

**Project Summary and Environmental Analysis
for the Proposed Dane County Landfill Site No. 2 (Rodefeld)
Eastern Vertical Expansion**

General Facility Information

Proposed Facility: Dane County Landfill Site No. 2 (Rodefeld) – Eastern Vertical Expansion,
License No. 3018, Facility Identification Number (FID) 113127300

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Licensee/property Owner: Dane County
Department of Waste & Renewables
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Madison, WI 53718

Facility Location: North ½ of Section 25 and NE ¼ of SE ¼ of Section 25, T7N, R10E, City of
Madison, Dane County, Wisconsin.

Facility Description

The Eastern Vertical Expansion (proposed vertical expansion) of Dane County Landfill Site No. 2 is proposed to be constructed as a contiguous vertical expansion to the existing Dane County Landfill Site No. 2 – Eastern Expansion (License #3018). The proposed vertical expansion would be located completely within the limits of the Eastern Expansion area approved in 2014.

The proposed vertical expansion would be located within a 220.4-acre parcel owned by Dane County. The landfill property is located approximately 1 mile east of the Interstate 90/39 and U.S. Highway (USH) 12/18 interchange. The landfill property is adjoined to the east by County Trunk Highway (CTH) AB and to the south by USH 12/18.

The proposed vertical expansion would reconfigure the currently approved final grades to provide a 21.3-acre vertical overlay on the existing landfill. The additional waste capacity of the expansion would be 990,300 cubic yards (cy). The approved height of the landfill would increase approximately 65 feet from the currently approved height, to a peak elevation of approximately 1,065 feet above mean sea level (ft-MSL).

The existing landfill total design capacity is 10,909,300 cy. The combined total design capacity of the existing landfill and the proposed vertical expansion would be 11,899,600 cy. Approximately 2,165,941 cy of capacity remained as of January 2021. At the time the feasibility report was prepared, the Eastern Expansion was being filled and the remaining site life for the facility was approximately six to six and a half

years, with the landfill's capacity projected to be consumed before 2027. Since the proposed vertical expansion would add approximately three to three and a half years of site life, the total remaining site life would be approximately nine and a half to ten years, with an anticipated date of closure in 2031 based on estimated waste intake at the landfill from historic tracking of incoming waste.

The proposed vertical expansion is not expected to change the landfill's existing traffic routes. While the landfill is operating, waste would continue to be delivered to the site via the existing entrance off USH 12/18 via an access road on the south side of the landfill.

The Wisconsin Department of Transportation (WisDOT) is planning changes to the USH 12/18 and CTH AB interchange. The proposed changes may impact both traffic routes and access to the landfill, as well as the landfill's existing screening and storm water features located near the interchange.

Primary Service Area

The service area for the proposed expansion would be the same as that of the existing landfill and includes only Dane County and the municipalities and industries within Dane County. Waste from outside of the service area may be accepted as well; however, it is not estimated to be a significant volume.

Proposed Waste Types and Leachate Characteristics

The proposed vertical expansion would accept all waste types currently approved for the existing landfill, including commercial solid waste, residential solid waste, industrial solid waste, construction and demolition waste, special wastes (non-municipal solid waste), and contaminated soil and other fee exempt waste for use as alternative daily cover (ADC).

Special waste would be accepted in accordance with the special waste acceptance plan and Wisconsin Department of Natural Resources (department) approvals. Special wastes are wastes that require prior review or special handling. They may be non-municipal solid waste type wastes that are not disposed of on a recurring basis at the existing landfill. In order to accept special waste, the Dane County Landfill Site No. 2 developed and implements a Special Waste Acceptance Plan as a screening procedure to determine if the waste is suitable for disposal and to determine appropriate disposal procedures. The Dane County Landfill Site No. 2 would continue utilizing an approved Special Waste Acceptance Plan during operation of the proposed vertical expansion.

Leachate recirculation is approved for the existing landfill and would be reviewed during the plan of operation.

Based on the landfill's average waste intake from 2017 to 2019, waste tonnages to be landfilled within the proposed vertical expansion would be expected to include the following waste and cover categories:

- Municipal Solid Waste (MSW)– 73.8% of total anticipated waste
- All other solid waste (non-hazardous) – 0.4% of total anticipated waste
- Construction and Demolition (C&D) Waste – 4.0% of total anticipated waste
- Waste Generated by Natural Disaster – 0.3% of total anticipated waste
- Material Recovery Facilities (MRF) Residuals (10% cap) – 2.5% of total anticipated waste
- Construction and Demolition MRF Residuals (mainly composed of plastic film, cardboard, insulation, plastics, and wood products) (30% cap) – 7.1% of total anticipated waste
- Fee Exempt Waste Used for Alternate Daily Cover (ADC) (contaminated soil and other waste exempt from fees) – 11.9% of total anticipated waste

Dane County Landfill Site No. 2 received approximately 239,311 tons of waste material in 2019. The average from 2017 to 2019 is 238,421 tons. During summer months, the landfill receives, on average, approximately 20 to 30 percent more waste by volume.

The filling operations and waste types of the proposed vertical expansion would mirror current operations. Therefore, leachate resulting from the proposed vertical expansion is anticipated to be similar in chemical composition and concentration to the leachate currently being managed from the existing landfill. Dane County Landfill Site No.2 currently has a leachate treatment agreement with the Madison Metropolitan Sewerage District (MMSD) publicly owned treatment works (POTW). All leachate from the proposed vertical expansion would continue to be collected and conveyed to the MMSD Wastewater Treatment Plant via an existing sewer line or would be recirculated into the landfill areas where there is a composite liner system installed. The MMSD Wastewater Treatment Plant has the capacity to treat the entire daily average calculated volume of leachate from the proposed vertical expansion and the existing landfill.

Relevant Approvals/ Permits

The following approvals and permits are required for the proposed vertical expansion:

- Favorable feasibility determination under ch. NR 512, Wis. Adm. Code
- Plan of Operation Approval under ch. NR 514, Wis. Adm. Code
- Air Permit(s) under ch. NR 400, Wis. Adm. Code Series (Operating and Construction). Dane County Landfill Site No. 2 currently has an operation permit (113127300-P20 issued June 20, 2019). Dane County would need to apply for and be issued an air pollution control construction permit prior to commencing construction of the proposed vertical expansion. Dane County would also need to apply for a revision to its operation permit.
- Storm Water Permit under ch. NR 216, Wis. Adm. Code. Dane County Landfill Site No. 2 currently has a Storm Water Permit (Tier 2 Industrial Storm Water General Permit No. S067857-5). Separate coverage under a Storm Water Construction Site Permit would not be necessary provided the industrial Stormwater Pollution Prevention Plan (SWPPP) would be updated and submitted with the Plan of Operation for review prior to construction of the proposed vertical expansion.
- Drinking Water variances under ch. NR 812, Wis. Adm. Code. Two water supply wells are located within 1,200 feet of the proposed vertical expansion and ch. NR 812, Wis. Adm. Code, variance approvals have been granted for both wells in the past. See proposed exemption request number four below.
- Local Negotiated Agreements with all participating affected municipalities and compliance with all applicable local rules and approvals. This process is independent from the department's plan review process.

The affected municipalities as defined under s. 289.01(1), Wis. Stats, in the area of the proposed vertical expansion include: the town of Blooming Grove, the town of Cottage Grove, the city of Madison, and Dane County. Notifications to the affected municipalities regarding the proposed landfill/expansion were sent on May 29, 2020. Copies of the notification letters and responses from the affected municipalities are included in Appendix N of the feasibility report. Responses were received from the City of Madison and Town of Cottage Grove, and both took the required steps to participate in the local siting process as defined in ch. 289, Wis. Stats. Dane County is not allowed to negotiate as an affected municipality.

Proposed Exemptions

Dane County has requested exemptions from the following Wisconsin Administrative Code (Wis. Adm. Code) requirements:

1. An Alternative Geotechnical Investigation Program (AGIP), as outlined in s. NR 512.085, Wis. Adm. Code, was requested by Dane County for the proposed vertical expansion.

The Dane County Landfill Site No. 2 was initially permitted in the early 1980s, and an expansion to the west was permitted in the early 1990s. The subsurface conditions of the proposed vertical expansion area have been investigated during the feasibility process for the original landfill in 1981 and 1982, and as part of the most recent Eastern Expansion permitted in 2014.

Because the proposed vertical expansion would be constructed completely within the Eastern Expansion limits approved in 2014, on top of areas that have already been disturbed for landfilling activities, no additional geotechnical investigation was conducted for the proposed vertical expansion. The horizontal limits of the landfill would not be changing, so any additional geotechnical investigation would involve drilling borings through waste into an approved liner and subbase system.

The feasibility report instead outlines and presents the relevant information included in the Eastern Expansion feasibility report. Because of this, multiple exemptions are being requested by Dane County for Wis. Adm. Code requirements that pertain to geotechnical testing requirements which would typically be performed in an undisturbed area prior to construction of a landfill or its expansion.

Dane County is requesting the following exemptions from Wis. Adm. Code that pertain to geotechnical testing requirements:

- a. An exemption from s. NR 507.05(1)(c), Wis. Adm. Code, which requires collection of soil samples at 5-foot intervals, for existing borings M28 and M29.
- b. An exemption from s. NR 507.05(1)(d), Wis. Adm. Code, which requires collection and testing of a soil sample from the screened interval of a monitoring well, for existing wells M6A, M6B, M6C, M9B, M28, and M29.
- c. An exemption from s. NR 507.05(1)(e), Wis. Adm. Code, which requires retention of soil samples until the department approves the report that included documentation of the soil samples.
- d. An exemption from s. NR 507.06(1)(b), Wis. Adm. Code, which requires standard penetration tests performed at each boring, for borings M1C, M28, and M29.
- e. An exemption from s. NR 507.14(5), Wis. Adm. Code, which requires documentation of monitoring devices and geologic sampling be submitted on the most current version of the department's forms.
- f. An exemption from s. NR 512.09(1) and (2), Wis. Adm. Code, to utilize existing borings, water table wells, and piezometers as shown in Table 1 in Attachment H of the feasibility report addendum no. 1.
- g. An exemption from s. NR 512.09(1)(a) and (2)(d), Wis. Adm. Code, which require borings and wells, respectively, to be located within 300 feet of the proposed limits of filling.

- h. An exemption from s. NR 512.09(4)(a), Wis. Adm. Code, which requires conducting five geotechnical grain-size tests on each major soil unit encountered during the geotechnical investigation.
 - i. An exemption from s. NR 512.09(4)(b), Wis. Adm. Code, which requires conducting two laboratory hydraulic conductivity tests for each fine-grained unit encountered during the geotechnical investigation.
 - j. An exemption from s. NR 512.09(4)(e) and (f), Wis. Adm. Code, which require monthly and quarterly stabilized water level measurements at newly installed monitoring wells and surface water bodies including streams, lakes, ponds, drainage ditches, and wetlands located within 1,000 feet of the proposed limits of filling.
 - k. An exemption from s. NR 512.09(4)(g), Wis. Adm. Code, which requires at least four rounds of baseline groundwater monitoring be performed on all observation wells and piezometers located outside the proposed limits of filling which were installed to evaluate the proposed property in accordance with s. NR 507.18, Wis. Adm. Code.
 - l. An exemption from s. NR 512.09(6)(b) and (c), Wis. Adm. Code, which require conducting consolidation testing on samples collected from each geologic unit in each landfill phase.
 - m. An exemption from s. NR 512.11(2), Wis. Adm. Code, which requires that geologic cross-sections of a contiguous expansion extend to include all previous borings for the existing landfill.
 - n. An exemption from s. NR 512.14(2)(b), Wis. Adm. Code, which requires geologic cross section sheets for the feasibility report to show the present topography, the proposed subbase, base, and final cover grades and the liner configuration.
 2. An exemption from s. NR 504.04(3)(a), Wis. Adm. Code, which states that a landfill may not be established where the limits of filling would be located within 1,000 feet of any navigable lake, pond, or flowage, not including landfill drainage or sedimentation control structures. There are two man-made navigable ponds within 1,000 feet of the existing landfill footprint. Both ponds are located on the public golf course (Yahara Hills) south of the existing landfill. An exemption to s. NR 504.04(3)(a), Wis. Adm. Code, for the 1,000 feet setback to these two ponds was previously granted as part of the Eastern Expansion in 2014.
 3. An exemption from s. NR 504.04(3)(d), Wis. Adm. Code, which states that a landfill may not be established where the limits of filling would be located within 1,000 feet of any of the nearest edge of the right-of-way of any state trunk highway, interstate or federal aid primary highway or the boundary of any public park or state natural area, unless the landfill is screened by natural objects, plantings, fences or other appropriate means so that it is not visible from the highway, park, or natural area. The right-of-way of USH 12/18 and recreational areas to the south and north (Yahara Hills public golf course and Hope Park, respectively) are located within 1,000 feet of the proposed vertical expansion. Dane County proposes to provide continuous screening of the waste within 1,000 feet of Highway 12/18.
 4. An exemption from s. NR 504.04(3)(f), Wis. Adm. Code, which states that a landfill may not be established where the limits of filling would be located within 1,200 feet of any public or private water supply well. Two water supply wells are located within 1,200 feet of the proposed vertical expansion: the biogas facility well (Wisconsin Unique Well Number [WUWN] YZ391) and the Niebuhr well (PW-96 [formerly PW-51], WUWN NG618). Well YZ391 is located on the landfill property and is owned by Dane County. A ch. NR 812, Wis. Adm. Code, variance approval for YZ391 was granted on May 31,

2018, and a subsequent approval was granted on August 14, 2018. An exemption to s. NR 504.04(3)(f), Wis. Adm. Code, for the 1,200 feet setback to PW-96 was previously granted as part of the Eastern Expansion in 2014. A variance approval for PW-96 was granted on February 3, 2014.

5. An exemption from s. NR 504.06(2)(b), Wis. Adm. Code, which requires a minimum separation distance of 10 feet between the seasonal high groundwater table and the bottom of the clay component of a composite liner or a clay liner. An exemption to s. NR 504.06(2)(b), Wis. Adm. Code, for the required separation distance to seasonal high groundwater was previously granted as part of the Eastern Expansion in 2014. The proposed vertical expansion does not affect the subbase grade design, and the seasonal high groundwater table has not changed since the Eastern Expansion was approved.
6. Exemptions from Chapter NR 140, Wis. Adm. Code, which establishes groundwater quality standards for a list of substances that need to be met at their designated point of standards application for the facility. Section NR 140.28 (1), Wis. Adm. Code, states that the department may not approve a proposed facility at a location where a Preventive Action Limit (PAL) or an Enforcement Standard (ES) has been attained or exceeded in groundwater unless an exemption has been granted. Sections NR 140.28 (2) through (4), Wis. Adm. Code, provide the criteria for granting exemption where background concentrations of substances exceed their respective groundwater quality standards.

Monitoring wells were previously installed for the landfill's Eastern Expansion, which the proposed vertical expansion would overlay. No additional monitoring wells were installed to evaluate the proposed vertical expansion. Dane County proposes to use the landfill's existing monitoring wells to monitor the proposed vertical expansion.

The requested exemptions include exceedances for chloride that were reported during detection monitoring at previously installed wells, as well as historical exemptions for antimony, cadmium, chloride, iron, manganese, and nitrate that were granted in 2014 during the permitting process for the Eastern Expansion and are being requested again. The requested exemptions for chloride are generally limited to select replacement wells that have been installed since the Eastern Expansion was approved in 2014.

The design of the existing Dane County Landfill Site No. 2 and Eastern Expansion are part of Dane County's justification for the requested exemptions. The existing landfill and the proposed vertical expansion are/would be constructed with a composite liner system, leachate collection system, landfill gas collection system, final cover system, gradient control system, and associated monitoring systems.

7. An exemption from s. NR 512.11(1), Wis. Adm. Code, which requires that the existing conditions plan sheet show all areas within 1,500 feet of the proposed limits of filling at a minimum scale of 1-inch equals 200 feet. The existing conditions plan sheet submitted with the feasibility report is drawn at a scale of 1-inch equals 300 feet for the sake of legibility.

Land Use and Zoning

Land within a 1-mile radius of the proposed vertical expansion is zoned Planned Development District, Industrial, Parks and Recreation, Conservancy District, Heavy Commercial, Commercial Center District, Agricultural and Agricultural Transition, Residential, General or Limited Commercial, Rural Mixed-Use, Utility, Transportation, and Road Right of Way, Farmland Preservation, and Natural Resource Conservation. Land use of the landfill property would not be changed by the proposed vertical expansion as it would be located on property that is already zoned as a Planned Development District and includes the existing landfill.

The land that would be used for the proposed vertical expansion is the existing open and operating landfill. The landfill is bordered by wetlands to the north, CTH AB to the east, USH 12/18 to the south, and wetlands and commercial developments to the west.

There is a recreational area (Yahara Hills public golf course) located south of the proposed vertical expansion, directly across USH 12/18, and a public park (Hope Park) located approximately 350 feet north of the proposed vertical expansion. There are no critical habitat areas or natural areas within 1 mile of the proposed vertical expansion.

Regional and Site-Specific Geological Information

Soils and Geology

Soils in the area of the proposed expansion consist primarily of well-drained silt loam, silty clay loam, and poorly drained muck, underlain by unconsolidated glacial drift of the Horicon Formation deposited over Ordovician age dolomite bedrock.

The Horicon Formation consists primarily of brown sandy till, with some glacial meltwater deposits of sand and gravel and glacial lake deposits of clay, silt, and sand. Previous geotechnical investigations performed in the area of the Eastern Expansion encountered glacial sediments to at least 95 feet below ground surface. The sediments encountered consisted of silty clay, poorly sorted silty sand glacial till with pebbles, cobbles, and boulders, and outwash and lacustrine deposits of sand and gravel.

The glacial deposits encountered in the borings advanced during the Eastern Expansion geotechnical investigation can be divided into four major geologic units. Beginning at the ground surface and progressing downward, the geologic units consist of surficial fine-grained loess and glaciolacustrine deposits, silty sand till, sand outwash, and an isolated fine-grained clay and silt lower lacustrine deposit. The till, outwash, and isolated lower lacustrine deposit are overlapping in some portions of the site and are derived from the Horicon Formation.

Surficial lean clay (CL) soil encountered beneath portions of the site during the Eastern Expansion geotechnical investigation is consistent with the presence of loess deposits and fine-grained lake deposits, and correlates well with previous investigations. For purposes of definition on cross sections, this unit is labeled as a loess deposit. This layer was not present in all of the borings installed during the Eastern Expansion geotechnical investigation due to landfill activities (grading, sedimentation pond, etc.) and typical heterogeneity in the Eastern Expansion area. This layer was removed during construction of the Eastern Expansion if it was encountered. During previous feasibility investigations in 1982 and 1992, this unit was identified and commonly described as a silty clay or lean clay with little to moderate plasticity, thicknesses up to 6.5 feet, and density ranging from medium stiff to hard.

The second major geologic unit encountered during the Eastern Expansion geotechnical investigation was commonly identified as a silty sand (SM) with gravel (till). This unit was encountered at all borings at varying depths depending on the thickness of the upper clay and surficial soils. The thickness of the unit ranged from a few feet where it is interbedded with outwash and up to 61 feet encountered at boring M-302B. This unit ranges in density from loose to very dense and is generally brown to red in color. The groundwater table generally occurs within the till unit under the Eastern Expansion.

The third major unit encountered during the Eastern Expansion geotechnical investigation is an outwash unit which consists of poorly graded sand (SP), poorly graded sand with gravel, or sand with silt (SP-SM). This unit's thickness and density is highly variable in most areas underlying the Eastern Expansion. The greatest

thickness was encountered at borings across the center of the Eastern Expansion area, with thicknesses ranging from 35 to 70 feet. The outwash unit was not observed at boring M-302B.

A fourth major unit of glaciolacustrine origin was encountered in the northwestern portion of the Eastern Expansion area (borings M-6C, M-9B, B311, and B-304B). This unit consists of lean clay/silty silt (CL) and silt (ML) and was encountered up to depths of 60 feet below ground surface (M-304B) and thicknesses ranging from 3 feet (M-304B) to 28 feet (M-9B, located outside the footprint of the Eastern Expansion). The unit is grayish brown to brown and generally stiff. Considering the entire landfill, this unit is most predominant in the northwest portion of the Eastern Expansion near the four borings described above and is considered an isolated deposit.

According to regional information, bedrock in the site vicinity consists of dolomite of the Prairie du Chien group and sandstone of the Trempealeau, Tunnel City, and Elk Mound groups in the eastern portion of the site. However, previous subsurface investigations performed at the site indicate that bedrock in the immediate area of the Eastern Expansion consists of the Galena-Platteville dolomite of the Sennipee Group.

Logs from water wells installed along CTH AB immediately east and north of the Eastern Expansion indicate that Galena-Platteville dolomite bedrock ranges in depth from 70 feet below ground surface (bgs) near the intersection of USH 12/18 and CTH AB (log from PW-37), to 153 feet bgs to the east of the Eastern Expansion, to 110 feet bgs near Hope park to the north of the Eastern Expansion (log from PW-48). To the west of the Eastern Expansion, logs from abandoned onsite water supply wells indicate bedrock depth ranges from 90 to 194 feet bgs.

There is a fault complex in the vicinity of the site, informally called the “Yahara Hills Complex”, with the disturbed area subdivided into discrete blocks separated by normal faults. The faults are considered inactive as they are not part of a currently active geologic process.

Bedrock was not encountered in borings drilled during the investigation for the 2014 Eastern Expansion. Depth to bedrock information was determined from private well logs (PW-36, PW-37, PW-47, PW-48, Community Well, Hope Park, and Niebuhr well). Based on the private well logs and borings advanced during previous investigations, the depth to bedrock is greater than 50 feet below the subbase of the Eastern Expansion, thus the depth to bedrock would be greater than 50 feet below the subbase of the proposed vertical expansion. Based on boring log M-1C, bedrock is at least 95 feet bgs under the center of the Eastern Expansion.

Hydrogeology

Three major aquifers and one aquitard exist in Dane County. The aquifers consist of the Mount Simon (Cambrian sandstone), the Upper Paleozoic, and the unlithified aquifers. The aquitard is the Eau Claire Formation. The unlithified aquifers are subdivided into three types, with the landfill underlain by Types 2 and 3; Type 2 consists of unconfined poorly sorted sand, gravel, and silt deposited as diamicton of well sorted offshore glacial lake sediment, and Type 3 consists of confined or partially confined, well to moderately well sorted sand and gravel overlain by silty or clayey lake sediments. The unlithified sand and gravel aquifers are able to produce economically useful quantities of water in certain areas of Dane County, but the Cambrian sandstone units are considered the primary aquifer in the county. The water supply well logs that were provided in the feasibility report for the Eastern Expansion indicated those wells were completed in the bedrock aquifer, indicating that the unconsolidated formations in the site vicinity do not produce enough water to supply a water supply well.

Based on measurements collected at the site, the regional water table in the site vicinity is approximately 870 ft-MSL. The groundwater system consists of two hydrostratigraphic units near the Eastern Expansion; the

surficial glacial deposits (till and outwash glacial deposits), and the bedrock aquifer. The surficial glacial deposits are generally the uppermost hydrostratigraphic unit in the vicinity of the Eastern Expansion. No perched water was encountered during drilling activities for the Eastern Expansion.

Groundwater Flow and Gradients

Based on review of the semiannual groundwater level monitoring performed since the Eastern Expansion in 2014, the June 2008 and December 2012 monitoring events still represent the highest and lowest seasonal groundwater table conditions for the site. High water table elevation and low water table elevation contour maps are presented on Plan Sheets 3 and 4 of the feasibility report, respectively.

The direction of groundwater flow during both periods was generally to the north under the Eastern Expansion area. Flow trends toward the north and northwest under the footprint of the approved landfill (according to regional sources, the flow direction in the bedrock aquifer is generally to the southwest [Figure 6-2 in Appendix M of the feasibility report]). The directions of flow are consistent with configurations observed during the previous landfill expansions.

In the Eastern Expansion feasibility report, the calculated horizontal hydraulic gradients across the Eastern Expansion area ranged from approximately 0.002 during the low water table conditions in December 2012 to approximately 0.003 during the high-water table conditions in June 2008.

In the Eastern Expansion feasibility report, water level data from June 2008 and December 2012 were used to calculate the vertical gradients between water table wells and the piezometers. The calculated vertical gradients between the water table and the piezometric surface in December 2012 ranged from -0.014 (upward flow) to 0.004 (downward flow) in wells near the Eastern Expansion. In June 2008, vertical gradients ranged from -0.026 (upward flow) to 0.006 (downward flow) at wells in the Eastern Expansion area.

Vertical gradients calculated for the June and December 2020 monitoring events ranged from -0.042 (upward flow) to 0.063 (downward flow). The strongest upward gradient was at the M6A/M6B well nest near the northern wetland/drainage ditch. The strongest downward gradient was at the WT108A/P108B well nest at the west end of the landfill. Cross Section I-I' (Plan Sheet 12 of the feasibility report) shows the vertical component of groundwater flow during high water conditions.

The geometric mean hydraulic conductivity of the till deposit is 9.4×10^{-4} cm/sec. The geometric mean of the underlying sand outwash is 9.1×10^{-3} cm/sec. The lacustrine deposit in the northwest portion of the Expansion area exhibits a geometric mean of 1.7×10^{-5} cm/sec.

The average linear velocity for groundwater flowing within the Horicon silty sand till aquifer is estimated to be on the order of 30 feet per year or 0.08-foot per day, based on the data provided in the Eastern Expansion feasibility report.

Given the consistent groundwater level monitoring results since the Eastern Expansion feasibility report was prepared, these estimates appear to continue to be representative of site conditions.

Baseline Groundwater Quality

Because the proposed vertical expansion would be constructed completely within the Eastern Expansion limits approved in 2014, on top of areas that have already been disturbed for landfilling activities, no additional monitoring wells were installed to identify or define the specific hydrogeologic and groundwater

quality conditions at the property. Baseline groundwater monitoring at the existing wells as required by s. NR 507.18, Wis. Adm. Code was performed at the wells as part of the landfill's previous permitting process.

Dane County is in the process of collecting baseline groundwater quality data at replacement wells M-17AR, M-17BR, M-28R, M-302AR, M-302BR, and M-303AR. Data from these wells and other wells installed at the landfill can be accessed at the WDNR GEMS database (<https://dnr.wisconsin.gov/topic/Landfills/gems.html>), using License No. 3018.

Constraints on Landfill Development

Locational Criteria

The proposed vertical expansion would not be located within 300 feet of a navigable river or stream or in a flood hazard area or floodplain. The proposed vertical expansion is not located within 10,000 feet of an airport runway used by turbojet aircraft, nor within 5,000 feet of an airport runway used by piston-type aircraft. The proposed vertical expansion is not located within 200 feet of a known Holocene fault or within a seismic impact zone, nor within an unstable area.

The following locational criteria items were identified as potential constraints on landfill development, per s. NR 504.04(3)(a), (d), and (f), Wis. Adm. Code:

1. There are two manmade navigable ponds within 1,000 feet of the existing landfill footprint. Both ponds are located on the public golf course (Yahara Hills) south of the existing landfill. Dane County is requesting a locational criteria exemption in relation to these ponds.
2. The existing limits of waste are located within 1,000 feet of the right-of-way of USH 12/18, Hope Park, and Yahara Hills Golf Course. Similar to the Eastern Expansion, Dane County would incorporate screening through the use of strategically placed plantings, screening berms along the perimeter, and where necessary, soil core berms within the waste mass constructed in conjunction with the filling sequence. Dane County is requesting a locational criteria exemption in relation to USH 12/18 and these recreational areas.
3. Two water supply wells, the biogas facility well (YZ391) and Michael Niebuhr well (PW-96), are located within 1,200 feet of the limits of filling. Dane County is requesting a locational criteria exemption in relation to these wells.

Performance Standards

The proposed expansion would be a vertical expansion above and within the footprint of the existing approved waste limits. The existing landfill and the proposed vertical expansion are/would be constructed with a composite liner system, leachate collection system, landfill gas collection system, storm water management system, final cover system, gradient control system, and associated monitoring systems. Therefore, a significant adverse impact to wetlands, a take of endangered or threatened species, a detrimental effect on surface water, a detrimental effect on groundwater quality, the migration and concentration of explosive gases, and/or the emission of any hazardous contaminant would not be expected.

Geotechnical Information

Site-specific geology includes soils consisting of silty sand till, fine-grained (clay/silt) meltwater deposits (glaciolacustrine), and sand outwash. The landfill has been designed to account for settlement of the liner as discussed in Section 8.5 of the feasibility report.

The Eastern Expansion gradient control system is designed to control the shallow water table in relation to the liner system and base grades under high water table conditions. The proposed vertical expansion would be constructed above the approved gradient control and liner system.

Construction and Operation

Constraints regarding design, materials, or support services necessary to construct and operate the proposed vertical expansion are not expected. The proposed vertical expansion lies entirely within the footprint of the Eastern Expansion and uses the gradient control, liner, and leachate collection and removal systems that were approved with the 2014 plan of operation.

Dane County would continue to use MMSD for leachate disposal or would recirculate the leachate into the landfill in areas where there is a composite liner system installed. An existing sewer line conveys the collected leachate to the MMSD. MMSD presently accepts leachate from the Dane County Landfill Site No. 2.

Operation of the proposed vertical expansion would be provided by Dane County Landfill Site No. 2 personnel and equipment consistent with current operations. On-site facilities to assist in the landfill support services include an office, shop, truck scale, leachate collection system, sedimentation basins, landfill gas extraction system, and renewable natural gas facility and flare.

Existing Facility Performance

Groundwater Quality Monitoring

Since 2018, the public welfare parameters chloride and manganese were detected at levels above their respective NR 140 PAL and/or ES at the facility's groundwater monitoring wells. Chloride exceeded the PAL and/or ES at wells MW14A, M14B, M17AR, M17BR, M23, M28R, M29, M302BR, WT113A, WT201A, WT202AR, WT204A, and WT207AR. Monitoring wells MW14A, M14B, M17AR, M17BR, M23, M28R, M29, M302BR, and WT207AR are located south and/or east of the landfill (upgradient and/or side-gradient of landfill) and high chloride concentrations may be due to road salt use on USH 12/18 and/or CTH AB. Monitoring wells WT113A, WT201AR, WT202AR, and WT204A are located west and/or north of the landfill (side-gradient and/or downgradient) and high chloride concentrations may be due to road salt use on the on-site paved roads. Other parameters that may indicate landfill impacts, such as VOCs at high and repeated concentrations, have not been detected at these wells.

Manganese exceeded the public welfare ES in the first sample collected from replacement well M17BR in December 2020 but was below the public welfare PAL in June 2021. M17BR is located southeast of the landfill (upgradient); manganese is naturally occurring, and the high concentration may be due to natural background levels. Other parameters that may indicate landfill impacts, such as VOCs at high and repeated concentrations, have not been detected at this well.

Since 2018, the public health parameters cadmium, lead, benzene, chloroform, and dichloromethane were detected at levels above their respective NR 140 PAL at the facility's groundwater monitoring wells. Except

for dichloromethane, none of these public health parameters were detected above their NR 140 ES. The cadmium and lead concentrations were below the laboratory's limit of quantitation (LOQ).

Chloroform was detected at concentrations above the PAL but below the ES in one sample from wells M302AR and M302BR in June 2019 but was not detected in the June 2020 or June 2021 samples. The chloroform concentrations were below the laboratory's LOQ and were flagged with quality control (QC) errors in the department's GEMS database, indicating that they may have been laboratory contaminants.

Benzene was detected at a concentration above the PAL but below the ES in one sample from well M303A in June 2018 but was not detected in the June 2019 sample or duplicate. Benzene was also not detected in the December 2020 sample from replacement well M303AR, or the June 2021 sample or duplicate from replacement well M303AR. Well M303AR is upgradient of the landfill.

Dichloromethane was detected at a concentration above the ES in one sample from well WT208ARR in December 2019 but was not detected in the previous sample round in June 2019, or the subsequent sample rounds in June 2020, December 2020, or June 2021. Dichloromethane can sometimes be attributed as a laboratory contaminant; however, it is not clear that was the case in this situation. Well WT208ARR is side-gradient of the landfill.

Additional VOCs have been detected at the landfill's monitoring wells since 2018 below the respective PAL for those substances. The VOC detections were isolated with no detections occurring in subsequent sampling and/or were detected at concentrations between the laboratory's limit of detection (LOD) and LOQ for those respective substances, and some of the VOC detections were flagged for QC errors.

The VOC detections since 2018 are a small percentage of the overall VOC sampling done at the landfill. In addition, these VOC detections were not repeated. The overall groundwater monitoring data and the groundwater flow direction support a conclusion that landfill's design and engineering features are functioning as intended, which is to contain, prevent and minimize releases to the environment from the waste.

Water Supply Well Monitoring

Water supply wells in the vicinity of the landfill withdraw water from the bedrock unit. Bedrock groundwater flow in the vicinity of the landfill is to south/southwest according to the regional piezometric surface map provided in Appendix M of the feasibility report. Except for the biogas facility well, the water supply wells routinely sampled by Dane County are located upgradient or side-gradient of the landfill according to the site maps provided in Attachment F of the feasibility report addendum no.1. The biogas well is located on the landfill property and is potable, but only used for process water and an emergency eye wash and shower station. Except for the biogas well and the Niebuhr well (PW-96), the water supply wells are located more than 1,200 feet from the landfill.

NR 140 PAL and/or ES exceedances have been reported for public health parameters including arsenic, lead, and nitrate+nitrite at some of the water supply wells routinely sampled by Dane County. Based on the groundwater flow within the bedrock and the location of the water supply wells relative to the landfill, and comparing the parameter concentrations detected in landfill monitoring wells to parameter concentrations detected in the water supply wells, other sources may be causing the NR 140 exceedances for arsenic, lead, or nitrate+nitrite in the water supply wells. Arsenic is naturally occurring, and high concentrations may be due to natural background levels. High lead concentrations may be related to lead in plumbing systems. High nitrate+nitrite concentrations may reflect impacts from agriculture and/or septic systems.

VOCs have been detected at the water supply wells currently sampled by Dane County since 2018. The VOC detections were all below the respective PAL for those substances and were isolated with no detections occurring in subsequent sampling, and the majority of substances were detected at concentrations between the laboratory's LOD and LOQ for those respective substances.

Surface Water Monitoring

Quarterly visual monitoring is conducted at each of the four on-site sedimentation basins in accordance with the facility's Tier 2 Industrial Storm Water Permit and associated Storm Water Pollution Prevention Plan (SWPPP). Any visual signs of discoloration have been attributed as being temporary due to disturbance/construction events.

Landfill Gas Monitoring

Landfill gas monitoring at the gas probes around the facility is performed quarterly and indicates that landfill gas is not migrating laterally from the landfill. The only methane detection at a gas probe in the 3-year period from 2018 through 2020 was an isolated detection of 0.3 percent methane at gas probe GP14 in September 2019.

Leachate Head Monitoring

Leachate head monitoring is performed monthly. The leachate head monitoring results for the horizontal leachate head wells installed in the drainage blanket (LHW9N/S through LHW10N/S) indicated that the leachate collection system in Phases 9 through 10 is effectively maintaining leachate head levels below 1 foot over the liner. The proposed vertical expansion would be constructed over Phases 9 through 12.

Gradient Control System

The 2019 Annual Report assessment of the condition and operation of the gradient control system indicates that the gradient control system is operating as expected. The gradient control system discharge point has been dry during all inspections.

Proposed Preliminary Landfill Design and Operation

The proposed vertical expansion has a design capacity of approximately 990,300 cy and would provide approximately three to three and a half years of disposal capacity. The proposed vertical expansion consists of approximately 21.3 acres located entirely within the Eastern Expansion footprint. Because of this, the gradient control system, subbase grades, liner system and base grades, and leachate collection system would remain as approved by the Eastern Expansion.

Subbase Grades and Drainage (Gradient Control System)

No changes to the existing subbase grades or gradient control system are proposed as part of the proposed vertical expansion. The gradient control system and subbase grades are already constructed for the horizontal portion of the Eastern Expansion.

The subbase grades for the Eastern Expansion were constructed with 3:1 interior sideslopes on all sides of the landfill. The subbase grades for the horizontal portion of the Eastern Expansion range from approximately 866 ft-MSL in the northern portion of Phases 9 and 10 to approximately 878 ft-MSL at the high point of Phases 9 and 10. The subbase of the Eastern Expansion maintains the bottom of the clay

component of the composite liner at all locations (excluding the sumps and leachate collection line undercuts) to be no lower than the high groundwater elevations observed on June 1, 2008.

In lieu of the 10-foot separation distance to the high groundwater table, Dane County installed a groundwater gradient control system in the horizontal expansion area of the Eastern Expansion to minimize the chances of groundwater reaching the bottom of the compacted clay liner. The gradient control system consists of 6-inch diameter SDR 11 HDPE collection piping located in 2-foot wide box-type trenches, with a 1-foot thick granular fill drainage layer located over the pipe trenches and extending 25 feet on each side of the trenches. The gradient control pipes follow the layout of the leachate collection pipes except in the area of the sumps where the gradient control pipes jog to the west to avoid the sumps. The gradient control pipes slope from south to north and connect to a lateral pipe that runs east to west between Phases 9 and 10. The lateral runs in a northwest direction under the Northeastern Sedimentation Basin before discharging to the ground surface adjacent to Northern Wetland 1.

Base Grade Slopes and Elevations

No changes to the existing base grades are proposed as part of the proposed vertical expansion. The base grades are already constructed for the horizontal portion of the Eastern Expansion.

The base grades (top of composite clay liner) for the horizontal portion of the Eastern Expansion range from approximately 870 ft-MSL in the northern end of Phases 9 and 10 to approximately 884 ft-MSL at the high point of Phases 9 and 10. The base of the Eastern Expansion has a minimum slope of 2.0 percent.

Liner

No changes to the existing liner are proposed as part of the proposed vertical expansion. All horizontal portions of the Eastern Expansion have been constructed (the department issued the Phase 11 and 12 Liner Construction Documentation Approval on April 14, 2021). The liner below the proposed vertical expansion would be the liner that is approved for the Eastern Expansion because the proposed vertical expansion is above the Eastern Expansion. The liner system for the Eastern Expansion consists of 4 feet of compacted clay followed by a 60-mil high density polyethylene (HDPE) geomembrane, a geotextile cushion and leachate drainage layer. The approved design for the Eastern Expansion includes an overlay over closed phases of the landfill that have composite final cover in the west portion of the Eastern Expansion. The composite final cover within the overlay will be modified to become the liner system for the portion of the landfill within the overlay (the remaining area to be constructed in the overlay area of the Eastern Expansion is Phase 10 Cell 3). The rooting zone and topsoil will be removed, and the remaining liner and drainage layer components will be constructed to meet the liner design requirements in the plan of operation for the Eastern Expansion.

Leachate Collection and Extended Collection Lines

No changes to the existing leachate collection system are proposed as part of the vertical expansion. The existing leachate collection system is designed with collection lines exceeding 1,200 feet. The leachate collection system was designed to maintain less than 12 inches of hydraulic head at the hydraulically most distant location of the liner system throughout the operating life and the post-closure care period of the facility. In order to monitor the performance of the leachate collection system, leachate head wells are included in each liner phase to measure leachate head on top of the liner.

The leachate collection system consists of a select aggregate drainage layer, leachate collection pipes, collection sumps, inclined riser piping containing submersible pumps, perimeter access vaults, leachate forcemain, and transfer manholes. Leachate generated by the proposed vertical expansion, including the overlay area of the Eastern Expansion, would be collected by the leachate collection system in Phases 9 through 12.

The leachate collection lines in Phases 4 and 10 would have the largest load increases due to the proposed vertical expansion final grades that peak at elevation 1,065 ft-MSL. Appendix I (of the feasibility report) contains the soil settlement calculations below the existing leachate collection lines in the proposed vertical expansion area. The calculations include settlement of the clay liner, and native clay and sand layers above bedrock. The calculations in Appendix I show the leachate collection lines in Phases 4 and 10 would maintain a minimum required pipe slope of 0.5 percent under the loading from the proposed vertical expansion.

Appendix I of the feasibility report also contains pipe strength calculations for the existing leachate collection lines below the proposed vertical expansion. The calculations show that the existing pipe strengths would be suitable to prevent excessive pipe deflection and pipe wall crushing below the proposed vertical expansion.

Leachate Generation Rate and Treatment

Leachate generation rates have been calculated as required by s. NR 512.12(3)(a)(b), Wis. Adm. Code. The maximum calculated leachate generation rate during operation is 25,278 gallons per day when all of the Eastern Expansion area is open. The maximum calculated leachate generation rate following closure is 9,135 gallons per day.

The collected leachate would continue to be discharged into the existing MMSD sanitary sewer system or recirculated back into the waste mass within the landfill. Dane County has an agreement with the MMSD to accept leachate from the landfill that includes the Eastern Expansion and the proposed vertical expansion.

Gas Collection and Management

Consistent with the existing system, the design of the proposed landfill gas management system would include vertical gas extraction wells connected by header pipes that would carry collected gas to the existing Renewable Natural Gas (RNG) plant located on the southern end of the landfill.

The construction of the gas extraction wells would consist of 36-inch-diameter boreholes drilled through the waste and extend within 10 feet vertically of the leachate collection system. The pipe in the borehole would be a minimum 6-inch-diameter (Schedule 80) PVC or an approved alternate. The wells would be spaced assuming a maximum radius of influence of 125 feet around the perimeter of the Eastern Expansion and 150 feet for the remainder of the Eastern Expansion and proposed vertical expansion. Gases from the landfill would be transferred through a header pipe, which would be sloped at a minimum of 2 percent so the condensate within the gas system may be collected and discharged with leachate to MMSD.

The existing gas extraction wells that collect gas in the older portion of landfill below the proposed vertical expansion liner would be extended as waste is filled so that the system can continue to collect gas in the older landfill area under the proposed vertical expansion.

Existing gas monitoring probes around the perimeter of the landfill would continue to be monitored for subsurface migration of landfill gas.

Final Waste Grades and Final Cover

The proposed vertical expansion would bring the Eastern Expansion's final cover grades to a peak with a maximum of 4H:1V and minimum 5 percent slopes within the existing footprint. The final cover would be seeded, fertilized, and mulched to limit erosion. The approved height of the landfill would increase approximately 65 feet from the currently approved height, to a peak elevation of approximately 1,065 ft-MSL.

The maximum intermediate waste grades are proposed to be up to 5 percent higher than the final waste grades to allow for settlement.

There are two options proposed for final cover construction: a two-foot compacted clay layer or a geosynthetic clay layer (GCL) with a two-foot layer of barrier soil per s. NR 504.07(4), Wis. Adm. Code, which is consistent with the design for the Eastern Expansion.

The proposed final cover system would consist of the following, from the top down:

- Native vegetation as detailed in a Plan Modification approved by the department on August 23, 2018 (Appendix B of the feasibility report)
- Six-inch topsoil layer
- Two and a half foot rooting zone layer
- Geocomposite drainage layer
- 40-mil LLDPE geomembrane
- Two-foot compacted clay layer, or GCL with a two-foot soil barrier layer
- Six-inch grading layer

Appendix I of the feasibility report contains the results of a waste global slope stability analysis. The results indicate that the 4H:1V waste slope with the assumed parameters would have an acceptable minimum safety factor of approximately 2.2, which would exceed the minimum recommended safety factor of 1.5.

Surface Water Runoff Management

The drainage patterns established for the Eastern Expansion would be maintained for the proposed vertical expansion. The preliminary storm water diversion berm layout provides the same drainage areas to the wetlands north (Wetland 1) and south (Wetland 4) of the existing Northeast and Southeast Sedimentation Basins, respectively.

The key features of the storm water management system include:

- Diversion berms to collect and route surface water from the final cover system to downslope flumes.
- Downslope flumes to collect and convey surface water from the diversion berms to the perimeter ditches.
- Perimeter ditches to route surface water to the sedimentation basins.
- Culverts to route surface water from the ditches at the entrances to the sedimentation basins.
- Sedimentation basins to provide treatment for the collected storm water before discharging to existing nearby wetlands.

Surface water balances for pre- and post- development conditions were evaluated as part of the Eastern Expansion permitting process. That evaluation showed approximately 20 acres of the approximate 500-acre watershed that drains into Wetland 1 would instead drain into Wetland 4 as a result of the Eastern Expansion development. The storm water management system features for the proposed vertical expansion would be designed to maintain the same approximate water balance to the wetlands.

If a favorable feasibility determination is granted, surface water control systems would be evaluated as part of the plan of operation to confirm if features in unchanged areas would adequately manage storm water runoff from the proposed vertical expansion area due to increases in slope length. Future design aspects conducted as part of the plan of operation would consider the diversion berm spacing along the vertical expansion, reinforcement of ditch flow lines, inlet and outlet structures, sedimentation basin sizing and vegetation establishment and maintenance.

Proposed Visual Screening

Similar visual screening techniques as approved for the Eastern Expansion would be implemented for the proposed vertical expansion. Visual screening from the proposed vertical expansion's waste disposal activities to Hope Park, the Yahara Hills public golf course, and USH 12/18 would be provided by:

- Preserving as many existing mature trees around the perimeter of the proposed vertical expansion as possible.
- Replacing trees that did not survive and were required as part of the 2014 plan of operation.
- Planting additional trees in select areas of the site.
- Placing a waste berm with intermediate cover on the exterior slope, then placing waste behind the berm.
- Constructing soil berms, as necessary, at the outside edge of the waste mass around the perimeter.

There is a potential that some of the screening methods above would need to be modified due to USH 12/18 & CTH AB interchange construction. Any changes made to the screening methods would be coordinated between Dane County and the department.

Proposed Soil Borrow Source

An estimated 33,200 cy of clay or barrier soil would be needed for the first phase of closure, as shown on Plan Sheet 17 of the feasibility report. If clay is selected for use during final cover construction, clay would be imported from off-site sources. Dane County owns a parcel adjacent to a previously approved clay borrow source, known as the Link Borrow Site. The Link Borrow Site has been identified and documented in reports separate from this feasibility report as a source of liner quality clay.

The parcel adjacent to the Link Borrow Site is estimated to have approximately 145,200 to 174,240 cy. The volumes are estimated based on the assumption of 5 to 6 feet of clay over 18 acres, within the 32 acre parcel, similar to the approved Link Borrow Site (a Conditional Use Permit was issued for the Link Borrow Site on May 24, 1994). An initial site inspection and clay borrow source investigation would be needed prior to use. The volume would be verified upon sampling and testing.

If a geosynthetic clay liner (GCL) final cover design option is used instead of clay, the barrier layer material would consist of either imported or on-site material. Imported material would be sourced from an awarded contractor, with sampling and testing results submitted prior to construction, while on-site material would be sourced from the rooting zone layer of Phase 10, Cell 3. Dane County estimates approximately 36,400 cy of barrier layer soil would be available in Phase 10, Cell 3. Sampling and testing would be needed to determine

the suitability of the rooting zone layer as soil barrier layer material. Department approval would be needed prior to use of any on-site or off-site source as soil barrier layer material.

Final Use

The current final use plan for the proposed vertical expansion is open green space, consistent with City of Madison zoning requirements and the Local Negotiated Agreement.

Proposed Operations

The proposed vertical expansion would be developed and operated as a vertical overlay on top of constructed landfill phases 9 through 12. Operational hours would be consistent with normal business days during daytime hours. The waste types accepted would be similar to those of current operations and include non-hazardous municipal, industrial, and commercial solid waste and special permitted waste.

Daily landfill operations would be confined to as small an area as possible. Waste would be placed and compacted in approximately 10- to 15-foot lifts. Daily cover consisting of soil or an approved alternate daily cover material would be placed over the waste at the end of each day of operation. Areas of the landfill that have not reached final waste grades, but would not be active for a period time, would receive intermediate soil cover that is vegetated until the area becomes active again and the intermediate cover would be removed.

Dane County has proposed maximum intermediate waste grades that are 5 % higher than final waste grades to allow for settlement prior to placement of the final cover. Prior to the placement of final cover in a given area, waste grades would be surveyed and regraded to accommodate placement of the composite cover to permitted 4H:1V final grades. At no time during the life of the landfill would waste volume exceed the permitted capacity of the landfill. The proposed overfill depth would be included in slope stability analyses in the plan of operation.

Dust would be controlled by minimizing the open area and with a water truck as needed. Operational activity would occur during normal business hours, not during evening hours. As such, the relative noise level from the proposed vertical expansion would be expected to be similar to that of existing operations. Odors would be controlled through minimizing the area open for waste placement, placement of daily cover at the end of each day, operation of the active gas extraction system, and utilizing odor making agents when appropriate. Windblown material would be controlled by proper landfill operational procedures including compaction and placement of daily cover, perimeter fencing, and the use of portable litter fencing when needed. Paper and other wind-blown debris would be collected daily.

Environmental Monitoring

Environmental monitoring would continue as currently approved, as discussed in the following sections. There is a potential that some monitoring points may need to be relocated due to USH 12/18 & CTH AB interchange construction. Any changes made to the monitoring network would be coordinated between Dane County and the department prior to construction.

Landfill Gas

An active gas extraction system is in place at the existing landfill and would be expanded for the proposed vertical expansion. The gas extraction wells and gas plant would be monitored to optimize operations and document compliance with the facility air permit. Gas probes located around the perimeter of the landfill would be monitored to confirm that subsurface gas migration is not occurring. The specific

number and location of gas extraction wells for the proposed vertical expansion would be detailed in the plan of operation.

Landfill Leachate

Leachate monitoring would be performed at the existing leachate head wells and leachate lift station in accordance with the monitoring program included in Appendix L of the feasibility report. Monitoring includes analysis of leachate quality, leachate head on the liner, and leachate volumes managed. Additional leachate drainage basin monitoring related to leachate recirculation and additional liquids application would be performed as required under the leachate recirculation plan.

Groundwater

The existing groundwater monitoring network approved in the Eastern Expansion Plan of Operation would be maintained as part of the proposed vertical expansion. The monitoring program includes wells which were originally installed to monitor the existing landfill. No additional groundwater monitoring wells are proposed as part of the proposed vertical expansion.

The existing monitoring plan is designed to provide water quality information for key chemical parameters at locations both upgradient and downgradient of the landfill. Water levels measured before sampling would be used to evaluate groundwater flow patterns and gradients at the site. Parameters and monitoring frequencies would continue as outlined in the approved Eastern Expansion Plan of Operation approval and subsequent modifications.

Surface Water

Storm water discharge at Dane County Landfill Site No. 2 is currently regulated by the Wisconsin Pollutant Discharge Elimination System (WPDES) Tier 2 General Permit for the Discharge of Storm Water Associated with Industrial Activity No. SO67857-4 (General Permit) issued to the facility. Coverage under this General Permit would continue for the proposed vertical expansion. Surface water monitoring would be performed in accordance with the WPDES permit requirements outlined in Appendix L of the feasibility report. The storm water monitoring program elements, including monitoring locations, are outlined in the landfill's existing SWPPP. A revised SWPPP would be submitted with the plan of operation to address the expansion.

Lysimeter

The existing lysimeter system would continue to be monitored for volume of discharge and for quality as outlined in the environmental monitoring tables included in Appendix L of the feasibility report. No additional lysimeters are proposed.

Settlement

Settlement monitoring of the final cover would be performed by collecting elevation data annually.

Environmental Analysis

Proposed Physical Changes

Terrestrial and Aquatic Resources

The proposed vertical expansion lies within the existing footprint of the Eastern Expansion. If approved, waste would be filled to a higher elevation over areas that have already been disturbed and that are currently used for landfilling. The proposed vertical expansion would increase the final elevation to 1065 feet M.S.L., or about 185.4 feet above predevelopment grades.

The proposed vertical expansion would have some aesthetic visual impacts. The approximately 65.4-foot increase in the height of the landfill would impact views further from the landfill than the currently approved height would. This would be most pronounced for the six residences and the church along CTH AB and immediately east of the landfill property. Once the area of the proposed vertical expansion is filled and covered with final cover, any impacts to visual aesthetics would be reduced. The increase in height may also lead to additional wind-blown material at and around the facility. Additional screening would likely be needed to minimize visual impacts and control wind-blown debris.

The soil materials needed to construct the proposed vertical expansion final cover system would be obtained from both on-site and off-site sources. General fill would be obtained from on-site stockpiles created from excavation performed during the horizontal portion of the Eastern Expansion. Granular materials would be obtained from off-site quarries. Topsoil stripped from the horizontal portion of the Eastern Expansion area was stockpiled for use in the final cover. Topsoil within Phase 10, Cell 3 would also be stockpiled for use in the final cover. If clay is the most cost-effective option during the time of final cover construction, clay would be imported from off-site sources. A clay borrow source would need to be approved by the department prior to use. If a GCL final cover is to be used, barrier soils would be obtained from either on-site or off-site sources which would require department approval prior to use.

Surface water would be managed in a similar manner used for surface water runoff from the existing site and consistent with the approach approved for the Eastern Expansion. The drainage patterns established for the Eastern Expansion have been maintained for the proposed vertical expansion. The design for surface water control includes berms, swales, and ditches located adjacent to and on the final cover. These features would collect and divert water, not in contact with waste, through downslope flumes to the existing Northeast and Southeast Sedimentation Basins before ultimately draining to two nearby wetlands. The sedimentation basins would limit the release of soil to adjacent properties and wetlands. After final closure, the total runoff to surrounding wetlands is expected to be similar to that of the runoff prior to landfill development.

Groundwater would be protected by existing and proposed engineering features. The Eastern Expansion includes a composite 4-foot-thick low-hydraulic conductivity clay layer with a geomembrane liner, a leachate collection and removal system, a gas collection system, and a gradient control system that restricts groundwater from reaching the landfill liner. Groundwater collected in the gradient control system would be discharged to the northern wetland that adjoins the landfill. The proposed vertical expansion would also include a composite final cover system. A composite final cover system protects groundwater by limiting the amount of water that infiltrates the landfill, thereby reducing the amount of leachate the landfill generates. Leachate is produced from the decomposition of waste and from precipitation infiltrating into the waste.

The proposed vertical expansion would generate leachate that would be managed by the existing leachate collection system. Leachate would flow into the highly permeable drainage blanket to leachate collection pipes that route the leachate to sumps at the lowest base elevation of each phase. From these sumps, the

leachate would either be pumped via an existing forcemain into an existing MMSD sanitary sewer system or recirculated back into the waste mass within the landfill.

Landfill Infrastructure

Existing buildings, roads, and landfill gas processing facility structures would be used for the proposed vertical expansion. Access to the landfill property is currently controlled using gates at the primary entrance points and natural barriers surrounding the property. No additional fencing, perimeter roads, ditches, or sedimentation basins would be required for the proposed vertical expansion.

Emissions and Discharges

The emissions and discharges produced from construction and operation of the proposed vertical expansion would generally be consistent with the emissions and discharges from current operations at the facility.

Municipal solid waste generates landfill gas as a result of the biological breakdown of the organic fraction of waste in the landfill. Landfill gas generally contains methane, which is odorless, carbon dioxide, and more than 100 different non-methane organic compounds (NMOCs) such as vinyl chloride, toluene and benzene, and other volatile compounds. Many of the compounds in landfill gas produce the landfill gas odor.

Odors produced by decomposing waste would be noticeable during the operational life of the facility. The odors would vary depending on temperature, wind speed and direction, and other weather conditions. The level or intensity of these effects would be similar to those occurring at the existing landfill. With the increase in elevation that would result from the proposed vertical expansion, there is potential for odors to travel further. There are a number of strategies for odor control at landfills, including effective gas collection and destruction, use of adequate daily cover, minimizing open area, effective leachate control and, if needed, vapor masking agents that can be sprayed to reduce odors.

The volume of landfill gas and fugitive emissions from the landfill cover may increase slightly as a result of the proposed vertical expansion. The peak volume of landfill gas generation would be estimated through modeling and submitted in the plan of operation and air permit application. The chemical characteristics of the landfill gas would not be expected to change. The landfill gas would be collected in the active gas collection system and treated at the existing RNG processing facility that converts landfill biogas into a pipeline quality natural gas. Horizontal migration of landfill gas is not expected to occur due to the presence of the composite landfill liner system and active landfill gas extraction system. Existing gas monitoring probes installed around the landfill perimeter would continue to be monitored for signs of gas migration. As part of the permitting process for the proposed vertical expansion, Dane County would submit an air pollution control construction permit and operation permit revision application to the department's Air Quality Division.

Engine exhaust from diesel and gasoline powered vehicles and equipment would be discharged to the atmosphere. The discharge would vary depending on the number of vehicles or pieces of equipment in operation at a given time. Vehicle exhaust would be kept to a minimum by maintaining vehicles in good operating condition. If approved, operation of the proposed vertical expansion would not be expected to significantly increase vehicular traffic during landfill operation over what currently occurs at the existing facility.

Dust would be generated from the gravel access or haul roads, earthwork activities, and wind blowing across exposed areas. Dust quality would vary based on the amount of vehicles/equipment in operation, weather conditions, and the amount of exposed area. With the increase in elevation that would result from the

proposed vertical expansion, there is potential for dust to travel further. Dust would be controlled with the application of water or commercial dust suppressants to access and haul roads as needed during dry weather conditions and stabilizing disturbed areas as soon as practicable. Dane County has developed a Dust Control Plan for the existing landfill that would be used for the proposed vertical expansion.

During operation, noise would be generated from waste hauling trucks and landfill equipment. During final cover construction events, noise impacts would occur from earth moving equipment. Noise impacts would occur during the hours of operation and would not be expected to increase over the existing noise levels during similar activities for the existing landfill.

Post-closure, emissions and discharges would be less than during active operations. Vehicle traffic would decrease once waste is no longer being accepted, thereby reducing noise, dust, and engine exhaust levels associated with vehicle and equipment operations. Once final cover is in place, the potential for odors would decrease and no additional water would be added to the waste mass, reducing the volume of leachate generated. The proposed vertical expansion's gas collection system would continue to operate post-closure as gas would continue to be generated within the landfill. Continued collection of landfill gas post-closure would also help reduce odors and potential emissions. Storm water runoff may increase with the final cover system in place; storm water features would be adequately sized to manage runoff during post-closure.

Existing Environment

The existing environment of the proposed vertical expansion is an existing landfill and existing features and facilities to support landfill operations.

Topographically, the proposed vertical expansion would be located in an area of flat to gently rolling terrain. Within the property boundaries, the natural land surface elevation varies from approximately 870 ft-MSL in the northern portion of the site to approximately 900 ft-MSL in the southern portion near USH 12/18. The predominant topographic surface feature within sight of the proposed vertical expansion is the existing landfill, which has an approved final elevation of 999.6 feet M.S.L. The proposed vertical expansion would increase the final elevation to 1065 feet M.S.L., or approximately 65 feet above the currently approved height.

The proposed vertical expansion would be located within the Yahara Watershed. The Yahara River is located approximately 3.5 miles west of the site and ultimately drains to the southeast into the Rock River near Fulton, Wisconsin. The Yahara River flows through four lakes – Mendota, Monona, Waubesa, and Kegonsa – of which Lake Waubesa is the closest to the existing landfill, located approximately 4 miles to the southwest. The watersheds can be further divided into the northern half of the site which is drained by ditches and unnamed streams to the east and eventually contributes to Door Creek, which flows into Lake Kegonsa. The southern half of the site is drained by ditches and unnamed streams into Mud Lake (a widening of the Yahara River at the north end of Lake Waubesa).

Several wetlands exist within the immediate vicinity of the existing landfill and were delineated in 2012 as part of the Eastern Expansion permitting. The existing northeast and southeast sedimentation basins discharge to areas adjacent to two of the wetlands (Wetland 1 and Wetland 4).

The Eastern Expansion, which the proposed vertical expansion would be constructed above, is located in an area underlain by a thick sequence of unconsolidated glacial drift of the Horicon Formation deposited over dolomite bedrock of Ordovician age. Past subsurface investigations and nearby private well logs indicate the bedrock in the immediate vicinity of the Eastern Expansion consists of the Galena-Platteville dolomite of the Sinnipee Group.

The uppermost hydrostratigraphic unit in the vicinity of the proposed vertical expansion generally occurs within the till and outwash glacial deposits. In general, the groundwater flow direction in the glacial unit near the proposed vertical expansion is to the north with a slight northwesterly component based on historical water table maps. Previous hydrogeological investigations show that the elevation of the water table ranges from about 857 to 874 ft-MSL. Groundwater elevations are generally higher in the spring and lower in the fall. Shallow groundwater generally discharges to a drainage ditch located within the southern portion of the wetland that parallels the north side of the existing landfill. Groundwater flow within the underlying bedrock is generally toward the southwest near the landfill. Water supply wells in the vicinity of the landfill withdraw water from the bedrock unit.

Air pollutants from the existing landfill and operations include methane, carbon dioxide and monoxide, sulfur dioxide, nitrogen dioxide, nonmethane organic compounds (NMOCs), and associated odors. The pollutants are generated through the decomposition of organic refuse and the volatilization of organic compounds in the absence of oxygen and through the use of operations equipment on site. The gas generated by the existing landfill is controlled by an active gas extraction system. The gas extracted from the landfill is and would continue to be treated at the existing RNG processing system located at the southern end of the site. The RNG processing system converts the landfill biogas into a pipeline quality natural gas.

The soil materials needed to construct the proposed vertical expansion final cover system would be obtained from both on-site and off-site sources. General fill would be obtained from on-site stockpiles created from excavation performed during the horizontal portion of the Eastern Expansion. Granular materials would be obtained from off-site quarries. Topsoil stripped from the horizontal portion of the Eastern Expansion area was stockpiled for use in the final cover. Topsoil within Phase 10, Cell 3 would also be stockpiled for use in the final cover. If clay is used for construction of the final cover, it would be obtained from off-site sources and may require department approval. If a GCL final cover is to be used, barrier soils would be obtained from either on-site or off-site sources.

Because the proposed vertical expansion would be located entirely within the approved Eastern Expansion limits, land uses would not be altered due to the proposed expansion. Other areas on the property are used for additional solid waste and recycling activities (e.g., shingle storage, C&D waste processing area, household hazardous waste and electronics drop-off site, wood yard, and tire storage area) and ancillary landfill support activities and infrastructure (e.g., roll off box storage, offices, maintenance buildings, scale, access roads, soil stockpiles, and landfill gas handling and processing facilities).

Wildlife activity in the area is mainly transient, such as traveling, feeding, and resting. Wildlife in the area include songbirds, raptors, and small to medium-sized mammals. Based on a review of the Natural Heritage Inventory, no endangered resources were identified in the project area. Additionally, a vertical landfill expansion is covered by the No/Low Impact List for All Species at All Times of the Year category under the department's Broad Incidental Take Permit/Authorization, as provided under s. 29.604, Wis. Stats.

The proposed vertical expansion would be located in a rural area that contains a mix of agricultural, industrial, and residential land uses. The area surrounding the proposed vertical expansion includes areas of woodland associated with the site screening. This consists of a mix of hardwoods and an understory composed of Boxelder, Mixed Oaks, Buckthorn, Black Locusts, Honeysuckle, Cherry, and Cotton woods. The neighboring property to the south is a publicly owned golf course; to the east is the Dane County highway garage and medical examiner's building, a self-storage business, residences, and a construction contractor's materials yard; to the north is Hope Park and the approximately 150-acre northern wetland; and to the west is the existing landfill, landfill office and buildings supporting landfill operations, and a hotel.

There are two designated state, county, or town recreational areas (e.g., parks, public forests, state natural areas, public hunting or fishing areas, or trails) within a 1,000-foot radius of the site: 1) Hope Park, a Dane

County park, located just north of the property, and 2) the City of Madison Yahara Hills Golf Course located just south of USH 12/18. These two recreational areas currently exist within 1,000 feet of the existing landfill.

Environmental Consequences

Physical Impacts

The topography and drainage in the immediate vicinity of the proposed vertical expansion have been previously altered by landfill activities. The proposed vertical expansion would alter the topography further by increasing the overall height of the landfill. The proposed vertical expansion final cover would extend to a maximum elevation of approximately 1,065 ft-MSL., which is approximately 65.4 feet higher than the approved maximum final grade for the existing landfill.

Dane County would incorporate screening measures including maintaining existing vegetation, planting new trees, and where necessary, use soil core berms in the waste mass to provide screening from the southern, northern, and eastern boundaries of the proposed vertical expansion

Construction and operation of the proposed vertical expansion would not be expected to impact surface water. Water that comes into contact with waste would be contained by the composite liner system and perimeter berms placed around active fill areas. Collected leachate would be discharged into an existing MMSD sanitary sewer system, or recirculated back into the waste mass within the landfill. A final cover system would be constructed as part of site closure. The final cover system would reduce the infiltration of precipitation, and the volume of leachate generated would gradually diminish over time. If a favorable feasibility determination is granted, surface water control systems would be evaluated as part of the plan of operation to confirm if features in unchanged areas would adequately manage storm water runoff from the proposed vertical expansion area due to increases in slope length.

Impacts on groundwater are not expected as a result of the proposed vertical expansion. Routine groundwater monitoring around the landfill would continue to be performed during operation and after closure (minimum of 40 years after closure). To protect groundwater, the currently approved design constructed in the Eastern Expansion beneath the vertical expansion includes:

- A gradient control system to intercept groundwater in high groundwater conditions before reaching the bottom of the liner system.
- A composite liner system to minimize the potential for leachate to leave the landfill.
- A leachate collection system so that leachate does not accumulate on the base of the landfill.

No significant impacts to air resources would be expected to occur due to the construction and operation of the proposed vertical expansion. The proposed vertical expansion would include a cover system with an active gas extraction system along with the existing liner system of the Eastern Expansion. These controls help prevent surface and subsurface gas migration. Existing gas monitoring probes would continue to be monitored throughout operation and post-closure to monitor for gas migration. A detailed landfill gas management system design would be included with the plan of operation.

Odor would be controlled by use of daily cover, keeping the gas collection and control system in working condition, and utilizing odor making agents when appropriate. Dane County has an Odor Control Plan that they would continue to follow.

Windblown material would be controlled by proper landfill operational procedures including compaction and placement of daily cover, perimeter fencing, and the use of portable litter fencing when needed. Paper and other wind-blown debris would be collected daily.

Temporary increases in fugitive dust levels may occur periodically due to site truck traffic on unpaved road surfaces. Dust would be controlled with the application of water or commercial dust suppressants to access and haul roads as needed during dry weather conditions and stabilizing disturbed areas as soon as practicable. Dane County has developed a Dust Control Plan for the existing landfill that would be used for the proposed vertical expansion.

Biological Impacts

The proposed vertical expansion results in no additional habitat loss from what is currently approved for waste disposal at the existing landfill. The existing landfill site and the proposed vertical expansion area are not critical habitat areas for endangered or threatened species. No critical habitat would be created nor destroyed as a result of the proposed vertical expansion. The proposed vertical expansion would not alter the current physical environment other than increasing the height of the landfill.

As documented in the department's June 10, 2020 Eastern Vertical Expansion ISI response letter, based on a review of the Natural Heritage Inventory, no endangered resources were identified in the project area. Department Hydrogeologist Tyler Sullivan checked the National Heritage Inventory again on October 20, 2021 and found the same results.

Storm water features would collect and divert water, not in contact with waste, through downslope flumes to the existing Northeast and Southeast Sedimentation Basins before ultimately draining to two nearby wetlands. The sedimentation basins would limit the release of soil to adjacent properties and wetlands. After final closure, the total runoff to surrounding wetlands is expected to be similar to that of the runoff prior to landfill development.

Impacts on Land Use

The proposed vertical expansion would be located entirely within the approved Eastern Expansion limits and would not require displacement of residents, public land withdrawal, or condemnations. Traffic patterns are not proposed to change from the present landfilling activities at the existing landfill.

The proposed vertical expansion would alter approximately 21.3 acres of land within the currently approved landfill. The proposed vertical expansion would be consistent with existing land uses in the area. The proposed vertical expansion would extend the current operating life of the landfill by approximately three to three and a half years. In general, this area has been used for waste disposal for more than 30 years.

Social and Economic Impacts

The proposed expansion would not adversely impact the socioeconomic welfare of the surrounding area. The proposed expansion would provide cost effective and responsible future waste disposal needs for residents and businesses. The landfill operations would provide direct employment to a limited number of local residents, and indirect employment opportunities through waste haulers, waste collection companies, construction trades, and professional services. The proposed vertical expansion would allow Dane County Landfill Site No. 2 to continue to economically meet the waste disposal needs of government, private residences and businesses in its service area.

The proposed vertical expansion would not result in significant changes in the waste filling operations. Thus, impacts on adjacent neighbors would be expected to be similar to those of the existing landfill. There may be equipment and truck noise and some odors during construction and operation of the facility. However, operational activity would occur during normal business hours, not during evening hours, and the relative noise level would be similar to that of existing operations. The filling rate would be similar to the current filling rate, so there is not expected to be an increase in truck traffic.

The levels of noise, odor, dust, and windblown debris are not expected to increase above current levels from existing operations. However, with the increase in elevation that would result from the proposed vertical expansion, there is potential for noise, odor, dust, and windblown debris to travel further. Dane County would continue to implement control measures outlined in their Dust and Odor Control Plans and continue to control litter through use of daily cover, perimeter fencing and use of portable litter fencing when needed, along with collection of wind-blown debris as needed.

Increased visual impacts would be expected with the proposed vertical expansion. This would be most pronounced for the six residences and the church along CTH AB and immediately east of the landfill property. Once the area of the proposed vertical expansion is filled and covered with final cover, any impacts to visual aesthetics would be reduced.

Special Resources

No special resources, including state or local natural areas, archaeological or historical areas, or prime agricultural land would be impacted by the proposed vertical expansion. As documented in the department's June 10, 2020 ISI response letter (Appendix B), archaeological issues and historical structures for the site were cleared by the department on May 13, 2020.

Probable Adverse Impacts That Cannot Be Avoided

If a favorable feasibility determination is issued, certain environmental impacts from the proposed vertical expansion may not be completely avoided. These impacts would be minimized through the proposed engineering design and the use of good management and operational practices. The proposed vertical expansion would extend the period of landfilling; thus, odor, noise, dust, and truck traffic associated with landfilling activities would be extended.

Potential impacts that cannot be avoided would include the following:

- Truck traffic, dust, engine emissions, and noise associated with the landfill would be extended for an additional three to three and a half years.
- Odors may periodically occur, but with the use of daily cover, minimizing the active waste disposal area, and operation of the active gas collection and control system, these issues should be limited in duration and intensity.
- The appearance and topography of the site would be altered during operation of the landfill and after the landfill is closed, including an increase in the overall height of the landfill by approximately 65 feet.
- After the landfill is closed, there would be limitations on the use of the property.

The physical changes to the area of the proposed vertical expansion caused by the construction, operation, and closure of the landfill would become a permanent feature of the landscape. To that extent, the increase in final grades of the landfill would be a prominent and obvious feature of the area's landscape. Environmental

monitoring would continue for a significant period of time to ensure that potential problems may be properly addressed.

If approved, the proposed vertical expansion would be constructed and operated with current industry standards and in compliance with department solid waste facility codes.

Potential Cumulative Effects

The primary cumulative effect of the expansion would be an increase in landfill gas and leachate generated on the property. If properly collected and treated, the gas and leachate should not have a significant impact on the surrounding environment. However, gas collection systems are not 100% efficient and human error or mechanical/infrastructure failures can lead to both fugitive gas emissions and leachate releases. Upgrades and repairs can be made to the gas collection and destruction (flare) systems, and some leachate infrastructure can be repaired or upgraded if problems arise.

Alternatives Analysis

There are several alternatives to landfilling; however, the alternatives do not eliminate the need for solid waste landfills. Alternatives to the proposed vertical expansion include: no action; enlarge or reduce the project to mitigate impacts; other locations or other landfills; another location on the property; and other waste management methods.

Alternative: No Action

This alternative assumes that the proposed vertical expansion would not be developed. The existing landfill is expected to reach capacity in 2028. If the proposed vertical expansion is not constructed, approximately 240,000 tons per year of waste currently received and expected to be received would have to be disposed of at other landfills. This would require waste to be hauled longer distances to be disposed of responsibly, resulting in increased emissions, higher disposal costs for residents, and loss of local resources. This would also shorten the life of other landfills and increase the need for additional waste disposal facilities in the area. There would be additional cost for transportation to the facilities, as well as wear on the roadways.

Alternative: Enlargement or Reduction of the Project

The proposed vertical expansion would be the final expansion permitted at the current landfill site due to various constraints for further landfill development both horizontally and vertically. Given these constraints, the proposed vertical expansion has been designed to optimize disposal volume. Enlarging the expansion is not feasible.

If the proposed vertical expansion were reduced, another landfill or landfill expansion elsewhere would have to be developed sooner. Developing the same amount of landfill capacity in an undeveloped location would increase the costs and forgo the efficiencies of using the same liner, leachate and gas collection and control systems, access roads, and monitoring network of the existing landfill.

Reducing the proposed vertical expansion would not significantly reduce environmental impacts but may have negative consequences as described above.

Alternative: Other Landfills, Locations or Methods

This alternative would involve developing a new landfill at another location or providing equivalent expansion capacity at another landfill in the service area. No other landfills in the Dane County Landfill Site No. 2 service area have received Feasibility Determinations for proposed expansions.

Given the need for landfill capacity for municipal solid waste in the service area, the impacts of the proposed facility would be moved to a different location, not eliminated entirely, and the impacts might be greater to the environment at another location that is not currently used for waste disposal. This option would be similar to the No Action alternative described above and would result in little environmental benefit and may have negative consequences compared to the proposed vertical expansion.

Alternative technologies are available for the management of solid waste, including recycling, composting, incineration, and processing. Although activities like waste reduction and recycling can be and have been effective at reducing the quantity of waste entering the waste stream, the quantity is not enough to eliminate the future need for landfills.

Evaluation of Alternatives to Land Disposal

Analysis of Alternatives to Land Disposal

Waste reduction, reuse and recycling are alternatives to land disposal, and these activities have already reduced the volume of waste in the service area that requires disposal at a landfill. Other alternatives to landfilling, such as incineration and complete waste composting, do not appear to be economically feasible at this time.

If the proposed vertical expansion is not developed, the waste that is currently disposed of at the existing landfill would have to be disposed of at another existing or new facility. The increased hauling distance and diminished competition and capacity may result in rising costs for waste disposal in the service area.

There are costs and benefits that need to be weighed for each technology and method available to best manage society's solid waste. In time, as suitable landfill space becomes scarcer and waste disposal costs increase, it is likely that the market would be a catalyst to increase recycling and improve other waste management technologies to handle waste disposal needs. At this time however, engineered landfills remain the most economical way to dispose of non-recyclable solid waste in a manner that prevents environmental pollution.

Evaluation of Implementing Alternatives to Land Disposal

Within the Dane County service area, there are voluntary and mandatory recycling and resource recovery programs for industrial, commercial, and municipal waste. A majority of the larger communities have implemented mandatory curbside pickup of recyclables on a regular basis. Other smaller communities have drop-off centers where recyclables are collected.

Dane County also operates the Clean Sweep program, which provides a location for residents and business owners to drop off hazardous materials and electronics. The program helps divert hazardous materials and electronics from the landfill and lowers risks associated with their improper disposal.

Dane County estimates the following waste diversion rates were achieved in 2020:

- 657 tons of tires were recycled into playground tile or incinerated for energy
- 46,656 tons of C&D material was processed for recycling
- 870 tons of brush and logs were ground into wood chip to be used as animal bedding and mulch
- 2,383 tons of shingles were recycled into asphalt
- 39 tons of products reused through Clean Sweep's exchange program

Alternative technologies are available for the management of solid waste, including recycling, composting, incineration, and processing. Many of these waste reduction and recycling technologies are mandated in Wisconsin and are already being utilized within the service area. Although activities like waste reduction and recycling can be and have been effective at reducing the quantity of waste entering the waste stream, the quantity reduced is not enough to eliminate the future need for landfills.

Needs and Design Capacity Analysis

Section 289.28, Wis. Stats. requires the department to determine whether a proposed facility is needed, and if there is insufficient need, to deny permission to construct or operate the proposed facility. The department has generally held that seven years of existing service area capacity or less suggests a new landfill is needed, because it could reasonably take up to seven years to site an alternative new landfill.

To determine if there is sufficient need for the proposed vertical expansion, the feasibility report compared the available waste disposal capacity in the service area (Dane County) to the amount of waste disposal capacity consumed each year (accounting for projected population growth) within the service area to estimate how many years of waste disposal capacity would be available as of 2022 without the proposed vertical expansion. The feasibility report used 2022 in this comparison because it would likely be the first year the proposed vertical expansion would accept waste if a favorable feasibility determination is granted. Based on this comparison, the feasibility report estimates the waste disposal capacity for the service area would be completely exhausted early in 2028 without the proposed vertical expansion. Therefore, the feasibility report concludes that the proposed vertical expansion is needed.

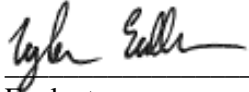
Section 289.29(1)(d), Wis. Stats. prohibits the department from approving a feasibility report for a proposed facility unless its proposed capacity is designed to be consumed within 15 years after it begins accepting waste. The projected site-life contained in the feasibility report is less than 15 years. The department will evaluate the need for the proposed expansion and the projected site-life and provide a determination on both in the feasibility determination.

Wisconsin Environmental Policy Act (WEPA) Compliance

Pursuant to s. NR 150.35, Wis. Adm. Code, the department has determined that the landfill feasibility review and public input process for the proposed landfill expansion meets the requirements of the Wisconsin Environmental Policy Act (WEPA) under s. 1.11(2)(c), Wis. Stats and s. NR 150.20, Wis. Adm. Code. Pursuant to s. NR 150.20(2)(a)(7), Wis. Adm. Code, a solid waste feasibility approval is an integrated analysis action, meaning department programmatic procedures provide for public disclosure and include an environmental analysis that provides sufficient information to establish that an environmental impact statement (EIS) is not required. This Project Summary contains an environmental analysis of the proposed landfill expansion. Pursuant to s. NR 512.06(3)(3), the department has made a preliminary determination that an EIS is not required for the proposed facility.

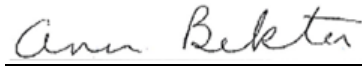
The landfill feasibility review process will provide for a 30-day public comment period, in which the public may submit written comments on the feasibility completeness determination, the environmental analysis, including the preliminary decision on the need for an EIS, and on the feasibility report. Members of the public may also request a public informational hearing on the proposed project during the 30-day public comment period.

Signed:



Evaluator:

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