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Regulation Compliance Report Closure Plan

Weston Disposal Site No. 3 Landfill Town of Knowlton, Marathon County, Wisconsin

Submitted to:

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1. Introduction

Wisconsin Public Service Corporation (WPSC) owns and operates the Weston Disposal Site No. 3 Landfill, located in the E 1/2 of the NW 1/4 and W 1/2 of the NE 1/4, Section 23, Township 26 North, Range 7 East, Town of Knowlton, Marathon County, Wisconsin. The WPSC Weston Disposal Site No. 3 Landfill is regulated as an industrial waste landfill by the Wisconsin Department of Natural Resources (WDNR) under the provisions of Chapter 289 Wisconsin State Statues, and all applicable requirements of Chapters NR 500 of the Wisconsin Administrative Code. The design, construction, operation, closure, and post-closure care requirements are specified in the WDNR conditionally approved Plan of Operations, License No. 3067, FID No. 737025120. The construction of Cells 1 and 2 commenced in May 2015. The landfill was placed into operation in 2016.

In addition to the state regulations, the landfill is also required to comply with 40 CFR Part 257 Subpart D – *Standards for Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments*. Weston Disposal Site No. 3 Landfill, Cells 1 & 2 is defined as a CCR unit and existing CCR landfill in accordance with § 257.53 since construction commenced prior to October 14, 2015. Future landfill cells are permitted by the WDNR in the conditionally approved Plan of Operation and defined as lateral expansions under § 257.53 when constructed.

This report fulfills the requirements for a written Closure Plan of the Weston Disposal Site No. 3, Cells 1 and 2 in accordance with § 257.102 - *Criteria for Conducting the Closure or Retrofit of CCR Units*. In accordance with § 257.102(b)(1) this report describes the engineering design of the landfill, phased development, a description of the final cover system and how the final cover will be constructed, and how the final cover system will meet the applicable performance standards contained in § 257.102(d). In addition, it also includes an estimate of the maximum inventory of CCR, an estimate of the maximum open area that would require closure at one time, and a generalized schedule based on the anticipated landfill filling rates and disposal volumes.

This closure plan includes the following sections:

Section 1 IntroductionSection 2 Closure NarrativeSection 3 Final Cover SystemSection 4 Schedule for ClosureSection 5 Conclusion and Certification

2. Closure Narrative

This section provides the closure narrative as required by § 257.102(b)(i). Closure of Cells 1 and 2 will be accomplished by leaving the CCR in place and installing a final cover meeting the requirements of § 257.102(d)(3) over the CCR. The final cover system is described in Section 3. The areal limits of Cells 1 and 2 are shown on drawing Sheet 6 of 29 - Cell 1 & 2 Site Preparation in Appendix A. Closure activities for Cell 1 and 2 will commence when CCR disposed in the cell reach final waste grades shown on drawings Sheet 7 of 29 - Cell 3 Site Preparation, Area A Closure and Sheet 14 of 29 - Top of Waste Grades in Appendix A. It will be necessary to laterally expand the landfill with the construction of Cell 3 before final waste grades are completed in Cell 1 and 2. At that time this closure plan will be updated to comply with the federal rules.

§ 257.102(b)(1)(iv) requires an estimate of the maximum inventory of CCR ever on the site over the active life of the CCR unit. The design capacity of Cell 1 and 2 is approximately 650,000 cubic yards. Therefore, prior to lateral expansion of the Weston Disposal Site No. 3 Landfill, in accordance with the approved Plan of Operation, the maximum CCR inventory of the landfill is 650,000 cubic yards.

§ 257.102(b)(1)(v) requires an estimate of the largest area of the CCR unit ever requiring final cover, at any time during the active life of the CCR unit. The area of Cells 1 and 2 is 15.2 acres. Therefore, prior to lateral expansion of the Weston Disposal Site No. 3 Landfill, in accordance with the approved Plan of Operation, the largest area of the CCR unit (Cell 1 and 2) requiring a final cover during the CCR unit's active life is 15.2 acres.

§ 257.102(d)(1)(i). The final cover system described in Section 3 is a composite final cover system which will envelop the CCR, minimizing post-closure infiltration and the potential release of CCR, leachate, or contaminated run-off from the closed unit. The landfill with the final cover is shown on Sheet 15 of 29 – Final Grades and final cover cross-sections are shown on drawings Sheet 19 of 29 – Engineering Cross-Section 324,700, Sheet 20 of 29 – Engineering Cross-Section 325,300, and Sheet 27 of 29 – Details. Fugitive dust from exposed CCR before and during final cover construction will be managed in accordance with the Fugitive Dust Control Plan. Surface water that has come into contact with CCR before and during final cover construction will be managed as leachate in accordance with the Runon and Run-off Control Plan.

§ 257.102(d)(1)(iii). Slope stability of the CCR and final cover is enhanced in the manner in which the CCR is conditioned, placed, and compacted; how the facility is operated to promote storm and contact water management; and how the leachate collection system is designed and monitored to ensure leachate is being removed from the waste and not allowed to build-up within the landfill. The permitted final cover slopes will be at a 5% minimum slope at the top of the landfill to promote surface water drainage and prevent ponding due to the settlement of the final cover system. The perimeter side slopes of the landfill will be at a

maximum slope of 25% to provide long-term stable slopes that promote stormwater drainage, can be protected from excessive erosion, and safely maintained.

§ 257.102(d)(1)(iv). The final cover system described in Section 3 will minimize infiltration, which in turn minimizes the demand on the leachate collection system. The final cover will be vegetated with grass to promote evapotranspiration and prevent erosion. The final cover system vegetation will be maintained by fertilizing as necessary to develop a well-established vegetative cover and periodic mowing to stimulate root growth and prevent the establishment of woody vegetation. Final slopes will be between 5% and 25% to facilitate mowing. Slopes greater than 10% will be covered with erosion matting after seeding to minimize erosion during the establishment of vegetative cover.

§ 257.102(d)(1)(v). The final cover system described in Section 3 uses readily available equipment and materials and can easily be completed in a single construction season.

3. Final Cover System

This section is included to fulfill the requirements of § 257.102(b)(1)(iii).

Filling to final contours will result in a final slope no greater than 25% sloping downward from the center of the fill area to the perimeter of the site. The top portion of the landfill will be graded to no less than 5% sloping downward from the center to ensure positive drainage to the perimeter of the site. Drainage features, such as the perimeter ditches, terraces, and runoff channels will be constructed, as necessary, to accommodate surface runoff from phased closure.

The final cover system has been designed to minimize leachate generation by limiting percolation through the final cover barrier layer, promoting subsurface drainage to limit head on the barrier layer, and establishing vigorous plant growth to maximize evapotranspiration. The final cover system has also been designed for stability and to reduce maintenance. Specifically, the final cover from top down will consist of 6 inches of topsoil, 30 inches of general fill for the rooting zone layer, a geocomposite drainage layer, which may be substituted with select granular fill meeting NR 504 WAC, a 40-mil linear low density polyethylene geomembrane and either 24 inches of compacted clay, 24 inches of compacted ash, or a GCL with 24 inches of compacted barrier soils.

The hydraulic conductivity of the final cover system is required by § 257.102(d)(3)(i)(A) to be less than or equal to the hydraulic conductivity of the bottom liner system or natural subsoils present or a hydraulic conductivity no greater than 1.0E-05 cm/s, whichever is less. The Weston Disposal Site No. 3 Landfill is designed and constructed with a composite base liner system consisting of 2 feet of compacted soil, geosynthetic clay liner, and polyethylene geomembrane. The approved final cover system is a composite final cover consisting of a 2-foot compacted barrier layer, polyethylene geomembrane, drainage layer, and vegetated soil layers. The final cover system meets the requirements of § 257.102(d)(3)(i)(A).

Construction equipment and methods normally used in developing landfills and performing earth-moving projects will be used. The following sub-sections discuss the construction of the individual components of the final cover system. Layout and details of the final cover system are shown on the drawings included in Appendix A.

3.1 Compacted Barrier Layer

A minimum 2-foot-thick layer of compacted barrier layer constructed of clay, soil, or fly ash will be used as the soil component of the composite barrier layer. The materials will be placed and compacted with a large vibratory smooth-drum roller, with a minimum operating weight of 15,000 pounds, and while in vibratory mode, can provide 30,000 pounds of compactive energy. The barrier layer will be placed and compacted in lifts not exceeding 6 inches. The prepared barrier layer shall provide a firm, smooth surface for deployment of the geomembrane. The barrier layer should be free of any angular particles protruding from

the surface greater than 0.5 inches, sharp breaks in grade or excessive rutting greater than 0.2 feet. The completed barrier layer will have a maximum hydraulic conductivity of 5×10^{-5} cm/s. Based on the laboratory test results of the FGD filter cake and typical fly ash properties, the compaction and hydraulic conductivity specifications should be achievable using standard construction equipment and methods normally used in developing landfills and performing earth-moving projects.

3.2 Geomembrane

The geomembrane component of the final cover system will be a 40-mil textured linear low-density polyethylene (LLDPE) geomembrane. The LLDPE geomembrane has been selected in order to provide flexibility of the final cover system to accommodate expected settling and subsidence in accordance with § 257.102(d)(3)(i)(D). Geomembrane panels will be positioned by suspending rolls of material with a front-end loader and unrolling the suspended material by hand or with the aid of an ATV, as the loader remains stationary. The geomembrane will be installed in a loose and relaxed condition. Panels will be overlapped approximately 4 inches and fusion-welded together. At seam intersections and other repair locations, a geomembrane patch extending a minimum of 12 inches beyond the intersection or repair will be extrusion-welded into place. All seams will be non-destructively tested by air or vacuum testing. The integrity of fusion welds will be air tested, and extrusion welds will be vacuum-tested.

3.3 Drainage/Rooting Layer and Topsoil

A geocomposite drainage layer and a 30-inch-thick rooting zone layer meeting the requirements of § 257.102(d)(3)(i)(B) will be installed above the geomembrane final cover. The drainage layer will be installed to aid in the removal of subsurface storm water drainage; the rooting zone layer will be installed to support vegetative growth, and both layers will provide protection of the geomembrane and compacted barrier layer. The geocomposite will be deployed such that the seams run perpendicular to the contour lines of the slope to the extent possible. The geonet will be cable-tied every 3 feet along the edge of the panels and every 12 feet for end seams. The top geotextile will be sewn. The rooting layer will be placed over the geocomposite in a single lift using low ground pressure dozers. The material will be classified as SW, SP, SM, SC, ML, or CL and have a maximum particle size of 3 inches. The rooting layer will consist of on-site or off-site soils. As an alternative, the geocomposite drainage layer can be replaced by a 12-inch thick sand drainage layer having a minimum hydraulic conductivity of 1×10^{-3} cm/s and a maximum particle size of 0.25 inches. If the granular drainage layer is used the rooting zone thickness will be reduced to 18 inches.

Meeting the requirements of § 257.102(d)(3)(i)(C), topsoil capable of sustaining vegetative growth will be placed and spread into a uniform loose lift thickness of 6 inches. Once placed, the topsoil will be fertilized, seeded, and mulched. On all slopes greater than 10%, a temporary straw mulch blanket will be used to limit erosion and protect the seed prior to the establishment of vegetation.

4. Schedule for Closure

This section is included to fulfill § 257.102(b)(1)(v). The first phase of construction, Cells 1 and 2, were completed in 2015 and Cell 2 was placed into service in 2016. In accordance with the WDNR approved Plan of Operation, the landfill has a phased development plan, describing the construction, operation, and closure of each phase of the landfill from the construction of Cell 1 to the closure of Cell 9. In general, the development plan requires active landfill cells which have reached final waste grades be closed as soon as practical to limit the maximum open area, leachate generation, and the potential operational problems. A schedule for completing all activities necessary to satisfy the closure criteria is dependent on the CCR generation rates, beneficial reuse programs, and disposal rate volumes. However, final closure of Cells 1 and 2 will begin no later than 30 days following the final waste receipt for the CCR unit in accordance with §257.102(e)(1).

Final cover construction at the Weston Disposal Site No. 3 Landfill will be completed in accordance with the WDNR approved Plan of Operation under License No. 3067. Therefore no additional state or local approvals are required for WPSC to begin construction of the next phase of the landfill or closure of an existing phase. The final cover system described in Section 3 uses standard and readily available equipment and materials and can easily be completed in a single construction season.

5. Conclusion and Certification

WPSC owns and operates the Weston Disposal Site No. 3 Landfill, located in the E 1/2 of the NW 1/4 and W 1/2 of the NE 1/4, Section 23, Township 26 North, Range 7 East, Town of Knowlton, Marathon County, Wisconsin. The Weston Disposal Site No. 3 Landfill is required to comply with 40 CFR Part 257 Subpart D – *Standards for Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments*. This plan fulfills the requirements for a written Closure Plan of the Weston Disposal Site No. 3 Landfill , Cell 1 and 2 in accordance with § 257.102 - *Criteria for Conducting the Closure or Retrofit of CCR Units*, describing the engineering design and construction of the final cover system, how the final cover system will meet the applicable performance standards contained in § 257.102(d), an estimate of the maximum inventory of CCR, an estimate of the maximum open area that would require closure at one time, and a generalized schedule based on the anticipated landfill filling rates and disposal volumes.

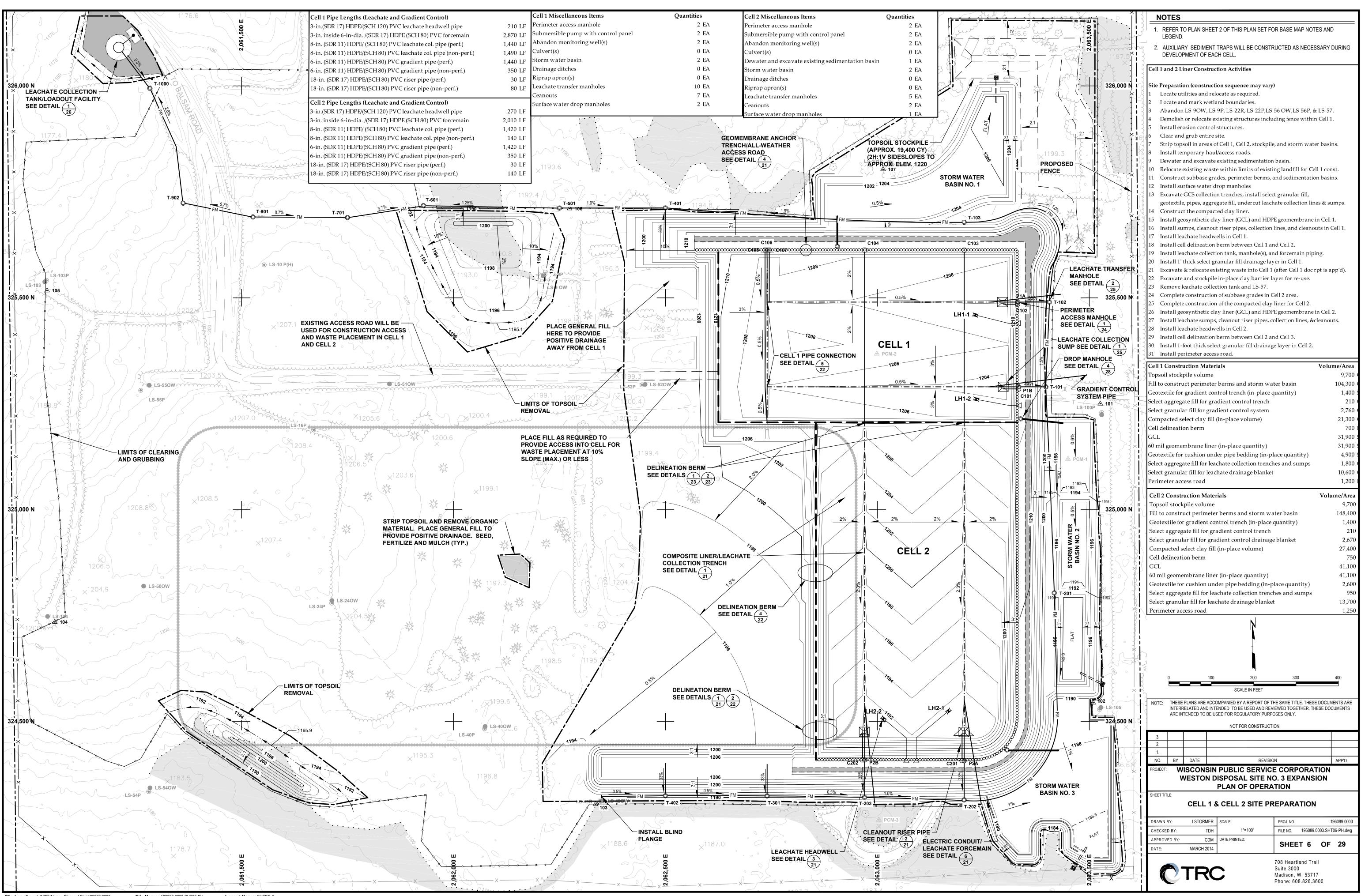
The Closure Plan was completed under the direction of John M. Trast, P.E. I am a licensed professional engineer in the State of Wisconsin in accordance with the requirements of ch. A-E 4, Wisconsin Administrative Code; that this document has been prepared in accordance with the Rules of Professional Conduct in ch. A-E 8, Wisconsin Administrative Code; and that, to the best of my knowledge, all information contained in this document is correct and the document was prepared in compliance with all applicable requirements in 40 CFR Part 257 Subpart D.

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Appendix A

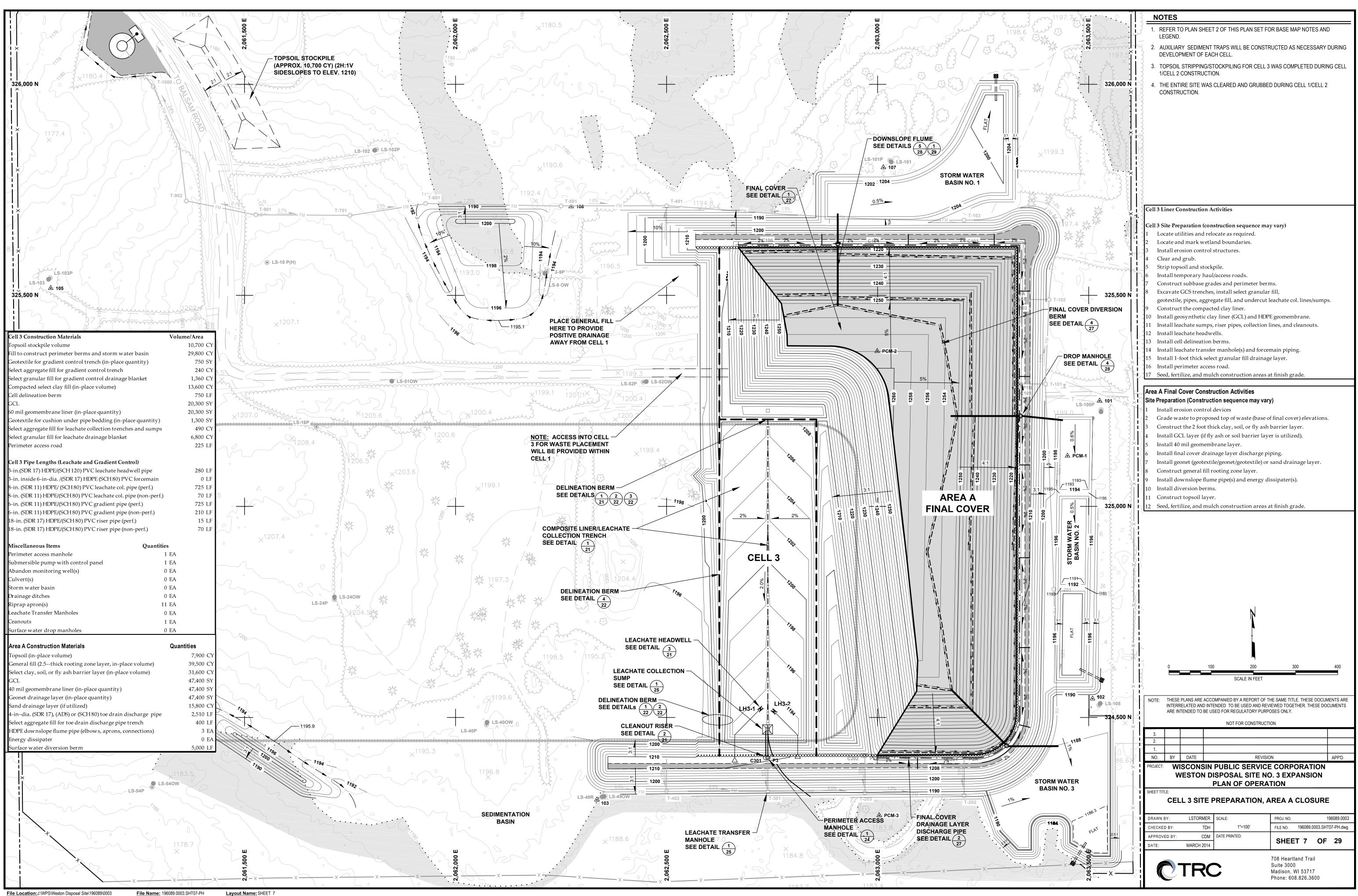
Weston Disposal Site No. 3, WDNR License No. 3067, Wisconsin Public Service Corporation, Plan of Operation Drawings

Sheet 6 of 29 – Cell 1 & 2 Site Preparation Sheet 7 of 29 – Cell 3 Site Preparation, Area A Closure Sheet 14 of 29 – Top of Waste Grades Sheet 15 of 29 – Final Grades Sheet 19 of 29 – Engineering Cross-Section 324,700 Sheet 20 of 29 – Engineering Cross-Section 325,300 Sheet 27 of 29 – Details.



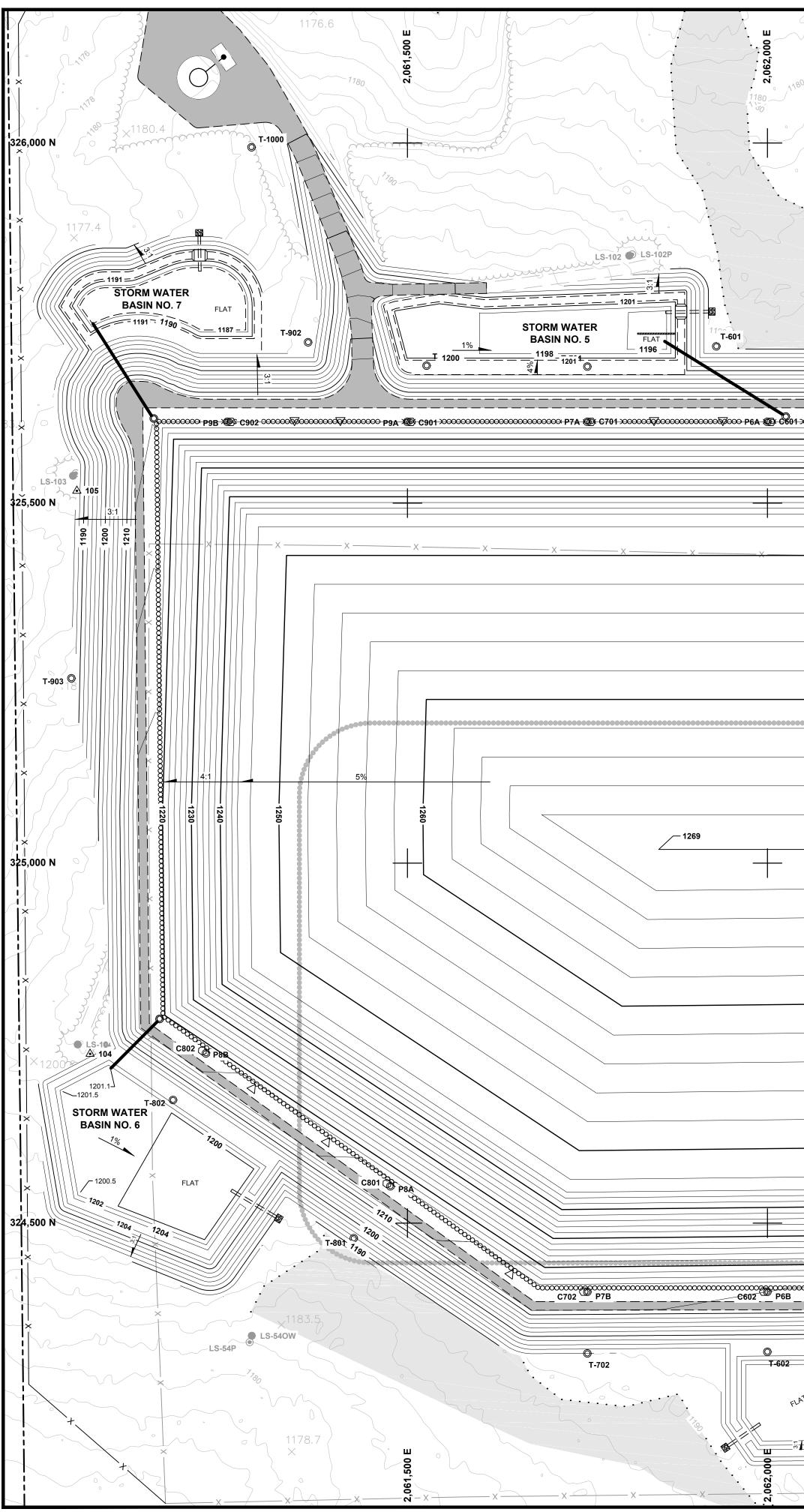
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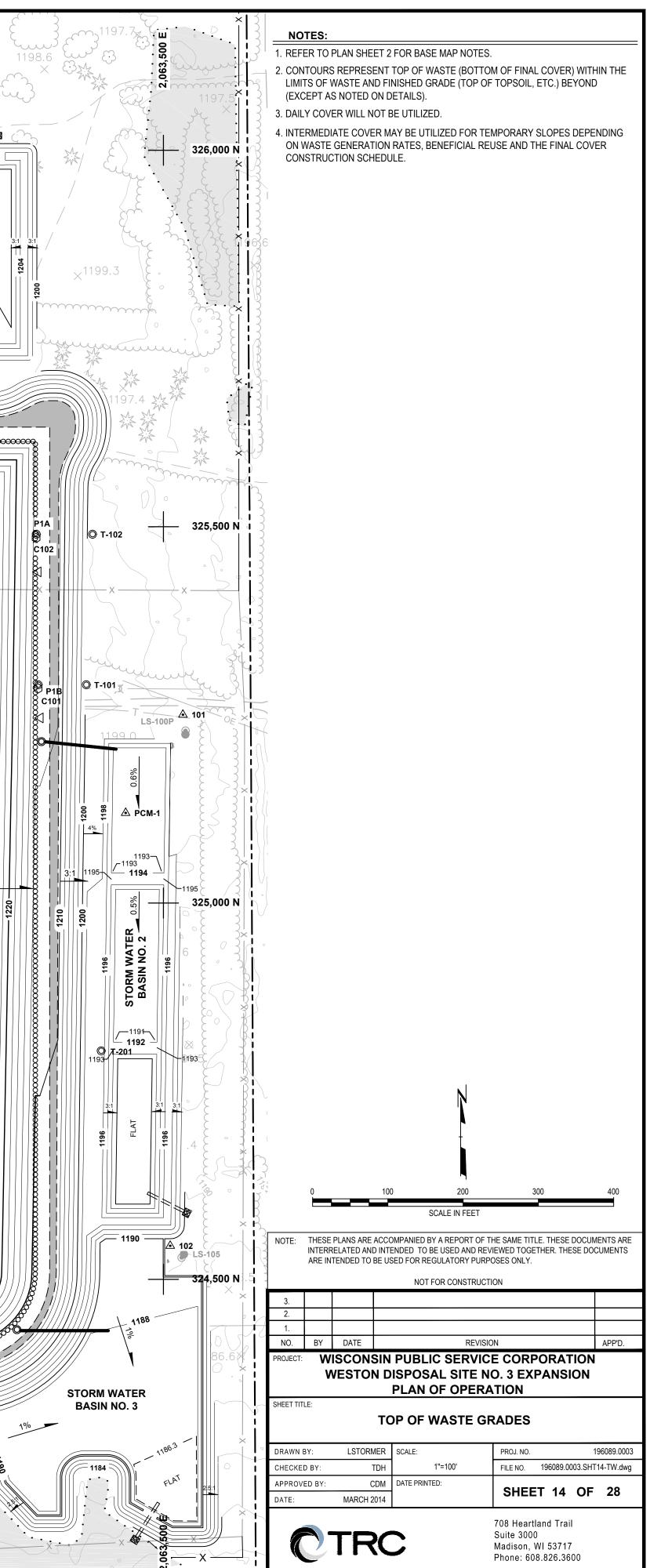
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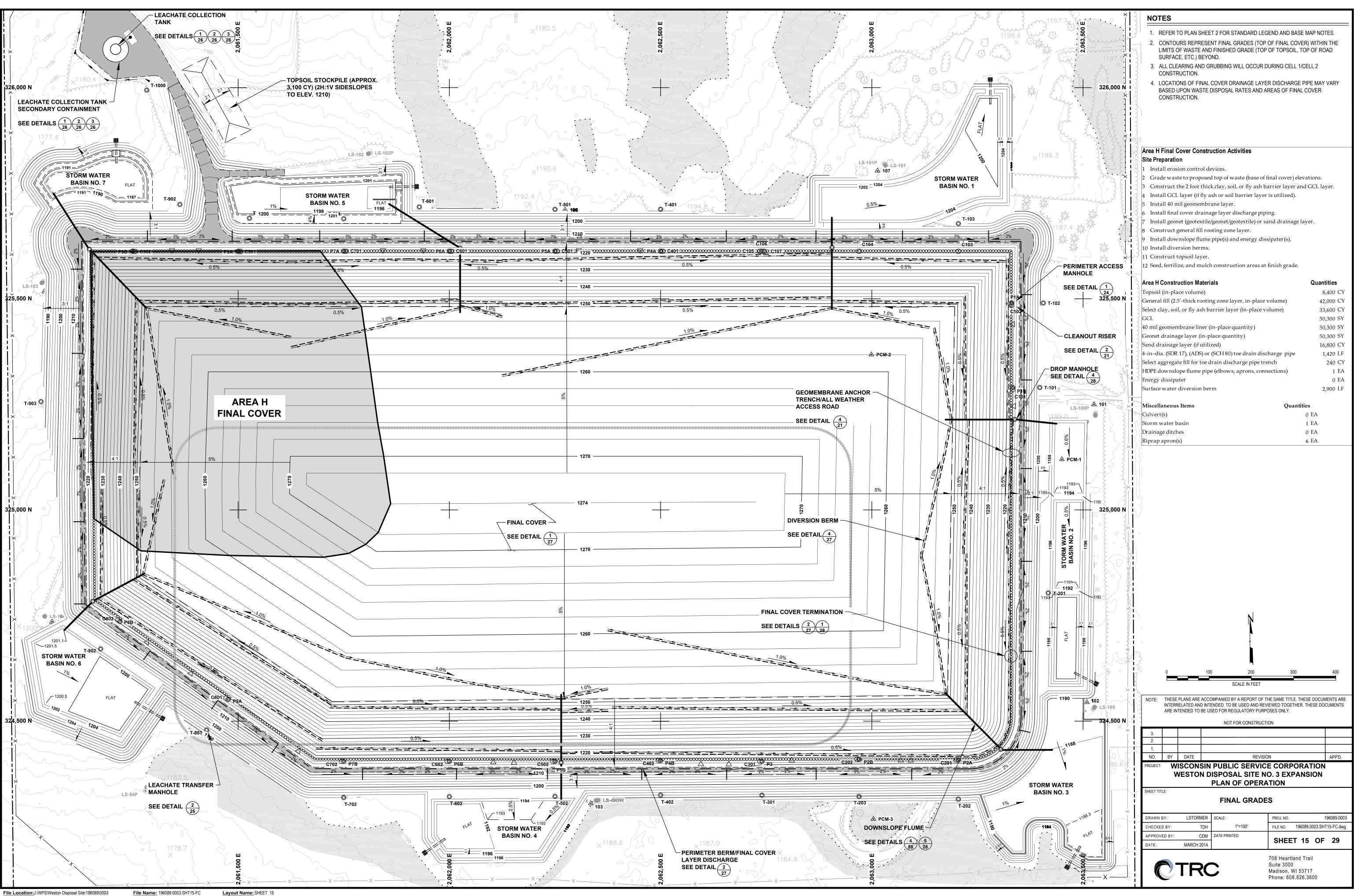


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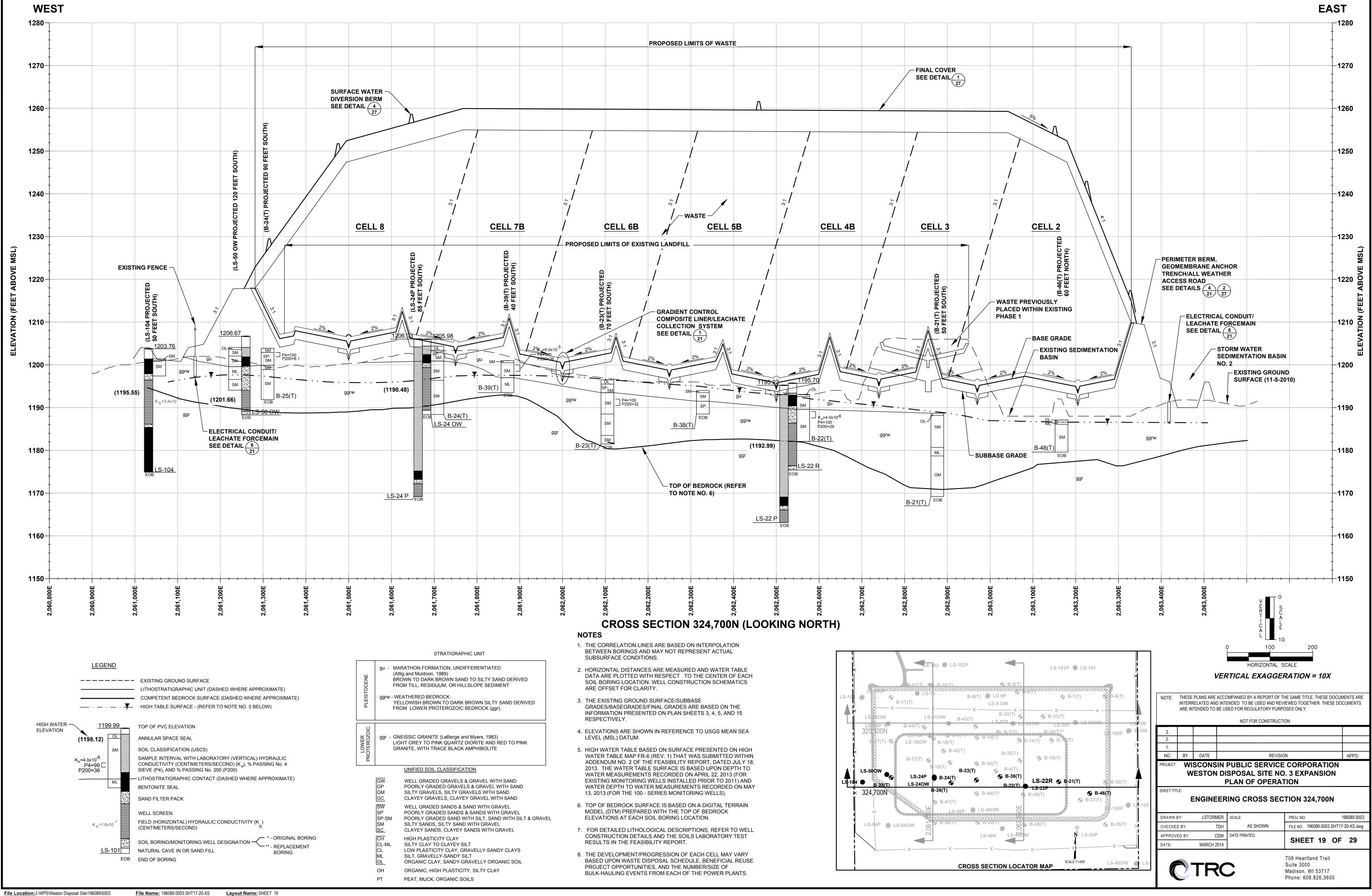
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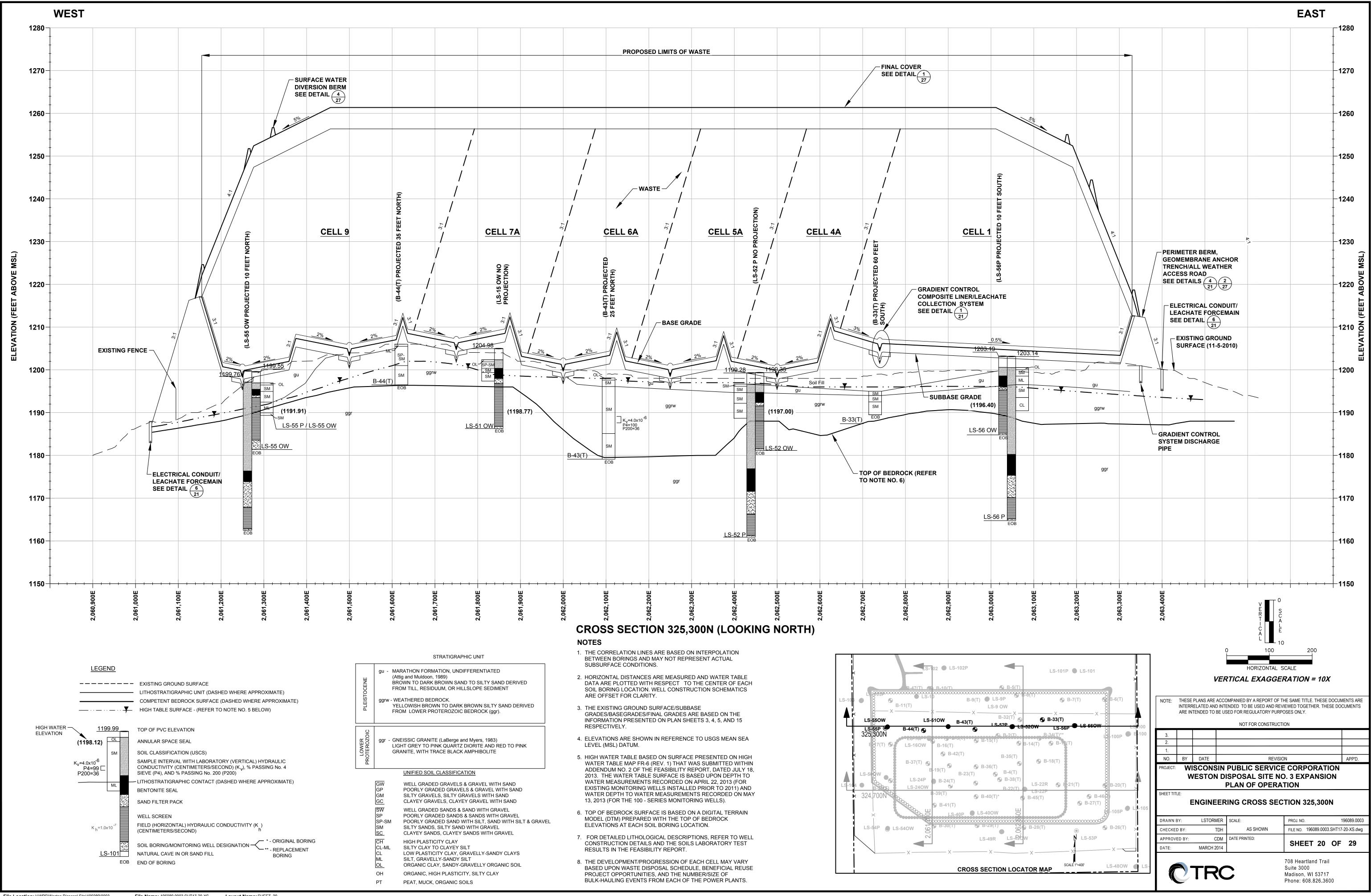
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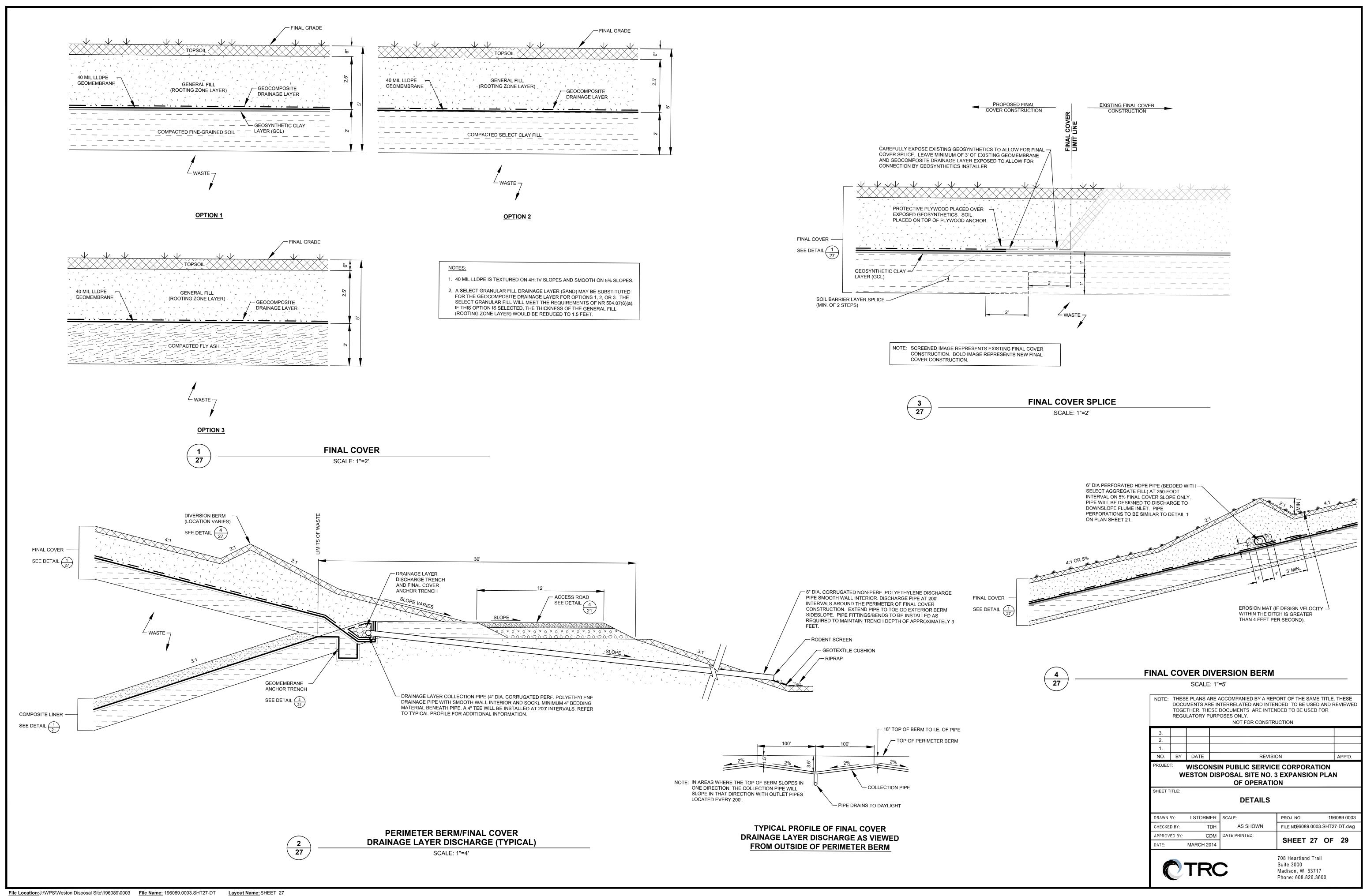
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