Ridgeview landfill April 28, 2008 approval

Tilkens, Gregory P - DNR to: Jean Greensley 11/17/2011 11:36 AM

History: This message has been replied to and forwarded.

2 attachments

Ridgeview PLOP.pdf PLOP Final.doc

Jean - attached are pdf and Word versions of the approval.

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APRIL 28, 2008

FILE REF: FID #436003260
Manitowoc CO
SW
APPR

Mr. Ray Seegers
WMWI Ridgeview RDF
PO Box 227
Whitelaw, WI 54247-0227

SUBJECT: Conditional Plan of Operation Approval, Ridgeview RDF Southern Expansion, Manitowoc County, Wisconsin

Dear Mr. Seegers:

We have completed our review of your plan of operation for the proposed Southern Expansion of the Ridgeview Recycling and Disposal Facility and determined that it is consistent with Wisconsin's solid waste regulations. Therefore the plan of operation is approved, subject to compliance with chs. NR 500-538, Wis. Adm. Code, and the conditions in the attached approval document.

Please read carefully this letter and attached approval conditions as they contain requirements for the construction and operation of the proposed landfill expansion.

You are reminded that approval by the Bureau of Waste Management and Materials does not relieve you of obligations to meet all other applicable federal, state, and local permits, zoning and regulatory requirements.

Please contact Leland Archiquette at 608-267-0542 or by email at Leland.Archiquette@wisconsin.gov if you have any questions regarding this approval.

Sincerely,

Len Polczinski

Len Polczinski
Waste & Materials Management Program Team Leader
Northeast Region

Cc: Michael Ruetten - STS Consultants
John Steimle - Town of Franklin
Charles E. Nate – Clerk, Town of Franklin
Terry Hegeman - NER
Leland Archiquette/File – WA/3
R. Grefe – WA/3

PROJECT SUMMARY

GENERAL INFORMATION

PROPOSED FACILITY: Waste Management Ridgeview Recycling and Disposal Facility (RDF) Southern Expansion, a non-contiguous expansion

LICENSEE AND PROPERTY OWNER: Waste Management of Wisconsin, Inc. (WMWI)

AUTHORIZED CONTACTS: Raymond Seegers, P.E., Environmental Engineer
Ridgeview RDF
P.O. Box 227
Whitelaw, WI 54247-0227

Kurt Kietzer, Regional Manager
Ridgeview RDF
P.O. Box 227
Whitelaw, WI 54247-0227

SITE LOCATION AND AREA: The proposed Southern Expansion will be located in portions of the SE ¼ and the SW ¼ of Sec. 26, T20N, R22E, Town of Franklin, Manitowoc County, Wisconsin. The existing facility is located about 1.3 miles north of STH 10, on Hempton Lake Road, approximately 1.6 miles NW of the City of Whitelaw. The proposed expansion will occupy 60.3 acres within a parcel of approximately 701 acres owned by WMWI. The landfill expansion will be developed in 4 Cells approximately 200+ feet south of the existing landfill.

PROPOSED WASTE TYPES: The proposed MSWLF expansion will accept the same waste types as the existing landfill, namely non-hazardous municipal, commercial and industrial solid waste, including utility ash and sludge, pulp and paper manufacturing waste, foundry waste, wastewater treatment sludge, high volume industrial waste, and treated contaminated soil.

EXPANSION CONSTRUCTION: WMWI proposes to construct the MSWLF expansion in four Cells, covering approximately 60.3 acres. Cell progression will be from east to west with Cell 4 adjacent to and south of Cell 3. Each Cell will be constructed in full without incremental construction. Clay for the liner for each Cell will come from within the footprint of the expansion.

PROPOSED PRELIMINARY CONSTRUCTION: WMWI proposes to conduct site clearing and grubbing, storm water improvements, construction of perimeter berms, removal of wetlands within the Cell 1 expansion footprint, abandonment of the groundwater wells within the Cell 1 expansion footprint, and construction of the clay portion of the liner in Cell 1 of the Southern Expansion in advance of receiving full Plan of Operation Approval.

PROPOSED SERVICE AREA: The landfill's proposed service area includes 12 counties in northeastern Wisconsin: Brown, Calumet, Door, Fond du Lac, Kewaunee, Manitowoc, Oconto, Outagamie, Shawano, Sheboygan, Waupaca, and Winnebago. The landfill will utilize STH 10 to the south and Hempton Lake Road for access, as is currently occurring.

PERIOD OF LONG-TERM CARE RESPONSIBILITY: WMWI will utilize bonds for proof of financial responsibility for closure and 40 years of long-term care of the expansion. However, WMWI will be responsible for long term care of the facility in perpetuity.

SITE CHARACTERISTICS

PRESENT LAND USE: The existing landfill lies north of the proposed expansion The area south of the proposed expansion is agricultural land bordered by Sunny Slope Road. The area east of the proposed expansion is agricultural land bordered by Madsen Road. The area west of the proposed expansion contains the landfill's offices and maintenance buildings and agricultural land bordered by Hempton Lake Road. The closest residence is located to the southeast approximately 900 feet from the proposed Cell 4 footprint.

TOPOGRAPHY AND HYDROLOGY: The existing landfill and proposed expansion lie on a 701 acre parcel of land owned by WMWI. The WMWI property lies within the Eastern Ridges and Lowlands Physiographic Province of Wisconsin, and is located approximately one mile east, south and west of the Branch River. The landscape has been extensively glaciated and as a result the land surface is hilly with closed depressions. Wetlands have formed in some of these depressions where low permeability soils are present. The prominent landform on the property is a bedrock influenced, northeast to southwest trending, terminal moraine resulting from the Lake Michigan lobe of the late Wisconsin Age glacial ice advance.

Within the footprint of the proposed facility land surface elevations vary between 860 and 910 feet Mean Sea Level (MSL). Locally, the highest elevations are at the existing landfill, which rises to about 1045 feet MSL.

FACILITY DESIGN AND CONSTRUCTION

EXPANSION CONSTRUCTION: WMWI proposes to construct the expansion in four cells covering approximately 60 acres. Cells 1 and 4 will be constructed in their entirety without separate modules. Cells 2 and 3 may be constructed in their entirety or in modules. The south ends of Cells 2 and 3 may be left undeveloped to allow drainage from Cell 4.

Closure sequencing in the plan of operation differs from the proposed closure sequencing in the Landfill Organic Stability Plan (OSP), which was submitted as an Addendum to the Plan of Operation. The OSP proposes to delay the final cover construction until the site has reached completion. The grant of exemption in the plan of operation approval provides that the placement of final cover may be delayed for no more than 5 years after initially reaching final waste grades.

SUBBASE AND BASE GRADES: The proposed subbase grades are deepest at the northern end of Cell 1, where the sump sub-base is at approximately 842 ft MSL, and slowly rise to the west and south through Cell 4. The separation distance from the subbase grades to groundwater is a minimum of 25 ft.

The base will be constructed with a herringbone design. Cells 1 and 2 will contain two leachate collection trenches. Cell 3 will contain three leachate collection trenches and Cell 4 will contain a single leachate collection trench. The collection trenches will be oriented to allow flow from the south to the north. Cells 1, 2, and 3 will each have a single leachate collection sump located at the northern end of the base. Cell 4 will have a leachate collection sump located at the western end of the base. The leachate collection lines in each Cell will be connected to the sump in that Cell. The base slope varies between 2% and 3% toward the leachate collection trenches. The leachate collection trenches will slope at 0.55% in the direction of flow.

The interior sidewalls on the eastern and western edges of the expansion will all contain 3:1 slopes. The sidewalls on the southern edge of the expansion are designed at 3:1 slope and 4:1 slopes, except for a portion of the northern sideslope near the sump in Cell 3, which will vary from a 4:1 to approximately 4.4:1 slope.

LYSIMETERS: Collection lysimeters were required in the Feasibility Determination. In response to this requirement WMWI has proposed a collection lysimeter under each Cell. Each lysimeter will be constructed below the subbase elevation adjacent to the toe of the slope at the low end of each Cell. The typical lysimeter will be rectangular in shape, which covers an area of 45 feet by 15 feet, and be 1½ feet deep. Each lysimeter is designed with, from the bottom up, one foot of compacted clay or a soil barrier layer with geosynthetic clay liner (GCL), a 4 oz/yd^2 non-woven geotextile, and a 60-mil HDPE geomembrane. A 4-inch diameter, perforated, SDR 17 HDPE collection pipe, covered with a geotextile sock, will be placed on the geomembrane. A 1½-foot layer of ASTM C-33 coarse aggregate will be used as fill material. A 10-oz/yd^2 non-woven geotextile will extend over the top of the aggregate layer and wrap along the inside of the lysimeter. The sump dimensions are 3-ft. wide, 5-ft. long, and 1-ft deep. The sump will be fabricated from one-inch thick HDPE flatstock. A solid-walled, 4-inch diameter SDR 17 HDPE sampling riser will be connected to a 4-inch diameter, perforated, SDR 17 HDPE within the sump and extend to the top of the sidewall berm. A wye connector will penetrate the flat stock of the sump and connect the sampling riser to the perforated collection pipe.

COMPOSITE LINER: The proposed liner will consist of 4 feet of compacted clay overlain by a 60-mil HDPE geomembrane liner. The clay liner will meet the specifications listed in s. NR 504.06(2), Wis. Adm. Code. The clay for liner construction will be obtained from within the expansion footprint. The 60-mil HDPE geomembrane is to be placed directly on top of the compacted, tested, and smoothed clay liner. The base will be covered by a smooth geomembrane and the sideslopes will be covered by a two-sided textured geomembrane. A 12 oz/yd^2 non-woven geotextile will be placed over the geomembrane and a one-foot granular drainage layer will be placed over the geotextile. The clay surface will be prepared in accordance with s. NR 504.06(3)(d), Wis. Adm. Code. This section requires the surface to be free of stones, grade stakes, and construction debris that may damage the geomembrane. A leak location test was not proposed for the installed geomembrane. This test is required in s. NR 516.07(2)(d), Wis. Adm. Code.

LEACHATE COLLECTION SYSTEM: The proposed one-foot drainage blanket consists of coarse aggregate with maximum size of 1½ inches and a minimum hydraulic conductivity of 1 cm/sec. The proposed leachate collection system piping will consist of 6-inch diameter perforated HDPE SDR 17 piping in the 2 western collection trenches in Cell 3 and in Cells 1 and 4. Six-inch diameter perforated Schedule 80 PVC pipes will be used in Cell 2 and the eastern trench in Cell 3. The collection piping will be installed in shallow V-shaped trenches. The collection lines in Cells 1 through 3 will slope to the north at 0.55%. The collection lines in Cells 4 will slope to the west at 0.55%.

The leachate will drain into a leachate sump in each Cell. In Cell 1 the sump will be located at the northern end of the eastern collection line. The western collection line will drain to the sump via a 6-inch diameter perforated HDPE SDR 17 pipe, sloped a 0.5%. In Cell 2 the sump will be located at the northern end of the western collection line. The eastern collection line will drain to the sump via a 6-inch diameter perforated Schedule 80 PVC pipe, sloped a 0.5%. In Cell 3 the sump will be located at the northern end of the eastern collection line. The 2 other collection lines will drain to the sump via 6-inch diameter perforated HDPE SDR 17 pipes from their northern terminus, along the northeastern edge of the Cell and tie into the eastern collection pipe approximately 250 feet from the sump. These 2 pipes will be sloped a 0.61%. Cell 4 will have one collection sump located at the western end of the collection line.

A minimum thickness of 4 inches of gravel will be placed in the trenches prior to installation of the leachate collection pipes. The pipe bedding material will consist of stone or crushed gravel with maximum size of 1½ inches and a minimum hydraulic conductivity of 1 cm/sec. Twelve inches of pipe bedding material will be placed above the top of the pipe and 12-inches of drainage blanket material will be placed over the bedding. All leachate collection pipes will have both ends attached to non-perforated pipe. Cleanout access will be gained from both ends of the collection pipes.

The leachate collection sumps in each Cell will contain a sump pump housed inside an 18-inch diameter HDPE SDR-17 pipe to pump leachate up the sidewall into the perimeter leachate conveyance system. The collection sumps in the Cells will vary in depth from 2.5 ft. to approximately 4 ft. and will measure approximately 10 feet by 15 feet at the base with sideslopes that vary from 3H:1V to 4.5H:1V. The 60-mill HDPE geomembrane will extend from the base liner into each sump. A second 60-mil HDPE geomembrane will line the bottom of each sump and be welded to the sump's sideslope. A 14-oz/yd^2 non-woven geotextile will cover the geomembrane. A 1-inch thick HDPE flatstock will be placed on the base of the sump. The proposed flatstock will measure 4 ft. by 9 ft. S. NR 504.06(5)(j)2. & 5., Wis. Adm. Code, requires the base of the sump to be covered with a thick polyethylene plate. The dimensions of the proposed flatstock are not sufficient to cover the base. Therefore, the Department is requiring additional flatstock or means to cover the base of each sump. An 18-inch sideslope riser pipe is proposed to be set on the HDPE flatstock at the base of the sump. The distance from the base of the sump to the top of the perimeter berm will vary in length from approximately 54 ft. in Cell 1, 58 ft. in Cell 2, 66 ft. in Cell 3, and 72 ft. in Cell 4.

The sump pump will pump the leachate up the sideslope through a 3-inch diameter flexible hose within the 18-inch diameter pipe to a riser vault at the top of the sideslope. Each riser vault, constructed of a 63-inch diameter HDPE SDR-32.5 manhole, will house check valves to prevent the backflow of leachate, pump controls, an air release valve, and a 4-inch HDPE SDR-11 leachate discharge pipe enclosed within an 8-inch HDPE SDR-32.5 containment pipe. The conveyance piping will route the leachate along the western side of the proposed expansion to the existing leachate conveyance piping that connects to the storage tank located southeast of the existing landfill's Phase 1.

The sideslope riser pipes from the leachate collection sumps will extend up the sideslopes and be connected to manholes that will house the leachate transfer piping. The sideslope risers will consist of 18-inch, solid walled HDPE SDR-17 pipe. The cleanout pipes that are adjacent to the riser pipes will extend from the sump area in each Cell to the top of the sideslope within a trench. A 60-mil textured HDPE rub sheet is proposed as additional protection for the geomembrane. The proposed rub sheet does not extend to the top of the sideslope as required in s. NR 504.06(3)(b), Wis. Adm. Code. Therefore, the Department is requiring the use of the required extra protection. The sumps will be backfilled with coarse aggregate with a maximum particle size of 1½ inches. The one-foot thick drainage blanket materials will overly the sump. The leachate cleanout pipes that are separate from the riser pipes are designed to be placed on the 12 oz/yd^2 non-woven geotextile that overlies the 60-mil geomembrane and within the one-foot thick drainage layer. The maximum cleanout length will be approximately 1,190 feet from the southern cleanout access for the eastern leachate collection line in Cell 3 to the toe of the slope of the northern sideslope.

LEACHATE LEVEL MONITORING: There will be two leachate head wells in each Cell of the proposed expansion, for a total of eight monitoring points. The head wells will consist of 6-inch diameter SCH 80 non-perforated pipe on the sideslope connected to a 6-inch SCH 80 non-perforated pipe on the base of the landfill ending with a 5-foot perforated section for the screen. The headwell piping will be placed on the geotextile that overlies the geomembrane liner and covered with 2 feet of pipe bedding material. A one-foot layer of drainage blanket stone will be placed over the bedding material.

LEACHATE STORAGE AND TREATMENT: The existing two 30,000-gallon tanks and the 14,000 gallon leachate tank will continue to be used for leachate storage, providing a total of 74,000 gallons of storage capacity. The capacity of the existing tanks to provide a four-day storage volume for the proposed leachate volumes was based on approximately 15 open acres and approximately 45 closed acres. The OSP proposes to delay the final cover construction until the site has reached completion. The placement of final cover may be delayed for no more than 5 years after initially reaching final waste

grades. The Department is requiring the recalculation of the volume of leachate anticipated for the additional open acreage to ensure that the storage capacity will be sufficient for 4 days of generation. Leachate that is disposed off-site will be pumped into tanker trucks and transported to the City of Manitowoc POTW. In addition, leachate recirculation has been proposed for the expansion, which will be pumped from the storage tanks and transported to the leachate recirculation system or discharged onto the waste mass. The existing leachate load-out facility adjacent to the existing tank will continue to be used.

LEACHATE RECIRCULATION: The conceptual plan includes application of leachate via pumping from a sideslope riser or the leachate storage tank into a recirculation piping network within trenches and the use of crushed glass distribution pads. Another option that may be employed is discharging the leachate from the tanker truck onto the working face. A third option that has been proposed is the use of vertical pipes within granular media filled columns. There are no details for the first and third options. The leachate from the combined storage tanks would not be able to be used for recirculation in the Southern Expansion without a Research, Development, and Demonstration (RD&D) Plan approval because the leachate in the collection tanks will be from a differently licensed landfill. Prior to initiation of the leachate recirculation program, the Department is requiring WMWI to submit the details for the distribution of the leachate from the sideslope risers to the recirculation system. The leachate piping will be 2-inch to 6-inch diameter SDR 17 HDPE perforated pipes. The perforations will be ½" diameter. The pipes will be sloped at 2% from the sideslope to the interior of the waste mass. The first 100 feet of the piping from the sideslope will be solid-walled. The perforations will be in rows oriented at 180° relative to the adjacent row with holes spaced 2 to 5-feet apart and offset from the adjacent row. The piping will be installed as filling progresses with a maximum 100-foot horizontal separation distance between pipes. The horizontal spacing may vary due to proximity to gas wells or other considerations. As filling progresses vertically, the piping will be horizontally offset from the lower level pipes. There will be a vertical separation distance of 40 feet between the levels with the first set of pipes set at a minimum of 20 feet above the liner.

The leachate distribution pipe trenches will be 14 to 18 inches wide with a minimum of 1 foot of bedding material. A select aggregate fill is proposed as optional. The Department is requiring WMWI to identify the material to be used as the trench fill for the distribution piping. A 6-oz/yd^2 geotextile will be installed over the trench with waste being applied directly over the geotextile.

In addition to the piping network within trenches, WMWI has proposed to use leachate distribution drain fields made of crushed glass. The drain fields' dimensions will be approximately 150 feet by 150 feet by 2 feet thick. The leachate distribution pipes for the drain fields will be similar to the pipes used in the trenches described above. The distribution pads will be covered will a layer of select waste or a geotextile to prevent the infiltration of fines. Each leachate pad must include a piping network with 3 pipes spaced 50 feet apart and the pipes set 25 feet from and parallel to the edge of the pad. The crushed glass must be off-spec material that is unsuitable for recycling.

FINAL COVER: The maximum final grades in the expansion area will be 1,079.5 feet MSL. The final landfill topography will include two crests located at approximate coordinates N 799,250 - E 2,537,750 and at N 799,100 - E 2,536,930. The proposed final grades will be at a 4:1 slope from the crests to the toe of slope.

The final cover system has been proposed with 2 options. The first option was proposed as (top to bottom): 6 inches of topsoil, 18 inches of rooting zone, a geocomposite drainage layer, a 40-mil polyethylene geomembrane, a geosynthetic clay liner, a 2 foot barrier layer of on-site soils, and a minimum 6 inch soil grading layer or up to 18 inches of foundry sand. The second option was proposed as (top to bottom): 6 inches of topsoil, 30 inches of rooting zone, a geocomposite drainage layer, a 40-mil

polyethylene geomembrane, 2 foot clay layer and a minimum 6 inch soil grading layer or up to 18 inches of foundry sand. The first proposed option does not meet the requirements of s. NR 504.07(6), Wis. Adm. Code, which specifies that 2.5 foot thick drainage and rooting zone layer be installed above the geomembrane. A condition in this approval establishes the code-defined minimum cover soil thickness of 30 inches of rooting zone soil for both options. A vegetative cover will be established over the final cover to minimize erosion.

The seepage from the drainage layer over the geomembrane will be collected in a toe drain collection system surrounding the landfill. The toe drain will consist of 4-inch diameter perforated PE pipe, surrounded by stone and placed at the toe of slope. The toe drain will slope at a minimum 2% and discharge through 4-inch diameter, corrugated non-perforated pipes located approximately every 200 feet along the perimeter of the landfill to drainage ditches surrounding the landfill.

No access road to the top of the landfill is planned.

STORMWATER DRAINAGE: Stormwater runoff will be controlled by drainage ditches, diversion berms, downslope flumes, perimeter drainage channels and storm sewers, culverts, and sedimentation basins. All stormwater control structures have been designed using a 25-year, 24-hour storm event with a TR-55 Type II storm distribution to determine peak flow rate. Perimeter drainage ditches will surround the entire landfill and direct all collected stormwater to one of 2 sedimentation basins. Sedimentation Basin No. 2 is located approximately 1,500 feet northeast of the proposed expansion and is currently used by the existing landfill. The proposed expansion will contribute approximately 3.4 ac-ft to Sedimentation Basin No. 2, which will be modified to accept the additional flow. Sedimentation Basin B will be located in the southeastern corner of the proposed expansion. Approximately 6.6 ac-ft will be diverted to the Basin B, which will have a capacity of approximately 13.0 ac-ft.

The stormwater sedimentation basins will remove suspended fines in the stormwater. Treated stormwater is then discharged in a controlled manner, which eventually flows off of the WMWI property from Sedimentation Basin No. 2. The discharge from Sedimentation Basin B will be routed through two outlet structures. The discharge from the western outlet will be directed to wetland A, 1.13-acre wooded wetland on the western side of the proposed landfill. The eastern outlet structure will discharge to wetland E, a 0.12-acre wetland on the eastern side of the proposed landfill. In addition to the principal outlets there will be drain tiles with valves that control the amount of flow to wetlands 4 and 2 located northeast and southwest of Sedimentation Basin B, respectively.

The perimeter drainage ditches will be located on the eastern, southern, and the southwestern sides of the proposed landfill. The northern side of the proposed landfill does not have a surface water control feature planned. The natural slope of the ground surface will direct water towards the northeastern corner where the surface water can enter the existing perimeter ditch that connects to Sedimentation Basin No. 2. The perimeter drainage ditch located on the southwestern portion of the proposed expansion will discharge to the wooded wetland. The drainage ditches are designed as V-shaped channels with a minimum depth of 2 feet and 2H:1V sideslopes. The channels will have varying slopes and are sized to accept all of the flow from a 25-year, 24-hour storm event. The erosion control will be riprap approximately 3.5 inches, except when the slope of centerline is greater than or equal to 4% when erosion matting be used.

Diversion berms will be installed along the final cover system to limit erosion and to collect and transfer stormwater to the downslope discharge flumes. The ditch created by the diversion berm will be a minimum of 2 feet deep and will be vegetated. The minimum slope along the flow line will be 2%. The 2 downslope flumes will convey stormwater runoff collected by the diversion berms. The downslope flume on the northeastern corner will direct flow towards the drainage ditch that connects to Sedimentation Basin No.2. The downslope flume on the southern side will discharge into Sedimentation

Basin B. Each downslope flume will be constructed with HDPE SDR-21 pipe. The inlet of each flume within the diversion berm will be of a standard corrugated metal pipe end section clamped to the HDPE pipe.

GAS COLLECTION SYSTEM: The waste mass is expected to produce decomposition gas during the active filling period and for a considerable period after closure. The owner is obligated to extract landfill gas for as long as is necessary. Gas monitoring and gas extraction are expected to be maintained during the long-term care period for this facility and beyond, if necessary.

The gas extraction system for the proposed expansion includes a horizontal system located at the ridge of each Cell's leachate drainage basin and 56 gas extraction wells installed at an approximate separation distance between 220 and 290 feet. The horizontal collection system will allow the recirculation of leachate and gas recovery as filling progresses. The perimeter wells will be spaced no more 235 feet apart. The gas extraction wells will be connected to lateral piping, which in turn will connect to the gas header piping. The gas will be drawn through the system by a blower which will direct the gas to existing gas engine plant or a utility flare. In addition to the permanent gas extraction system, temporary gas extraction may include connections to the leachate piping or leachate recirculation piping and horizontal piping within the waste mass.

The gas extraction wells will be installed in phases of the site life as substantial areas reach final grades. In the plan as submitted, the wells are designed to withdraw landfill gas only. The Department is requiring a revision to the design to include the ability to extract leachate as well. The well casing will be constructed of 8-inch diameter Schedule 80 PVC piping or HDPE piping. There were no specifications for the pipe thickness for the HDPE pipe. Sec. NR 504.08(2)(c), Wis. Adm. Code, specifies that SCH 80 PVC pipe or an approved alternate be used for the gas wells. The lower portions of each well casing will be slotted or perforated. The slots will be 3/16″ wide, 8-inches long and spaced 45° apart. The perforations will consist of ¾″ diameter holes, 6-inches on center with adjacent rows staggered. Solid walled, 8-inch diameter Schedule 80 PVC or HDPE piping will complete the well casing. The solid portion of each well will extend into the waste mass a minimum of 15 feet from the top of the final cover. The narrative portion of the plan of operation report states that the lower $^{2}/_{3}$ to ¾ of the final well depth will have perforated pipe. The gas well schedule on plan sheet No. POO-18 shows 34 of the wells having perforations of 76% to 93% of the well depth. The Department is requiring a redesign of the perforated sections of the gas well piping to meet the code requirements.

Each gas well will be centered in a 36-inch diameter borehole. The borehole will extend to a minimum of 10 feet from landfill base grades. The bottom of each gas well will be a minimum of one foot from the bottom of the borehole. The annular space of borehole will be backfilled with an AASHTO No. 2 or larger washed stone to cover the slotted or perforated portions of the pipe. Bentonite will be used as a seal above the stone. General soil fill will be placed above the bentonite seal. A PVC sleeve pipe will be placed around the well pipe above the final grade. The pipe boot will be clamped to the PVC sleeve. The well head, temperature monitoring device and gas monitoring port will be attached to the exposed well pipe. The well heads will be either 2-inch or 3-inch diameter SCH 80 PVC pipe. A flexible hose will connect the well pipe to the same diameter stick-up, which connects to the buried gas lateral piping. The stick-up will contain the gas flow control valve. The gas lateral piping will connect to the underground gas header piping system around the perimeter of the landfill.

The gas header piping will consist of HDPE SDR-17 pipe designed in a looped system to carry a maximum of 4,668 standard cubic feet per minute (scfm). The calculated maximum gas flow rate for the entire landfill is 3,051 cfm (from the Organic Stability Plan). The perimeter gas header piping will vary

in diameter from 12 to 24 inches. The interior header loop piping will be a 12-inch diameter pipe. All gas lateral pipes will be 6 to 8 inches in diameter.

Condensate will be separated from the gas by vertical condensate knockouts and condensate drains, which will be installed in low points on the northern and southern sides of the header network. The condensate knockouts will be constructed of 48-inch diameter HDPE SDR-32.5 pipe. The condensate will gravity drain from the knockout via a 4-inch diameter HDPE pipe, which is sloped at 3% and connected to an 18-inch HDPE straw drain manhole. The condensate will discharge by gravity from the straw drain via a 4-inch diameter, sloped HDPE pipe, which is connected to a leachate cleanout pipe on the interior sideslope.

Monitoring for the concentrations of migrating decomposition gas components will be performed at gas probes located outside the limits of waste filling. An additional 3 gas probes will be installed with the proposed expansion and are intended to detect any gas migration that may occur outside the landfill. One probe will be located to the west of Cell 3, one to the east of Cell 1 and one to the south of Cell 4. The existing gas probe GP-10 located in the northeast corner of the proposed expansion will also be used for monitoring.

CLAY BORROW SOURCE: All clay for the liner and cap will come from the footprint of the proposed expansion. A geosynthetic clay liner (GCL) and soil barrier layer is proposed as an option to replace the clay layer in the final cover, but the option to use clay in the final cover system is still open. The upper foot of the barrier layer must be a fine-grained soil or well-graded sandy soil with fines. Approximately 639,000 yd^3 will be needed to complete clay liner and final cover construction in the expansion. Approximately 790,500 yd^3 of clay is available in the proposed landfill limits.

FACILITY OPERATION

DISPOSAL OPERATION: The report does not offer specifics to the waste placement procedure when filling is started in newly constructed Cell. Therefore, the Department is requiring the initial waste placement to consist of placing waste at the edge of each active area and spreading the waste over the drainage blanket with the compactor. The initial lift of waste that will be placed over the drainage blanket is proposed as a 4-foot thick layer of waste. The Department is requiring this initial lift to be of select waste that does not contain items that may blind off the leachate collection system or damage the composite liner system, such as large pieces of concrete, metal posts, or special waste. After the initial 10-foot lift of waste has been placed, subsequent lifts of waste must be no greater than 2 feet thick.

Daily cover is required by regulatory code. WMWI has proposed using soil, or alternate daily cover materials, such as foundry wastes, geotextile tarps, bioremediated soils, paper mill waste, or power plant ash. It is advisable to remove as much daily cover as possible at the beginning of the next operating day to minimize barriers to the downward percolation of leachate and the outward movement of gas. Therefore, the Department is specifically requiring these certain types of alternative daily cover, materials which would create a barrier to the movement of leachate and gas, to be removed as much as possible at the beginning of the next operating day.

WASTE TYPES: WMWI anticipates that it will receive about 620,000 tons of waste annually, about 50% of which will be residential and commercial wastes that are conventionally thought of as municipal refuse. The rest of the waste mass is expected to be various industrial solid wastes, sewage treatment plant wastes, and miscellaneous other solid wastes.

WMWI has not proposed, and the Department does not approve the acceptance of hazardous, toxic, radioactive, or medical wastes at this landfill, other than the unavoidable inclusion of small amounts in municipal refuse.

LEACHATE RECIRCULATION: Leachate recirculation has been proposed. A detailed description is included under the section "Facility Design and Construction." Based on the predictions in the Organic Stability Plan, the amount of leachate needed to reach optimum moisture content of 35% to 45% for decomposition is approximately 80,200 gal/day to 188,600 gal/day. This amount exceeds the approximately 11,516 gal/day of leachate expected during open conditions.

The leachate recirculation warning symptoms and failure thresholds were spelled out in the organic stability plan and correspond to the warning symptoms and failure thresholds contained in s. NR 514.07(7)(f), Wis. Adm. Code..

ENVIRONMENTAL AND PERFORMANCE MONITORING

Environmental and performance monitoring will extend through the period of active site operation and perpetual long-term care. Monitoring data will be reported to the Department on diskettes in a format supplied by the Department, as specified in s. NR 507.26(3), Wis. Adm. Code. Media to be monitored include: groundwater, leachate, air, landfill gas, and surface water.

LEACHATE: Leachate samples will be obtained directly from sump riser manholes for analysis. The volume of leachate collected will be recorded monthly.

LEACHATE HEAD LEVELS: Eight leachate head wells are proposed for the expansion. Leachate head will be monitored monthly where leachate recirculation has been used and quarterly in other areas.

LYSIMETER MONITORING: WMWI has proposed an annual VOC scan. The volume of liquid collected from Lysimeters LSY-1, LSY-2, LSY-3, and LSY-4 must be determined monthly in accordance with s. NR 507.21(1), Wis. Adm. Code. The parameters listed in s. NR 507.30, Appendix I, Table 5 must also be included in the monitoring. If the volume collected is insufficient to perform an analysis of all the parameters, the VOC scan will take precedence.

GAS SYSTEM AND PROBES: Plan sheet No. 9 of the Plan of Operation submittal provides the monitoring schedule for gas monitoring. In addition to the monitoring that is proposed, the Department is including additional monitoring requirements in the conditions of this approval. Monitoring of the gas wellheads must begin as soon as they are operational.

SURFACE SETTLEMENT: Surface settlement monitoring of the final cover has not been proposed. Therefore, the Department is requiring WMWI to propose a monitoring method to be conducted on an annual basis.

SURFACE WATER MONITORING:
The surface water monitoring plan in Schedule 3 of the attached approval will be used to monitor the facility's surface water discharge.

Surface water sampling points will include two locations in Sedimentation Basin B. Samples will be collected semi-annually. The plan of operation proposes to sample for pH and specific conductance. The

Feasibility Report included BOD_5 to be included in the monitoring plan. Schedule 3 includes BOD_5. Additional samples must be collected from the sedimentation basin if an overflow occurs.

GROUNDWATER MONITORING: Several groundwater monitoring wells are located within the Cells. These wells will be sampled until the respective Cell is constructed. Prior to excavation to sub-base grade for the Cell the wells within the Cell boundary will be abandoned.

BOREHOLE MONITORING: Twelve deep boreholes extending 150 feet below the top of bedrock have been installed. Geophysical tests have been performed in lieu of coring. Heat pulse flow meter testing was performed at 5-foot intervals below the water table to identify significant groundwater flow zones within the bedrock. The boreholes will be instrumented to collect temperature, and conductivity measurements at multiple levels along with barometric pressure and head.

A weather station will be installed on site to collect hourly air temperature and daily precipitation data along with hourly soil moisture and soil temperature at multiple depths.

The data from the deep boreholes and the weather station will be evaluated to estimate the velocity of groundwater moving through the dolomite driven by precipitation in the recharge area for the bedrock aquifer beneath the landfill. This in turn will be used to determine the depth of groundwater monitoring wells and sampling frequency within the bedrock aquifer.

CLOSURE AND LONG TERM CARE

COST ESTIMATES: Closure costs reflect the most expensive area to close. The closure cost estimates included in Table 6.1 of the Plan of Operation indicate that 19.1 acres will be the largest area to be closed. This area represents Cell 2 and a portion of Cell 1. The Organic Stability Plan has proposed leaving the entire landfill open until final grades are reached, but the Department is limiting this time frame to 5 years after initially reaching final waste grades. The open area must be recalculated with respect to the Organic Stability's closure schedule. The surface water diversion berms and toe of slope drains were not accounted for in the estimates for premature closure. The LLDPE geomembrane estimate of $\$0.29/ft^2$ appears low. Recent estimates available in Department files range from $\$0.45$ to $\$0.55/ft^2$. Therefore, the Department is requiring the closure costs to be recalculated.

Actions to be taken during the long-term care, along with the associated cost estimates, were included in Table 6.2 of the Plan of Operation. The surface water control maintenance tasks were not accounted for. The Leachate Maintenance and Repairs and the Gas System Repair and Maintenance tasks do not clearly define what the tasks include. It is not clear if the electricity costs for operating the leachate pumps, flare, or engine plant are included. The gas probe monitoring includes only the 3 probes that will be installed for the expansion. Gas probe GP-10 in the northeastern corner of the expansion must be included in the monitoring. Therefore, the Department is requiring the long-term care cost to be recalculated.

Although WMWI will be perpetually responsible for the long term care of this landfill, proof of owner financial responsibility for a long-term care period of only 40 years is required by law. Long-term care costs must reflect estimated yearly expenses for: groundwater, surface water, gas, and leachate control system monitoring and maintenance; leachate and condensate collection and treatment; site maintenance; site inspections and erosion repairs. WMWI presently uses bonds for owner financial responsibility and proposes to continue use of bonds to provide proof of financial responsibility for closure and long-term care costs. The estimated closure and long-term care costs are summarized in the attached tables.

PROJECT SUMMARY
ORGANIC STABILITY PLAN

The organic stability plan was submitted in accordance with NR 514.07(9), Wis. Adm. Code, which requires landfills to submit a plan for significantly reducing the amount of degradable organic material remaining after site closing in order to materially reduce the amount of time the landfill will take to achieve landfill organic stability.

The objective of the landfill organic stability plan is achievement of all of the measured goals in NR 514.07(9)(c), Wis. Adm. Code and stated below.

Goals of the Organic Stability Plan

1. A monthly average total methane plus carbon dioxide gas production rate less than or equal to 5% of the maximum monthly average total gas production rate observed during the life of the facility, or less than 7.5 cubic feet of total gas per year for each cubic yard of waste in the facility.

2. A steady downward trend in the rate of total methane plus carbon dioxide gas production.

3. Production of total methane plus carbon dioxide gas cumulatively representing 75% or greater of the projected total gas production of the landfilled waste.

4. Reduction of the time necessary to reach landfill organic stability to 40 years or less after site closing.

WMWI's general approach to meet these goals is to increase the moisture content of the waste through the following measures:

1. Leachate recirculation of Ridgeview's Southern Expansion leachate only.

2. Delay of the final cover placement.

The conditions of the exemption to s. NR 514.07(3)(b), Wis. Adm. Code, contain limitations on the delay of the final cover placement.

Leachate Recirculation

Increasing the moisture content is the primary strategy to reduce the amount of time required to reach organic stability.. Increasing the moisture content is anticipated to increase the rate of waste degradation, which will reduce the amount of non-degraded organic material left in the landfill at the end of the post-closure period (40 years after closure). The moisture content will be increased through leachate recirculation. Total liquid addition will be limited to the anticipated amount of leachate generated 11,516 gal/day for open conditions. Revisions to this limit may be needed due to changing conditions or other information.

Recirculating leachate helps accomplish the following:

- Stabilization through accelerated biodegradation
- Reduction of contaminants in the leachate
- Reduction in leachate treatment costs
- Improved compaction and maximization of approved airspace

- Improved long-term integrity of the final cover through reduced post-capping differential settlement
- Enhanced gas production

Exemption Requested

- Sec. NR 514.07(3) (a) & (b), Wis. Adm. Code, to allow the delay of final cover placement and the placement of waste in areas that have reached final waste grades and received intermediate cover.

Warning Symptoms

Leachate recirculation will be suspended upon discovery of warning symptoms and may not resume in the area where the problem occurred until changes are made to the system or the warning symptoms have declined to acceptable levels. Warning symptoms proposed include the following:

- Leachate head wells showing elevated liquid levels except in new cells and after large rain events;
- Significant or persistent odors;
- Leachate chemistry showing acidic conditions;
- Leachate seeps that are constant or recurring in areas near active recirculation or liquids addition;
- Excessive pressures within the waste mass measured as positive pressure that cannot be corrected within 15 days; and,
- Poor waste decomposition based on methane concentration.

Additional warning symptoms are included in the conditions of this approval.

Failure Thresholds

Leachate recirculation will be suspended whenever any of the failure thresholds are exceeded. Leachate recirculation may not resume until the Department has reviewed and approved changes to the system that will result in meeting the thresholds. Failure thresholds proposed include the following:

- Saturated conditions in the waste mass to be determined when drilling gas wells.
- Cracks, open or closed, across the waste surface, or other signs of block movement of waste
- Visible changes in outline of the waste mass (i.e., bulging or obvious changes in slope)
- Collapse of access roads or other soil structures such as biopiles or stockpiles

Additional failure thresholds are included in the conditions of this approval.

Monitoring and Evaluation

Implementation of the organic stability plan will be monitored and evaluated for effectiveness. The leachate recirculation monitoring will be in accordance with NR 507.215(1)-(4), Wis. Adm. Code, which includes liquid mass balance, leachate head, leachate characteristics and landfill gas monitoring.

Contingency Plan

The contingency plan will need to be implemented if monitoring and evaluation of the organic stability plan indicate the facility is unlikely to achieve the goals outlined in NR 514.07(9)(c), Wis. Adm. Code and stated above. If it is determined that liquid addition may not achieve the landfill organic stability

goals due to technical, operational, or political issues, then WMWI will evaluate the other options available at that time for achieving organic stability and will update the contingency plan as part of the annual reporting process. Contingency plan options could include but are not limited to the following:

- Evaluate additional sources of liquids or liquid wastes through an RD&D plan
- Phasing modifications to allow for large flat areas for infiltration of rainwater
- Modify the approach to develop new distribution methods or modify the configuration of the distribution system
- Improve the gas control system

Reporting

Annual progress reports will be prepared as required by s. NR 514.07(9)(d), Wis. Adm. Code. Each annual report will include an evaluation of whether changes are needed in the plan to correct problems or improve results. WMWI may update the contingency plan at this time also. Every 5 years, WMWI will examine progress against the approved plan to evaluate the likelihood that the plan will enable the facility to reach the goals listed above and determine whether the contingency plan will be implemented. A report describing the evaluation and determination may be submitted to the Department as part of the annual report for that year. The Department may require that the contingency plan be implemented if its review finds that the progress the landfill has made is significantly different than the approved plan.

BEFORE THE
STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

CONDITIONAL PLAN OF OPERATION APPROVAL
FOR THE RIDGEVIEW RECYCLING & DISPOSAL FACILITY
SOUTHERN EXPANSION

FINDINGS OF FACT

The Department finds that:

1. Waste Management of Wisconsin, Inc. (WMWI) has proposed the Ridgeview Recycling & Disposal Facility (Ridgeview RDF) Southern Expansion, a non-contiguous, non-hazardous solid waste landfill, located in portions of the SE ¼ and SW ¼ of Sec. 26, T20N, R22E, Town of Franklin, Manitowoc County, Wisconsin.

2. On September 6, 2006, the Department received a report titled, "Plan of Operation, Southern Expansion, Ridgeview Recycling & Disposal Facility" and 23 associated plan sheets, prepared by STS Consultants, LLC, on behalf of WMWI. The report was dated September 1, 2006.

3. On June 19, 2007, the Department received a report titled, "Landfill Organic Stability Plan, Plan of Operation Addendum, Southern Expansion, Ridgeview Recycling and Disposal Facility, Town of Franklin, Wisconsin."

4. On August 7, 2007, the Department requested additional information regarding the Organic Stability Plan.

5. On October 9, 2006, the Department received a request to suspend our review of the Plan of Operation for the Southern Expansion Landfill. The request was prepared by WMWI and was dated October 4, 2006.

6. On October 8, 2007, the Department received a letter report titled, "Ridgeview Plan of Operation" and 23 associated plan sheets. The plan sheets were prepared by STS Consultants, LLC. The letter report, dated October 4, 2007, contained revisions to the September 1, 2006, Plan of Operation for the Southern Expansion Landfill and the additional information requested for the Organic Stability Plan.

7. On November 7, 2007, the Department issued to WMWI an incompleteness determination for the Plan of Operation.

8. On November 12, 2007, the Department received a request from WMWI to begin initial construction of the Southern Expansion of Ridgeview RDF.

9. On November 14, 2007, the Department issued a favorable Feasibility Determination for the Southern Expansion of Ridgeview RDF, license number 04292, located in portions of the SE ¼ and SW ¼ of Sec. 26, T20N, R22E, Town of Franklin, Manitowoc County, Wisconsin.

10. In the November 14, 2007, Feasibility Approval for the WMWI Southern Expansion landfill the Department granted groundwater exemptions for arsenic (As), manganese (Mn), & nitrite + nitrate nitrogen (nitrate).

11. On December 5, 2007, the Department sent WMWI invoice #0008526 for the $1,650 Initial Construction request review fee. On December 10, 2007 the issued a conditional plan approval to begin initial construction of the Southern Expansion of Ridgeview RDF.

12. On December 14, 2007, the received a response to the Plan of Operation Incompleteness Determination, prepared by STS | AECOM on behalf of WMWI. The response was dated December 12, 2007.

13. On January 3, 2008, the Department issued to WMWI an Incompleteness determination for the Plan of Operation.

14. On January 18, 2008, the Department received the Initial Construction Request review fee.

15. On January 28, the Department received the response to the Plan of Operation Incompleteness Determination, prepared by STS | AECOM on behalf of WMWI. The response was dated January 25, 2008.

16. On February 8, 2008, the issued a Completeness Determination for the WMWI Southern Expansion Plan of Operation.

17. On February 22, 2008, the Department via email requested clarifying information on the leachate recirculation pipe spacing and received a response the same day.

18. On March 7, 2008, the Department via email requested clarifying information on the pipe specifications for the downslope flume. The Department received the response to the request on March 10, 2008.

19. Based on an examination of the groundwater quality data and circumstances at the site, the Department finds that:

    a. Baseline concentrations of substances of public health and welfare concern greater than the current NR 140 PAL, but less than the ES, have been detected in the following groundwater monitoring wells:

        (1) Arsenic: MW-201, MW-201A, MW-202A, MW-202R, MW-203, MW-208, MW-208A, MW-209, MW-209A, MW-210A, MW-211A, MW-212, MW-212A, and MW-225.

        (2) Nitrite + Nitrate Nitrogen : MW-201, MW-201A, MW-202A, MW-203, MW-203A, MW-208, MW-208A, MW-209A, MW-210A, MW-211A, MW-212A, MW-224, and MW-225.

    b. Baseline concentrations of substances of public health and welfare concern greater than the current NR 140 ES, have been detected in the following groundwater monitoring wells:

        Nitrite + Nitrate Nitrogen: MW-203, MW-203A, MW-208, MW-210A
        Manganese: MW-225

    c. The concentrations of arsenic and nitrate for the wells listed in Finding 19a. and b. above are representative of baseline water quality conditions.

d. Because the landfill is designed with extensive engineering features such as clay and composite liners and a leachate collection system, the landfill is designed to achieve the lowest concentrations of arsenic, nitrate nitrogen, and manganese, technically and economically feasible.

e. The concentrations of the indicator parameters pH, specific conductance, alkalinity, hardness, and sodium measured in groundwater monitoring well MW-201A are not representative of baseline water quality conditions; and,

f. The concentration of sodium is not representative for the following wells and sampling dates:

MW-202R	12/12/2002	39.7 mg/l
MW-212A	12/12/2002	32.6 mg/l
MW-224	02/25/2004	36 mg/l

20. On March 1, 2004, revisions to ch. NR 140, Wis. Adm. Code, became effective such that the NR 140.10, Table 1 Enforcement Standard (ES) and Preventative Action Limit (PAL) for arsenic were reduced from 50 and 5 μg/l to 10 and 1 μg/l respectively.

21. The PALs established in this approval are based on at least 8 sample results for each substance at each monitoring well.

22. The PALs established in this approval are equal to the mean background water quality plus 3 standard deviations or the minimum increase specified in s. NR 140.20, Wis. Adm. Code, whichever is greater.

23. The ACLs established in this approval are equal to the mean background water quality plus 2 standard deviations.

24. The calculated PALs and ACLs were rounded up to 2 significant figures.

25. The indicator parameter preventive action limits (PALs) and special conditions set forth below are needed to assure that an increase in the concentrations of alkalinity, ammonia-nitrogen, specific conductance, sodium, and hardness do not cause an increased threat to public health or welfare or inhibit compliance with ch. NR 500 through 538, Wis. Adm. Code.

26. In 2001, the Department completed research into the effectiveness of Chemical Oxygen Demand (COD) in detecting groundwater contamination from landfills and found that COD is not an effective indicator parameter for detection groundwater monitoring at landfills that accept primarily municipal solid waste. In the same study the Department found that Dissolved Organic Carbon (DOC) was an effective indicator parameter for detecting groundwater contamination from municipal solid waste landfills.

27. Additional documents considered in connection with the review of the Plan of Operation include the following:

a. The November 14, 2007 Feasibility Determination for the Southern Expansion of the Ridgeview RDF;

b. A paper titled, "Earthen Materials in Surface Barriers", Craig Benson, UW-Madison; and Miland Khire, GeoSyntec Consultants, Boca Raton, FL, National Academy Press, 1997;

c. The June 2006, Plan of Operation for the WMWI Ridgeview Recycling and Disposal Facility;

d. The May 4, 2007 Organic Stability Plan Approval for the WMWI Ridgeview RDF;

e. The Department of Natural Resources Conservation Practice Standard 1001 for Wet Detention Basins;

f. How to Calculate Preventative Action Limits (PALs) and Alternative Concentration Limits (ACLs) for Solid Waste Facilities; WDNR Publication PUB WA1105-2007;

g. Evaluating Options for Changing Groundwater Monitoring Requirements for Landfills to Reduce Mercury Used by Laboratories; 2001; WDNR Project #151; by J. Connelly; et al.;

h. Analysis of Well Hydrographs in a Karst Aquifer: Estimates of Specific Yields and Continuum Transmissivities; November 1994; L. A. Shevenell; Nevada Bureau of Mines and Geology;

i. Determination of Rock Mass Permeability; 1976; Timothy W. Zeigler; U.S. Army Engineer Waterways Experiment Station Vicksburg, MS; U.S. Department of Commerce; National Technical Information Service; AD/A021 192;

j. Time Lag and Soil Permeability In Ground-Water Observations; April 1951; M. Juul Hvorslev; Bulletin No. 36; Waterways Experiment Station; Corps Of Engineers; U. S. Army, Vicksburg; Mississippi;

k. Study and Interpretation of the Chemical Characteristics of Natural Water; 1989; John D. Hem; US Geological Survey Water-Supply Paper 2254; US Dept. of the Interior; US Government Printing Office; Washington; D.C.;

l. Groundwater quality data in the Department's GEMS database for Ridgeview RDF, Ridgeview EIP, and Lemberger Transport and Recycling Landfills;

m. Locational Data Standards, Version 1.1, 2001; Wisconsin Department of Natural Resources. Available at http://www.dnr.state.wi.us/org/at/et/geo/location/loc_stds.html; and,

n. Information available in the Department's files.

28. Additional facts relevant to the review of Plan of Operation for the Southern Expansion of the Ridgeview RDF include the following:

a. The Plan of Operation report does not offer specifics to the waste placement procedure when filling is started in a newly constructed Cell.

b. A leak location test was not proposed for the installed geomembrane. This test is required in s. NR 516.07(2)(d), Wis. Adm. Code.

c. The collection sumps in the Cells will measure approximately 10 feet by 15 feet at the base. The proposed flatstock will measure 4 ft. by 9 ft. S. NR 504.06(5)(j)2. & 5., Wis. Adm. Code, requires the base of the sump to be protected with a thick polyethylene plate or other means acceptable to the department. The dimensions of the proposed flatstock are not sufficient to cover the base.

d. A 60-mil textured HDPE rub sheet is proposed as additional protection for the geomembrane for the installation of the sideslope risers. The proposed rub sheet does not extend to the top of the sideslope as required in s. NR 504.06(3)(b), Wis. Adm. Code.

e. The leachate tank storage capacity was calculated prior to the submittal of the Organic Stability Plan, which proposes to delay the placement of final cover to allow additional precipitation to infiltrate into the waste mass.

f. The Organic Stability Plan proposes revisions to the leachate recirculation program proposed in the plan of operation.

g. The October 4, 2007 response to the request for additional information regarding the Organic Stability Plan included an exemption request to the requirements of s. NR 514.07(3)(b), Wis. Adm. Code, which prohibit the placement of waste in areas that have reached final grades and received intermediate cover.

h. WMWI Ridgeview RDF will continue to accept paper mill sludge. Paper mill sludge contains sulfates, which can materialize in the extracted gas.

29. The special conditions set forth below are needed to assure that the landfill is operated in an environmentally sound fashion and will not inhibit compliance with the standards set forth in the applicable provisions of chs. NR 500-538, Wis. Adm. Code.

CONCLUSIONS OF LAW

1. The Department has the authority under s. 289.30(6) Stats., to issue a Plan of Operation Approval if the approval will not inhibit compliance with the applicable portions of chs. 280 to 299, Stats., and chs. NR 500-538, Wis. Adm. Code.

2. The Department has the authority under s. 289.30(6) Stats., to issue a Plan of Operation Approval with conditions if the conditions will not inhibit compliance with the applicable portions of chs. 280 to 299, Stats., and chs. NR 500-538, Wis. Adm. Code.

3. The Department has the authority under s. 160.15(3), Stats., and s. NR 140.20, Wis. Adm. Code, to establish preventative action limits for indicator parameters.

4. The Department has the authority under s. NR 140.20(1), Wis. Adm. Code, to exclude any sample result which is nonrepresentative of background water quality.

5. The Department has the authority under s. 160.19(8), Stats., and s. NR 140.28, Wis. Adm. Code, to grant exemptions to groundwater standards and to specify terms and conditions under which the Department may seek remedial action relating to standards for which an exemption has been granted. This may include establishing alternative concentration limits.

6. The calculated PALs and ACLs for the site contained in this document are approved by the Department.

7. Per s. NR 500.05(3), Wis. Adm. Code, an applicant is required to submit one electronic copy of a plan or report prepared in accordance with the appropriate sections of chs. NR 500 to 538 and one copy of any plan sheets or drawings submitted as a part of the plan or report be submitted to the Department. The complete electronic copy of the report and the separate electronic copy of any plan sheets or drawings shall be provided in formats and on media acceptable to the department. The electronic copy shall be submitted to the bureau of waste management in Madison unless otherwise specified.

8. The Department has the authority under s. NR 507.19(3), Wis. Adm. Code, to approve in writing other sampling parameters for the detection groundwater monitoring program at a solid waste disposal facility.

9. The Department has the authority under s. NR 500.08(4), Wis. Adm. Code, to issue an exemption to the requirements of chs. NR 500 to 538, Wis. Adm. Code.

10. The conditions of approval set forth below are needed to ensure compliance with the applicable portions of chs. 30, 31, 160 and 280 to 299 and ss. 1.11, 23,40, 59.692, 59.693, 60.627, 61.351, 61.354, 62.231, 62.234, and 87.30, Stats., and chs. NR 500-538, Wis. Adm. Code.

11. In accordance with the foregoing, the Department has the authority under s. 289.30(6), Stats., to issue the following Plan of Operation Modification Approval.

EXEMPTIONS GRANTED

The Department hereby grants an exemption to WMWI Ridgeview RDF to s. NR 514.07(3)(b), Wis. Adm. Code, to allow the removal of intermediate cover and placement of additional waste in areas that have reached final waste grades, subject to the following conditions:

1. The placement of final cover may be delayed for no more than 5 years after initially reaching final waste grades.

2. The magnitude and rate of change of settlement shall be determined and recorded prior to removal of the intermediate cover. The areas receiving the additional waste shall be identified on plan sheets, which depict each separate area that has received the additional waste. This data shall be reported once in the annual report and as composite data in the five-year report.

CONDITIONAL PLAN OF OPERATION APPROVAL
WMWI RIDGEVIEW RECYCLING AND DISPOSAL FACILITY
SOUTHERN EXPANSION

The Department approves the Plan of Operation and Organic Stability Plan for the Southern Expansion of the Ridgeview RDF, subject to the following conditions:

General

1. All aspects of the construction, operation, monitoring, and closure of this facility shall be performed in accordance with the original plan of operation, the plans of operation for each approved expansion, the approvals for the modifications to the plans of operation, the requirements of NR 500 to 520, Wis. Adm. Code, the conditions of this approval, and the conditions of all subsequent approvals where the conditions have not been superseded by this or subsequent

approvals. In the case of any discrepancies between the conditions of this or subsequent approvals and the approved plans, the conditions of approval shall take precedence.

2. Any proposed modifications to the plan of operation or this approval shall be proposed to the Department for review and approval. If the modifications are compatible with the desired performance of this facility, as determined by the Department, an addendum will be added to this approval indicating acceptance of those changes. Written Department approval is necessary prior to implementing any changes with the exception of minor field modifications that are documented in accordance with NR 516.04(3)(d), Wis. Adm. Code. All field modifications shall be discussed with the Department prior to implementation. Other changes may be handled as expedited plan modifications under s. NR 514.09, Wis. Adm. Code as appropriate.

3. WMWI shall recalculate of the volume of leachate anticipated for the additional open acreage proposed in the Organic Stability Plan to ensure that the storage capacity will be sufficient for 4 days of generation.

4. WMWI shall recalculate the closure costs based on the largest open area allowed with the Organic Stability Plan.

5. WMWI shall recalculate the long-term care costs to include the surface water control maintenance tasks, and the monitoring of GP-10. In addition, WMWI shall define the tasks associated with the Leachate Maintenance and Repairs and the Gas System Repair and Maintenance identified in Table 6.2 of the Plan of Operation and whether the electricity costs associated with operating the leachate pumps, flare, or engine plant are included.

Operational

6. The initial waste placement shall consist of placing waste at the edge of each active area and spreading the waste over the drainage blanket with the compactor.

7. The initial lift of waste in a newly constructed Cell shall be of select waste that does not contain items that may damage the composite liner system, such as large pieces of concrete, metal posts, and waste that may impede the flow of leachate to the leachate drainage blanket. After the initial 10-foot lift of waste has been placed, subsequent lifts of waste must be no greater than 2 feet thick.

8. At the beginning of the next operating day WMWI Ridgeview RDF shall remove as much alternative daily cover as possible that has the potential to create a barrier to the movement of leachate and gas.

Construction

9. WMWI shall install additional flatstock or other means to cover the base of each sump.

10. WMWI shall extend the rub sheet used as protection for the 60-mil geomembrane to the top of the sideslope for the installation of the sideslope risers.

11. A leak location test shall be performed on the installed geomembrane.

12. If WMWI installs silt fencing during frozen ground conditions, a narrative describing the method used to ensure the silt fence is properly installed shall be submitted for approval to the Department. This condition supersedes condition #1 of the December 10, 2007 conditional plan approval to

begin initial construction of the Southern Expansion of Ridgeview RDF.

13. Prior to initiation of the leachate recirculation program from the sideslope risers, WMWI shall submit the details for the distribution of the leachate from the sideslope risers to the recirculation system.

14. WMWI shall identify the material to be used as the trench fill for the leachate recirculation distribution piping.

15. The crushed glass used in the leachate distribution pads must be off-spec material that is unsuitable for recycling. The Northeast Region's Recycling Coordinator shall be contacted to make an inspection of the source of the glass to ensure that it meets this requirement prior to its use.

16. The rooting zone for all final cover options shall be a minimum of 30 inches thick to meet the code requirements of s. NR 504.07(6), Wis. Adm. Code.

17. All gas wells shall be designed to include the ability to extract leachate.

18. WMWI shall identify the specifications of the HDPE pipe thickness for the gas wells, prior to its use, if this option is selected.

19. Prior to the installation of the gas wells, WMWI shall submit for approval the redesign of the gas wells that have perforated sections that exceed the code requirements.

Environmental Monitoring

19. WMWI shall perform environmental monitoring at the Ridgeview Southern Expansion Landfill in accordance with this plan approval and chs. NR 500 – 526 and NR 140, Wis. Adm. Code. In the case of any discrepancies between the conditions of this approval and any prior approval, the conditions of this approval shall take precedence.

20. The environmental monitoring requirements contained herein shall commence with the issuance of this approval and shall continue unless otherwise modified by the Department in writing.

21. WMWI shall provide the Department with documentation that potable wells PW-4 (Schaumburek) and PW-5 (Braun) have been abandoned in accordance with s. NR 812.26, Wis. Adm. Code, no later than when the Site Construction Documentation Report is submitted for the first increment of Cell 1.

22. WMWI shall provide the Department with a revised Environmental Monitoring and Long-Term Care Plan Sheet that displays the Ch. NR 140, Wis. Adm. Code, design management zone (DMZ) in addition to the features contained on sheet POO-9, revision 4. The drawing shall be submitted no later than when the Site Construction Documentation Report is submitted for the first increment of Cell 1.

23. The designated groundwater monitoring wells for compliance with Subtitle D wells shall be MW-201, MW-202A, MW-211A, and MW-225.

24. WMWI shall implement environmental monitoring at the Ridgeview Southern Expansion Landfill in accordance with the following schedules:

Schedule 1: DETECTION GROUNDWATER MONITORING PROGRAM			
DNR ID	**Monitoring Well Name**	**Frequency**	**Parameters**
	Group A Wells:		
2	MW-201A	Monthly for 2 years	04189 Groundwater Elevation
5	MW-202R		
6	MW-203		
7	MW-203A	semi-annually (June and December)	00010 Field Temperature in □C 00094 Field Specific Conductance @ 25□C 00400 Field pH 00941 Chloride, Filtered 22413 Total Hardness, Filtered 39036 Total Alkalinity, Filtered 01020 Boron, Filtered 00950 Fluoride, Filtered 00608 Ammonia Nitrogen, Filtered 00631 Nitrate + nitrite as N, Filtered 00946 Sulfate, Filtered 00930 Sodium , Filtered 00681 Dissolved Organic Carbon 04189 Groundwater Elevation Note sample odor (00001), color (00002), and turbidity (00003), if present
16	MW-208		
17	MW-208A		
18	MW-209		
19	MW-209A		
20	MW-210A		
22	MW-212		
23	MW-212A		
32	MW-224		
34	MW-227[1]		
35	MW-228		
36	MW-212C[4]		
997	Field Blank		
999	Trip Blank		
		Annually (June)	VOCs (NR 507, Appendix III)
	Group B Wells:		
10	MW-205(2)	Monthly for two years then Semi-annually (unless abandoned) (June and December)	04189 Groundwater Elevation
11	MW-205A(2)		
12	MW-206(3)		
13	MW-206A(3)		
14	MW-207(3)		
15	MW-207A(3)		
24	MW-213(2)		
25	MW-213A(2)		
	RCRA Subtitle D Wells:	Semi-annually (June and December)	Parameters listed in Group A plus VOCs (NR 507, Appendix III)
1	MW-201		
4	MW-202A		
21	MW-211A		
33	MW-225		
	(1) Well shall be installed prior to placement of waste in Cell 2 (2) Well scheduled to be abandoned prior to excavation of the appropriate increment of Cell 2 (3) Well scheduled to be abandoned prior to excavation of the appropriate increment of Cell 3 (4) Well shall be installed prior to disturbance of soil or vegetation for sub-base of Cell 3		

Schedule 2: SURFACE WATER MONITORING			
	DNR ID / Staff Gauge	**Frequency**	**Parameters**
850 851	SG-3 SG-4	Monthly for two years [not required in Jan., Feb., Dec.] Semi-annually thereafter (May and November)	99520 Surface water elevation
Schedule 3: Sedimentation Basins			
855	Sed. Basin B	Semi-annually (June and December) In the event of an overflow	94 Specific Conductance 400 pH 310 Biochemical Oxygen Demand
Schedule 4: Lysimeter monitoring			
500 501 502 503	LSY-1 LSY-2 LSY-3 LSY-4	Monthly	32 Leachate Volume pumped (1000's of gallons)
		Semi-annually (June and December)	94 Specific Conductance 340 Chemical Oxygen Demand 400 pH, field 410 Alkalinity, Total 625 Nitrogen, Total Kjeldahl 900 Hardness, Total 929 Sodium, Total 940 Chloride, Total 951 Fluoride, Total 945 Sulfate, Total 1022 Boron, Total
		Annually(June)	VOCs per NR 507.30, Appendix III
Schedule 5: Leachate Quality Monitoring			
400 401 402 403	SRM-1 SRM-2 SRM-3 SRM-4	Monthly	32 Leachate Volume pumped (1000's of gallons)
		Semi-annually (June and December)	95 Specific Conductance 150 Total Suspended Solids 310 Biochemical Oxygen Demand 341 Chemical Oxygen Demand 400 pH, field 410 Alkalinity, Total 610 Nitrogen, Total Ammonia 625 Nitrogen, Total Kjeldahl 900 hardness, Total 929 Sodium, Total 940 Chloride, Total 951 Fluoride, Total 945 Sulfate, Total 1022 Boron, Total 1027 Cadmium, Total 1051 Lead, Total 1055 Manganese, Total 1147 Selenium, Total 71900 Mercury, Total 74010 Iron, Total VOCs per NR 507.30, Appendix II
		annually	Semi-volatile compounds per NR 507.30, Appendix IV

Schedule 6: Leachate Head Monitoring			
600 601 602 603 604 605 606 607	LH-C1A LH-C1B LH-C2A LH-C2B LH-C3A LH-C3B LH-C4A LH-C4B	Quarterly (March/June/September/December) (reported semi-annually)	31 Depth of Leachate [from top to bottom in feet] 99423 Elevation, Leachate (Feet Above MSL)
Schedule 7: Landfill Gas Monitoring			
(DNR ID#)	**Sampling Point**	**Frequency**	**Parameters**
700 701 702	GPS-1 GPS-2 GPS-3 GP-10 (reported with data from lic. No. 3041)	Quarterly (March/June/September/December) (reported semi-annually)	00011 Temperature, Air 00025 Barometric Pressure 46381 Barometric Pressure Trend, 46385 Wellhead Pressure 04189 Depth to Groundwater 85547 Methane (% of dissolved gases) 85544 Carbon dioxide (% of dissolved gases) 85550 Oxygen (% of dissolved gases)
	Gas Extraction Wells	Monthly (reported semi-annually)	46385 Wellhead Pressure (applied vacuum in inches of water) 46382 Header Pressure (available vacuum in inches of water) 46388 Gas Temperature (°F) 99098 Gas Flow Rate (Cubic Feet/Minute) 46387 Valve Opening (% open) 85547 Methane (% of dissolved gases) 85544 Carbon dioxide (% of dissolved gases) 85550 Oxygen (% of dissolved gases) 99848 Balance gas (Other than O_2, CH_4, CO_2)
705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742	GW01 GW02 GW03 GW04 GW05 GW06 GW07 GW08 GW09 GW10 GW11 GW12 GW13 GW14 GW15 GW16 GW17 GW18 GW19 GW20 GW21 GW22 GW23 GW24 25GW GW26 GW27 GW28 GW29 GW30 GW31 GW32 GW33 GW34 GW35 GW36 GW37 GW38	Annual (reported w/ subsequent semi-annually results)	99423 Elevation, Leachate (Feet Above MSL) 00031 Leachate, depth in feet

743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760	GW39 GW40 GW41 GW42 GW43 GW44 GW45 GW46 GW47 GW48 GW49 GW50 GW51 GW52 GW53 GW54 GW55 GW56		
	Combined Gas Flow	Monthly (reported semi-annually) To be reported with data from 3041	46382 Header Pressure (inches of water) 46388 Gas Temperature (°F) 99098 Gas Flow Rate (Cubic Feet/Minute) 99599 Gas Extracted, Total Monthly Volume 85547 Methane (% of dissolved gases) 85544 Carbon dioxide (% of dissolved gases) 85550 Oxygen (% of dissolved gases) 99848 Balance gas (Other than O_2, CH_4, CO_2)
		Annual (reported w/subsequent semi-annual)	99243 Sulfur,Total Reduced VOCs, Landfill Gas
Schedule 8: Surface Settlement Monitoring			
DNR ID#	**Sampling Point**	**Frequency**	**Parameters**
	Point ID numbers to be assigned if settlement hubs are used	Annually	99422 Land Surface Elevation (feet rel. to MSL)

25. MW-228 shall be installed prior to submittal of the Construction Documentation Report for Cell 1. MW-227 shall be installed prior to submittal of the Construction Documentation Report for Cell 2. Baseline groundwater monitoring shall be performed on these two wells as required in Ch. NR 507, Wis. Adm. Code. Detection groundwater monitoring shall be performed on MW-227 and MW-228 as specified in Schedule 1.

26. MW-209 shall not be abandoned as proposed in the Plan of Operation. Monitoring shall be performed on this well as directed in Schedule 1.

27. Monthly groundwater elevations shall be collected from the wells specified in Schedule 1 for a two year period. The elevation readings shall coincide with the deep bedrock investigation. The elevations shall be reported with the semi-annual detection groundwater monitoring results.

28. Preventative Action Limits (PALs) are established for indicator parameters at the groundwater monitoring wells identified in Table 2.

29. Alternative Concentration Limits (ACLs) are approved for the substances at the groundwater monitoring wells identified in attached Table 2.

Table 2

Point Name	WDNR Pt ID	Parameter Abbreviation							
		COND, FIELD @25C	FILTERED ALKALINITY $CACO_3$	DISS. NH_3-N	DISS. SODIUM (NA)	TOT FILTERED HARDNESS	DISS. ARSENIC (AS)	DISS. NO_2 & NO_3	Diss. Manganese
		94	39036	608	930	22413	1000	631	1056
		PAL					ACL		
MW-201	1	870	440	2.1	24	450	3.1	4.5	
MW-201A	2			2.3			4.8	5.9	
MW-202A	4	990	450	2.1	17	490	2.4	9.5	
MW-202R	5	860	400	2.1		410		1.5	
MW-203	6	980	390	2.1	19	480	2.6	14	
MW-203A	7	940	400	2.1	16	470		17	
MW-208	16	880	360	2.1	17	440	3.5	14	
MW-208A	17	880	370	2.1	20	430	2.1	8.5	
MW-209	18	730	320	2.1	17	370	2.8		
MW-209A	19	720	320		16	360	5.8	4.2	
MW210A	20	960	410	2.1	16	480	2.4	11	
MW-211A	21	950	400	2.1	16	480	2.3	9.2	
MW-212	22	730	350	2.2	15	380	8.2		
MW-212A	23	750	330	2.1	28	380	1.3	4.1	
MW-224	32	1200	450	2.1		520		14	
MW-225	33	870	410	2.1	22	680	9.5	6.8	150

30. MW-201A shall be redeveloped within 30 days of the date of this approval and pH and specific conductance measured prior to and after development. The results shall be reported to the Department within 15 days of completion of redevelopment of this well.

31. After an additional four (4) samples each for specific conductance at wells MW-201A and MW-224; alkalinity and hardness at MW-201A; sodium at wells MW-201A and MW-202R; and ammonia at MW-209A have been collected and analyzed as part of the detection groundwater monitoring program WMWI shall recalculate PALs for these parameters at these wells and submit the PALs to the Department within 120 days of collection of the fourth sample.

32. WMWI shall notify the Department of any exceedance of the ACLs approved in Table 2 in accordance with s. NR 507.30, Wis. Adm. Code. For notification and response purposes:

    a. Where the ACL is greater than the NR 140 PAL, but less than the ES, the ACL shall be considered a PAL and the NR 140 ES remains in effect.

    b. Where the ACL is greater than the ES the ACL shall replace the ES.

33. After eight samples have been analyzed for Dissolved Organic Carbon (DOC), WMWI shall calculate PALs at each well and submit a plan modification request.

34. The proposed permanent monitoring wells in BW-227, BW-228, and BW-229 shall be constructed as follows:

    a. 3-foot long slotted screens shall be used rather than 5-foot and 10-foot screens as proposed;

    b. Construction shall conform to ch. NR 141, Wis. Adm. Code, standards for wells in bedrock;

    c. The estimated hydraulic conductivity of the fine grain and coarse grain filter packs shall be provided. The value may be estimated by using an empirical formula such as Kozeny-Carman or Hazen derived from a grain size analysis of the filter material;

    d. The center of the slotted screen shall be located as follows based upon drawings received from WMWI:

Drawing number	Location of center of screened interval in feet below ground surface [BGS].
8c/227	103 & 136 ft BGS,
8c/228	87 ft, 129 ft, & 170 ft BGS , and
8c/229	100 ft & 141 ft BGS

35. A hydraulic conductivity test shall be performed on each well constructed in Condition 34 after construction and development of the well. A laminar equivalent hydraulic conductivity in cm/sec shall be calculated using a standard porous media analytical method such has Bower & Rice or Hvorslev. If the Bower and Rice method (Bower 1989) is used the rationale for selecting the values of h (saturated thickness of the aquifer) and coefficients A, B, & C shall be provided. The average fracture aperture and hydraulic conductivity shall then be re-calculated using the formulas in

Attachment I for those screened intervals where fractures/fissures or other high permeability features are present:

a. Tables shall be provided for each screened interval providing the hydraulic conductivity derived using R values of 1 cm, 30 cm, 300 cm, and 30000 cm in equation 1 of Attachment I.

b. A table shall be provided for each screened interval for each well listing the depth (in mean seal level) and the total measured thickness of the fracture/fissure and/or high permeability features present and those calculated (e) using equation 1.

c. A hydraulic conductivity value shall be calculated for each straight line segment of the graph of head as a function of time constructed for each test. A table listing these values shall be provided.

36. WMWI shall provide in the corresponding Cell Construction Documentation Report the analytical results of a sample from the water source used for leak testing each lysimeter. The source of the water shall be identified and the sample shall be analyzed for the appropriate analytes, including a VOC scan and quantification, as specified in Table 5 of s. NR 507.30, Wis. Adm. Code.

37. WMWI shall install the groundwater observation well at the MW-212 well nest prior to any additional disturbance of soil or vegetation within the boundaries of proposed Cell 3 of the landfill. After construction of this well groundwater elevation measurements shall be made on a monthly basis for 24 consecutive months and the results reported to the Department with the semi-annual groundwater monitoring results. Baseline groundwater water quality shall be established for this well as required by Ch. NR 507, Wis. Adm. Code.

38. WMWI shall submit to the Department an electronic copy of all subsequent submittals per s. NR 500.05(3), Wis. Adm. Code, [define: construction documentation reports, etc.]. The electronic copy of the report shall be in Adobe Acrobat Portable Document Format [PDF file] unless otherwise approved by the Department.

39. WMWI shall submit in electronic format individual files containing the following: survey monuments, the perimeter of the subbase excavation, the limits of waste fill, limits of waste of other landfill on the property, Ch. NR 140 DMZ, sedimentation basins, manholes, groundwater monitoring wells, bedrock wells [BW series], staff gauges, lysimeter perimeters [both upper and lower], lysimeter sampling ports, leachate transfer pipes, leachate collection lines, leachate cleanouts, leachate head wells, leachate tanks, sedimentation basins, gas flares, gas plants, gas header valves, gas headers, gas header access points, gas extraction lines, and gas probes. Each file shall be in ESRI shape file format. A text file with an index and description of the individual files shall be submitted as well as a text file for each individual shape file indicating at the minimum how the data was collected, software used, define field attributes, and coordinate system. All horizontal feature locations shall be referenced using the WTM83/91 coordinate system. All vertical elevations shall be referenced to National Geodetic Vertical Datum of 1929 (NGVD29) or more recent survey.

40. WMWI shall provide a table with the coordinates for all newly constructed lysimeters [upper and lower corners], gas wells, monitoring wells, and gas probes using the appropriate horizontal and vertical datum in all Cell Construction Documentation Reports. A shape file containing the landfill liner contours shall be submitted whenever a new area of liner is documented.

41. The investigation outlined in the November 2, 2007 letter from STS|AECOM to the Department and Condition 8 of the Department's November 14, 2007, Feasibility Approval letter to WMWI shall be completed.

a. Within 45 days of the date of this approval, WMWI shall submit a report which summarizes the portions of the investigation completed to date and contains a proposal for an interim 2-year monitoring program. This submittal shall contain:

(1) A scope of work and schedule for implementing the remaining portions of the monitoring program; and,

(2) procedures and a schedule for constructing a calibration curve for purposes of converting the measurements made by the soil moisture probes in centibars to soil moisture in percent dry weight.

b. WMWI shall implement the two-year monitoring program within 30 days of receipt of Department concurrence of the scope of work and schedule.

c. Within 90 days of completion of the two-year monitoring program a report interpreting the data collected during the investigation and a plan of operation modification containing a proposed long-term monitoring program for the bedrock aquifer shall be submitted to the Department.

d. WMWI shall submit the deep bedrock aquifer investigation data from the BW series wells to the Department in electronic format semi-annually with the results from the detection groundwater monitoring program. The appropriate parameter codes to be used when reporting the data collected are:

Parameter #	Full Name	Short Name	Units
00010	TEMPERATURE, WATER (DEGREES CENTIGRADE)	WATER TEMP	C
00021	TEMPERATURE, AIR (DEGREES FAHRENHEIT)	AIR TEMP	F
00025	BAROMETRIC PRESSURE (MM OF HG)	BAROMET PRESSURE	mm
00045	PRECIPITATION, TOTAL (INCHES PER DAY)	PRECIP,TOT,DAILY	in
00094	SPECIFIC CONDUCTANCE, FIELD (UMHO/CM @ 25C)	COND, FIELD @25C	umho/cm
72020	ELEVATION, GROUNDWATER (FEET ABOVE MSL)	GRNDWTR ELEV,MSL	ft
99919	ELEVATION,GRNDWTR,BARO PRESS CORRCTD(FT ABOVE MSL)	GWELEVCRRCTD,MSL	ft
99607	TEMPERATURE, SOIL, (DEGREES F)		F
46311	MOISTURE CONTENT IN SOIL (PERCENT) DRY WGT BASIS	MOISTURE DRY WGT % SOIL O	%, percent

All hydraulic head data must be converted to mean sea level. Where hourly measurements are made the time of each measurement should be entered at the end of the Analysis Method Number field as: ____SMPLTMEXXXX; where ____ denotes four blank spaces and XXXX denotes the 24 hour clock time at which the measurement was made. Example: 8:25 a.m. would be reported as ____SMPLTME0825.

42. WMWI shall add the following elements to the Warning Symptoms of the Organic Stability Plan:

    a. Gas wells flooded and/or showing little or no gas production;

    b. Elevated gas temperatures indicating a potential subsurface fire, and/or evidence of smoke, burning odors, or other signs of subsurface fire. Carbon monoxide levels shall be monitored on a gas sample with an elevated temperature.

    c. Ponded leachate over recirculation trenches or on the active fill area;

    d. Gas or odor emissions that require major adjustments of the gas extraction system to control;

    e. Gas generation that is close to or exceeding flare and /or gas utilization equipment capacity when keeping vacuum on all gas extraction wells; and,

    f. Anomalous increase in leachate pumping in or near a leachate drainage basin being subjected to leachate recirculation.

43. WMWI shall add the following elements to the Failure Thresholds of the Organic Stability Plan:

    a. Flowing leachate seeps with constant liquid output and observable flow for many feet down a sideslope;

    b. Abnormal vibration or shaking observed while standing on the waste surface from traffic several feet away;

    c. Trucks or other vehicles sinking into soft MSW, particularly if waste is wet or saturated, but only if this problem is persistent and not weather-related; and,

    d. Massive odor and gas release that cannot be readily controlled by operation of gas extraction controls.

44. Both the annual and five-year reports shall include the following elements:

    a. Amount waste placed;

    b. Amount of leachate collected and recirculated;

    c. Gas volumes collected;

    d. Verification of the attainment of a k value of 0.077;

    e. Settlement assessments and data used to make the assessment; and,

    f. Quality assessments of leachate, gas, and condensate and a comparison between recirculation and non-recirculation areas.

45. Environmental and performance monitoring of the gas extraction system shall be conducted in accordance with the attached Schedule 7 and the following:

    a. Gas extraction wells shall be monitored annually for liquid level and reported to the Department in both feet above MSL and depth in well. The Department may approve an alternative

monitoring frequency if a leachate pump is installed in a gas extraction well or if liquid levels remain below 50 percent of the screened interval for 4 consecutive monitoring periods and remains that way during the subsequent monitoring.

b. If so equipped, WMWI shall submit the gas flow rate directed to each individual landfill gas control system, including gas conditioning units, open flares, and/or enclosed combustors (e.g. enclosed flares, turbines, internal combustion engines, boilers or process heaters).

c. The combined gas flow shall be monitored at the blower/compressor annually for total reduced sulfur compounds using test methods EPA Method 16, ASTM D5504, or ASTM D6228 and volatile organic compounds (VOCs) using EPA Test Method TO-14A or TO-15, or similar methods as approved by the Department.

d. This information shall be reported electronically to the Department on a semi-annual basis in accordance with s. NR 507.26, Wis. Adm. Code.

46. The gas flare shall be monitored continuously for temperature and flow when in operation. The data recorder printout or electronic data shall be available for Department staff review in accordance with s. NR 506.17, Wis. Adm. Code.

47. Any active vertical gas extraction well experiencing leachate head levels covering 50 percent or more of the screened interval shall be re-sampled within 90 days of the initial measurement. Leachate extraction equipment shall be installed within 180 days after initial discovery in any vertical gas extraction well that exhibits leachate head levels covering 50 percent or more of the screened interval during two or more consecutive monitoring periods. The Department may require installation of leachate extraction equipment in wells that exhibit leachate head levels covering less than 50 percent of the open screened interval if, in the Department's opinion, dewatering is necessary to maintain an effective gas extraction system or if it is determined that the head levels are a result of actual leachate head levels in that location of the landfill.

48. WMWI shall submit an annual report to the Department no later than April 1 of each year that includes information required in conditions of this approval and a summary of the following activities related to the gas extraction system:

a. Results of surface emission monitoring, to include supporting narrative, a map identifying problems areas, recent calibration data for portable analyzer, as well as meteorological conditions at the time of inspection, including: temperature, barometric pressure trend, average wind speed, wind direction and sky conditions. The report shall describe remedial measures taken to correct areas of landfill gas emissions at or above 500 ppm methane above background or areas with stressed vegetation or other physical signs of landfill gas emergence. The report shall include construction documentation in accordance with s. NR 516, Wis. Adm. Code, for any repairs conducted on the barrier layer of final covered areas;

b. Records of periods of shutdowns of the gas extraction system, length of time of shutdown, and corrective action for the system or individual extraction wells;

c. Any maintenance, cleaning, repair, or replacement of gas extraction wells, header or lateral lines, gas condensate knock-outs, gas mover equipment or gas combustion equipment components, or valve assemblies; and,

d. Any assessment of the performance of the gas extraction system, including each gas extraction well to determine open screened interval, liquid level, and changes in overall extraction performance.

49. To avoid duplication of monitoring efforts, the requirements of this approval may be conducted in conjunction with the surface emission and wellhead monitoring required under the compliance demonstration section of the landfill's Air Pollution Control Operation Permit.

The Department reserves the right to require the submittal of additional information and to modify this approval at any time, if in the Department's opinion, modifications is necessary. Unless specifically noted, the conditions of this approval do not supersede or replace any previous conditions of approval for this facility.

NOTICE OF APPEAL RIGHTS

If you believe you have a right to challenge this decision made by the Department, you should know that Wisconsin statutes, administrative codes and case law establish time periods and requirements for reviewing Department decisions.

To seek judicial review of the Department's decision, sections 227.52 and 227.53, Stats., establish criteria for filing a petition for judicial review. Such a petition shall be filed with the appropriate circuit court and shall be served on the Department. The petition shall name the Department of Natural Resources as the respondent.

Dated: April 28, 2008 DH/NER

DEPARTMENT OF NATURAL RESOURCES
For the Secretary

Len Polczinski
Len Polczinski
Waste & Materials Management Team Supervisor
Northeast Region

Len Polczinski for
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