<240	<1100
04/20/22	<200	<230	<270	<300	<210	<240	<200	<240	<1100
07/19/22	<100	<120	<130	<150	<110	<120	<100	<120	<550
10/18/22	<100	<120	<130	<150	<110	<120	<100	<120	<550
01/17/23	<100	<120	<130	<150	<110	<120	<100	<120	<550
04/25/23	<100	<120	<130	<150	<110	<120	<100	<120	<550
07/20/23	<100	<120	<130	<150	<110	<120	<100	<120	<550
10/11/23	<40	<46	<53	<60	<42	<48	<40	<48	<220
01/24/24	<10	<12	<13	<15	<11	<12	<10	<12	<55
04/18/24	<10	<12	<13	<15	<11	<12	<10	<12	<55
07/16/24	<10	<12	<13	<15	<11	<12	<10	<12	<55
10/03/24	<20	<23	<27	<30	<21	<24	<20	<24	<110

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Table P-1
Analytical Data Summary Table - Leachate Sample Point LST-01 (2021-2024)
Timberline Trail RDF - Northern Expansion No. 2 Feasibility Report
WDNR License No. 3455
Township of Stubbs, Rusk County, WI

LST-01	PARAMETERS								
	SVOCs								
DATE	4-Bromophenyl Phenyl Ether L (µg/L)	4-Chlorophenylphenyl Ether (µg/L)	4-Nitroaniline (µg/L)	4-Nitrophenol (µg/L)	Acenaphthene (µg/L)	Acenaphthylene (µg/L)	Acetophenone (µg/L)	Anthracene (µg/L)	Benz(A)Anthracene (µg/L)
10/05/21	<45	<35	<25.0	<150	<41	<38	<54	<28	<36
01/13/22	<230	<180.0	<130.0	<760	<210	<190	<270	<270	<180
04/20/22	<230	<180.0	<130.0	<760	<210	<190	<270	<270	<180
07/19/22	<110	<88.0	<63.0	<380	<100	<95	<140	<140	<90
10/18/22	<110	<88.0	<63.0	<380	<100	<95	<140	<140	<90
01/17/23	<110	<88.0	<63.0	<380	<100	<95	<140	<140	<90
04/25/23	<110	<88.0	<63.0	<380	<100	<95	<140	<140	<90
07/20/23	<110	<88.0	<63.0	<380	<100	<95	<140	<140	<90
10/11/23	<45	<35.0	<25.0	<150	<41	<38	<54	<54	<36
01/24/24	<11	<8.8	<6.3	<38	<10	<10	<14	<14	<9
04/18/24	<11	<8.8	<6.3	<38	<10	<10	<14	<14	<9
07/16/24	<11	<8.8	<6.3	<38	<10	<10	<14	<14	<9
10/03/24	<23	<18.0	<13.0	<76	<21	<19	<27	<27	<18

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Timberline Trail RDF - Northern Expansion No. 2 Feasibility Report
WDNR License No. 3455
Township of Stubbs, Rusk County, WI

LST-01	PARAMETERS								
	SVOCs								
DATE	Benzo(A)Pyrene (µg/L)	Benzo(B)Fluoranthene (µg/L)	Benzo(Ghi)Perylene (µg/L)	Benzo(K)Fluoranthene (µg/L)	Benzyl Alcohol (µg/L)	Bis(2-Chloroethoxy)Methane L (µg/L)	Bis(2-Chloroethyl) Ether (µg/L)	Bis(2-Chloroisopropyl) Ether (µg/L)	Bis(2-Ethylhexyl) Phthalate (Dehp) (µg/L)
10/05/21	<47	<34	<35	<73	<200	<35	<40	<52	<220
01/13/22	<240	<170	<180	<370	<1000	<180	<200	<260	<1100
04/20/22	<240	<170	<180	<370	<1000	<180	<200	<260	<1100
07/19/22	<120	<85	<88	<180	<500	<88	<100	<130	<550
10/18/22	<120	<85	<88	<180	<500	<88	<100	<130	<550
01/17/23	<120	<85	<88	<180	<500	<88	<100	<130	<550
04/25/23	<120	<85	<88	<180	<500	<88	<100	<130	<550
07/20/23	<120	<85	<88	<180	<500	<88	<100	<130	<550
10/11/23	<47	<34	<35	<73	<200	<35	<40	<52	<220
01/24/24	<12	<9	<9	<18	<50	<9	<10	<13	<55
04/18/24	<12	<9	<9	<18	<50	<9	<10	<13	<55
07/16/24	<12	<9	<9	<18	<50	<9	11 J	<13	<55
10/03/24	<24	<17	<18	<37	<100	<18	<20	<26	<110

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Timberline Trail RDF - Northern Expansion No. 2 Feasibility Report
WDNR License No. 3455
Township of Stubbs, Rusk County, WI

LST-01	PARAMETERS								
	SVOCs								
DATE	Butyl Benzyl Phthalate (µg/L)	Chrysene (µg/L)	Dibenz(A,H)Anthracene (µg/L)	Dibenzofuran (µg/L)	Diethyl Phthalate (µg/L)	Dimethyl Phthalate (µg/L)	Di-N-Butyl Phthalate (µg/L)	Di-N-Octyl Phthalate (µg/L)	Diphenylamine (µg/L)
10/05/21	<100	<33	<42	<51	<22.0	<36	<31.0	<47	<82
01/13/22	<500	<170	<210	<260	<110.0	<180	<160.0	<240	<410
04/20/22	<500	<170	<210	<260	<110.0	<180	<160.0	<240	<410
07/19/22	<250	<83	<110	<130	<55.0	<90	<78.0	<120	<210
10/18/22	<250	<83	<110	<130	<55.0	<90	<78.0	<120	<210
01/17/23	<250	<83	<110	<130	<55.0	<90	<78.0	<120	<210
04/25/23	<250	<83	<110	<130	<55.0	<90	<78.0	<120	<210
07/20/23	<250	<83	<110	<130	<55.0	<90	<78.0	<120	<210
10/11/23	<100	<33	<42	<51	<22.0	<36	<31.0	<47	<82
01/24/24	<25	<8	<11	<13	<5.5	<9	<7.8	<12	<21
04/18/24	<25	<8	<11	<13	<5.5	<9	<7.8	<12	<21
07/16/24	<25	<8	<11	<13	<5.5	<9	<7.8	<12	<21
10/03/24	<50	<17	<21	<26	<11.0	<18	<16.0	<24	<41

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Timberline Trail RDF - Northern Expansion No. 2 Feasibility Report
WDNR License No. 3455
Township of Stubbs, Rusk County, WI

LST-01	PARAMETERS								
	SVOCs								
DATE	Fluoranthene (µg/L)	Fluorene (µg/L)	Hexachlorobenzene (µg/L)	Hexachlorobutadiene (µg/L)	Hexachlorocyclopentadiene (µg/L)	Hexachloroethane (µg/L)	Indeno(1,2,3-Cd)Pyrene (µg/L)	Isophorone (µg/L)	M-Cresol (µg/L)
10/05/21	<40	<36	<51	<68	<59	<59	<47	<43	110 J
01/13/22	<200	<180	<260	<340	<300	<300	<240	<220	<200
04/20/22	<200	<180	<260	<340	<300	<300	<240	<220	210 J
07/19/22	<100	<90	<130	<170	<150	<150	<120	<110	<100
10/18/22	<100	<90	<130	<170	<150	<150	<120	<110	<100
01/17/23	<100	<90	<130	<170	<150	<150	<120	<110	<100
04/25/23	<100	<90	<130	<170	<150	<150	<120	<110	<100
07/20/23	<100	<90	<130	<170	<150	<150	<120	<110	<100
10/11/23	<40	<36	<51	<68	<59	<59	<47	<43	<40
01/24/24	<10	<9	<13	<17	<15	<15	<12	<11	60
04/18/24	<10	<9	<13	<17	<15	<15	<12	<11	<10
07/16/24	<10	<9	<13	<17	<15	<15	<12	<11	41
10/03/24	<20	<18	<26	<34	<30	<30	<24	<22	26 J

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Analytical Data Summary Table - Leachate Sample Point LST-01 (2021-2024)
Timberline Trail RDF - Northern Expansion No. 2 Feasibility Report
WDNR License No. 3455
Township of Stubbs, Rusk County, WI

LST-01	PARAMETERS								
	SVOCs								
DATE	M-Dichlorobenzene (µg/L)	Naphthalene (µg/L)	Nitrobenzene (µg/L)	N-Nitrosodimethylamine (µg/L)	N-Nitrosodi-N-Propylamine (µg/L)	O-Cresol (2-Methylphenol) (µg/L)	O-Dichlorobenzene (µg/L)	P-Chloro-M-Cresol (µg/L)	P-Cresol (µg/L)
10/05/21	<78	<76.0	<29.0	<220	<54	<40	<79	<45	110 J
01/13/22	<31	<17.0	<150.0	<1100	<270	<200	<32	<230	<180
04/20/22	<16	10.0 J	<150.0	<1100	<270	<200	<16	<230	210 J
07/19/22	<16	<8.6	<73.0	<550	<140	<100	<16	<110	<90
10/18/22	<31	<17.0	<73.0	<550	<140	<100	<32	<110	<90
01/17/23	<39	<22.0	<73.0	<550	<140	<100	<40	<110	<90
04/25/23	<39	<22.0	<73.0	<550	<140	<100	<40	<110	<90
07/20/23	<39	<22.0	<73.0	<550	<140	<100	<40	<110	<90
10/11/23	<39	<22.0	<29.0	<220	<54	<40	<40	<45	<36
01/24/24	<39	<22.0	<7.3	<55	<14	26 J	<40	<11	60
04/18/24	<16	8.7 J	<7.3	<55	<14	<10	<16	<11	<9
07/16/24	<16	10 J	<7.3	<55	<14	17 J	<16	<11	41
10/03/24	<16	<8.6	<15.0	<110	<27	<20	<16	<23	26 J

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Timberline Trail RDF - Northern Expansion No. 2 Feasibility Report
WDNR License No. 3455
Township of Stubbs, Rusk County, WI

LST-01	PARAMETERS					
	SVOCs					
DATE	P-Dichlorobenzene (µg/L)	Pentachlorophenol (Pcp) (µg/L)	Phenanthrene (µg/L)	Phenol (µg/L)	Pyrene (µg/L)	Pyridine (µg/L)
10/05/21	<84	<220	<44	<39.0	<34.0	<41
01/13/22	<34	<1100	<220	<200.0	<170.0	<210
04/20/22	<17	<1100	<220	<200.0	<170.0	<210
07/19/22	<17	<550	<110	<98.0	<85.0	<100
10/18/22	<34	<550	<110	<98.0	<85.0	<100
01/17/23	<42	<550	<110	<98.0	<85.0	<100
04/25/23	<42	<550	<110	<98.0	<85.0	<100
07/20/23	<42	<550	<110	<98.0	<85.0	<100
10/11/23	<42	<220	<44	<39.0	<34.0	<41
01/24/24	<42	<55	<11	18.0 J	<8.5	<10
04/18/24	<17	<55	<11	<9.8	<8.5	<10
07/16/24	<17	<55	<11	22.0 J	<8.5	27 J
10/03/24	<17	<110	<22	<20.0	<17.0	<21

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Table P-1
Analytical Data Summary Table - Leachate Sample Point LST-01 (2021-2024)
Timberline Trail RDF - Northern Expansion No. 2 Feasibility Report
WDNR License No. 3455
Township of Stubbs, Rusk County, WI

LST-01	PARAMETERS								
	Field Parameters		Other MSW Leachate Monitoring Parameters						
Date	Specific Conductance, Field (µmho/cm at 25° C)	pH, Field (Standard Units)	Solids, Total Suspended (mg/L)	Biochemical Oxygen Demand, 5 day 20°C (mg/L)	Chemical Oxygen Demand, Unfiltered (mg/L)	Alkalinity, Total (mg/L as CaCO3)	Nitrogen, Ammonia, Total (mg/L as N)	Nitrogen, Kjeldahl, Total (mg/L As N)	Hardness, Total (mg/L as CaCO3)
10/05/21	8,410	7.68	7.6	234 J	3,880	8,680	1,400	1,240	651
11/18/21	4,000	7.23	32.4	117	3,420	-	1,110	923	-
12/22/21	4,000	7.24	25.6	144 J	2,470	-	821	834	-
01/13/22	18,970	7.78	25.2	322 J	4,130	7,610	1,330	1,500	717
02/24/22	-	7.80	30.0	98.8	6,020	-	1,380	1,350	-
03/24/22	-	7.98	48.4	106	6,290	-	870	875	-
04/20/22	9,320	7.89	25.2	139	2,750	4,970	753	722	627
05/04/22	-	7.98	48.4	113	4,380	-	767	950	-
06/21/22	7,000	7.88	28.8	128	3,930	-	1,030	915	-
07/19/22	16,040	7.79	20.8	157	4,950	7,940	1,040	955	692
08/16/22	17,040	7.77	40.0	664	6,210	-	1,060	1,120	-
09/26/22	15,340	7.54	39.2	697	2,810	-	1,050	1,190	-
10/18/22	16,950	7.96	20.4	<120	3,820	8,710	962	1,110	879
11/21/22	15,940	7.87	46.8	3.3	6,310	-	1,140	1,240	-
12/08/22	-	7.88	41.6	191	5,580	-	1,160	1,440	-
01/17/23	17,390	7.86	29.2	135	3,370	10,400	1,270	1,540	759
02/22/23	-	7.58	20.4	107	2,500	-	931	874	-
03/16/23	-	7.58	35.2	138	2,280	-	922	1,020	-
04/25/23	15,870	7.73	4.0 J	111	1,530	5,310	848	758	618
05/11/23	12,130	7.77	26.4	113	1,650	-	896	792	-
06/27/23	12,000	7.64	50.0	221	2,260	-	1,240	1,300	-
07/20/23	11,920	7.74	45.2	108	2,300	4,200	1,220	1,120	778
08/30/23	15,910	7.86	88.4	144	2,400	-	1,340	1,120	-
09/27/23	4,460	7.86	121.0	173	2,870	-	1,590	1,710	-
10/11/23	7,630	7.64	<2.0	98.4	1,660	6,330	832	896	553
11/15/23	12,500	7.99	66.8	164	2,420	-	397	1,190	-
12/21/23	15,780	11.2	41.6	305	2,200	-	1,530	1,090	-
01/24/24	10,730	7.71	4.4 J	231	2,520	7,390	1,250	1,150	726
02/22/24	17,490	7.81	25.6	255	2,190	-	1,350	1,170	-
03/26/24	17,620	7.57	17.6	173	2,310	-	1,190	1,250	-
04/18/24	11,770	7.83	2.8 J	33.9	1,410	7,900	1,060	905	699
05/28/24	12,910	7.82	21.6	164	1,470	-	767	778	-
06/20/24	12,290	7.81	14.8	189	1,610	-	1,240	756	-
07/16/24	12,650	7.61	6.0 J	184	2,850	8,140	947	1,130	628
08/22/24	12,310	7.68	3.2 J	119	2,290	-	996	987	-
09/25/24	16,760	7.61	24.0	168	2,410	-	1,130	1,170	-
10/03/24	15,420	7.64	<2.0	129	2,020	7,390	1,300	1,130	745

*Table notes are provided on the last page of the data summary.



Table P-1
Analytical Data Summary Table - Leachate Sample Point LST-01 (2021-2024)
Timberline Trail RDF - Northern Expansion No. 2 Feasibility Report
WDNR License No. 3455
Township of Stubbs, Rusk County, WI

LST-01	PARAMETERS									
	Other MSW Leachate Monitoring Parameters									
Date	Sodium, Total (mg/L Na)	Chloride, Total or Dissolved (mg/L Cl)	Sulfate, Total (mg/L SO4)	Fluoride, Total (mg/L F)	Cadmium, Total (µg/L Cd)	Lead, Total (µg/L Pb)	Manganese, Total (µg/L Mn)	Selenium, Total (µg/L Se)	Mercury, Total (µg/L Hg)	Iron, Total (mg/L Fe)
10/05/21	2,630	2,560	<17.5	-	0.98 J	4.1	1,240	<8.70	<0.043	4.0
11/18/21	1,510	-	-	-	-	-	-	-	-	-
12/22/21	1,570	-	-	-	-	-	-	-	-	-
01/13/22	2,220	3,060	61.7	-	<0.50	3.3	-	<8.70	<0.043	-
02/24/22	2,490	-	-	-	-	-	-	-	-	-
03/24/22	1,630	-	-	-	-	-	-	-	-	-
04/20/22	1,480	1,620	25.5 J	<1.3	<0.50	1.5	1,240	<8.70	<0.086	2.6
05/04/22	1,650	-	-	-	-	-	-	-	-	-
06/21/22	1,930	-	-	-	-	-	-	-	-	-
07/19/22	1,950	2,470	38.9 J	-	0.58 J	1.9	-	<8.70	<0.260	-
08/16/22	2,350	-	-	-	-	-	-	-	-	-
09/26/22	2,450	-	-	-	-	-	-	-	-	-
10/18/22	2,540	1,910	226.0	-	<0.50	0.38 J	1,570	<8.70	<1.300	1.5
11/21/22	2,620	-	-	-	-	-	-	-	-	-
12/08/22	2,670	-	-	-	-	-	-	-	-	-
01/17/23	2,560	2,590	64.00	-	0.56 J	2.1	-	<8.70	<1.300	-
02/22/23	2,120	-	-	-	-	-	-	-	-	-
03/16/23	1,950	-	-	-	-	-	-	-	-	-
04/25/23	1,580	1,380	102.0	1.8 J	<0.50	1.2	1,440	<8.70	<0.130	3.60
05/11/23	1,820	-	-	-	-	-	-	-	-	-
06/27/23	2,390	-	-	-	-	-	-	-	-	-
07/20/23	2,330	2,170	103.0	-	<0.50	2.1	-	<8.70	<0.130	-
08/30/23	2,430	-	-	-	-	-	-	-	-	-
09/27/23	2,590	-	-	-	-	-	-	-	-	-
10/11/23	1,770	1,970	66.4	-	0.60 J	1.2	1,040	<8.70	<0.260	1.2
11/15/23	2,300	-	-	-	-	-	-	-	-	-
12/21/23	2,380	-	-	-	-	-	-	-	-	-
01/24/24	2,330	2,350	23.5 J	-	<0.50	3.1	-	<8.70	<0.260	-
02/22/24	2,210	-	-	-	-	-	-	-	-	-
03/26/24	2,660	-	-	-	-	-	-	-	-	-
04/18/24	1,960	2,550	104.0	4.2 J	<0.50	2.0	1,230	<8.70	<0.042	2.9
05/28/24	1,330	-	-	-	-	-	-	-	-	-
06/20/24	1,530	-	-	-	-	-	-	-	-	-
07/16/24	1,910	2,150	32.7 J	-	<0.50	2.5	-	<8.70	<1.300	-
08/22/24	418	-	-	-	-	-	-	-	-	-
09/25/24	2,240	-	-	-	-	-	-	-	-	-
10/03/24	2,320	2,430	28.4 J	-	<0.50	2.2	1,150	<8.70	<0.420	2.8

Notes:

mg/L = milligrams per liter
µg/L = micrograms per liter

- = analysis not applicable/not available

J = result value was between the laboratory limit of detection and limit of quantitation

< = the analyte was not detected at a concentration at or above the method detection limit (i.e. < MDL)

Prepared by: AH

Checked by: DP/AC

In accordance with the June 7, 2006 Conditional Plan of Operation Approval for the Timberline Trail Recycling and Disposal Facility Northern Expansion, semi-annual monitoring is required at LST-01 for MSW leachate sampling parameters and VOCs, and annual monitoring is required for acid extractable compounds and base/neutral extractable compounds. Additionally, MSW leachate sampling parameters (pH, BOD, COD, ammonia-N, specific conductance, alkalinity, and hardness) are measured quarterly in accordance with the August 20, 2024 Conditional Plan of Operation Approval Modification for the Research, Development and Demonstration Plan Renewal.

The pH value reported on December 21, 2023 is an outlier. This value was likely incorrectly reported into GEMS database but any correction could not be determined.

APPENDIX D1: COMPLIANCE LETTER



November 25, 2025

Nathan Coller
Sr. Hydrogeologist
Wisconsin Department of Natural Resources
810 W. Maple Street
Spooner, WI 54801-1255
Nathan.coller@wisconsin.gov

Re: Response to Item #7; Notice of Incompleteness

Timberline Trail Recycling & Disposal Facility
Feasibility Report – Proposed Northern Expansion No. 2
Weyerhaeuser, Wisconsin
WDNR License No. 03455 FID No. 855040230

Dear Mr. Coller:

On behalf of Waste Management of Wisconsin, Inc. (WMWI), this responds to item #7 of the Department's November 10, 2025, Notice of Incompleteness for the Feasibility Report for the Timberline Trail Recycling & Disposal Facility Proposed Northern Expansion No. 2.

Pursuant to § 289.34 (2), Wis. Stats., WMWI is both the sole owner of the real property upon which the expansion will be located, and the sole applicant seeking to construct and operate the proposed expansion. The only party that owns 10% or more of WMWI's legal or equitable interests or assets is Waste Management Holdings, Inc. (WMH). Given that, WMWI makes the following disclosures:

WMWI has a greater than 10% interest in the Omega Hills North Landfill (Omega Hills), and WMWI entered into a Stipulation and Judgment with the State of Wisconsin in 1989. The leachate head levels set forth in the Stipulation and Judgment are unachievable and are being replaced with a Conditional Long-Term Care and Corrective Action Plan Modification Approval, which remains under development by the Department.

WMWI has a greater than 10% interest in the Metro Recycling and Disposal Facility (Metro). On May 9, 2025, WDNR issued a Notice of Noncompliance (NON) concerning certain stormwater controls. Metro has complied with all follow-up conditions or requirements in response to the NON and is awaiting WDNR final approval to administratively close the NON.

WMWI has a greater than 10% interest in the Metro Recycling and Disposal Facility (Metro). On November 18, 2025, WDNR issued a Notice of Violation (NOV) concerning certain alleged Air Permit Violations. Metro has been asked to attend an enforcement conference on December 11, 2025, to review and discuss the alleged violations and corrective actions. Metro staff has accepted attendance at this meeting to resolve and correct the issues.

WMH has a greater than 10% interest in WM Waste, Inc., which owns a facility in Union Grove, Wisconsin. The facility's Feasibility and Plan of Operation Report (FPOR) approval in effect in 2019 required biennial sampling of the stormwater pond's outfall (surface water) and sediment,

and in 2019, the facility missed one scheduled round of stormwater pond sediment sampling. This has previously been reported to the Department. On April 25, 2024, the Department issued a Final Determination to Conditionally Approve the facility's updated FPOR (Final Determination). Conditions 94, 96 and 104 of the Final Determination each required the submittal by the facility of certain plans and information by deadlines which were not met. All such submittals have been made and have since been approved by the Department.

The Omega Hills, Metro and WM Waste Union Grove facilities are all covered by adequate financial assurance, copies of which are on file with the Department and can be provided upon request. As such, these facilities are exempt from § 289.34(3), Wis. Stats.

Lastly, we understand the Department interprets legal or equitable interests to be beyond the direct ownership of assets or shares/membership interests in these entities. WMH has a greater than a 10% interest in Advanced Disposal Services (ADS). Although we disagree with that statutory interpretation, attached is a listing of all of the Wisconsin solid or hazardous waste facilities which are owned by WMWI, WMH or ADS.

After a good faith and diligent investigation, with the exception of the matters disclosed herein, neither WMWI nor WMH are:

- a. In noncompliance with the plan approvals or orders issued by the Department for a solid or hazardous waste facility in Wisconsin.
- b. An owner or previously owned a 10% or greater legal or equitable interest in person, or in assets of a person, who is not in compliance with a plan approval or order issued by the Department for a solid or hazardous waste facility in Wisconsin.

If you have any questions regarding this information, please contact me at (262) 443-2240.

Sincerely,



Tyler Field
Senior Engineering Manager

ATTACHMENT 1

**List of Solid or Hazardous Waste Facilities Owned by
Waste Management of Wisconsin, Inc.
and
Waste Management Holdings, Inc.
and
Advanced Disposal Services**

WASTE MANAGEMENT OF WISCONSIN, INC.

DISPOSAL FACILITIES – OWNED, ACTIVE/CLOSED

NAME	ADDRESS	CITY	STATUS
Boundary Road	W124 N89255	Menomonee Falls	Closed
Brookfield Landfill	18860 Rivendell Drive	Brookfield	Closed
City Disposal Corp Landfill		Dunn	Closed
Eaton Landfill	Trestle Rd. approx.. .75 miles south of Hwy 29	Eaton	Closed
Hagen Farm		Stoughton	Closed
Madison Prairie RDF	6002 Nelson Rd.	Sun Prairie	Active
Metro RDF	10712 S. 124 th St	Franklin	Active
Muskego Landfill		Muskego	Closed
Neosho Landfill	Station Road approx.. 1550 feet east of Hwy 67	Rubicon	Closed
Omega Hills Landfill	N29 W12730 County Lind Rd	Germantown	Closed
Orchard Ridge RDF	W124 N9355 Boundary Rd.	Menominee Falls	Active
Pheasant Run RDF	19414 60 th St	Bristol	Active
Polk Landfill	Hwy 175 at intersection Hwy 164	Slinger	Closed
Reclamation Landfill	43 rd Street approx. 2760 feet north of 7 Mile Road	Raymond	Closed
Ridgeview RDF	6207 Hempton Lake Rd	Whitelaw	Active

Rusk County Small C&D Landfill	County Road G at intersection with Old Airport Road	Ladysmith	Closed
Sawyer County Small C&D Landfill	14612 W County Road B	Hayward	Closed
Stone Ridge Landfill	S82W21595 Wauer Lane	Muskego	Closed
Timberline Trail RDF	N4581 Hutchinson Rd.	Weyerhaeuser	Active
Valley Trail RDF	N9101 S. Willard Rd	Berlin	Active
SOLID WASTE DISPOSAL FACILITIES – SOLD			
Clark County Small C&D Waste Facility		Thorp	Sold
SOLID WASTE TRANSFER FACILITIES – OWNED, ACTIVE OR CLOSED			
WM - Ashland Transfer	510 Industrial Park Rd.	Ashland	Active
WM - Green Bay TS	1861 Allouez Ave.	Green Bay	Active
WM - Hayward Transfer	14612 W. County Hwy B	Hayward	Closed
WM - La Crosse	415 Island St.	La Crosse	Active
WM - Lake Delton	S 2439 Highway 12	Baraboo	Active
WM - Menasha Transfer	1860 Novak Dr	Menasha	Active
WM - River Falls	250 Summit St.	River Falls	Active
WM – Osceola TS	2312 Oak Dr.	Osceola	Active

Phillips Transfer	310 S. Airport Rd	Phillips	Closed
Somerset Transfer Station	611 Laser Drive	Somerset	Closed
WMI of WI-Prairie du Chein	62949 Vineyard Coulee Rd	Prairie du Chein	Active
SOLID WASTE TRANSFER FACILITIES – SOLD OR DIVESTED			
WM – Antigo	1715 Deeglise St.	Antigo	Divested
WM - Chippewa Falls	11888 30 th Ave.	Chippewa Falls	Divested
WM Darlington	11500 Ames Rd	Darlington	Divested
WM - Door County TS	1509 Division Road	Sturgeon Bay	Sold
WM-Janesville	304 W. Sunny Lane	Janesville	Divested
WM - Ladysmith Transfer Station	W8527 Gokey Rd	Ladysmith	Sold
WM - Madison	2418 W. Badger Rd	Madison	Sold
WM - Mosinee	1372 State Hwy 34	Mosinee	Divested
WM – Peshtigo	N3989 County E	Peshtigo	Sold
WM - Sheboygan Falls T/S	115 Birch Rd	Sheboygan Falls	Divested
WM of Southeast Wisconsin	1508 S. Popple Avenue	Marshfield	Sold
Waupaca TS	E1571 Stratton Lake Road	Waupaca	Sold

Waste Management Holdings, Inc.

HAZARDOUS WASTE FACILITIES - OWNED, ACTIVE OR CLOSED

NAME	ADDRESS	CITY	STATUS
WM Waste, Inc.	21211 Durand Ave.	Union Grove	Open

ADVANCED DISPOSAL SERVICES

SOLID WASTE DISPOSAL FACILITIES – OWNED, ACTIVE/CLOSED

NAME	ADDRESS	CITY	STATUS
Cranberry Creek Landfill Inc	2510 Engle Road	Wisconsin Rapids	Active
Valley Meadows LF	W5429 Hoge Rd	Fort Atkinson	Closed

SOLID WASTE DISPOSAL FACILITIES – SOLD OR DIVESTED

Glacier Ridge Landfill	N7296 County Rd V	Horicon	Divested
Emerald Park Landfill	W124 S10629 South 124th Street	Muskego	Divested
Hickory Meadows Landfill, LLC	W 3105 Schneider Road	Hilbert	Divested
Mallard Ridge Landfill	W 8470 State Road 11	Delavan	Divested
Seven Mile Landfill	8001 Olson Drive	Eau Claire	Divested

APPENDIX E1: PIPE STRENGTH CALCULATION



8040 Excelsior Drive, Suite 305
 Madison, WI 53717
 (877) 633-5520
 www.tetrattech.com

CLIENT:	Waste Management of Wisconsin, Inc.	PRE:	TD
PROJECT:	Timberline Trail RDF – Northern Expansion No. 2 FR Addendum No. 1	CHK:	JPR
SUBJECT:	Revised Pipe Strength Calculations	DATE:	11/12/2025
PROJECT NO.	209-4251388		

T-1C 8-inch SDR 11 HDPE LEACHATE COLLECTION PIPE

Purpose: Evaluate the 8-inch diameter SDR-11 high density polyethylene (HDPE) leachate collection pipe under the maximum overburden stress from Northern Expansion No. 2.

Approach: Estimate the loads applied on the leachate collection pipe and determine if adequate factors of safety against pipe deflection and crushing can be obtained. The collection pipe with the highest overburden load is located in proposed Phase 10 as shown on Figure T-1A. The estimated overburden stress considers both the maximum intermediate grades (Sheet 23 of Reference 3) and permitted final grades (Sheet 24 of Reference 3) with the thickest final cover system option. Only the worst-case loading is used to evaluate pipe strength.

- References:**
- 1.) Plastics Pipe Institute 2nd Edition Handbook of PE Pipe, Buried PE Pipe Design.
 - 2.) ISCO Industries, Typical Properties and Dimension Charts.
 - 3.) Timberline Trail RDF Northern Expansion No. 2 Feasibility Report Plan Set.
 - 4.) Figure T-1A: Pipe Strength and Settlement Evaluation.

- Assumptions:**
- 1.) Neglect live loads once waste is placed at intermediate or final grades.
 - 2.) The collection pipe meets specifications of ASTM F714: Standard Specification for Polyethylene (PE) Plastic Pipe (DR-PR) Based on Outside Diameter.
 - 3.) Top of Stone Elevation = 1194.70, Top of Maximum Intermediate Grade Elevation = 1450.87, and Top of Final Cover Elevation = 1432.58.
 - 4.) Unit weight of waste is assumed to be 90 pounds per cubic foot (pcf).
 - 5.) Poisson Ratio (μ) of the stone backfill is assumed to be 0.3 (conservative).
 - 6.) The maximum compressive strength of HDPE at yield is 1,600 psi.
 - 7.) The HDPE pipe has a modulus of elasticity (E) of 130,000 psi.

Calculations: Calculate the overburden stress applied to the leachate collection pipe for the following conditions, then use the worst-case loading to evaluate the pipe for deflection and crushing:

- Condition 1 – Maximum Intermediate Grades (Sheet 23 of Reference 3).
- Condition 2 – Permitted Final Grades (Sheet 24 of Reference 3) with the thickest cover system option (i.e., Options C or D with 3.5 feet of rooting zone soil).



CLIENT:	Waste Management of Wisconsin, Inc.	PRE:	TD
PROJECT:	Timberline Trail RDF – Northern Expansion No. 2 FR Addendum No. 1	CHK:	JPR
SUBJECT:	Revised Pipe Strength Calculations	DATE:	11/12/2025
PROJECT NO.:	209-4251388		

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Pipe Loading $P_T = P_E + P_L$

Dead Load

$$P_T = \sum \frac{\gamma_{fill} * H_{fill}}{144}$$

where,

- P_T = Pipe Total Load, lb/in²
- P_E = Earth Load, lb/in²
- P_L = Live Load, lb/in²
- γ_{fill} = Fill Unit Weight, lb/ft³
- H_{fill} = Height of Fill, ft

A summary of material type, thickness, and calculated overburden stress for each condition is summarized in Tables 1 and 2 below.

Table 1 – Condition 1: Maximum Intermediate Grades

Fill Type	Height, H _{fill} (ft)	Unit Weight, γ_{fill} (pcf)	Earth Load (psi)
Intermediate Cover	1.00	125	0.87
Waste	255.17	90	159.48
Leachate Drainage Material	1.00	135	0.94
Total	257.17	-	161.29

Table 2 – Condition 2: Permitted Final Grades with the Thickest Final Cover Option

Fill Type	Height, H _{fill} (ft)	Unit Weight, γ_{fill} (pcf)	Earth Load (psi)
Topsoil	0.50	105	0.36
Rooting Zone	3.50	120	2.92
Clay / Soil Barrier Layer	2.00	130	1.81
Grading Layer	0.50	125	0.43
Waste	231.38	90	144.61
Leachate Drainage Material	1.00	135	0.94
Total	238.88	-	151.07

Based on the above calculations, the worst-case pipe loading occurs under the maximum intermediate waste grades with intermediate cover. Neglecting live loads, $P_L = 0$ psi and $P_T = P_E = 161.29$ psi = **23,225 psf**. The calculated P_E is then then adjusted for the pipe perforations based on the following equation:

$$Design P_E = \frac{P_E}{\left(1 + \frac{n \times d}{12}\right)}$$

Where,

- n = number of perforations per foot of pipe
- d = diameter of perforations (in)

The collection pipe has four 3/8-inch diameter perforations per foot; therefore, the **Design $P_E = 26,543$ psf**.



CLIENT:	Waste Management of Wisconsin, Inc.	PRE:	TD
PROJECT:	Timberline Trail RDF – Northern Expansion No. 2 FR Addendum No. 1	CHK:	JPR
SUBJECT:	Revised Pipe Strength Calculations	DATE:	11/12/2025
PROJECT NO.:	209-4251388		

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Deflection

Based on Reference 1, a deflection limit of 7.5% provides a large safety factor against instability and strain and is considered a safe design deflection. Since the depth of burial is greater than 50 feet, the deflection of the leachate collection pipe was estimated using Watkins-Gaube method as shown below.

$$E_S = M_S \frac{(1 + \mu)(1 - 2\mu)}{(1 - \mu)} \qquad R_F = \frac{12E_S(DR - 1)^3}{E}$$

$$\frac{\Delta X}{D_M} (100) = D_F \epsilon_S \qquad \epsilon_S = \frac{P_E}{144E_S} \qquad M_S = \left(\frac{500}{20}\right) * (P_E - 80) + 6,000$$

Where,

- E_S = Secant Modulus of the Soil, psi
- M_S = One-Dimensional Modulus of Soil, psi
- R_F = Rigidity Factor, unitless
- μ = Soil Poisson Ratio, unitless
- E = Modulus of Elasticity of Pipe, psi
- ϵ_S = Soil Strain, psi
- D_F = Deformation Factor, unitless
- DR = Pipe Diameter Ratio (DR)
- $\frac{\Delta X}{D_M}$ = Pipe Deflection

A summary of the calculation parameters and estimated deflection is provided in the table below:

Parameter	Value	Unit
Earth Load, P_E , (w*H)	26,543	psf
Poisson Ratio, μ	0.30	NA
Vertical Soil Stress (psi)	161.29	psi
Modulus of Soil Reaction, M_S	6,500	psi
Secant Modulus of the soil, E_S	4,829	psi
Modulus of Elasticity Pipe, E	130,000	psi
Pipe DR	11	NA
Rigidity Factor, R_F	446	NA
Deformation Factor, D_F	1.05	NA
Soil Strain, ϵ_S	0.038	NA
Percent Pipe Deflection, %	4.01%	NA

The maximum deflection for the 8-inch diameter SDR-11 HDPE collection pipe is estimated to be 4.01%. This is less than the maximum allowable pipe deflection of 7.5% by a safety factor of 1.9.



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CLIENT:	Waste Management of Wisconsin, Inc.	PRE:	TD
PROJECT:	Timberline Trail RDF – Northern Expansion No. 2 FR Addendum No. 1	CHK:	JPR
SUBJECT:	Revised Pipe Strength Calculations	DATE:	11/12/2025
PROJECT NO.	209-4251388		

Compressive Stress

Crushing occurs when the compressive stress in the HDPE pipe wall exceeds the compressive yield stress of the pipe material. The equation below was used to calculate the compressive stress resulting from the worst-case pipe loading.

$$S = \frac{(P_E + P_L) * DR}{288}$$

Where,

- P_E = Vertical Earth Load, psf
- P_L = Vertical Live Load, psf
- S = Compressive Stress, psi

A summary of the calculation parameters and estimated compressive stress is provided in the table below:

Parameter	Value	Unit
Vertical Earth Load, P _E	26,543	psf
Vertical Live Load, P _L	0	psf
Pipe DR	11	NA
Compressive Stress, S	1,014	psi

The maximum compressive stress on the 8-inch diameter SDR-11 HDPE collection pipe is estimated to be 1,014 psi. This is less than the 1,600 psi yield stress of HDPE by a safety factor of 1.6.

Results: The calculated factors of safety against pipe deflection and crushing are considered adequate.

crown may completely reverse its curvature inward and collapse. See Figure 3-1A.

A deflection limit of 7.5% provides at least a 3 to 1 safety factor against reverse curvature.

Bending strain occurs in the pipe wall as a result of ring deflection—outer-fiber tensile strain at the pipe springline and outer-fiber compressive strain at the crown and invert. While strain limits of 5% have been proposed, Jansen ⁽¹²⁾ reported that, on tests of PE pipe manufactured from pressure-rated resins and subjected to soil pressure only, “no upper limit from a practical design point of view seems to exist for the bending strain.” In other words, as deflection increases, the pipe’s performance limit will not be overstraining but reverse curvature collapse.

Thus, for non-pressure applications, a 7.5 percent deflection limit provides a large safety factor against instability and strain and is considered a safe design deflection. Some engineers will design profile wall pipe and other non-pressure pipe applications to a 5% deflection limit, but allow spot deflections up to 7.5% during field inspection.

The deflection limits for pressurized pipe are generally lower than for non-pressurized pipe. This is primarily due to strain considerations. Hoop strain from pressurization adds to the outer-fiber tensile strain. But the internal pressure acts to reround the pipe and, therefore, Eq. 3-10 overpredicts the actual long-term deflection for pressurized pipe. Safe allowable deflections for pressurized pipe are given in Table 3-11. Spangler and Handy ⁽¹³⁾ give equations for correcting deflection to account for rerounding.

TABLE 3-11
Safe Deflection Limits for Pressurized Pipe

DR or SDR	Safe Deflection as % of Diameter
32.5	7.5
26	7.5
21	7.5
17	6.0
13.5	6.0
11	5.0
9	4.0
7.3	3.0

* Based on Long-Term Design Deflection of Buried Pressurized Pipe given in ASTM F1962.



Iron Pipe Size (IPS) and Dimension Data

PE2708

DriscoPlex® 4800 Series Polyethylene Industrial Pipe

Pressure Ratings are calculated using 0.63 design factor for HDS at 73°F as listed in PPI TR-4 for PE 2708 materials. 4800 Series can accommodate total pressure during surge events (hydraulic transients) to 1.5 times the pipe's pressure rating for recurring surges and to 2.0 times the pipe's pressure rating for occasional surges. Temperature, Chemical, and Environmental use considerations may require use of additional design factors.

Pressure Rating		267 psi DR 7.0			200 psi DR 9.0			160 psi DR 11.0			125 psi DR 13.5			
Nominal Pipe Size	IPS OD (in)	Minimum Wall (in)	Average ID (in)	Weight (lbs/ft)	Minimum Wall (in)	Average ID (in)	Weight (lbs/ft)	Minimum Wall (in)	Average ID (in)	Weight (lbs/ft)	Minimum Wall (in)	Average ID (in)	Weight (lbs/ft)	Nominal Pipe Size
2"	2.375	0.339	1.656	0.93	0.264	1.816	0.75	0.216	1.917	0.63	0.176	2.002	0.52	2"
3"	3.500	0.500	2.440	2.02	0.389	2.676	1.63	0.318	2.825	1.37	0.259	2.950	1.14	3"
4"	4.500	0.643	3.137	3.34	0.500	3.440	2.70	0.409	3.633	2.26	0.333	3.793	1.88	4"
6"	6.625	0.946	4.619	7.24	0.736	5.064	5.85	0.602	5.348	4.90	0.491	5.585	4.07	6"
8"	8.625	1.232	6.013	12.26	0.958	6.593	9.92	0.784	6.963	8.31	0.639	7.271	6.91	8"
10"	10.750	1.536	7.494	19.05	1.194	8.218	15.41	0.977	8.678	12.91	0.796	9.062	10.73	10"
12"	12.750	1.821	8.889	26.80	1.417	9.747	21.67	1.159	10.293	18.16	0.944	10.748	15.09	12"
14"	14.000	2.000	9.760	32.31	1.556	10.702	26.13	1.273	11.302	21.90	1.037	11.801	18.19	14"
16"	16.000				1.778	12.231	34.13	1.455	12.916	28.60	1.185	13.487	23.76	16"
18"	18.000				2.000	13.760	43.19	1.636	14.531	36.20	1.333	15.173	30.08	18"
20"	20.000							1.818	16.145	44.69	1.481	16.859	37.13	20"
22"	22.000							2.000	17.760	54.07	1.630	18.545	44.93	22"
24"	24.000										1.778	20.231	53.47	24"
26"	26.000										1.926	21.917	62.75	26"
28"	28.000										2.074	23.603	72.78	28"
30"	30.000													30"
32"	32.000													32"
34"	34.000													34"
36"	36.000													36"
42"	42.000													42"
48"	48.000													48"
54"	54.000													54"

Additional sizes and DR's may be available. Please contact Performance Pipe for further details.

This size and dimension chart is intended for reference purposes. It should not be used in place of the advice from a licensed Professional Engineer. Pipe weights are calculated in accordance with PPI TR-7. Average inside diameter is calculated using IPS OD and Minimum wall plus 6% for use in estimating fluid flows. Actual ID will vary. When designing components to fit the pipe ID, refer to pipe dimension and tolerances in the applicable pipe manufacturing specification.

Visit www.performancepipe.com for the most current literature.

HIGH DENSITY POLYETHYLENE PIPE
Typical Physical Properties***

Property	Specification	Unit	Nominal Value
Material Designation	PPI / ASTM		PE 3408
Material Classification	ASTM D-1248		III C 5 P34
Cell Classification	ASTM D3350-99		345464C
-Density (3)	ASTM D-1505	gm/cm ³	0.955
-Melt Index (4)	ASTM D-1238 (216 kg/190;C)	gm/10 min.	0.11*
-Flex Modulus (5)	ASTM D-790	psi	135,000
-Tensile Strength (4)	ASTM D-638	psi	3,200
PENT (6)	ASTM F-1473	Hours	>100
-HDB @73; F (4)	ASTM D-2837	psi	1,600
-HDB @ 140 Deg F	ASTM D-2837	psi	800
-U-V Stabilizer (C)	ASTM D-1603	% C	2.5
Hardness	ASTM D-2240	Shore "D"	65
Compressive Strength (yield)	ASTM D-695	psi	1,600
Tensile Strength @ Yield (Type IV Spec.)	ASTM D-638 (2"/min.)	psi	3,200
Elongation @ Yield	ASTM D-638	%, minimum	8
Tensile Strength @ Break (Type IV Spec.)	ASTM D-638	psi	5,000
Elongation @ Break	ASTM D-638	%, minimum	750
Modulus of Elasticity	ASTM D-638	psi	130,000
PENT (6)	ASTM F-1473	Hours	>100
(Cond. A, B, C: Mold. Slab)	ASTM D-1693	Fo, Hours	>5,000
(Compressed Ring - pipe)	ASTM F-1248	Fo, Hours	>3,500
Slow Crack Growth	Battelle Method	Days to Failure	>64
Impact Strength (IZOD) (.125" Thick)	ASTM D-256 (Method A)	In-lb / in notch	42
Linear Thermal Expansion Coef.	ASTM D-696	in / in/;F	1.2x10 ⁻⁴
Thermal Conductivity	ASTM D-177	BTU-in/ft ² / hrs/ degreesF	2.7
Brittleness Temp.	ASTM D-746	degrees F	< -180
Vicat Soft. Temp.	ASTM D-1525	degrees F	257
Heat Fusion Cond.	ASTM D-1525	@ psi degrees F	75 @ 400

*** This list of typical physical properties is intended for basic characterization of the material and does not represent specific determinations of specifications. The physical properties values reported herein were determined on compression molded specimens prepared in accordance with Procedure C of ASTM D 1928 and may differ from specimens taken from pipe.

** Tests were discontinued because no failures and no indication of stress crackinitiation.

* Average Melt Index value with a standard deviation of 0.01

This document reports accurate and reliable information to the best of our knowledge but our suggestions and recommendations cannot be guaranteed because the conditions of the use are beyond our control. The user of such information assumes all risk connected with the use thereof. Chevron Phillips Chemical Co. and its subsidiaries assume no responsibility for the use of information presented herein and hereby expressly disclaims all liability in regards to such use.

APPENDIX F1: ALTERNATIVE FINAL COVER CALCULATIONS

Methodology: The purpose of this spreadsheet is to determine the flow rate of a liquid through various liner types. This spreadsheet uses Giroud's leakage through composite liners methodology to estimate the leakage flow rate. This method applies the equations for both flow into an orifice and Darcy's flow. The flow into an orifice equation is utilized for the assumption that there will be at least one hole per acre of liner that will allow liquid to flow through. Darcy's flow estimates the flow rate of water in soil. Therefore, these two equations were used to create an empirical equation to estimate the flow rate of liquid through a liner.

Description: Giroud, et al, reviews mechanisms and rates of leakage through composite liners, presents analytical and laboratory studies, and draws conclusions for evaluating leakage. The work describes two main leakage scenarios – perfect contact (no lateral interface flow) and imperfect contact (allowing lateral flow between geomembrane and soil) – and develops two- and three-dimensional steady-state analytical models, compares numerical and experimental results, and locates best- and worst-case field conditions on leakage-rate graphs to provide guidance for design and assessment of composite liner performance.

Shaded cells represent values to be input
 Shaded cells represent cells to be calculated

Description: Estimates infiltration for Geomembrane over infinite permeability subsurface, clay liner, and composite

Reference Equations:

Flow Into an Orifice:

$$Q = CA(2gh)^{1/2}$$

Where: C_d = coefficient of discharge
 A = area of orifice (m^2)
 g = acceleration due to gravity (m/s^2)
 h = head acting on orifice centerline (m)
 Q = flowrate (m^3/s)

Contact coefficients	
Poor contact	0.21
Average contact	0.68
Excellent contact	1.15

Darcy's Flow:

$$Q = kiA$$

Where: k = soil permeability (cm/s)
 i = hydraulic gradient = $\frac{d}{d + T}$
 d = depth of liquid over soil layer (m)
 T = thickness of clay liner
 A = cross-sectional area (m^2)
 Q = flowrate (m^3/s)

Giroud Flow Through Composite:

$$Q = C * a^{0.1} * h^{0.9} * k^{0.74}$$

Where: C = contact coefficient (0.21 to 1.15 typically)
 A = area of hole (m^2)
 h = head (m)
 k = soil permeability (cm/s)
 Q = flowrate (m^3/s)

Layer: Clay - 0.25 inch of liquid

		Average contact	
Contact quality		0.68	
Contact coefficient	C	0.68	
Area of hole	a	0.0001	m ²
Thickness of liner	t	2.0	ft
Thickness of liner	t	0.61	m
Depth of liquid	d	0.25	ft
Depth of liquid	d	0.006	m
Head	h	1.00	
Permeability	k	1.00E-09	m/s
Leakage/flow	Q	5.94E-08	m ³ /s
		1.36	gallons/day

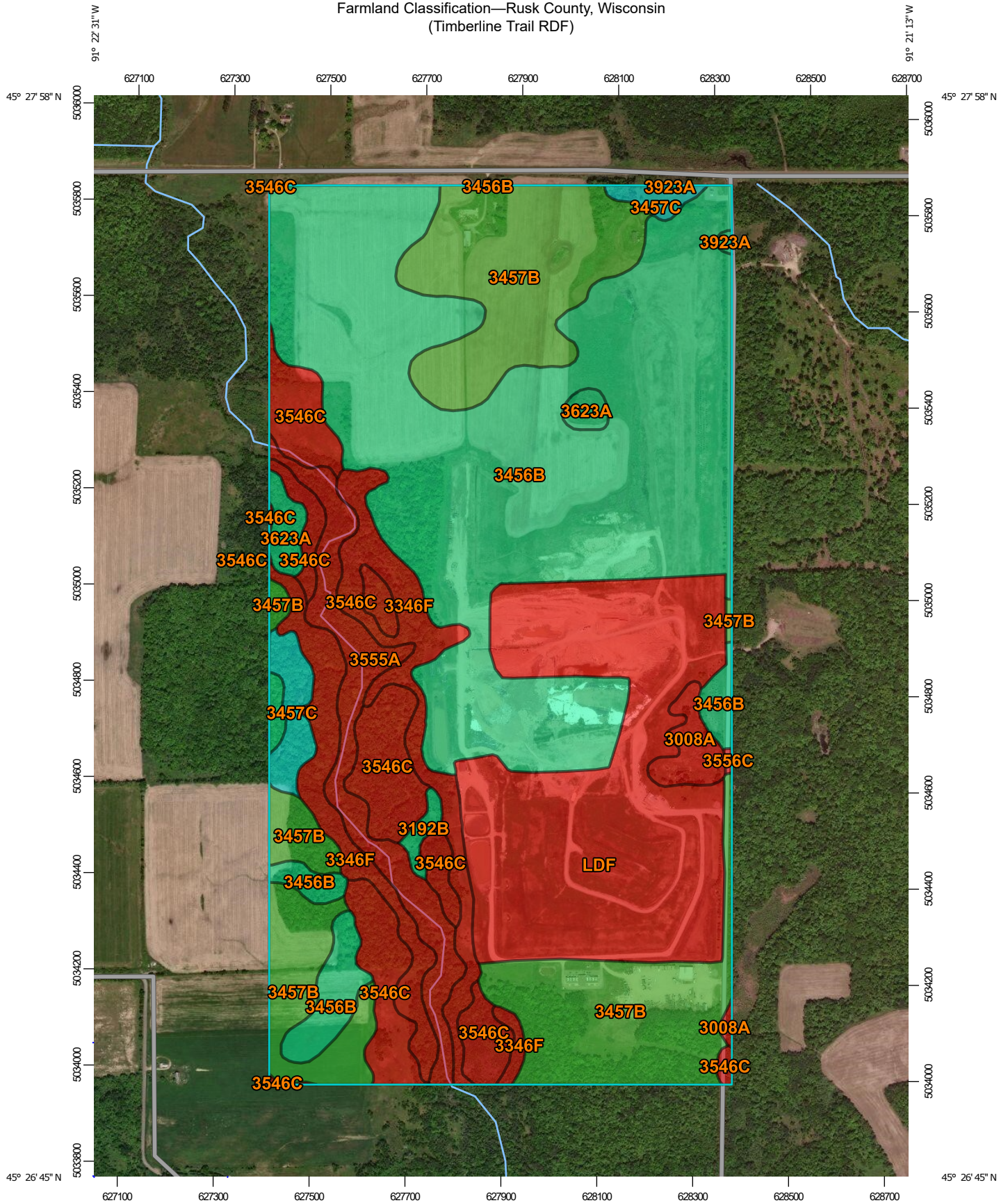
Layer: GCL - 0.25 inch of liquid

		Average contact	
Contact quality		0.68	
Contact coefficient	C	0.68	
Area of hole	a	0.0001	m ²
Thickness of liner	t	0.0208	ft
Thickness of liner	t	0.00635	m
Depth of liquid	d	0.021	ft
Depth of liquid	d	0.006	m
Head	h	2.00	
Permeability	k	5.00E-11	m/s
Leakage/flow	Q	1.20E-08	m ³ /s
		0.27	gallons/day

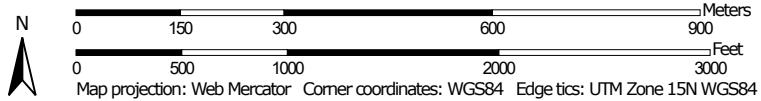
Conclusion: An analysis was done to determine the infiltration rates of a 2-foot thick clay layer and a GCL layer below a geomembrane. Both cases assumed average contact with the overlying layers, a standard 1 cm² hole per acre, and 0.25-inch of liquid head. Based on the alternative final cover requirements, the permeability of the liner system must be less than or equal to 1×10^{-7} cm/s and provide equivalent or better infiltration reduction. The permeability and infiltration of the proposed alternative final cover system using a GCL liner, 5×10^{-9} cm/s and 0.27 gallons/day, respectively, is lower than the WDNR rule requires.

APPENDIX G1: FARMLAND CLASSIFICATION MAP

Farmland Classification—Rusk County, Wisconsin
(Timberline Trail RDF)



Map Scale: 1:10,900 if printed on A portrait (8.5" x 11") sheet.




Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 15N WGS84



Farmland Classification—Rusk County, Wisconsin
(Timberline Trail RDF)









MAP LEGEND








Area of Interest (AOI)






 Area of Interest (AOI)








Soils



Soil Rating Polygons

-  Not prime farmland
-  All areas are prime farmland
-  Prime farmland if drained
-  Prime farmland if protected from flooding or not frequently flooded during the growing season
-  Prime farmland if irrigated
-  Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
-  Prime farmland if irrigated and drained
-  Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season









-  Prime farmland if subsoiled, completely removing the root inhibiting soil layer
-  Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
-  Prime farmland if irrigated and reclaimed of excess salts and sodium
-  Farmland of statewide importance
-  Farmland of statewide importance, if drained
-  Farmland of statewide importance, if protected from flooding or not frequently flooded during the growing season
-  Farmland of statewide importance, if irrigated

-  Farmland of statewide importance, if drained and either protected from flooding or not frequently flooded during the growing season
-  Farmland of statewide importance, if irrigated and drained
-  Farmland of statewide importance, if irrigated and either protected from flooding or not frequently flooded during the growing season
-  Farmland of statewide importance, if subsoiled, completely removing the root inhibiting soil layer
-  Farmland of statewide importance, if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60



































-  Farmland of statewide importance, if irrigated and reclaimed of excess salts and sodium
-  Farmland of statewide importance, if drained or either protected from flooding or not frequently flooded during the growing season
-  Farmland of statewide importance, if warm enough, and either drained or either protected from flooding or not frequently flooded during the growing season
-  Farmland of statewide importance, if warm enough
-  Farmland of statewide importance, if thawed
-  Farmland of local importance
-  Farmland of local importance, if irrigated

-  Farmland of unique importance
-  Not rated or not available


















Soil Rating Lines

-  Not prime farmland
-  All areas are prime farmland
-  Prime farmland if drained
-  Prime farmland if protected from flooding or not frequently flooded during the growing season
-  Prime farmland if irrigated
-  Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
-  Prime farmland if irrigated and drained
-  Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season

Farmland Classification—Rusk County, Wisconsin
(Timberline Trail RDF)

	Prime farmland if subsoiled, completely removing the root inhibiting soil layer		Farmland of statewide importance, if drained and either protected from flooding or not frequently flooded during the growing season		Farmland of statewide importance, if irrigated and reclaimed of excess salts and sodium		Farmland of unique importance		Prime farmland if subsoiled, completely removing the root inhibiting soil layer
	Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60		Farmland of statewide importance, if irrigated and drained		Farmland of statewide importance, if drained or either protected from flooding or not frequently flooded during the growing season		Soil Rating Points Not prime farmland		Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
	Prime farmland if irrigated and reclaimed of excess salts and sodium		Farmland of statewide importance, if irrigated and either protected from flooding or not frequently flooded during the growing season		Farmland of statewide importance, if warm enough, and either drained or either protected from flooding or not frequently flooded during the growing season		Prime farmland if drained		Prime farmland if irrigated and reclaimed of excess salts and sodium
	Farmland of statewide importance		Farmland of statewide importance, if subsoiled, completely removing the root inhibiting soil layer		Farmland of statewide importance, if warm enough		Prime farmland if protected from flooding or not frequently flooded during the growing season		Farmland of statewide importance
	Farmland of statewide importance, if protected from flooding or not frequently flooded during the growing season		Farmland of statewide importance, if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60		Farmland of statewide importance, if thawed		Prime farmland if irrigated		Farmland of statewide importance, if drained
	Farmland of statewide importance, if irrigated				Farmland of local importance		Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season		Farmland of statewide importance, if protected from flooding or not frequently flooded during the growing season
					Farmland of local importance, if irrigated		Prime farmland if irrigated and drained		Farmland of statewide importance, if irrigated
							Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season		

Farmland Classification—Rusk County, Wisconsin
(Timberline Trail RDF)

<p> Farmland of statewide importance, if drained and either protected from flooding or not frequently flooded during the growing season</p> <p> Farmland of statewide importance, if irrigated and drained</p> <p> Farmland of statewide importance, if irrigated and either protected from flooding or not frequently flooded during the growing season</p> <p> Farmland of statewide importance, if subsoiled, completely removing the root inhibiting soil layer</p> <p> Farmland of statewide importance, if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60</p>	<p> Farmland of statewide importance, if irrigated and reclaimed of excess salts and sodium</p> <p> Farmland of statewide importance, if drained or either protected from flooding or not frequently flooded during the growing season</p> <p> Farmland of statewide importance, if warm enough, and either drained or either protected from flooding or not frequently flooded during the growing season</p> <p> Farmland of statewide importance, if warm enough</p> <p> Farmland of statewide importance, if thawed</p> <p> Farmland of local importance</p> <p> Farmland of local importance, if irrigated</p>	<p> Farmland of unique importance</p> <p> Not rated or not available</p> <p>Water Features</p> <p> Streams and Canals</p> <p>Transportation</p> <p> Rails</p> <p> Interstate Highways</p> <p> US Routes</p> <p> Major Roads</p> <p> Local Roads</p> <p>Background</p> <p> Aerial Photography</p>	<p>The soil surveys that comprise your AOI were mapped at 1:12,000.</p> <p>Please rely on the bar scale on each map sheet for map measurements.</p> <p>Source of Map: Natural Resources Conservation Service Web Soil Survey URL: Coordinate System: Web Mercator (EPSG:3857)</p> <p>Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.</p> <p>This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.</p> <p>Soil Survey Area: Rusk County, Wisconsin Survey Area Data: Version 22, Sep 10, 2025</p> <p>Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.</p> <p>Date(s) aerial images were photographed: Sep 12, 2010—Jun 1, 2017</p> <p>The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.</p>
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Farmland Classification

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
3008A	Lupton and Cathro soils, 0 to 1 percent slopes	Not prime farmland	5.0	1.1%
3192B	Worcester sandy loam, 0 to 4 percent slopes	Prime farmland if drained	1.6	0.4%
3346F	Newot-Pence complex, 15 to 45 percent slopes, very stony	Not prime farmland	32.7	7.3%
3456B	Magnor, very stony and Magnor silt loams, 0 to 4 percent slopes	Prime farmland if drained	171.6	38.3%
3457B	Freeon, very stony and Freeon silt loams, 2 to 6 percent slopes	All areas are prime farmland	86.7	19.4%
3457C	Freeon, very stony and Freeon silt loams, 6 to 15 percent slopes	Farmland of statewide importance	7.5	1.7%
3546C	Newood-Pence complex, 6 to 15 percent slopes, very stony	Not prime farmland	35.2	7.9%
3555A	Fordum silt loam, 0 to 2 percent slopes, frequently flooded	Not prime farmland	20.1	4.5%
3556C	Newood, very stony-Magnor, very stony-Cathro complex, 0 to 15 percent slopes	Not prime farmland	0.2	0.0%
3623A	Capitola muck, 0 to 2 percent slopes, very stony	Prime farmland if drained	4.6	1.0%
3923A	Capitola-Cebana complex, 0 to 2 percent slopes, very stony	Prime farmland if drained	0.4	0.1%
LDF	Landfill	Not prime farmland	82.0	18.3%
Totals for Area of Interest			447.5	100.0%

Description

Farmland classification identifies map units as prime farmland, farmland of statewide importance, farmland of local importance, or unique farmland. It identifies the location and extent of the soils that are best suited to food, feed, fiber, forage, and oilseed crops. NRCS policy and procedures on prime and unique farmlands are published in the "Federal Register," Vol. 43, No. 21, January 31, 1978.

Rating Options

Aggregation Method: No Aggregation Necessary

Tie-break Rule: Lower