Global Operations, Environment, Health & Safety

1 Plastics Avenue
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Via Electronic Mail

December 6, 2022

Mr. Richard Fisher
Office of Site Remediation and Restoration
U.S. Environmental Protection Agency, Region I
5 Post Office Square - Suite 100
Boston, MA 02109-3912

Re: GE-Pittsfield/Housatonic River Site
Rest of River (GECD850) – Upland Disposal Facility
Interim Pre-Design Investigation Data Summary Report for Upland Disposal Facility Area
Upland Disposal Facility Conceptual Design Plan

Dear Mr. Fisher:

In accordance with EPA's February 25, 2022 conditional approval letter for GE's *Pre-Design Investigation Work Plan for Upland Disposal Facility*, enclosed for EPA's review and approval are the following: (1) GE's *Interim Pre-Design Investigation Data Summary Report for Upland Disposal Facility Area* (Interim PDI Data Summary); and (2) GE's *Upland Disposal Facility Conceptual Design Plan*. These are provided in separate e-mails. In addition, due to the size of the Interim PDI Data Summary, the text, tables, and figures for that report are being provided directly by email and a link to a SharePoint site is also provided for the entire document, including the appendices.

Please let me know if you have any questions about these submittals.

Very truly yours,

Matthew Calacone/csc

Matthew Calacone
Senior Project Manager – Environmental Remediation

Enclosures

Cc: *(via electronic mail)*
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General Electric Company

Upland Disposal Facility Conceptual Design Plan

GE-Pittsfield/Housatonic River Site

December 2022

Upland Disposal Facility Conceptual Design Plan

GE-Pittsfield/Housatonic River Site

December 2022

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Contents

Tables

Figure

Appendix

Abbreviations

3H:1V	three horizontal to one vertical
amsl	above mean sea level
ARAR	applicable or relevant and appropriate requirement
Arcadis	Arcadis U.S., Inc.
CD	Consent Decree for GE-Pittsfield/Housatonic River Site
CFR	Code of Federal Regulations
cm/s	centimeter per second
CMR	Code of Massachusetts Regulations
CRA	cultural resource assessment
cy	cubic yard
EPA	U.S. Environmental Protection Agency
ERE	Environmental Restriction and Easement
Eversource	Eversource Energy
Final Revised SOW	Final Revised Rest of River Statement of Work
Final UDF PDI Summary	Final Pre-Design Investigation Summary Report for Upland Disposal Facility Area
GE	General Electric Company
HDPE	high-density polyethylene
Interim PDI Data Summary	Interim Pre-Design Investigation Data Summary Report for the Upland Disposal Facility Area
Lane	The Lane Construction Corporation
MassDEP	Massachusetts Department of Environmental Protection
mil	one thousandth (0.001) of an inch
MWPA	Massachusetts Wetlands Protection Act
NPDES	National Pollutant Discharge Elimination System
PCB	polychlorinated biphenyl
PDI	pre-design investigation
Revised Permit	Revised Final Modification to GE's Resource Conservation and Recovery Act Corrective Action Permit (December 2020)
ROR	Rest of River

SOW	Statement of Work
Stormwater Handbook	Massachusetts Stormwater Handbook and Stormwater Standards (February 2008)
UDF	Upland Disposal Facility
UDF OMM Plan	Operation, Monitoring, and Maintenance Plan for UDF

1 Introduction

This Upland Disposal Facility Conceptual Design Plan (Conceptual Design Plan) has been prepared on behalf of the General Electric Company (GE) to present the proposed conceptual design elements for the Upland Disposal Facility (UDF) and UDF support area associated with the Rest of River (ROR) Remedial Action. The ROR consists of the portion of the Housatonic River and its backwaters and floodplain (excluding portions of certain residential properties) downstream of the confluence of the East and West Branches of the Housatonic River, which is located approximately two miles downstream from GE's former manufacturing facility in Pittsfield, Massachusetts. The UDF will be constructed on a 75-acre property (the GE Parcel) that was formerly part of an active sand and gravel quarry and that GE acquired from The Lane Construction Corporation (Lane) in April 2021. Figure 1 shows the GE Parcel, along with the anticipated limits of the UDF consolidation area (the waste-containing portion of the UDF) and the associated operational area. In addition, the GE Parcel will contain a UDF support area, which is currently undefined and not shown on the figure and which may include facilities such as sediment dewatering, water treatment, and/or loading areas.

On December 16, 2020, pursuant to the 2000 Consent Decree (CD) for the GE-Pittsfield/Housatonic River Site, the U.S. Environmental Protection Agency (EPA) issued a Revised Final Permit Modification to GE's Resource Conservation and Recovery Act Corrective Action Permit (Revised Permit) specifying a Remedial Action for the ROR (EPA 2020). The selected ROR Remedial Action includes a provision for GE to construct and utilize a UDF at the former Lane site for the disposal of certain of the sediments and soils to be removed as part of the Remedial Action. In accordance with the requirements of the Revised Permit, GE submitted to EPA a Rest of River Statement of Work (SOW) specifying the deliverables and activities that GE will conduct to design and implement the ROR Remedial Action. After receipt of EPA comments, GE submitted a Final Revised Rest of River SOW on September 14, 2021 (Final Revised SOW; Anchor QEA et al. 2021). That Final Revised SOW included pre-design and design requirements for the UDF and UDF support area. On September 16, 2021, EPA issued an approval letter for the Final Revised SOW.

On November 24, 2021, GE submitted a Pre-Design Investigation Work Plan for the UDF in accordance with the Final Revised SOW. That work plan was conditionally approved by EPA on February 25, 2022. GE subsequently began the pre-design investigation (PDI) of the UDF area and conducted numerous PDI activities in 2022. The PDI activities conducted through November 2022 are described in GE's *Interim Pre-Design Investigation Data Summary Report for the Upland Disposal Facility Area* (Interim PDI Data Summary; Arcadis and AECOM 2022), which is being submitted concurrently with this Conceptual Design Plan. Those activities are also briefly summarized in Section 2.3 of this plan. The PDI is ongoing, as also discussed in Section 2.3.

1.1 Purpose and Objectives

This Conceptual Design Plan documents the technical basis for the proposed UDF design and demonstrates compliance with the Final Revised SOW. As presented herein, the UDF design is at the conceptual level and subject to revision based on the collection and analysis of additional data in the PDI, further evaluation of site conditions, consideration of UDF operational requirements, and design calculations. The final design for the UDF will be presented in a Final Design Plan (described in Section 4.3.2.2 of the Final Revised SOW) and the associated Operation, Monitoring, and Maintenance Plan for the UDF (UDF OMM Plan) (described in Section 4.3.2.3 of the Final Revised SOW).

1.2 Site Description and History

The GE Parcel generally consists of previously disturbed and barren ground areas void of vegetation, open grassed and wooded areas, and ponds that were created as part of the prior quarry operations. The bordering site features are Valley Street to the north, Woodland Road to the east, the Lee Municipal Landfill to the south, and property of Northeast Paving (a Division of Eurovia Atlantic Coast, LLC) to the west located off Willow Hill Road. The soils on site largely consist of sand and gravel. There is a general east-to-west slope in the groundwater table across the site. There is an existing Eversource Energy (Eversource) utility easement containing overhead electric utility lines on the western and southern sides of the GE Parcel. There are no known underground utilities within the GE Parcel.

1.3 Design Report Organization

The remainder of this Conceptual Design Plan is organized into the following sections:

- Section 2 provides a summary of the performance standards, other constraints, and design elements for the UDF and includes a very brief summary of PDI activities to date.
- Section 3 presents a summary of the components and purpose of the baseliner system.
- Section 4 presents a summary of the components and purpose of the final cover system.
- Section 5 provides an overview of the various operational and support areas for the UDF.
- Section 6 provides a preliminary discussion of measures to address habitat impacts at the UDF area.
- Section 7 addresses the anticipated conditions and processes that will occur during closure of the UDF.
- Section 8 addresses the post-closure activities to be performed at the UDF area, including long-term monitoring and maintenance of the UDF area.
- Section 9 presents a proposed schedule for submission of the UDF Final Design Plan.
- Section 10 lists the references cited in this Conceptual Design Plan.

The current set of preliminary design drawings is provided in Appendix A.

Note that some of the UDF components or UDF-related activities covered by the above-listed sections cannot be described in any detail at this time and must await completion of the UDF design. These components and activities are identified as such in a number of sections of this Conceptual Design Plan and will be described in the Final Design Plan for the UDF. The design information presented herein reflects the state of design as of the date of this Conceptual Design Plan and will be expanded upon in the Final Design Plan and/or the associated UDF OMM Plan.

2 Design Summary

This section provides a summary of the basis of the UDF design, including the performance standards in the Revised Permit, applicable or relevant and appropriate requirements (ARARs), PDI information obtained to support the design, the overhead electric utility line easement, the berm and baseliner system, the final cover system, management of leachate and surface water, and the UDF operational and support areas.

2.1 Performance Standards for UDF

Section II.B.5.a of the Revised Permit sets forth the performance standards for the UDF. In summary, those performance standards require that the UDF meet the following construction and design requirements (paraphrased):

- Be constructed at the location shown on Figure 6 of the Revised Permit.
- Provide a maximum design capacity of 1.3 million cubic yards (cy).
- Have a consolidation area with a maximum footprint of 20 acres and a maximum elevation of 1,099 feet above mean sea level (amsl). If the seasonally high groundwater elevation is determined to be higher than 950 feet amsl, the maximum elevation of the consolidation area may be increased by the number of feet between the seasonally high groundwater and 950 feet amsl in order to achieve the maximum waste capacity of 1.3 million cy.
- Include two bottom liners (referred to herein as a baseliner), separated by a drainage layer, and incorporate primary and secondary leachate collection systems.
- Have the baseliner a minimum of 15 feet above a conservative estimate of the seasonally high groundwater elevation. The seasonally high groundwater elevation will be projected using site-specific groundwater elevation data collected in the location of the UDF and modified to account for historical groundwater level fluctuations at similarly sited off-site, long-term monitoring wells in Massachusetts. This estimation will be performed pursuant to a methodology reviewed and approved by EPA.
- Provide for the consolidation area to be covered with a low-permeability cap that includes a hydraulic barrier, drainage layer(s), and vegetation.
- Ensure that the liners/barriers for both the bottom of the UDF and the cap have a permeability equal to or less than 1×10^{-7} centimeters per second (cm/s) and a minimum thickness of 30 thousandths of an inch (mil) and are chemically compatible with polychlorinated biphenyls (PCBs).
- Include a stormwater management system to control surface runoff and minimize the potential for surface erosion or stormwater contribution to leachate generation.
- Include a groundwater monitoring network around the UDF to monitor for PCBs and other constituents identified in the groundwater monitoring plan as approved or modified by EPA.

Compliance with these performance standards is discussed as appropriate throughout this Conceptual Design Plan.

2.2 Applicable or Relevant and Appropriate Requirements and Other Pertinent Regulations

In addition to the performance standards for the UDF presented in Section II.B.5.a of the Revised Permit and summarized in the preceding section, the Revised Permit identifies, in Attachment C, the ARARs for the ROR Remedial Action. The listed ARARs that are pertinent to and considered for the UDF design are presented in Table 2-1 (attached), using the same format as in Attachment C to the Revised Permit. The actions to be taken in the UDF design to comply with these ARARs (where not waived by EPA) are also described in Table 2-1.

In addition to these listed ARARs and the performance standards in the Revised Permit, the design of the baseliner and final cover system components for the UDF has considered as a guide the technical requirements of 310 Code of Massachusetts Regulations (CMR) 19.000 (*Solid Waste Management*) relating to such components of a solid waste landfill (notably, 310 CMR 19.110 and 19.112).

2.3 Pre-Design Investigation

A comprehensive PDI commenced in March 2022 to acquire necessary data to support engineering evaluations and design of the UDF. The results of the activities and investigations conducted to date as part of the PDI are presented in the Interim PDI Data Summary. Those activities include, among others, a baseline habitat assessment, a topographic and bathymetric field survey, a soil geotechnical evaluation, engineering and environmental soil testing, piezometer and monitoring well installation, groundwater elevation and quality testing, and a cultural resource assessment (CRA). These activities are briefly summarized below. The PDI is ongoing as of the date of this Conceptual Design Plan and is scheduled to be completed in late 2023, after which all the data collected during the PDI will be presented in a Final Pre-Design Investigation Summary Report for the Upland Disposal Facility Area (Final UDF PDI Summary), which may incorporate portions of the Interim PDI Data Summary.

2.3.1 Baseline Habitat Assessment

A baseline habitat assessment of the GE Parcel was conducted by AECOM to form a detailed baseline ecological characterization and assessment of existing conditions and to serve as the foundation for developing the Final Cover/Closure Plan for the UDF area and UDF support area. All field investigations were conducted with oversight by scientists representing EPA. This assessment concluded that the east-central part of the GE Parcel contains an area that constitutes a wetland under federal and state criteria and a resource area under the Massachusetts Wetlands Protection Act (MWPA) and also includes a certifiable vernal pool, and that one of the three artificial gravel-pit ponded areas on the parcel also constitutes a resource area under the MWPA. This habitat assessment is described in detail in the Interim PDI Data Summary and Appendix C to it. See also Section 6 below.

2.3.2 Topographic and Bathymetric Field Survey

A topographic survey of the GE Parcel was conducted by Hill Engineers, Architects, and Planners, Inc., in May and June 2022 (provided in Appendix D to the Interim PDI Data Summary Report). Existing topography across the GE Parcel is variable and features several localized high and low points, including pond areas, likely

attributable to the site's history as a sand and gravel quarry. The topographic field survey was combined with bathymetric surveys of the water-filled depressions to yield a continuous top-of-existing-ground-surface model. This combined topographic/bathymetric information is depicted on Design Drawing 2.

2.3.3 Geotechnical Evaluation

As a part of the PDI, a soil boring program was implemented to evaluate the engineering properties for site soils. These properties will be used in the UDF design to evaluate slope stability, settlement, and other geotechnical parameters. The soil classifications will also be used in the design of stormwater infiltration basin(s), although additional field testing may be necessary once the footprint and depth of the basin(s) are established as part of the detailed design phase. Subsurface data collected during the geotechnical investigation indicate that the soils at the GE Parcel are consistent with the characteristics and stratification of a glacial outwash deposit. The composition, elevation, and general slope of the underlying bedrock surface were also identified during the soil boring program of the geotechnical investigation. Details of the geotechnical investigation are presented in the Interim PDI Data Summary.

2.3.4 Engineering and Environmental Soil Testing

A series of soil testing was performed through both field and laboratory means to determine the engineering properties and the environmental quality of site soils. Standard penetration testing was performed to ascertain values that will be used during the design of the UDF to estimate engineering properties of site soils. Soil classification and soil index properties were also derived for use in the development of engineering parameters, such as shear strength and soil elastic modulus, to support the stability and settlement evaluations, as well as for determining re-use criteria of excavated materials during construction of the UDF and for estimation of the permeability of the site soils. Soil testing for environmental quality was also conducted to determine the presence and concentration of chemical constituents (if any) in the existing soil that will allow the establishment of baseline chemical conditions for comparative evaluations during UDF operations and post-closure monitoring of the UDF. Details of soil testing performed as part of the PDI are provided in the Interim PDI Data Summary.

2.3.5 Piezometer and Monitoring Well Installation

Six piezometer wells and 11 monitoring wells, including two deep-shallow monitoring well pairs, were installed within the GE Parcel. Collectively, these piezometer and monitoring wells are being used to collect groundwater elevation data across the GE Parcel. The monitoring wells may also be used for long-term monitoring of site groundwater during construction, operation, and post-closure of the UDF. Further discussions on the installation of the piezometer and monitoring wells are provided in the Interim PDI Data Summary.

2.3.6 Groundwater Elevation Monitoring

Groundwater elevation monitoring is being conducted within and outside of the GE Parcel utilizing the six piezometer wells, the 11 monitoring wells installed within the GE Parcel, two pre-existing monitoring wells located outside of the GE Parcel at the Lee Municipal Landfill, and two surface water monitoring points located on an artificial pond within the GE Parcel and on the Housatonic River at the Crystal Street Bridge. The seasonally high groundwater elevation in the area of the UDF will be developed using the groundwater elevation in each well, modified, as appropriate, by a technical method that has been reviewed and approved by the EPA. The

conservative estimate of the seasonally high groundwater elevation will be used to establish the bottom elevation of the UDF and to evaluate slope stability. Descriptions of the monitoring locations and results of the groundwater elevation monitoring to date are provided in the Interim PDI Data Summary.

2.3.7 Groundwater Quality Monitoring

Semi-annual groundwater quality monitoring is being conducted at the GE Parcel for purposes of establishing baseline groundwater chemical quality conditions prior to construction of the UDF. This monitoring commenced in June 2022 and will continue through 2023. The results from the groundwater quality monitoring performed in June 2022 are presented in the Interim PDI Data Summary, and the results from the monitoring in the remainder of 2022 and in 2023 will be presented in the Final UDF PDI Summary Report. The baseline groundwater chemical quality conditions will be used in developing a groundwater monitoring plan that will be implemented during construction and operation of the UDF and during the UDF final cover/closure period. Further description of the UDF groundwater monitoring plan will be provided in the UDF Final Design.

2.3.8 Cultural Resources Assessment

An initial Phase IA CRA of the GE Parcel was conducted by AECOM under an EPA-approved work plan. The Phase IA CRA did not identify any previously recorded or visible cultural resources within that parcel. However, three locations within portions of the GE Parcel that could potentially be used for UDF support activities were identified as having a potential to contain archaeological resources. A subsequent Phase 1B intensive archaeological survey was then performed at those areas under another EPA-approved work plan and with oversight by EPA representatives. It concluded, based on the combined background research and field studies, that the GE Parcel does not contain any significant cultural resources and that no additional CRA studies or mitigation measures are required. The findings of these assessments are described in detail in the Interim PDI Data Summary and Appendices K and L to it.

2.4 Overhead Electric Utility Line Easement

An existing Eversource easement is located on the western and southern sides of the GE Parcel, as shown on Figure 1. A system of overhead electric wires, towers, and guy wires are located within the easement. The planimetric layout of the UDF has been developed to accommodate the easement and the utilities therein. Specifically, the UDF perimeter berm fill placement has been designed to avoid interference with the towers and guy wires. Although perimeter berm fill does extend into the easement, the fill projection is limited to the extent practicable and occurs at locations that are between the towers. The access road atop the perimeter berm is located completely outside of the easement so that vehicle traffic on the access road is not required to travel beneath the overhead wires and is not restricted by overhead clearance to the wires. Finally, the waste consolidation area for the UDF is also located completely outside of the easement. Design grading and location of other UDF-related features, including stormwater management system components and vehicle access areas along the easement, have not been completed. These features and grading conditions will be provided in the Final Design Plan.

2.5 Perimeter Berm and Baseliner System

The UDF will be encircled by a perimeter berm as shown on Design Drawing 3. The perimeter berm is anticipated to be constructed from site soils excavated from within and adjacent to the UDF footprint. The perimeter berm will be elevated to protect the UDF from inundation by surface water run-on from outside of the UDF footprint and will provide support of systems designed to contain leachate generated within the consolidation area. The perimeter berm also will provide vehicle access to the UDF perimeter and, following closure, stormwater conveyance for runoff from the final cover. Design Drawing 7 shows additional details of the perimeter berm.

The UDF design includes a baseliner system beneath the consolidation materials, extending across the floor of the UDF and along the interior side slopes of the perimeter berm. The baseliner system will consist of two composite liners – an upper (primary) liner and a lower (secondary) liner. The primary liner will consist of a combination of a high-density polyethylene (HDPE) geomembrane underlain by a geosynthetic clay liner. The secondary liner will consist of a combination of an HDPE geomembrane underlain by a geosynthetic clay liner and a one-foot-thick compacted clay liner.

A primary leachate collection system will be included above the primary liner, and a secondary leachate collection system will be included between the primary and secondary liners. The primary system will collect leachate from the overlying consolidation material and convey the leachate to a sump(s) for removal from the UDF. The secondary leachate collection system will function as a leak detection system for the primary liner and will also convey leachate to a sump(s).

At this time, it is anticipated that the UDF will be divided into two cells separated by an intercell berm constructed of compacted clay. In terms of leachate management, the cells will be hydraulically separated, and each will have its own collection sump. The cells may be constructed at the same time or in phases as waste disposal capacity is needed. Further detail regarding the perimeter berm and baseliner system is provided in Section 3.

2.6 Final Cover System

The UDF final cover system design includes cover soils capable of supporting permanent vegetation and subsurface geosynthetics to minimize the percolation of precipitation into the consolidation area and, hence, leachate generation, following closure. A composite layer of an HDPE geomembrane underlain by a geosynthetic clay liner will comprise the hydraulic barrier of the final cover system. A geocomposite drainage layer directly above that barrier will provide for collection and conveyance of precipitation that infiltrates through the overlying cover soils. The drainage layer will also improve stability of the cover system by limiting buildup of porewater pressure in the cover soils. Design grading and configuration of the final cover, which consider surface water management and slope stability, are shown on Design Drawing 4. Further details regarding the final cover system are provided in Section 4.

2.7 Leachate Management

The design of the leachate collection system has not been completed as part of the conceptual design. Therefore, this section contains limited detail regarding leachate management, with a more detailed design to be provided in the Final Design Plan.

As mentioned in Section 2.5, the UDF is anticipated to include two individual cells, each with its own primary and secondary leachate collection systems. Leachate will be removed from each cell using a side-slope riser pipe that extends from the top of the perimeter berm down to the leachate collection sump at the toe of the perimeter berm. Each sump will be subdivided into primary and secondary systems by the UDF baseliner. Separate primary and secondary side-slope riser pipes will be located in each cell's subdivided sump. A submersible pump will be maintained in each side-slope riser pipe within the sumps to allow for automated evacuation of leachate that collects. The submersible pumps will convey leachate though a flexible hose that connects the pumps to pressurized, double-contained HDPE pipes (referred to as force main pipes) buried in the perimeter berm. These leachate force main pipes will extend to a leachate storage facility at the southern end of the UDF, as shown on Design Drawing 5.

2.8 Surface Water Management

The UDF conceptual design includes a comprehensive surface water drainage system consisting of open channels, culverts, and infiltration basins. A drainage ditch located along the full perimeter of the consolidation area will collect and convey surface water runoff to an infiltration basin north of the UDF. Runoff from peripheral areas, including the exterior side slope of the UDF perimeter berm, will be limited and managed by smaller infiltration areas along the edges of the UDF. The general concepts of the surface water management system components are shown on Design Drawing 4.

2.9 UDF Operational and Support Areas

The design aspects of the UDF operational and support areas have not been completed as part of the conceptual design. Therefore, those aspects are discussed in only a limited way in this Conceptual Design Plan and will be described in detail in the Final Design Plan.

3 Perimeter Berm and Baseliner System

As discussed in Section 2.5, the UDF design includes an earthen berm around the circumference of the UDF and a baseliner system beneath the consolidation material and up the interior side slope of the perimeter berm, as shown on Design Drawing 3. Cross-sections depicting the perimeter berm and baseliner system and their relationship to other components of the UDF design are shown on Design Drawings 6 and 7. The baseliner system will have two composite liners (primary and secondary) and two leachate collection systems (primary and secondary). The components of the baseliner system are depicted on Design Drawing 8. This description of the perimeter berm and baseliner system is conceptual and subject to revision based on the collection and evaluation of additional data (notably the additional groundwater elevation data) collected during the remainder of the PDI, as well as additional design work.

3.1 Performance Standards

The UDF baseliner system will comply with the performance standards stipulated in Section II.B.5.a of the Revised Permit. Additionally, the UDF baseliner system will be consistent with applicable standards for primary and secondary liner system components found in 310 CMR 19.110: *Ground Water Protection Systems*.

3.2 Perimeter Berm Design

The perimeter berm is a fundamental component of the UDF and will provide numerous functions. The perimeter berm will control both surface water run-on from outside of the UDF and, in combination with the baseliner system, leachate from within the UDF. The perimeter berm will also provide vehicle access to the UDF and include stormwater drainage features that will function during operation of the UDF as well as following closure of the UDF. Both the baseliner and final cover systems will terminate on the perimeter berm. Finally, the perimeter berm will provide space in which to construct utilities needed during UDF operation.

As designed, the perimeter berm creates a waste consolidation area of approximately 13.2 acres, which is less than the maximum of 20 acres allowed by the Revised Permit. Design conditions that established the size of the 13.2-acre consolidation area include accommodation of the Eversource overhead electric utility line easement and associated features to the west and south of the UDF, the parcel boundary configuration to the east of the UDF, and the habitat areas to the north of the UDF. Given those constraints, the resulting 13.2-acre consolidation area represents the maximum horizonal limits for positioning of the UDF perimeter berm and associated stormwater management features. Given those maximum horizontal limits, the remaining design variables controlling the UDF waste consolidation capacity are the depth of the baseliner (relative to groundwater) and the height (peak elevation) of the final cover.

The perimeter berm will be trapezoidal in cross-section with a perimeter drainage ditch formed into the top surface near the berm centerline. The perimeter drainage ditch will be trapezoidal in cross-section with three-foot horizontal to one-foot vertical (3H:1V) side slopes. The perimeter drainage ditch will be of sufficient size (base width and depth) to convey surface water runoff from the perimeter access road and, following closure, from the final cover system. Runoff collected by the perimeter drainage ditch will be routed to an infiltration basin located to the north of the UDF. A 25-foot-wide perimeter access road will be included along the outside edge of the perimeter berm. The access road will likely be surfaced with aggregate and will have an inward cross slope of 1 to 2% to direct runoff into the perimeter drainage ditch. The outside and inside side slopes of the perimeter berm will

be slopes at 3H:1V. The exterior side slope (away from the consolidation area) of the perimeter berm will be covered with topsoil and stabilized with vegetation. The interior side slope (towards the consolidation area) will be covered by the baseliner system. The perimeter berm grading is depicted as part of the subgrade design on Design Drawing 3, and a typical perimeter berm detail is shown on Design Drawing 7.

3.3 Baseliner Design

This section describes the baseliner design, including system components, groundwater and bedrock offsets, grading design, settlement, and leachate collection system design. The UDF design includes a baseliner consisting of a double liner system in compliance with the Revised Permit. Both the upper (primary) and lower (secondary) liner systems will be composite liners having two components. The primary liner system will consist of a 60-mil HDPE geomembrane underlain by a geosynthetic clay liner. The secondary liner will consist of a 60-mil HDPE geomembrane underlain by a geosynthetic clay liner and one foot of compacted clay with a maximum allowable permeability of 1×10^{-7} cm/s. The primary leachate collection system will include a geocomposite drainage layer. On the floor areas of the UDF, the primary leachate collection system will also include a one-foot-thick granular drainage layer above the geocomposite. The primary leachate collection system will be constructed directly above the primary liner system. The secondary leachate collection system will consist of the same components as the primary system and will be constructed between the primary and secondary liner systems.

3.3.1 Baseliner System Components

The baseliner system will have two different configurations, depending on whether the baseliner is installed on floor areas or against the side slopes of the perimeter berm or intercell berm. On floor areas, the baseliner system will be composed of the following components (in descending order from top to bottom):

- Operations layer, consisting of one-foot-thick well-graded aggregate and non-woven geotextile;
- Primary leachate collection system, consisting of a one-foot-thick granular drainage layer and a geocomposite drainage layer;
- Primary liner, consisting of a 60-mil textured HDPE geomembrane underlain by a geosynthetic clay liner;
- Secondary leachate collection system, consisting of a one-foot-thick granular drainage layer and a geocomposite drainage layer; and
- Secondary liner, consisting of a 60-mil textured HDPE geomembrane underlain by a geosynthetic clay liner and one-foot-thick compacted clay liner having a maximum permeability of 1×10^{-7} cm/s.

On side slopes, the baseliner components have been modified to eliminate the granular drainage layers of the primary and secondary leachate collection systems, but to provide additional thickness to the operations layer so that the primary liner retains the same cover thickness for protection from heavy equipment during consolidation activities. On side slope areas, the baseliner system will be composed of the following components (in descending order from top to bottom):

- Operations layer, consisting of two-foot-thick well-graded aggregate;
- Primary leachate collection system, consisting of a geocomposite drainage layer;
- Primary liner, consisting of a 60-mil textured HDPE geomembrane underlain by a geosynthetic clay liner;

- Secondary leachate collection system, consisting of a geocomposite drainage layer; and
- Secondary liner, consisting of a 60-mil textured HDPE geomembrane underlain by a geosynthetic clay liner and one-foot-thick compacted clay layer having a maximum permeability of 1×10^{-7} cm/s.

The HDPE geomembranes in the baseliner system are widely used in environmental containment systems and are chemically compatible with PCBs. The permeability of intact geomembranes is very low and typically on the order of 1×10^{-13} cm/s, which is many times less permeable than the maximum value allowed by the Revised Permit. The maximum allowable permeability for the compacted clay layer in the secondary liner complies with the value identified in the Revised Permit. The thicknesses of the HDPE geomembranes are greater than the minimum required by the Revised Permit. Details pertaining to the baseliner system are depicted on Design Drawing 8.

3.3.2 Groundwater and Bedrock Offsets

The Revised Permit and Massachusetts solid waste landfill regulations both stipulate minimum vertical offsets from bedrock and groundwater. Section II.B.5.a of the Revised Permit requires that the UDF baseliner have a minimum 15-foot vertical offset above seasonally high groundwater elevation. According to 310 CMR 19.110(6), the lowermost low-permeability layer of the baseliner must be a minimum of four feet above the top of bedrock or the maximum high groundwater table. Complying with Revised Permit requirement, therefore, also satisfies the groundwater offset specified in 310 CMR 19.110(6).

Continuous groundwater elevation gauging is a component of the PDI, as discussed in Section 2.3.6, and is ongoing as of the date of this Conceptual Design Plan. Once groundwater gauging is complete, the collected elevation data will be evaluated, with modifications, as appropriate, by a technical method that takes into account historical groundwater level fluctuations at similarly sited long-term monitoring wells in Massachusetts. GE proposes to determine this technical method following continued collection and evaluation of the PDI elevation data, so that all such data are available for the evaluation, and to propose the method in the Final UDF PDI Summary Report. With completion of the groundwater gauging program in 2023 and evaluation of the resulting data using that method, a conservative estimate will be made of the seasonally high groundwater elevation, and that estimate will also be presented in the Final UDF PDI Summary Report. After EPA approval, that estimated elevation will be used in the final UDF design to determine the offset from that elevation to the UDF baseliner, to provide the minimum required 15-foot offset.

The top-of-bedrock elevation was confirmed at three boring locations as part of the PDI. The highest top-of-bedrock elevation occurred at 957.5 feet at the boring for monitoring well MW-2022-1. The top of bedrock was lower at the two remaining locations (in the borings for monitoring wells MW-2022-2 and MW-2022-3). Once the final UDF baseliner floor elevations are established based on groundwater elevation data, the bedrock offset can be estimated to verify that the four-foot minimum specified in 310 CMR 19.110(6) is met.

3.3.3 Grading Design

The floor of the baseliner will have a minimum slope of 2% (post-settlement) to conform with 310 CMR 19.110 and to ensure positive drainage within the primary and secondary leachate collection systems towards the designated leachate collection sump areas. To maximize airspace efficiency, the floor of the UDF will be sloped to generally mirror the estimated slope of the groundwater table across the GE Parcel in the UDF area. The maximum slope of the baseliner system will be 3H:1V against the interior side slopes of the perimeter berm and

against the side slopes of the intercell berm. These slope gradients are commonly used in landfill baseliner construction. The UDF subgrade is depicted on Design Drawing 3. Within the consolidation area, the grading depicted on Design Drawing 3 is the bottom of the baseliner system. Outside of the limits of consolidation, the grading depicted is final grade. It is noted that Design Drawing 3 does not reflect the presence of leachate collection sumps in the cells. These will be included as the design advances.

3.3.4 Settlement

Design of the UDF baseliner system will consider settlement with regard to consolidation of soils underlying the UDF in response to constructed overburden materials. Analysis of settlement has not been completed as part of conceptual design. Analyses and evaluations pertaining to settlement conditions and their accommodation in the design of the UDF will be conducted as the design advances. The Final Design Plan will include a formal calculation package documenting the baseliner settlement evaluation.

3.3.5 Leachate Collection System Design

This section provides some information regarding the leachate collection system. However, the design of the leachate collection system has not been completed, and a more detailed design will be included in the Final Design Plan.

The conceptual leachate management plan for the UDF is seen on Design Drawing 5, which shows the general layout and components of the leachate management system. It is noted that this drawing does not depict the layout of leachate collection piping, as the design of this piping has not yet been completed.

3.3.5.1 Drainage Layer Design

Design of the primary leachate collection system will consider the rate of liquid reaching the drainage layer under active (uncapped) conditions and closed (capped) conditions, with the former anticipated to govern. A water balance model such as the EPA's Hydrologic Evaluation of Landfill Performance software will likely be used to estimate the rate of liquid reaching the primary leachate collection system. Although the primary system includes both a granular drainage layer and a geocomposite in the floor areas of the UDF, the geocomposite will be designed to provide capacity to convey this peak flow to the downstream features (e.g., leachate collection pipes or sumps) without relying on the capacity contribution from the overlying granular drainage layer. In side-slope areas, the granular drainage layer is omitted because of the greater capacity within the geocomposite due to steeper slopes. The Final Design Plan will include a formal calculation package documenting the drainage layer design for the primary leachate collection system. It is anticipated that the geocomposite in the secondary leachate collection system will be composed of the same material and have the same hydraulic capacity as the primary system. Because the secondary system typically has lower flow rates than the overlying primary system, this will provide a conservative design basis for the secondary leachate collection system.

3.3.5.2 Leachate Collection Pipe Design

Leachate collection pipes will be used to remove collected leachate from the geocomposite layer (discussed in Section 3.3.5.1) and convey the liquid to leachate collection sumps. Leachate collection piping will be included in both the primary and secondary leachate collection system of each cell. The collection piping will be perforated to allow leachate to enter the piping along the floor of the UDF. Non-perforated cleanouts will extend from the

perforated pipes to above final grade along the top of the perimeter berm. These cleanouts will allow for periodic remote inspection and/or maintenance access as needed.

Both perforated and non-perforated piping will likely consist of fused solid wall (standard dimension ratio type) HDPE construction. Collection piping will be located based on the proposed baseliner system grading (e.g., coincident with areas of leachate confluence) and/or at appropriate spatial intervals as needed given the capacity of the contributing geocomposite and the rate at which leachate is expected to reach the primary leachate collection system. Similar to the geocomposite in the primary and secondary leachate collection systems, the leachate collection pipe design for the secondary system is expected to be identical to that in the primary system. The capacity of the collection piping will be based on the Manning equation for pipe-full conditions. The structural performance of the leachate collection piping will be analyzed to verify that the pipe strength is sufficient to withstand the anticipated loading from burial and equipment operations in the UDF. The Final Design Plan will include a formal calculation package documenting the leachate collection pipe design.

3.4 Site Excavation and Backfill Earthwork Quantities

Following site preparation, excavation for UDF construction will proceed to the subgrade elevations within the consolidation area depicted on Design Drawing 3. Note that this drawing also depicts fill placement needed to construct the perimeter berm. It is anticipated that excavated soil can be used as fill to create the perimeter berm and other peripheral features requiring fill. The intention is to maximize the re-use of excavated material while achieving compliance with the performance standards of the Revised Permit (discussed in Section 2.1).

A mass earthwork analysis was performed as part of this Conceptual Design Plan. This analysis was inclusive of the perimeter berm and peripheral (conceptual) grading shown on Design Drawing 3. The analysis did not include the road/pipe corridor to the north, the UDF operational area located in the southeastern portion of the GE Parcel, or the stormwater basins shown on Design Drawing 3. Earthwork computations for these areas will be developed based on more advanced designs and the results provided in the Final Design Plan.

Below are quantities generated from the preliminary earthwork analysis. The excess excavated materials will be evaluated for potential reuse as part of the overall remedial project.

Table 3-1. Conceptual Mass Earthwork Volume Estimate

Excavation Volume	Fill Volume[1]	Surplus Excavation Volume
620,000 cy	370,000 cy	250,000 cy

Note:

[1] Assumes excavated material is suitable for re-use in construction for required fill components.

4 Final Cover System

Following placement of consolidation materials, the consolidation area will be covered with a multilayered geosynthetic final cover system to isolate the consolidation material from direct contact with the environment, minimize leachate generation, and support the establishment of vegetation. As with the baseline liner system, this description of the final cover system is conceptual and may be revised based on the collection and evaluation of additional PDI data and on additional design work.

4.1 Performance Standards

The UDF final cover system will comply with the performance standards specified in Section II.B.5.a of the Revised Permit. Additionally, the UDF final cover system will be consistent with the relevant standards for the final cover system components found in 310 CMR 19.112: *Landfill Final Cover Systems*.

4.2 Final Cover Design

This section describes the final cover design, including system components, grading design, settlement, slope stability, and disposal capacity.

4.2.1 Final Cover System Components

The final cover system will consist of the following components (in descending order from top to bottom):

- Six-inch-thick topsoil layer;
- Eighteen-inch-thick general fill soil layer;
- Geocomposite drainage layer;
- 60-mil textured HDPE geomembrane;
- Geosynthetic clay liner; and
- Six-inch-thick soil subbase layer.

The layering and individual final cover components will meet the applicable performance standards in the Revised Permit and the relevant standards in 310 CMR 19.112 for final cover system components. The total cover soil thickness of 24 inches is greater than the minimum thickness required by 310 CMR 19.112(9). As with the baseliner, the HDPE geomembrane in the final cover system is widely used in environmental containment systems and is chemically compatible with PCBs. The permeability of intact geomembranes is very low and typically on the order of 1×10^{-13} cm/s, which is many times less permeable than the maximum value allowed by the Revised Permit. The thicknesses of the HDPE geomembrane to be used in the final cover is greater than the minimum required by the Revised Permit.

4.2.2 Grading Design

The UDF final grading plan following final cover installation is depicted on Design Drawing 4. The maximum (peak) elevation of the UDF, inclusive of the final cover, will be approximately 1,098 feet, which is one foot below the maximum elevation allowed by the Revised Permit.

The plateau of the final cover system will be graded to promote positive drainage of surface water runoff to collection drainage swales and culverts and to minimize infiltration of precipitation within the consolidation area. A minimum slope of 5% will be provided on the plateau of the final cover to comply with 310 CMR 19.112(2). The side slopes of the final cover system will have a maximum slope of 3H:1V that considers slope stability requirements and complies with 310 CMR 19.112(2). Further discussion of slope stability is provided in Section 4.2.4.

4.2.3 Settlement

Design of the UDF final cover system will consider settlement with regard to consolidation of the materials placed within the UDF. As noted with regard to the baseliner system, analysis of settlement has not been completed as part of conceptual design. Analyses and evaluations pertaining to settlement conditions and their accommodation in the design of the UDF will be conducted as the design advances. The Final Design Plan will include a formal calculation package documenting the final cover settlement evaluation.

4.2.4 Slope Stability

To support this Conceptual Design Plan, cross-section(s) through the UDF at proposed excavation subgrade and final closure conditions were evaluated for global stability. Global stability of the conceptual landfill grades was evaluated using the Spencer method of analysis using SLOPE/W (Geo-Slope International Ltd., Slope/W 2019), a slope stability software. Design slopes were analyzed for both static and pseudo-static (seismic) conditions. Further discussion of this slope stability analysis is provided in the following subsections.

4.2.4.1 Model Development

Input parameters and results for the global stability models for this Conceptual Design Plan are discussed below. Soil parameters used in the slope stability model evaluations were estimated for each material type (i.e., dredged/waste materials, underlying soils, and compacted perimeter berm and cover soils). The input soil parameters corresponding to these material types included material unit weight (in pounds per cubic foot), shear strength in terms of internal angle of friction (in degrees), and cohesion (in pounds per square foot), as applicable. These estimated material properties were derived from a review of boring logs of soil borings advanced at the UDF area and from the results of geotechnical laboratory testing. Site material properties as determined from laboratory testing and review of soil boring logs will continue to be evaluated and adjusted as the data are finalized and the UDF design progresses.

Geosynthetic shear strength parameters could represent the weakest interface shear strength for the UDF. For purposes of the current global stability evaluation, the baseliner system components were modeled as one layer. The assumed shear strength for this single modeled layer represents the critical (weakest) interface of the collective layers that it represents. Groundwater was included in the stability models and was based on elevation data collected from the site monitoring wells.

For the pseudo-static evaluations, a peak ground acceleration was developed from the Unified Hazard Tool of the U.S. Geological Survey Earthquake Hazards Program. Based on the site location, the Unified Hazard Tool estimated a peak ground acceleration of 0.084 of the acceleration due to gravity. Consistent with industry standards for seismic stability using the pseudo-static approach, vertical acceleration is taken as 0.0.

Results of preliminary global stability analyses for the conceptual design are summarized in the following subsection.

4.2.4.2 Global Static and Seismic Stability

Global stability of the UDF was evaluated using deep-seated circular failure surfaces for both static and pseudo-static conditions. Two sections through the UDF limits were evaluated, one under final grading conditions and one for the temporary subgrade excavation grade conditions. The analyses were performed using the Spencer method, which satisfies both moment and force equilibrium. Circular searches with forced exit and entry locations were used to evaluate failure surfaces for each cross-section. The limits of the exit/entry locations are varied to estimate the critical failure surface and corresponding minimum factor of safety.

The static cases were evaluated with a temporary construction surcharge of 250 pounds per square foot positioned at the top of slope for each section and compared to a minimum factor of safety of 1.50. For the (seismic) pseudo-static evaluations, a minimum factor of safety of 1.0 was required. Factor of safety values for the sections analyzed for this conceptual design meet or exceed these minimum required values. These stability evaluations will be updated in the final design, and compliance with the minimum factor of safety will be verified and demonstrated in calculations provided in the Final Design Plan.

4.2.5 Disposal Capacity

The estimated net volume capacity of the UDF has been determined by: (1) making a volumetric comparison of final grade elevations shown on Design Drawing 4 to subgrade elevations shown on Design Drawing 3 within the consolidation area limits (to show the estimated gross volume); and then (2) subtracting the estimated volumes required to construct the baseliner and final cover systems (based on the thickness and surface area of those systems). The net available volume for consolidation material placement is 1.3 million cy. At the time of submittal of this Conceptual Design Plan, site groundwater elevation data are still being collected. Consequently, the final floor elevation of the UDF has yet to be determined. Once this elevation is finalized, the design grading may need to be adjusted to remain compliant with Revised Permit's requirements.

4.2.6 Final Cover Installation

The UDF final cover will likely be installed in a phased manner on areas that have achieved final grade and where installation of the final cover will not impact continued operation of the UDF as required prior to final closure. Phasing of final cover installation will consider the management of stormwater in a manner that avoids generating contact water resulting from final cover areas and continuing consolidation material placement operations.

4.3 Subsurface Drainage System Design

The design of the subsurface drainage system has not been completed as part of the conceptual design. This section, therefore, contains only limited information regarding that system. A more detailed design will be provided in the Final Design Plan.

4.3.1 Drainage Layer Design

The geocomposite drainage layer included in the final cover system will collect and convey non-contact water that infiltrates into the final cover soil layers. This layer will minimize hydraulic head on the underlying geomembrane and geosynthetic clay liner, thereby reducing leakage into the consolidation material and the subsequent generation of leachate. The geocomposite drainage layer will also enhance slope stability for the overlying final cover system layers. The design of the geocomposite drainage layer will be based on the anticipated maximum rate of infiltration through the cover soil and appropriate reduction factors and an overall factor of safety. The Final Design Plan will include calculations documenting the drainage layer design.

4.3.2 Collection and Conveyance Piping Design

Subsurface collection and conveyance piping will be used to remove non-contact water from the geocomposite layer (discussed in Section 4.3.1) and will release the collected water into the stormwater management features on and around the perimeter of the UDF. The collection piping will be perforated to allow non-contact water to enter the piping. Non-perforated conveyance piping will be used wherever the piping is to provide a conveyance function but collection is not needed. Both types of piping will likely consist of corrugated HDPE construction. Collection piping will be located based on the proposed final grading (e.g., coincident with surface water diversion berms as indicated on Design Drawing 9) and at appropriate spatial intervals as needed given the capacity of the contributing geocomposite and the rate at which non-contact water infiltrates through the cover soil to the geocomposite drainage layer. The capacity of the collection and conveyance piping will be based on the Manning equation for pipe-full conditions. The Final Design Plan will include calculations documenting the subsurface collection and conveyance piping design.

4.4 Surface Water Management System Design

The design of the surface water management system has not been completed as part of the conceptual design. This section, therefore, contains limited information regarding that system, and will be expanded in the Final Design Plan. Stormwater management features will be designed in accordance with the requirements of EPA's National Pollutant Discharge Elimination System (NPDES) regulations under the Clean Water Act on stormwater discharges – namely, 40 Code of Federal Regulations (CFR) 122.26(c)(1)(ii)(C) and 122.44(k) – which constitute an ARAR. In addition, the UDF stormwater management system design will be consistent with the Massachusetts Stormwater Handbook and Stormwater Standards (Stormwater Handbook; MassDEP 2008). Construction and operation of the UDF will employ best management practices that will control stormwater runoff from the UDF area in a manner that minimizes erosion, sediment migration, and other potential impacts to drainage conditions downgradient of the UDF.

4.4.1 Drainage Patterns

Stormwater runoff from the final cover will flow via sheet flow across the constructed grade before being intercepted by surface water diversion berms or by the perimeter drainage ditch at the edge of the consolidation area. Stormwater that is collected and conveyed by open channels and culverts from the UDF will be conveyed to an infiltration basin proposed to the north of the UDF. A portion of the stormwater runoff from the outside side slopes of the UDF perimeter berm cannot be routed to this stormwater basin because of elevation constraints and

will instead be managed by infiltration features constructed along the toe of the perimeter berm. Stormwater runoff from the UDF support area is anticipated to drain into a smaller infiltration basin located to the south of the UDF.

4.4.2 Open Channel Design

Open channels will include the perimeter drainage ditch along the top of the perimeter berm and surface water diversion berms on the side slopes of the UDF itself as well as on a portion of the perimeter berm side slope. The open channel design will include an assessment of channel capacity (flow rate) and erosive forces. Channel capacity will be evaluated using Manning's equation for open channel flow and is a function of channel slope, cross-section, and channel roughness. The potential for erosion in the open channels will be assessed for both newly constructed (bare soil) and established (vegetated) conditions and may dictate the need for temporary or permanent erosion protection such as matting, riprap, or other armoring.

4.4.3 Culvert Design

Culverts will be used where needed to convey stormwater beneath roads or other features to maintain continuity of those features. Culverts may also be used to convey stormwater down the side slopes of the UDF. The culvert design will be based on the peak design flow rate at the culvert inlet and will account for energy losses within the barrel as well as at the entrance and exit. The culvert design will also account for tailwater effects associated with downstream features. Each culvert will include outlet protection to dissipate flow energy and minimize erosion of the receiving ground surface.

4.4.4 Stormwater Basin Design

Infiltration basins will act as both a water quality treatment measure and as a means of attenuation for the peak runoff flow rates resulting from higher intensity precipitation events. The size and depth of the infiltration basins will be determined based on the estimated peak storm event flow rates and volumes and the infiltration capacity (permeability) of the basin soils.

5 UDF Operational and Support Areas

The design aspects relating to the UDF operational and support areas have not been completed as part of the conceptual design. This section, therefore, contains limited information regarding those areas, including the monitoring activities to be conducted. More detailed design information regarding UDF operational and support areas, including the monitoring to be conducted in them, will be provided in the Final Design Plan and the associated UDF OMM Plan.

5.1 Site Security

The portion of the GE Parcel that will include the UDF consolidation area will be surrounded by a chain-link fence that will be installed prior to UDF construction. Access into the fenced area will be provided at discrete locations via locking gates. These locations are anticipated to coincide at crossings with existing and proposed roads. Additionally, the UDF operational area is anticipated to be secured by a chain-link fence. Other portions of the GE Parcel that may be designated as the UDF support area may include chain-link fence in certain locations.

5.2 Disposal Material Management and Placement

As of the date of this Conceptual Design Plan, methods for transporting dredged or excavated material to the UDF for disposal are still being evaluated but will include trucking or conveyance via slurry within a temporary pipe to the UDF. The methods and procedures for transport of material to the UDF will be described in GE's On-Site Transportation and Disposal Plan. The methods for managing and placing that material within the UDF are dependent on the means of delivery of the material from the remedial areas. The material will be placed in a manner that maximizes the capacity of the UDF and minimizes impacts to the community and environment. The disposal of such material at the UDF will be discussed further in the Final Design Plan.

5.3 Management of Contact and Non-Contact Waters

Waters from the UDF may include runoff from rainfall or snow melt, decant water from the consolidation operation, and leachate collected in the primary or secondary leachate collection systems. Regardless of origin, the management of waters generated from or encountered within the UDF will depend on whether the waters have had the potential for contact with the consolidation material (contact water) or not (non-contact water).

Non-contact waters may include any of the following:

- Water or runoff from the existing ground surface within the UDF or UDF support area footprint;
- Water encountered in the ground or managed during the excavation of the UDF and during baseliner construction;
- Runoff from a newly constructed cell prior to placement of consolidation material;
- Runoff from unused portions of a cell that are segregated from active portions of cells by geomembrane;
- Runoff from the UDF perimeter berm;
- Runoff from intermediate final cover(s); and

- Runoff from the UDF final cover at any stage of construction following completion of the final cover geomembrane.

Contact waters include any other waters besides those listed above. By default, waters will be assumed to be contact waters unless the origin and potential for non-contact with consolidation materials are determined. Once final cover has advanced to and includes completion of the geomembrane layer, runoff from the area will be assumed to be non-contact in nature. Therefore, maintaining separation between contact and non-contact waters is necessary for proper management of UDF waters.

5.4 UDF Support Facilities

It is anticipated that UDF support facilities will be constructed to provide access to the UDF perimeter berm, parking for personnel, staging for inbound/outbound materials and equipment, and a location for a leachate storage and treatment facility. More details regarding those support facilities, including their locations within the GE Parcel, will be provided in the Final Design Plan.

5.5 Groundwater Monitoring

A system of groundwater monitoring wells was installed as part of the PDI, as noted in Section 2.3.5. These monitoring wells are depicted on Design Drawing 2 and are located to encircle the UDF consolidation area. The locations of these monitoring wells allow for sampling of groundwater upgradient and downgradient of the UDF, as well as to the sides. These wells have already been sampled for groundwater quality (see Section 2.3.7) and will continue to be sampled on a routine basis. Data collected prior to construction of the UDF will be used to establish baseline conditions for comparison to future sampling data.

5.6 Air Monitoring

Development of the baseline air monitoring program to be operated prior to use of the UDF and design of the air monitoring program to be implemented during construction and operation of the UDF have not been completed as part of the conceptual design. Therefore, those air monitoring programs will be described in the Final Design Plan and/or the associated UDF OMM Plan.

5.7 Surface Water Monitoring

As discussed in Section 5.3, waters from the UDF will be considered either contact or non-contact, depending on their origin. Contact surface water is assumed to require collection and treatment. Non-contact surface water will be managed as traditional stormwater in accordance with the requirements of EPA's Clean Water Act NPDES regulations on stormwater discharges (40 CFR 122.26(c)(1)(ii)(C) and 122.44(k)) and the Stormwater Handbook (MassDEP 2008). Surface water monitoring during UDF operation will be dependent on the design of the stormwater management system, which is still being developed and will be presented in the Final Design Plan and/or UDF OMM Plan.

6 Measures to Address Habitat Impacts

The Final Revised SOW requires that the Conceptual Design Plan provide a preliminary discussion of the habitat impacts of the UDF and support areas and potential measures to address such impacts. Based upon the baseline habitat assessment presented in the Interim PDI Data Summary and the conceptual design of the UDF to date, this section presents a preliminary discussion of habitat impacts and potential measures to address them. For this purpose, it is recognized that while the anticipated limits of consolidation material (the consolidation area) and the associated operational area have been identified, the associated support area within the GE Parcel remains undefined. Given this situation as well as the fact that the design is only conceptual at this stage, the identification of habitat impacts has not been completed and will be evaluated further in the Final Design Plan.

Habitat impacts within the consolidation area will be limited due to the prevailing habitat cover types in this area and the associated land use history as a recently disturbed earth removal area. The area consists of approximately 15.5 acres in total area, roughly 92% of which were previously subject to this past earth work and are currently either in a non-vegetated condition (2.66 acres or 17%) or composed of recently established grassland with some scattered woody shrubs and forbs (11.58 acres or 75%). Only 1.22 acres of the consolidation area (7.9%) consist of forested cover habitat. Since the habitat value of such disturbed cover conditions is generally limited to a small suite of wildlife species adapted to such conditions and given the land use history of such recent disturbances, the impacts related to this loss of habitat will be minimal. Further, the longer-term state of this consolidation area is anticipated to be established in a similar grassland cover type, such that the long-term habitat impacts will also be minor and may even constitute an improvement in the habitat.

Activities outside of the consolidation area, in both the operational and support areas, will affect a greater range of habitat conditions, including both early successional grassland/non-vegetated habitat and mature forested cover, as described in the baseline habitat assessment. Habitat impacts from activities in such areas will be addressed by several best management measures, preliminary short-term measures (e.g., sedimentation/erosion controls and time of year restrictions for some construction activities), and long-term measures (e.g., vegetative screening or buffers and habitat restoration). All such measures will be further evaluated and discussed in the Final Design Plan when construction activities are more completely designed.

The impacts (if any) from the construction and operation of the UDF and UDF support facilities on the identified regulated wetlands and MWPA resource areas and the identified vernal pool (mentioned in Section 2.3.1 and described in the baseline habitat assessment) will also evaluated further during additional design activities. Further, to the extent that mitigation for the loss of regulated resource areas is required, the additional data necessary for such mitigation will be collected during additional PDI activities, and the mitigation measures will be described in the Final Design Plan.

Potential impacts on the habitat of threatened or endangered species, notably the northern long-eared bat (as also discussed in the baseline habitat assessment), and potential measures to address such impacts (if any) will also be evaluated further as the design proceeds. Such impacts and measures, if any, will addressed in the Final Design Plan.

7 UDF Closure

The design of the UDF closure has not been completed as part of the conceptual design. As a result, this section provides only very limited information regarding UDF closure. The planned closure activities will be discussed further in Final Design Plan, with specific details to be presented in the Final Cover/Closure Plan for the UDF (described in Section 4.3.2.5 of the Final Revised SOW).

7.1 Final Cover Phasing

Final cover construction will likely be performed in a phased manner to reduce the generation of leachate due to rainfall and snowmelt and to confine the consolidation material at the earliest opportunity. The timing and extent of each phase of final cover construction will be driven by the actual rate of consolidation material placement, the ability to achieve final grade while leaving sufficient open area for ongoing consolidation operations, and the ability to manage stormwater runoff and maintain separation between contact and non-contact stormwater.

7.2 Documentation for Final Cover Construction

Drawings and specifications will be prepared for each phase of final cover construction. A certification report will be prepared following the completion of each phase of final cover.

7.3 Future Land Use Restrictions

In accordance with Section II.B.7.d.(2) of the Revised Permit, GE will prepare and record a Grant of Environmental Restriction and Easement (ERE) in accordance with the CD to prohibit excavation of the closed UDF, prohibit extraction, consumption, or utilization of groundwater underneath the UDF area (including a 500-foot zone around the waste consolidation area) and restrict the future use of and access to the UDF area. The Final Cover/Closure Plan for the UDF will describe GE's plans for preparing and recording this ERE and for conducting subsequent inspections to evaluate compliance with the ERE. It will also discuss potential future uses of the area.

8 UDF Post-Closure Activities

The design of post-closure activities for the UDF and associated areas has not been completed as part of the conceptual design. Those activities will be discussed further in the Final Design Plan, with additional and final details in the UDF Post-Closure Monitoring and Maintenance Plan (described in Section 5.2 of the Final Revised SOW). Those activities will include long-term groundwater and air monitoring, routine periodic inspections and maintenance or repair of the final cover system and other components of the UDF, inspections and maintenance/repairs of ancillary components of the UDF (e.g., fences, gates, signs), inspections to ensure compliance with the ERE for the UDF area, and associated documentation and reporting.

9 Schedule

As provided in the EPA-approved *Final Revised Overall Strategy and Schedule for Implementation of the Corrective Measures* (Anchor QEA 2022) and stated in the Interim PDI Data Summary, the Final UDF PDI Summary Report will be submitted within 60 days after the last groundwater elevation gauging event. That report will include a conservative estimate of the seasonally high groundwater elevation (including the data and method used to develop that estimated elevation) for EPA review and approval. GE proposes to submit the UDF Final Design Plan within 60 days after EPA approval of the Final UDF PDI Summary Report. In accordance with the Final Revised SOW, the UDF Final Design Plan will be accompanied by the UDF OMM Plan.

10 References

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Table

Table 2-1
Applicable or Relevant and Appropriate Requirements for Upland Disposal Facility
Upland Disposal Facility Conceptual Design Plan

ARCADIS

Statute/Regulation	Citation[1]	Synopsis of Pertinent Requirements	Status	Action(s) to be Taken to Achieve ARARs
CHEMICAL-SPECIFIC ARARs				
Federal ARARs				
None				
State ARARs				
None				
Guidance To Be Considered				
Cancer Slope Factors	EPA's Integrated Risk Information System (IRIS)	Guidance values used to evaluate carcinogenic risk purportedly associated with exposure to PCBs.	To be considered.	Considered by EPA in selecting disposal option for removed sediments and soils.
Reference Doses	EPA's IRIS	Guidance values used to evaluate non-carcinogenic hazards purportedly associated with exposure to PCBs.	To be considered.	Considered by EPA in selecting disposal option for removed sediments and soils.
PCBs: Cancer Dose-Response Assessment and Application in Environmental Mixtures (EPA 1996)	EPA/600/P-96/001F (Office of Research and Development September 1996)	Guidance describing EPA's reassessment of the purported carcinogenicity of PCBs. It includes revised Cancer Slope Factors for PCBs based on the pathway of exposure.	To be considered.	Considered in establishing EPA's Cancer Slope Factors.
Guidelines for Carcinogenic Risk Assessment (EPA 2005)	EPA/630/P-03/001F (EPA Risk Assessment Forum, March 2005)	Framework and guidelines for assessing potential cancer risks from exposure to pollutants and other environmental agents.	To be considered.	Considered by EPA in selecting disposal option for removed sediments and soils.
Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (EPA, 2005)	EPA/630/R-03/003F (EPA Risk Assessment Forum, March 2005)	Guidance on issues relating to assessing cancer risks associated with early-life exposures, including an adjustment for carcinogens acting through a mutagenic mode of action.	To be considered.	Considered by EPA in selecting disposal option for removed sediments and soils.

Statute/Regulation	Citation[1]	Synopsis of Pertinent Requirements	Status	Action(s) to be Taken to Achieve ARARs
LOCATION-SPECIFIC ARARs				
Federal ARARs				
Clean Water Act – Section 404 and Implementing Regulations	33 USC 1344 33 CFR Parts 320-323, 325, 332 (Army Corps of Engineers) 40 CFR Part 230 (EPA)	For discharge of dredge or fill material to waters of the United States, including wetlands: (a) there must be no practicable alternative with less adverse impact on aquatic ecosystem (including wetlands); (b) the discharge cannot jeopardize the existence of any threatened or endangered (T&E) species; (c) the discharge cannot cause or contribute to significant degradation of waters of the U.S., including significant adverse effects on human health or welfare, aquatic life, aquatic ecosystem, or recreational, aesthetic, and economic values; and (e) the discharger must take appropriate and practicable steps to minimize or mitigate potential adverse effects on aquatic ecosystem. Mitigation/restoration is required for unavoidable impacts to aquatic ecosystem.	Applicable if the Upland Disposal Facility (UDF) or support facilities will affect a water of the United States	If any UDF-related earthwork or other activity will involve the discharge of material into a water of the U.S., including the wetland located in the east-central portion of the GE Parcel, the associated stream, and/or the vernal pool at the northern end of the wetland, that activity will be conducted in accordance with these standards. In such a case, there would be no practicable alternative with less adverse impact on the aquatic ecosystem (including wetlands); and implementation of the subject activities will meet the other requirements of these regulations, including performance of appropriate and practicable steps to minimize potential adverse impacts of the discharge on the wetland, stream, and/or pool. In particular, filling and grading work will be managed in a manner that limits impacts to adjacent site areas and avoids the uncontrolled discharge of stormwater runoff beyond areas designated and provided for management of construction-based stormwater. If necessary, mitigation/restoration will be conducted consistent with these regulations. In the event that these requirements apply, the steps to be taken to comply with them will be specified in the Final Design Plan.
Protection of Wetlands	44 CFR Part 9	Regulation sets forth policy, procedure and responsibilities to implement and enforce Executive Order 11990, Protection of Wetlands.	Relevant and appropriate	If any UDF-related earthwork activities will affect the above-referenced wetland in the east-central portion of the GE Parcel, those activities will be conducted in accordance with the policy, procedure and responsibilities stated in this regulation to implement the Executive Order. See also prior entry.

Statute/Regulation	Citation[1]	Synopsis of Pertinent Requirements	Status	Action(s) to be Taken to Achieve ARARs
Fish and Wildlife Coordination Act	16 U.S.C. 662 *et seq*.	Sets forth requirements related to federal actions that may modify a stream or ither water body.	Applicable	If any UDF-related activities will modify a stream or other water body at the GE Parcel, the activities subject to this Act will comply with any substantive requirements in this Act.
National Historic Preservation Act and Regulations	54 USC 300101 *et seq*. 36 CFR Part 800	A federal agency must take into account the project's effect on properties included or eligible for inclusion in the National Register of Historic Places (NRHP).	Applicable (but determined not to require further actions here)	Investigations conducted at the GE Parcel have determined that that parcel does not contain, and the UDF-related activities will not impact, any cultural resources that are listed or meet the eligibility criteria for listing on the NRHP. Thus, the listed ARAR will not require further actions at the GE Parcel.
Archaeological and Historic Preservation Act	54 U.S.C. 312501 *et seq*.	When a federal agency finds, or is notified, that a federal construction project may cause irreparable loss or destruction of significant scientific, prehistorical, historical, or archeological data, it must notify Department of Interior (DOI). If DOI determines that the data are significant and may be irrevocably lost or destroyed, it is to conduct a survey and other investigation of the affected area and recover and preserve such data as necessary in the public interest.	Applicable (but determined not to require further actions here)	Investigations conducted at the GE Parcel have determined that that parcel does not contain any significant cultural resource and that the UDF-related activities will not cause loss or destruction of significant scientific, prehistorical, historical, or archeological data. Thus, the listed ARAR will not require further actions at the GE Parcel.
Executive Order 11990 (Protection of Wetlands)	Executive Order	Federal agencies are required to avoid adversely impacting wetlands unless there is no practicable alternative, and the proposed action includes all practicable measures to minimize harm to wetlands that may result from such use.	To be considered	If any UDF-related activities will affect the above-referenced wetland in the east-central portion of the GE Parcel, those activities will be conducted in accordance with the substantive requirements in this Executive Order. In such a case, there would be no practicable alternative to performing the UDF-related activities in the wetland; and any filling or grading in the wetland will be conducted in a manner designed to minimize the extent of

Statute/Regulation	Citation[1]	Synopsis of Pertinent Requirements	Status	Action(s) to be Taken to Achieve ARARs
				impact to the wetland, as will be specified in the Final Design Plan.
Endangered Species Act and Regulations	16 USC 1536(a)-(d) 50 CFR Part 402, Subparts A&B 50 CFR 17	A federal agency must ensure that any action authorized, funded, or carried out by it is not likely to jeopardize the continued existence of a listed threatened or endangered (T&E) species or result in destruction or adverse modification of critical habitat, unless an exemption is granted. If a listed species or critical habitat may be present in the action area, the steps set forth in the regulations must be followed, including implementation of mitigation measures where necessary.	Applicable	In the event that it is determined that UDF-related activities will adversely affect a federally listed T&E species (notably, the northern long-eared bat), measures to avoid, minimize, and/or mitigate such effects will be developed in accordance with these requirements and will be specified in the Final Design Plan.
State ARARs				
Clean Water Act – Water Quality Certification Regulations	314 CMR 9.00 et seq., Including 9.06 and 9.07	For discharge of dredged or fill material to waters of the U.S. in Massachusetts, section 9.06 requires, *inter alia*, that: (a) no such discharge is allowed if there is a practicable alternative with less adverse impact on aquatic ecosystem (including wetlands); (b) appropriate and practicable steps must be taken to avoid and minimize adverse effects on wetlands; (c) there must be no discharge that would adversely affect estimated habitat of rare wildlife species under Wetlands Protection Act; and (d) stormwater discharges must be controlled with best management practices (BMPs). For dredged material management, section 9.07 contains limited	Section 9.06 is applicable if the UDF or support facilities will affect a wetland that constitutes a water of the United States. Section 9.07 is partially applicable.	If any UDF-related earthwork or other activity will involve the discharge of material into a water of the U.S., including the wetland located in the east-central portion of the GE Parcel, the associated stream, and/or the vernal pool at the northern end of the wetland, that activity will be conducted in accordance with the standards in section 9.06. In such a case, there would be no practicable alternative with less adverse impact on the aquatic ecosystem (including wetlands); and implementation of the subject activities will meet the other requirements of these regulations, including performance of appropriate and practicable steps to minimize potential adverse impacts of the discharge, avoiding any impact to the estimated habitat of rare species, and controlling stormwater discharges with BMPs. In the event that these regulations apply, the steps to

Statute/Regulation	Citation[1]	Synopsis of Pertinent Requirements	Status	Action(s) to be Taken to Achieve ARARs
		requirements that apply to the management of such material at an upland facility. These include requirements that dredged material management be conducted to ensure protection of human health, public safety, public welfare, and the environment, and that dredged material placed at upland locations is subject to notification requirements and thresholds in the Massachusetts Contingency Plan (MCP).		be taken to comply with them will be specified in the Final Design Plan. The UDF will meet the limited requirements of section 9.07 for upland disposal of dredged material except that the notification requirements and thresholds in the MCP are not applicable to disposal at the UDF in accordance with the Revised Permit.
Massachusetts Wetlands Protection Act and Regulations	MGL c. 131, section 40 310 CMR 10.00, including 10.53	These requirements govern removal, dredging, filling, or altering of banks, land under a waterbody, bordering vegetated wetland, riverfront areas, and other designated resource areas. Provisions include 10.53(3), which authorizes certain projects as "limited projects," including, in 10.53(3)(q), responses to a release or threat of release of oil and/or hazardous materials in accordance with the MCP if: (a) there is no practicable alternative consistent with the MCP that would be less damaging to resource areas; and (b) steps are taken to avoid or minimize impacts to resource areas, including meeting specific standards to the maximum extent practicable.	Applicable if UDF or support facilities would affect a regulated resource area under these regulation	If UDF-related earthwork or other activities will remove, dredge, fill, or alter resource areas under these regulations, including the wetland in the east-central portion of the GE Parcel, the associated stream and/or vernal pool, and/or the southeastern-most gravel-pit ponded area, those activities will be conducted in accordance with the requirements of these regulation, including the "limited project" requirements (which are considered applicable to the Rest of River remedy). In such a case, there would be no practicable alternative that would be less damaging to resource areas; and GE will take steps to avoid or minimize impacts to resource areas, including meeting specific standards for a "limited project" to the maximum extent practicable. Such steps will be specified in the Final Design Plan.
Massachusetts Site Suitability Criteria	310 CMR 16.40(3) & (4)	Site suitability criteria for solid waste facilities, including facility-specific and general site suitability criteria. They include a prohibition on location of a solid waste management facility in an	Potentially applicable or relevant and appropriate	To the extent that these criteria would apply to the siting of the UDF, most of those criteria are met. However, for any such criteria that are not met, including 310 CMR 16.40(4)(d), EPA has determined that such requirements are not appropriate for the UDF, but that if they are deemed

Statute/Regulation	Citation[1]	Synopsis of Pertinent Requirements	Status	Action(s) to be Taken to Achieve ARARs
		Area of Critical Environmental Concern (ACEC) (310 CMR 16.40(4)(d).		an ARAR, EPA has waived those requirements under Section 121(d)(4)(B) of CERCLA on the ground that compliance with them would pose a greater risk to human health and the environment than use of the UDF. See Attachment C of the Revised Permit at pp. C-10 – C-11.
Massachusetts Hazardous Waste Facility Location Standards	310 CMR 30	Location standards for hazardous waste disposal facilities, including landfills. They include a requirement that no such facility may be located in an ACEC (310 CMR 30.708), as well as various other locational requirements for the active portion of the facility. Any waste containing PCBs at a concentration equal to or greater 50 mg/kg constitutes a listed hazardous waste under the Massachusetts hazardous waste regulations (310 CMR 30.131). However, the locational requirements for hazardous waste landfills do not apply to disposal facilities for wastes with a PCB concentration equal to or greater than 50 mg/kg if such facilities comply with the applicable requirements of EPA's TSCA regulations (40 CFR Part 761) except with respect to a disposal facility located in an ACEC (see 310 CMR 30.501(3)(a)).	Potentially applicable or relevant and appropriate for UDF because it will receive some material with a PCB concentration equal to or greater than 50 mg/kg. Specifically, the prohibition on location of a hazardous waste landfill in an ACEC would apply unless waived. The other locational requirements in these regulations are subject to the TSCA exemption given EPA's determination that the UDF will comply with the TSCA regulations through a risk-based determination under 40 CFR 761.61(c).	To the extent that material to be disposed of at the UDF is deemed to be a Massachusetts hazardous waste solely because of presence of PCBs at concentrations greater than 50 mg/kg, EPA has determined that the requirements of these regulations are not appropriate for the UDF, but that if any provision of these regulations is deemed an ARAR, EPA has waived such provision under Section 121(d)(4)(B) of CERCLA on the ground that compliance would pose a greater risk to human health and the environment than use of the UDF. See Attachment C of the Revised Permit at p. C-13. This waiver would apply to the provision of these regulations prohibiting location of a hazardous waste facility in an ACEC.

Table 2-1
Applicable or Relevant and Appropriate Requirements for Upland Disposal Facility
Upland Disposal Facility Conceptual Design Plan

ARCADIS

Statute/Regulation	Citation[1]	Synopsis of Pertinent Requirements	Status	Action(s) to be Taken to Achieve ARARs
Massachusetts Historical Commission Act and Regulations	MGL c. 9, section 27c 950 CMR 71.07	If a project has an area of potential impact that could cause a change in the historical, architectural, archaeological, or cultural qualities of a property on the State Register of Historic Places, these provisions establish a process for notification, determination of adverse impact, and evaluation of alternatives to avoid, minimize or mitigate such impacts.	Relevant and appropriate (but determined not to require further actions here)	Investigations conducted at the GE Parcel have determined that that parcel does not contain, and the UDF-related activities will not impact, any historical, architectural, archaeological, or cultural qualities of a property on the State Register of Historic Places. Thus, the listed ARAR will not require further actions at the GE Parcel.
Massachusetts Endangered Species Act (MESA) and Regulations	MGL c. 131A 321 CMR 10.00, Parts I, II, and V. 321 CMR 10.00, Part IV	A proposed activity in mapped Priority Habitat for a state-listed threatened or endangered species or species of special concern, or other area where such a species has occurred may not result in a "take" of such species, unless it has been authorized through a conservation and management plan that provides a long-term net benefit to the conservation of the affected state-listed species.	Applicable (but determined not to require further actions here)	Investigations conducted at the GE Parcel have determined that that parcel does not contain Priority Habitat for a state-listed species. Thus, the listed ARAR will not require further actions at the GE Parcel, and no conservation and management plan is necessary.
Establishment of ACECs	301 CMR 12.11(1)(c)	Provides for establishment of ACECs in the State. An ACEC designation affects other state laws and regulations.	Relevant and appropriate	The ACEC regulations pertain to State agency actions and are not applicable to the federal EPA action. However, the UDF-related activities comply with the substantive requirements of 301 CMR 12.11(1)(c), which may be relevant and appropriate, by advancing the values of 301 CMR 12.11(1)(c), while avoiding adverse effects on identified values in section 12.11(1)(c) to the extent practicable.

Table 2-1
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ACTION-SPECIFIC ARARs				
Federal ARARs				
TSCA Regulations on Disposal of PCB Remediation Waste	40 CFR 761.61(c)	Provides for risk-based approval of a disposal method for PCB Remediation Waste (i.e., waste containing PCBs with concentrations at or above 50 mg/kg) based on a finding that the method will not pose an unreasonable risk of injury to human health or the environment.	Applicable (because some waste to be placed in the UDF will contain material with a PCB concentration of 50 mg/kg or greater)	Will be met because the Revised Permit contains a determination by EPA under 40 CFR 761.61(c) that the selected remedy, including on-site disposal at the UDF, will not pose an unreasonable risk of injury to human health or the environment. See Attachment D to Revised Permit.
TSCA Regulations on Discharge of PCB-containing Water	40 CFR 761.50(a)(3)	Prohibits discharge of water containing PCBs to navigable waters unless PCB concentration is <3 mg/L or discharge is in accordance with NPDES discharge limits.	Applicable	Contact water and leachate generated within the UDF consolidation area will be managed and treated prior to discharge in accordance with NPDES discharge limits. Any discharge to navigable waters will comply with this provision.
TSCA Regulations on Decontamination	40 CFR 761.79	Establishes decontamination standards and procedures for removing PCBs from water, organic liquids, and various types of surfaces.	Applicable	Construction and operation of the UDF will involve the handling of PCB-impacted material and equipment. Where decontamination is conducted, it will comply with this provision.
Clean Water Act – NPDES Regulations (stormwater discharges)	40 CFR 122.26(c)(1)(ii)(C) 40 CFR 122.44(k)	Best management practices (BMPs) must be employed to control pollutants in stormwater discharges during construction activities.	Applicable	The UDF design includes stormwater management features. Construction and operation of the UDF will employ BMPs that will control stormwater runoff from the UDF area in a manner that minimizes erosion, sediment migration, and other potential impacts to drainage conditions downgradient of the UDF.

Table 2-1
Applicable or Relevant and Appropriate Requirements for Upland Disposal Facility
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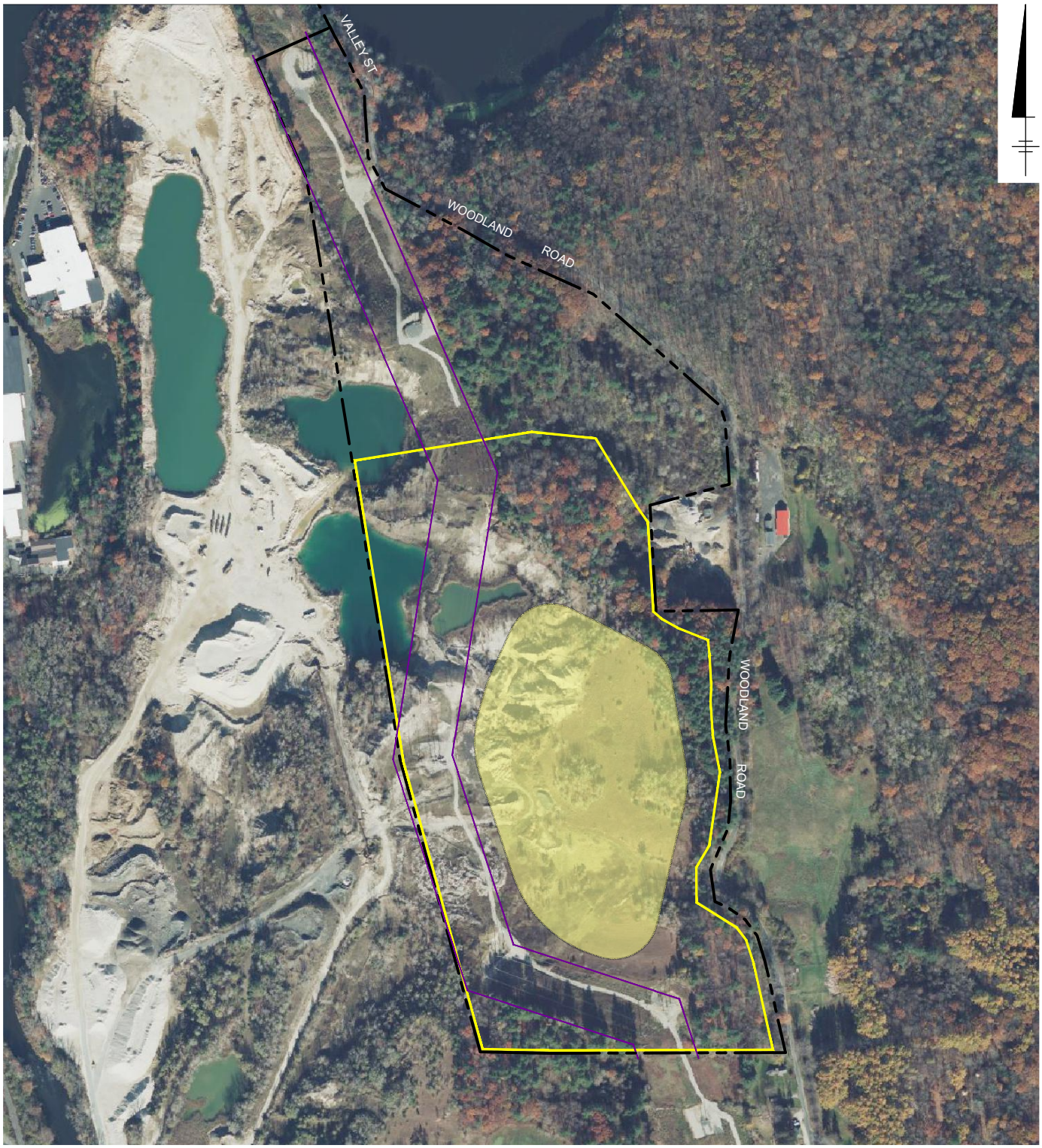
State ARARs				
Massachusetts Clean Water Act and Wetlands Protection Act – Stormwater Management Standards	310 CMR 10.05(6)(k) 314 CMR 9.06(6)(a)	Projects subject to regulation under the Wetlands Protection Act or that involve discharge of dredged or fill material into a water of the U.S. must incorporate stormwater BMPs to attenuate pollutants in stormwater discharges, as well as to provide a setback from receiving waters and wetlands, in accordance with specified stormwater management standards.	Applicable if UDF or support facilities would affect a resource area under the Wetlands Protection Act and/or a water of the U.S.	If UDF-related earthwork or other activities will affect regulated resource areas and/or waters of the U.S., including the wetland in the east-central portion of the GE Parcel, the associated stream and/or vernal pool, and/or the southeastern-most gravel-pit ponded area, the requirements of these regulations will be met to control stormwater discharges during such activities.
Massachusetts Air Pollution Control Regulations	310 CMR 7.00	These provisions regulate air emissions, dust, odor, and noise, among other things.	Applicable	The UDF will include measures for air monitoring, and control and mitigation of dust emissions associated with the construction and operation of the UDF. The UDF activities will comply with these regulatory provisions.
To Be Considered				
TSCA PCB Spill Cleanup Policy	40 CFR Part 761, Subpart G	Policy used to determine adequacy of cleanup of spills resulting from the release of materials containing PCBs at concentration of 50 mg/kg or greater.	To be considered for any new PCB spills that occur during work at the UDF area.	Will be considered in the event of any new spill that results from the release of PCBs at a concentration of 50 mg/kg or greater and that occurs during the construction or operation of the UDF.

Note:

1. ARARs consist only of the substantive requirements of the provisions cited in this column, not any administrative requirements included therein.

Figure



LEGEND:

- GE PARCEL BOUNDARY
- UPLAND DISPOSAL FACILITY LIMITS OF CONSOLIDATED MATERIAL
- UPLAND DISPOSAL FACILITY OPERATIONAL AREA
- EXISTING OVERHEAD TRANSMISSION EASEMENT

0 500’ 1000’

GRAPHIC SCALE

NOTES:

1. SITE FEATURES OBTAINED FROM DRAWING ENTITLED “PLAN OF LAND SURVEYED FOR THE LANE CONSTRUCTION CORPORATION” PREPARED BY SK DESIGN GROUP, INC., DATED JUNE 4, 2010.
2. AERIAL IMAGERY: © MICROSOFT CORPORATION © 2022 MAXAR ©CNES (2022) DISTRIBUTION AIRBUS DS.
3. UPLAND DISPOSAL FACILITY LIMITS OF CONSOLIDATED MATERIAL AND OPERATIONAL AREA SHOWN ARE CONCEPTUAL ONLY.

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
GE-PITTSFIELD/HOUSATONIC RIVER SITE

SITE PLAN

ARCADIS

FIGURE
1

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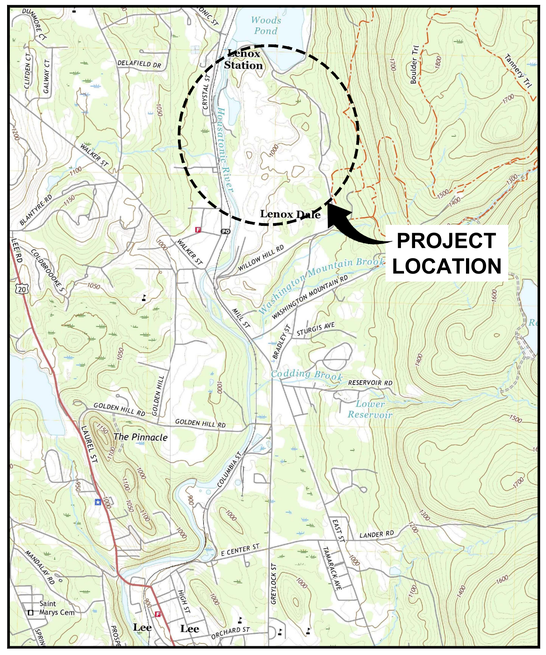
IMAGES:

Appendix A

Preliminary Design Drawings

PRELIMINARY DESIGN DRAWINGS

GE-PITTSFIELD/HOUSATONIC RIVER SITE
UPLAND DISPOSAL FACILITY
CONCEPTUAL DESIGN PLAN

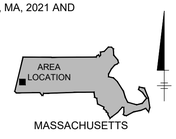


REFERENCE: BASE MAP USGS 7.5 MINUTE QUADRANGLE., EAST LEE, MA, 2021 AND STOCKBRIDGE, MA, 2021.

LOCATION MAP

0 2000' 4000'

GRAPHIC SCALE



MASSACHUSETTS

LEE, MASSACHUSETTS
BERKSHIRE COUNTY

DECEMBER 2022

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

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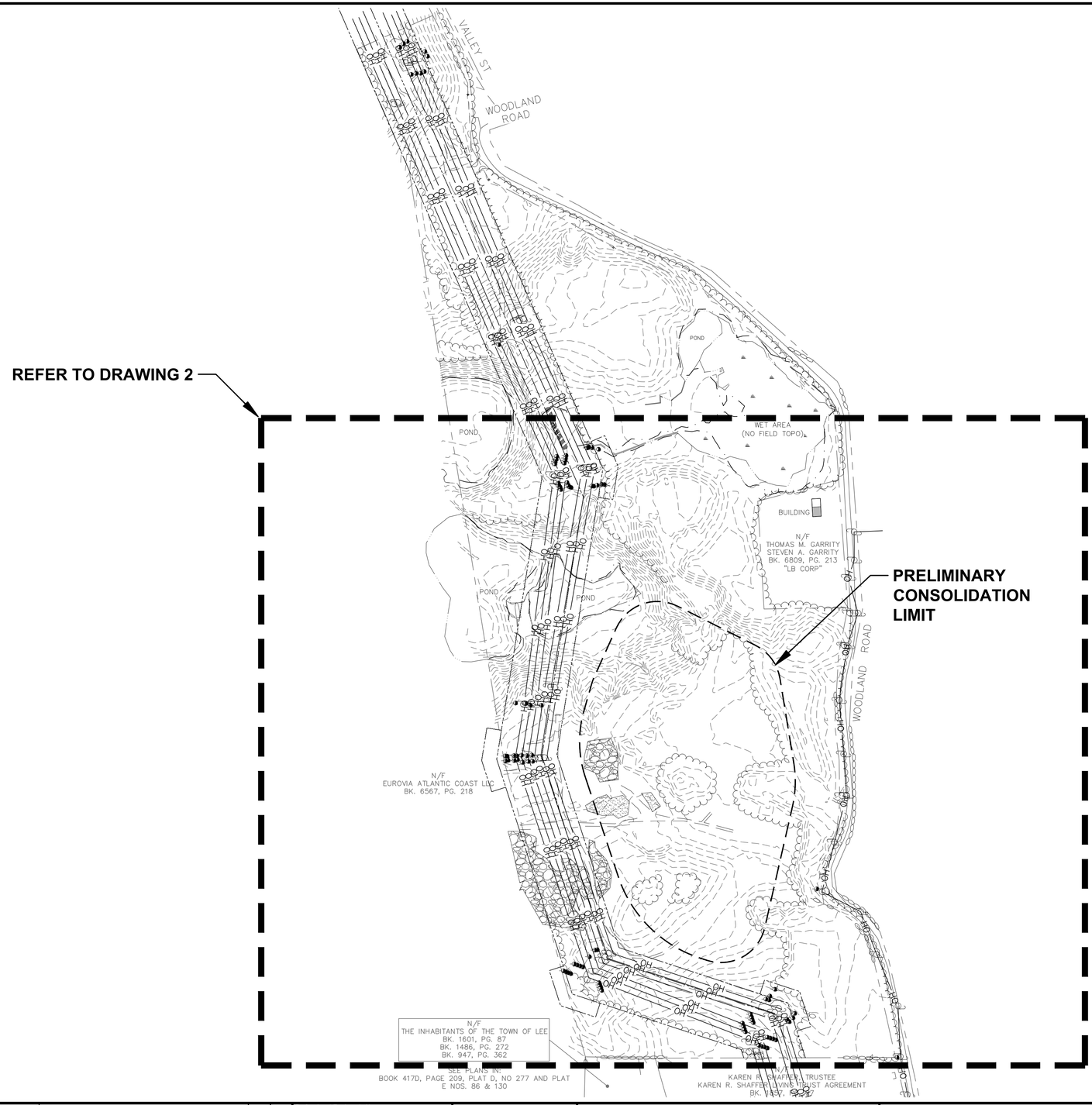
INDEX TO DRAWINGS



REFER TO DRAWING 2

LEGEND

- UTILITY POLE
- WET AREA
- APPROXIMATE PROPERTY BOUNDARY
- EDGE OF GRAVEL
- EDGE OF WATER
- EDGE OF WETLAND
- STONEWALL
- OVERHEAD WIRES
- EDGE OF TREE/BRUSH LINE
- PHRAGMITES
- CONCRETE DEBRIS PILE
- GRAVEL PILE
- TIMBER MATTING
- ELEVATION CONTOUR (5-FOOT INTERVAL)
- OVERHEAD LINE EASEMENT

NOTE:

1. SEE DRAWING 2 FOR ADDITIONAL BASEMAP INFORMATION.
2. ALL DESIGN FEATURES SHOWN ARE PRELIMINARY (CONCEPTUAL) ONLY AND ARE SUBJECT TO CHANGE IN THE FINAL DESIGN.

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IMAGES:
X-UDF-BDR-C-LD
X-UDF-EXISTING SITE
X-UDF-PROPOSED

1"=200' 200' 0 200' 400'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name		
Professional Engineer's No.		
State	Date Signed	Project Mgr.
Designed by	Drawn by	Checked by

DRAFT NOT FOR CONSTRUCTION

ARCADIS

ARCADIS U.S., INC.

GE-PITTSFIELD/HOUSATONIC RIVER SITE • LEE, MASSACHUSETTS

UPLAND DISPOSAL FACILITY CONCEPTUAL DESIGN PLAN

OVERALL KEY PLAN

GENERAL

ARCADIS Project No.
30132437

Date
DECEMBER 2022

ARCADIS
ONE LINCOLN CENTER
110 WEST FAYETTE STREET
SYRACUSE, NEW YORK 13202
TEL. 315.446.9120

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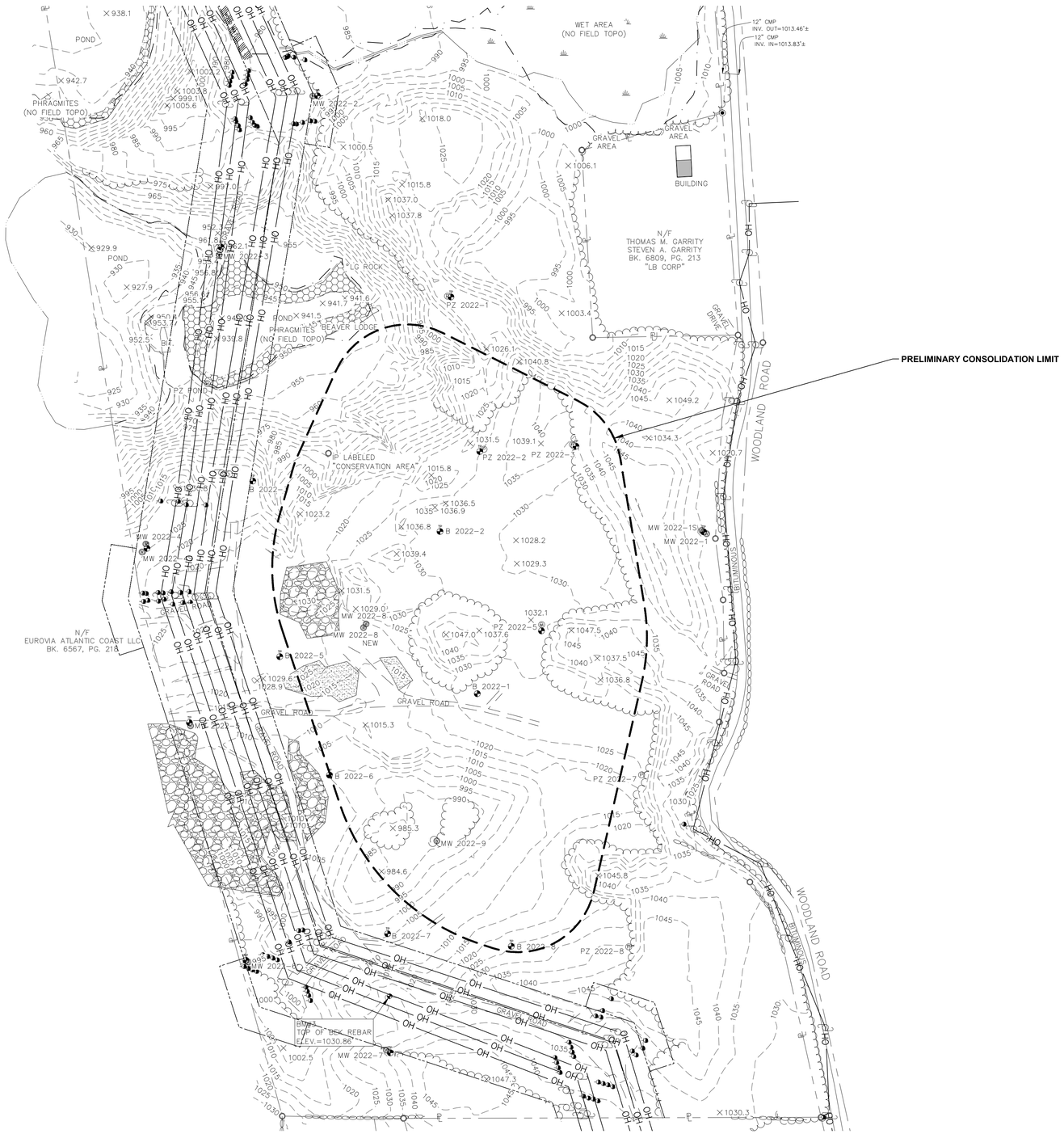

LEGEND

- REBAR FOUND
- IRON PIN FOUND
- CONCRETE BOUND FOUND
- GRANITE BOUND FOUND
- BENCH MARK
- UTILITY POLE
- GUY WIRE
- MONITORING WELL
- BORING
- PIEZOMETER
- WET AREA
- SPOT ELEVATION (1101.7)
- APPROXIMATE PROPERTY BOUNDARY
- EDGE OF GRAVEL
- EDGE OF BITUMINOUS
- EDGE OF WATER
- EDGE OF WETLAND
- STONEWALL
- OH — OVERHEAD WIRES
- EDGE OF TREE/BRUSH LINE
- PHRAGMITES
- CONCRETE DEBRIS PILE
- GRAVEL PILE
- TIMBER MATTING
- 1010 — ELEVATION CONTOUR (5-FOOT INTERVAL)
- OVERHEAD LINE EASEMENT

NOTES:

1. BASEMAP INFORMATION BASED ON A FIELD SURVEY CONDUCTED IN MAY/JUNE, 2022 BY HILL-ENGINEERS, ARCHITECTS, PLANNERS, INC. EXCEPT WETLAND LIMITS WHICH WERE PROVIDED BY AECOM. TOPOGRAPHY INCLUDES A MERGE OF FIELD SURVEY AND BATHYMETRY WITHIN PONDED FEATURES.
2. SURVEY ON CERTAIN PORTIONS OF THE PARCEL (E.G. SLOPED AREAS) MAY INCLUDE LIMITED INFORMATION DUE TO ACCESS LIMITATIONS.
3. HORIZONTAL DATUM IS NSRS 2007 MASSACHUSETTS STATE PLANE, MAINLAND ZONE, US FOOT. VERTICAL DATUM IS NORTH AMERICAN VERTICAL DATUM 1988 (NAVD88).
4. ALL DESIGN FEATURES SHOWN ARE PRELIMINARY (CONCEPTUAL) ONLY AND ARE SUBJECT TO CHANGE IN THE FINAL DESIGN.

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X-UDF-EXISTING SITE
X-UDF-PROPOSED

1"=120' (120' 0 120' 240')

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name		
Professional Engineer's No.		
State	Date Signed	Project Mgr.
Designed by	Drawn by	Checked by

DRAFT NOT FOR CONSTRUCTION

ARCADIS U.S., INC.

GE-PITTSFIELD/HOUSATONIC RIVER SITE • LEE, MASSACHUSETTS

UPLAND DISPOSAL FACILITY CONCEPTUAL DESIGN PLAN

EXISTING CONDITIONS

GENERAL

ARCADIS Project No. 30132437

Date DECEMBER 2022

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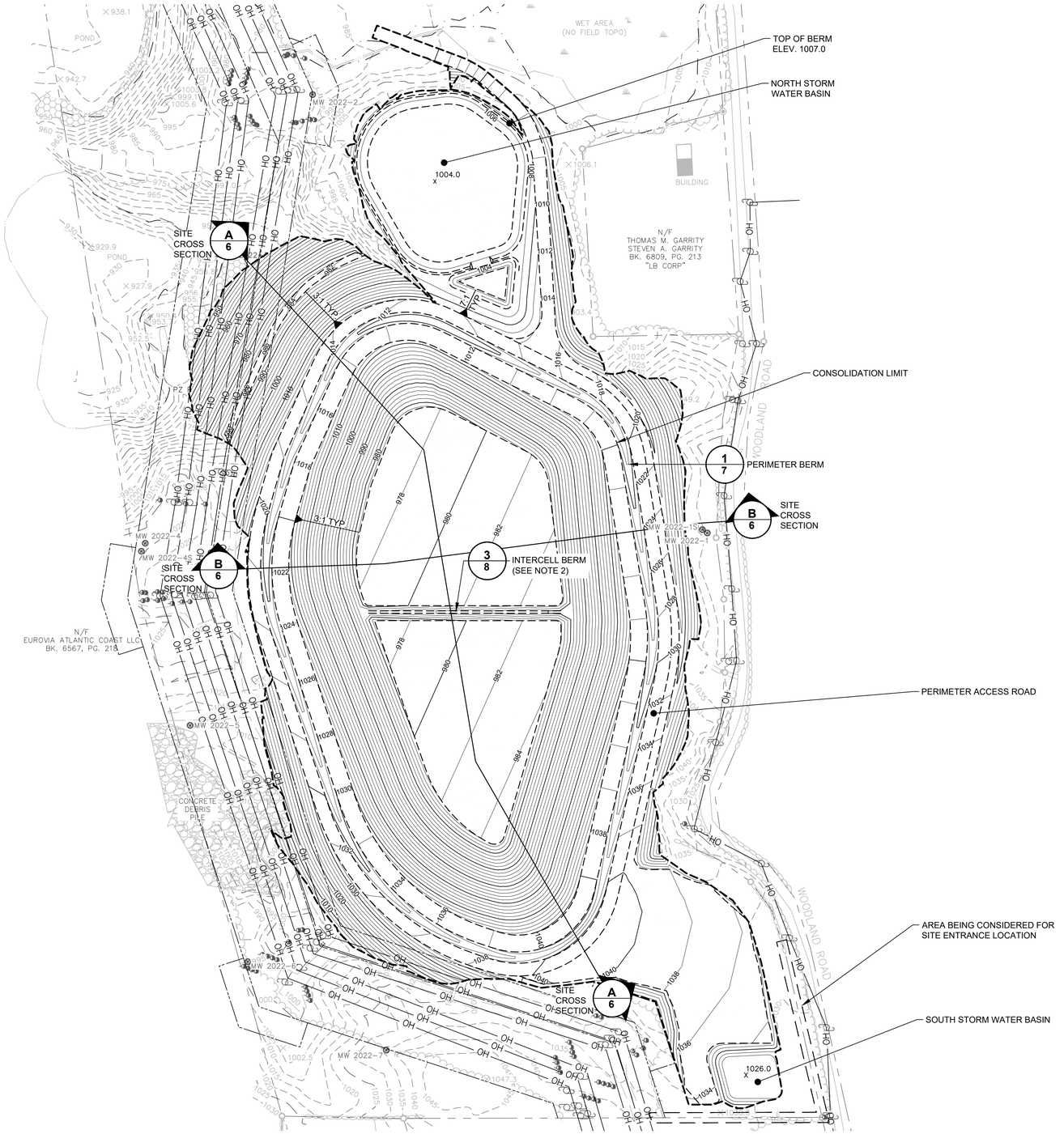
TEL. 315.446.9120

2



LEGEND

- REBAR FOUND
- IRON PIN FOUND
- CONCRETE BOUND FOUND
- GRANITE BOUND FOUND
- BENCH MARK
- UTILITY POLE
- GUY WIRE
- MONITORING WELL
- BORING
- PIEZOMETER
- WET AREA
- SPOT ELEVATION
- APPROXIMATE PROPERTY BOUNDARY
- EDGE OF BITUMINOUS
- EDGE OF WATER
- EDGE OF WETLAND
- STONEWALL
- OVERHEAD WIRES
- OVERHEAD LINE EASEMENT
- EDGE OF TREE/BRUSH LINE
- PHRAGMITES
- CONCRETE DEBRIS PILE
- GRAVEL PILE
- ELEVATION CONTOUR (5-FOOT INTERVAL)
- DESIGN ELEVATION CONTOUR (2-FOOT INTERVAL)
- DESIGN GRADE BREAK
- APPROXIMATE LIMIT OF DESIGN GRADING
- DESIGN SPOT ELEVATION
- EDGE OF GRAVEL

NOTES:

1. REFER TO DRAWING 2 FOR BASEMAP INFORMATION.
2. .ALL DESIGN FEATURES SHOWN ARE PRELIMINARY (CONCEPTUAL) ONLY AND ARE SUBJECT TO CHANGE IN THE FINAL DESIGN.

C:\Users\kdavis\ACCDocs\Arcadis\AUS-GE-HOUSATONIC-PITTSFIELD Massachusetts\Project Files\2022\01-In Progress\01-DWG\HOUSATONIC-UDF-G03-SG PLAN.dwg LAYOUT: 3 SAVED: 12/2/2022 4:32 PM ACADVER: 24.2S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ---- PLOTTED: 12/2/2022 4:35 PM BY: DAVIS, KATHI

XREFS:
IMAGES:
X-UDF-BDR-C-LD
X-UDF-EXISTING SITE
X-UDF-PROPOSED

120' 0 120' 240'
1"=120'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING:

USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name		
Professional Engineer's No.		
State	Date Signed	Project Mgr.
Designed by	Drawn by	Checked by

DRAFT
NOT FOR CONSTRUCTION

ARCADIS

ARCADIS U.S., INC.

GE-PITTSFIELD/HOUSATONIC RIVER SITE • LEE, MASSACHUSETTS

UPLAND DISPOSAL FACILITY CONCEPTUAL DESIGN PLAN

PRELIMINARY LINER SUBGRADE PLAN

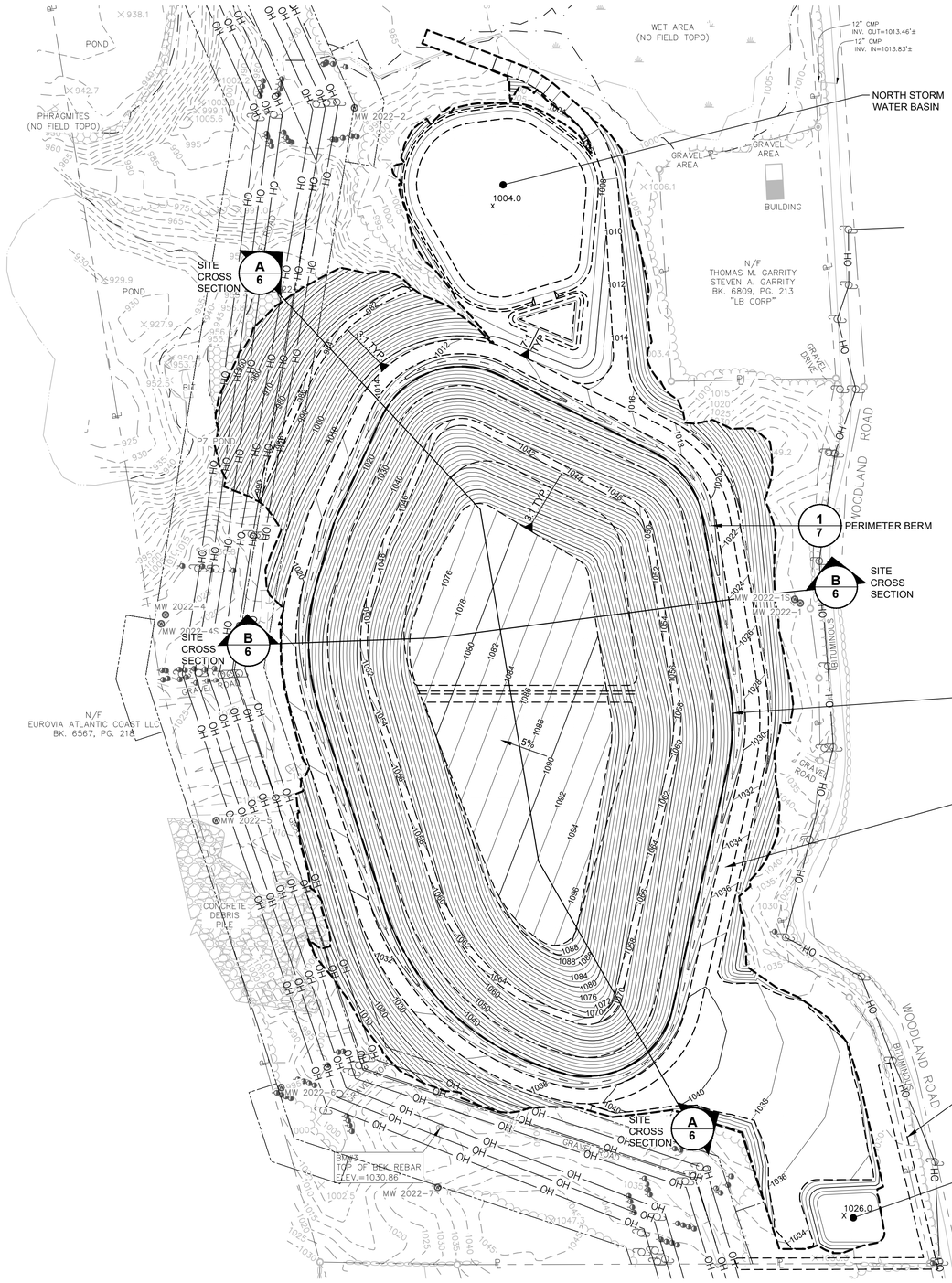
GENERAL

ARCADIS Project No.
30132437

Date
DECEMBER 2022

ARCADIS
ONE LINCOLN CENTER
110 WEST FAYETTE STREET
SYRACUSE, NEW YORK 13202
TEL. 315.446.9120

3



LEGEND

- REBAR FOUND
- IRON PIN FOUND
- CONCRETE BOUND FOUND
- GRANITE BOUND FOUND
- BENCH MARK
- UTILITY POLE
- GUY WIRE
- MONITORING WELL
- BORING
- PIEZOMETER
- WET AREA
- SPOT ELEVATION (1101.7 x)
- APPROXIMATE PROPERTY BOUNDARY
- EDGE OF BITUMINOUS
- EDGE OF WATER
- EDGE OF WETLAND
- STONEWALL
- OVERHEAD WIRES (OH)
- OVERHEAD LINE EASEMENT
- EDGE OF TREE/BRUSH LINE
- PHRAGMITES
- CONCRETE DEBRIS PILE
- GRAVEL PILE
- ELEVATION CONTOUR (5-FOOT INTERVAL) (1010)
- DESIGN ELEVATION CONTOUR (2-FOOT INTERVAL) (1020)
- DESIGN GRADE BREAK
- APPROXIMATE LIMIT OF DESIGN GRADING
- DESIGN SPOT ELEVATION (1002.0 x)
- EDGE OF GRAVEL
- DESIGN DRAINAGE FEATURE

NOTES:

1. ALL DESIGN FEATURES SHOWN ARE PRELIMINARY (CONCEPTUAL) ONLY AND ARE SUBJECT TO CHANGE IN THE FINAL DESIGN.

C:\Users\kdavis\ACCDocs\Arcadis\AUS-GE-HOUSATONIC-PITTSFIELD Massachusetts\Project Files\2022\01-In Progress\01-DWG\HOUSATONIC-UDF-G04-FG PLAN.dwg LAYOUT: 4 SAVED: 12/2/2022 4:37 PM ACADVER: 24.2S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ---- PLOTTED: 12/2/2022 4:37 PM BY: DAVIS, KATHI

XREFS:
IMAGES:
X-UDF-BDR-C-LD
X-UDF-EXISTING SITE
X-UDF-PROPOSED

1"=120' (120' 0 120' 240')

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name		
Professional Engineer's No.		
State	Date Signed	Project Mgr.
Designed by	Drawn by	Checked by

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ARCADIS U.S., INC.

GE-PITTSFIELD/HOUSATONIC RIVER SITE • LEE, MASSACHUSETTS
UPLAND DISPOSAL FACILITY CONCEPTUAL DESIGN PLAN

PRELIMINARY FINAL COVER PLAN

GENERAL

ARCADIS Project No.
30132437

Date
DECEMBER 2022

ARCADIS
ONE LINCOLN CENTER
110 WEST FAYETTE STREET
SYRACUSE, NEW YORK 13202
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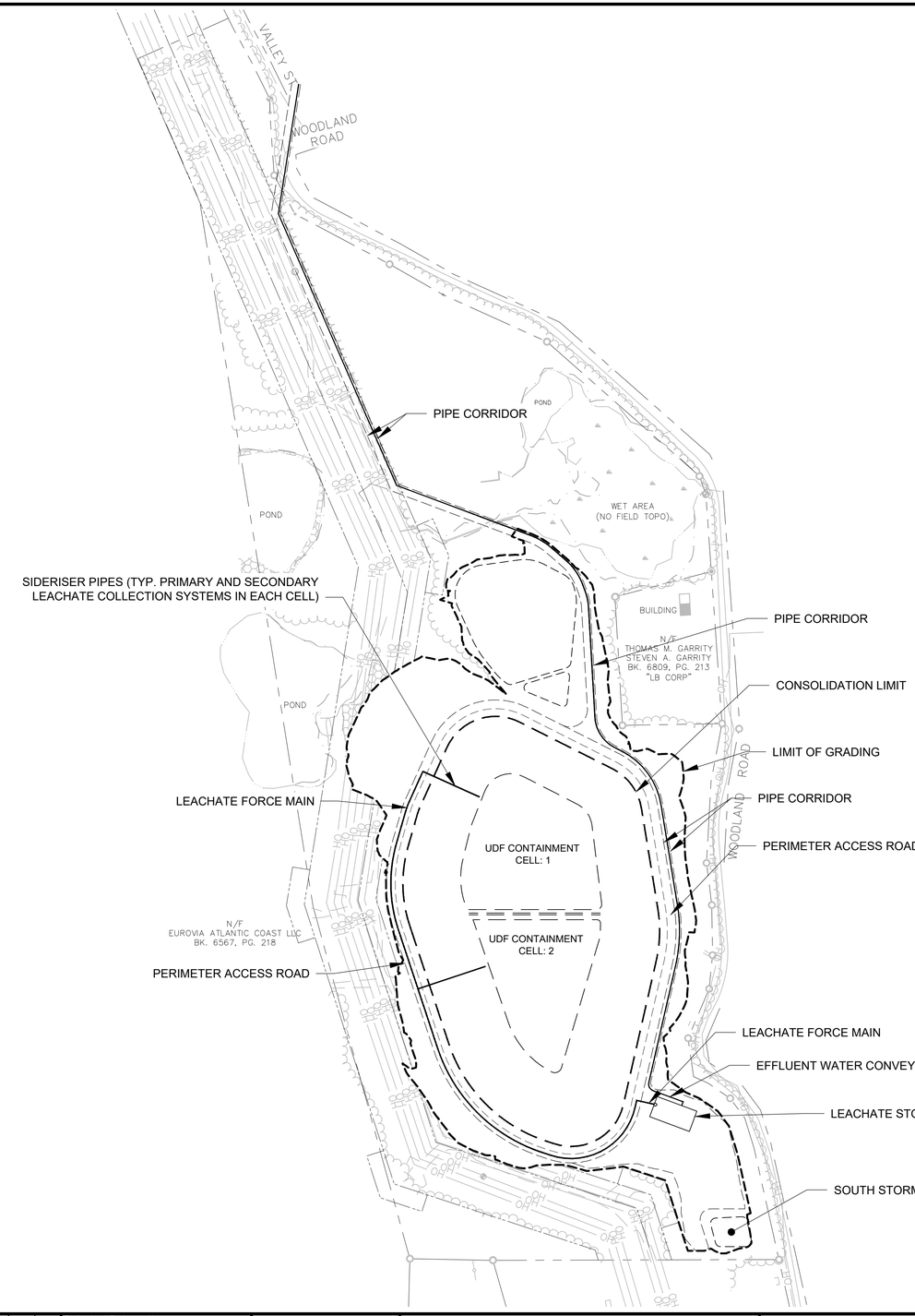
4



LEGEND

- REBAR FOUND
- IRON PIN FOUND
- CONCRETE BOUND FOUND
- GRANITE BOUND FOUND
- BENCH MARK
- UTILITY POLE
- WET AREA
- 1101.7 x — SPOT ELEVATION
- P/L — APPROXIMATE PROPERTY BOUNDARY
- EDGE OF GRAVEL
- EDGE OF BITUMINOUS
- EDGE OF WATER
- EDGE OF WETLAND
- DRAINAGE FEATURE
- OH — OVERHEAD WIRES
- DESIGN GRADE BREAK
- APPROXIMATE LIMIT OF DESIGN GRADING

NOTES:

1. REFER TO DRAWING 2 FOR BASEMAP INFORMATION.
2. ALL DESIGN FEATURES SHOWN ARE PRELIMINARY (CONCEPTUAL) ONLY AND ARE SUBJECT TO CHANGE IN THE FINAL DESIGN.

200' 0 200' 400'
1"=200'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING:

USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name

Professional Engineer's No.

State	Date Signed	Project Mgr.
Designed by	Drawn by	Checked by

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GE-PITTSFIELD/HOUSATONIC RIVER SITE • LEE, MASSACHUSETTS

UPLAND DISPOSAL FACILITY CONCEPTUAL DESIGN PLAN

PRELIMINARY LEACHATE MANAGEMENT PLAN

GENERAL

ARCADIS Project No.
30132437

Date
DECEMBER 2022

ARCADIS
ONE LINCOLN CENTER
110 WEST FAYETTE STREET
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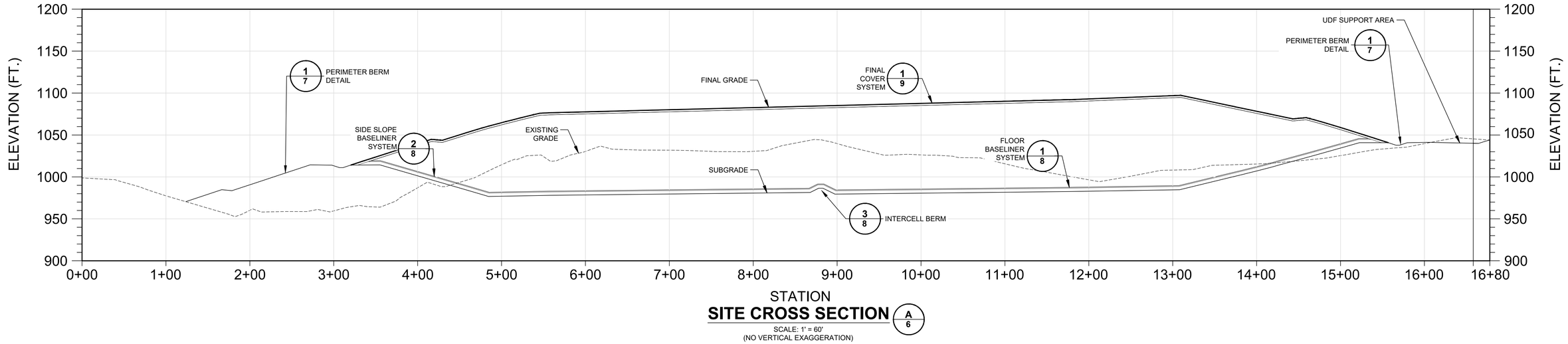
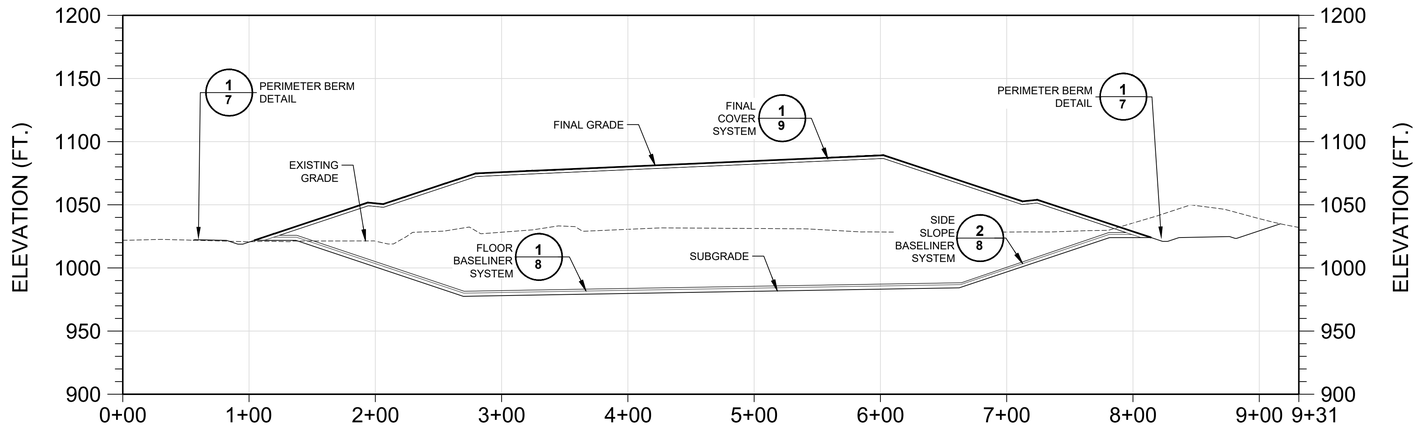
5



SITE CROSS SECTION A/6

SCALE: 1" = 60'
(NO VERTICAL EXAGGERATION)



SITE CROSS SECTION B/6

SCALE: 1' = 60'
(NO VERTICAL EXAGGERATION)

NOTE:

1. ALL DESIGN FEATURES SHOWN ARE PRELIMINARY (CONCEPTUAL) ONLY AND ARE SUBJECT TO CHANGE IN THE FINAL DESIGN.

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XREFS:
X-UDF-BDR-C-LD
X-UDF-PROPOSED
IMAGES:

1"=60' 60' 0 60' 120'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING:

USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name		
Professional Engineer's No.		
State	Date Signed	Project Mgr.
Designed by	Drawn by	Checked by

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GE-PITTSFIELD/HOUSATONIC RIVER SITE • LEE, MASSACHUSETTS
UPLAND DISPOSAL FACILITY CONCEPTUAL DESIGN PLAN

PRELIMINARY SITE CROSS SECTIONS

GENERAL

ARCADIS Project No.
30132437

Date
DECEMBER 2022

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ONE LINCOLN CENTER
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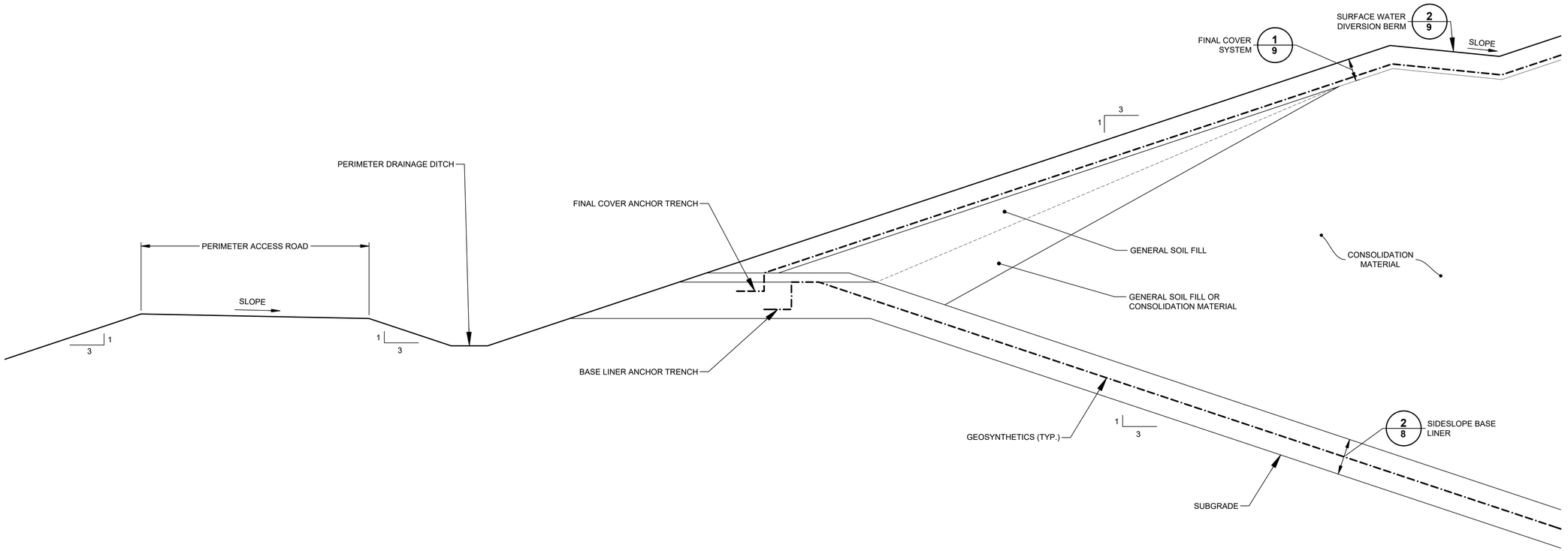
SYRACUSE, NEW YORK 13202
TEL. 315.446.9120

6



PERIMETER BERM SECTION 1

1X VERTICAL EXAGGERATION

GENERAL NOTES:

1. ALL DESIGN FEATURES SHOWN ARE PRELIMINARY (CONCEPTUAL) ONLY AND ARE SUBJECT TO CHANGE IN THE FINAL DESIGN.

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XREFS: IMAGES:
X-UDF-BDR-C-LD

NOT TO SCALE

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name		
Professional Engineer's No.		
State	Date Signed	Project Mgr.
Designed by	Drawn by	Checked by

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GE-PITTSFIELD/HOUSATONIC RIVER SITE • LEE, MASSACHUSETTS

UPLAND DISPOSAL FACILITY CONCEPTUAL DESIGN PLAN

PRELIMINARY PERIMETER BERM SECTION

GENERAL

ARCADIS Project No. 30132437

Date DECEMBER 2022

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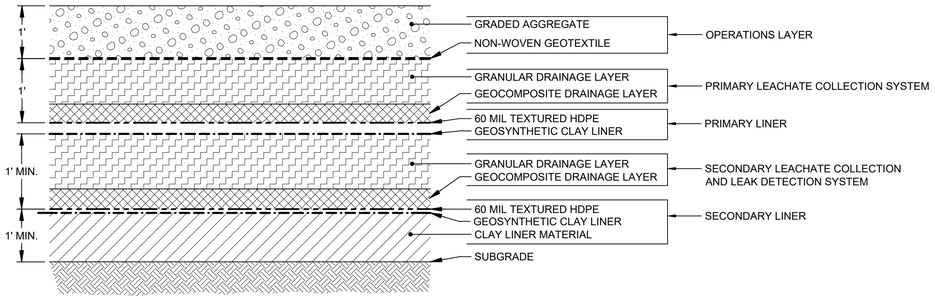
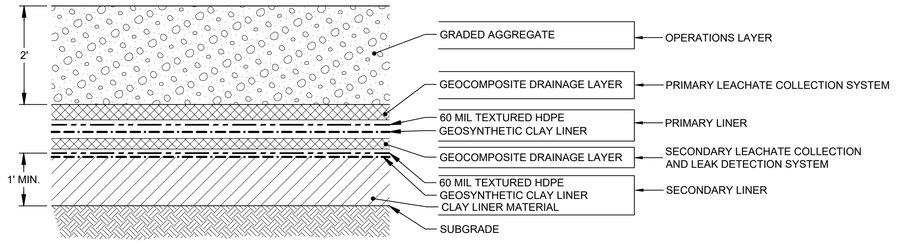
ONE LINCOLN CENTER
110 WEST FAYETTE STREET
SYRACUSE, NEW YORK 13202
TEL. 315.446.9120



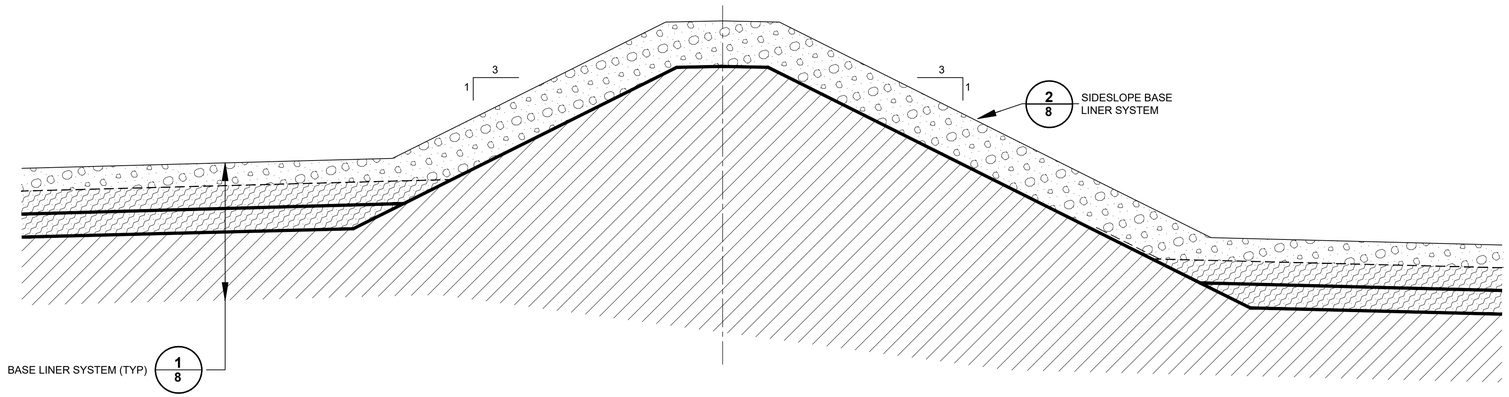
FLOOR BASE LINER SYSTEM 1

NOT TO SCALE



SIDESLOPE BASE LINER SYSTEM 2

NOT TO SCALE



INTERCELL BERM 3

NOT TO SCALE

GENERAL NOTES:

1. GEOSYNTHETICS ARE SHOWN AT AN EXAGGERATED SCALE FOR CLARITY.
2. ALL DESIGN FEATURES SHOWN ARE PRELIMINARY (CONCEPTUAL) ONLY AND ARE SUBJECT TO CHANGE IN THE FINAL DESIGN.

C:\Users\ksarton\ACCDocs\Arcadis\AUS-GE-HOUSATONIC-PITTSFIELD Massachusetts\Project Files\2022\01-In Progress\01-DWG\HOUSATONIC-UDF-G07-DETAILS.dwg LAYOUT: 8 SAVED: 11/28/2022 7:58 AM ACADVER: 24.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ---- PLOTTED: 11/29/2022 2:36 PM BY: SARTORI, KATHERINE

XREFS:
X-UDF-BDR-C-LD

IMAGES:

NOT TO SCALE

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name

Professional Engineer's No.

State	Date Signed	Project Mgr.
Designed by	Drawn by	Checked by

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ARCADIS U.S., INC.

GE-PITTSFIELD/HOUSATONIC RIVER SITE ● LEE, MASSACHUSETTS

UPLAND DISPOSAL FACILITY CONCEPTUAL DESIGN PLAN

PRELIMINARY LINER SYSTEM DETAILS

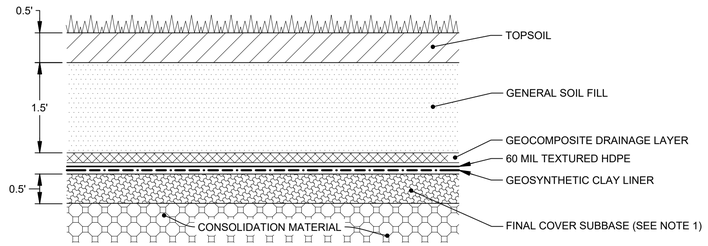
GENERAL

ARCADIS Project No.
30132437

Date
DECEMBER 2022

ARCADIS
ONE LINCOLN CENTER
110 WEST FAYETTE STREET
SYRACUSE, NEW YORK 13202
TEL. 315.446.9120

8

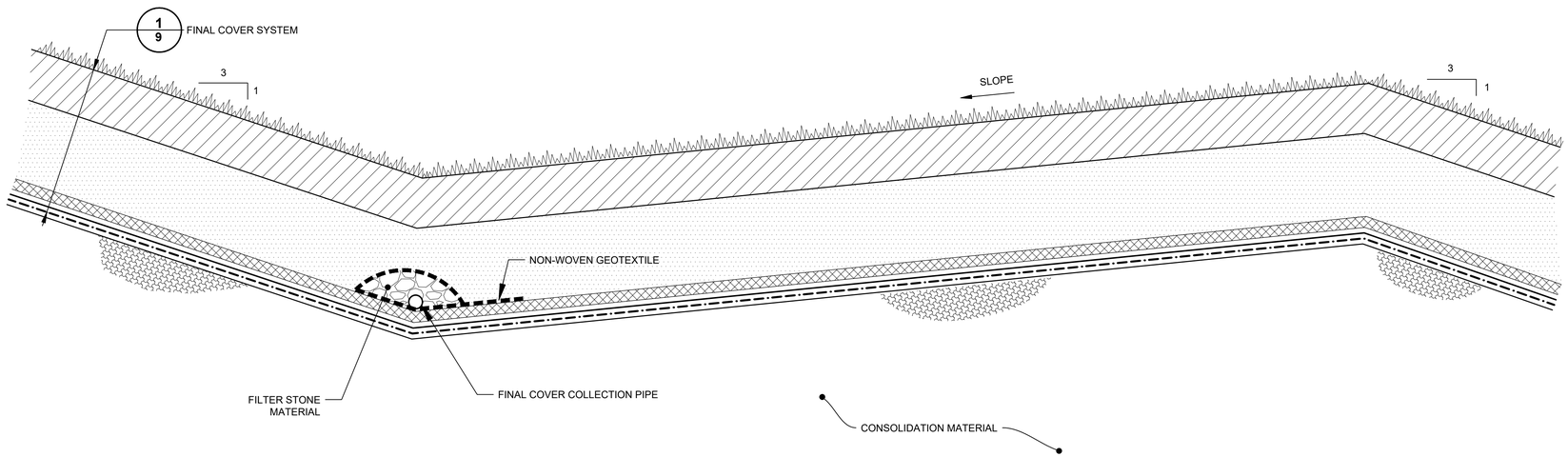


NOTES:

1. FINAL COVER SUBBASE TO BE SELECT CONSOLIDATION MATERIAL AND/OR IMPORTED SOIL MATERIAL.

FINAL COVER SYSTEM (1)

NOT TO SCALE



FINAL COVER DIVERSION BERM (2)

NOT TO SCALE

GENERAL NOTES:

1. ALL DESIGN FEATURES SHOWN ARE PRELIMINARY (CONCEPTUAL) ONLY AND ARE SUBJECT TO CHANGE IN THE FINAL DESIGN.

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XREFS:
X-UDF-BDR-C-LD

IMAGES:

NOT TO SCALE

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING:

USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name		
Professional Engineer's No.		
State	Date Signed	Project Mgr.
Designed by	Drawn by	Checked by

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GE-PITTSFIELD/HOUSATONIC RIVER SITE • LEE, MASSACHUSETTS

UPLAND DISPOSAL FACILITY CONCEPTUAL DESIGN PLAN

PRELIMINARY
FINAL COVER SYSTEM DETAILS

GENERAL

ARCADIS Project No.
30132437

Date
DECEMBER 2022

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ONE LINCOLN CENTER
110 WEST FAYETTE STREET
SYRACUSE, NEW YORK 13202
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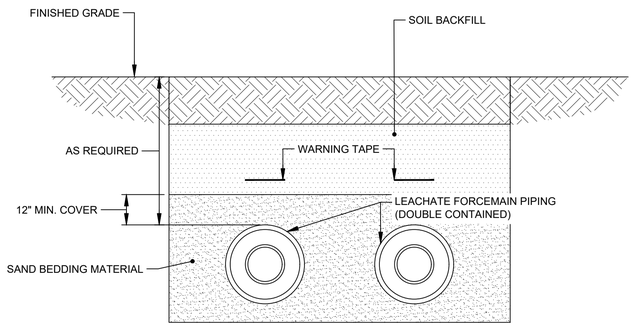
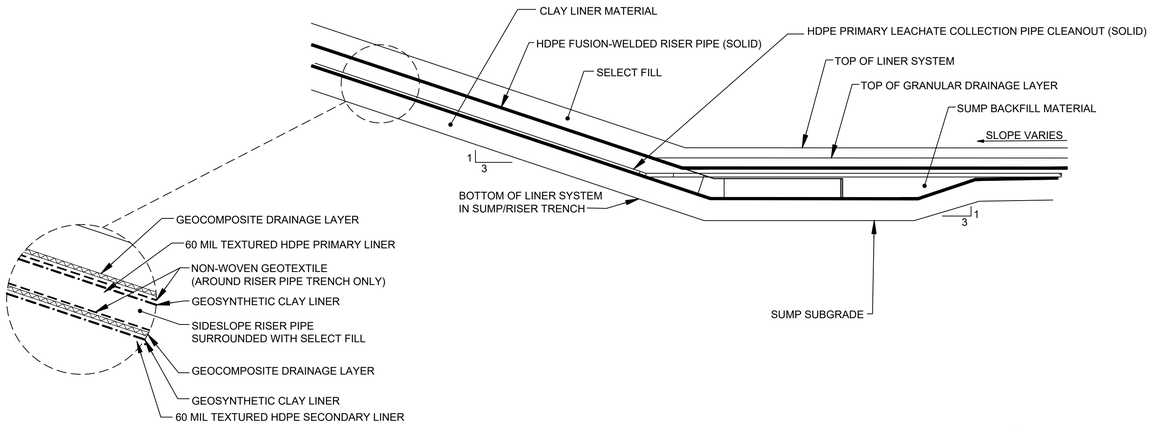
9



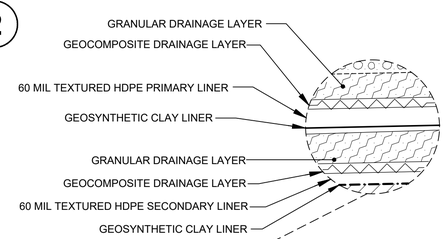
LEACHATE FORCEMAIN TRENCH 1

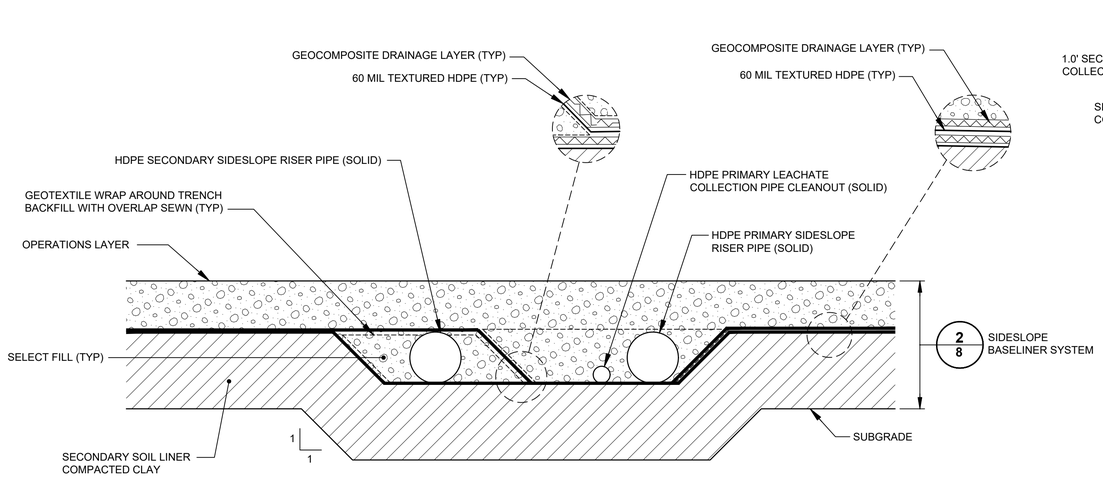
NOT TO SCALE



TYPICAL SUMP AND RISER DETAIL 2

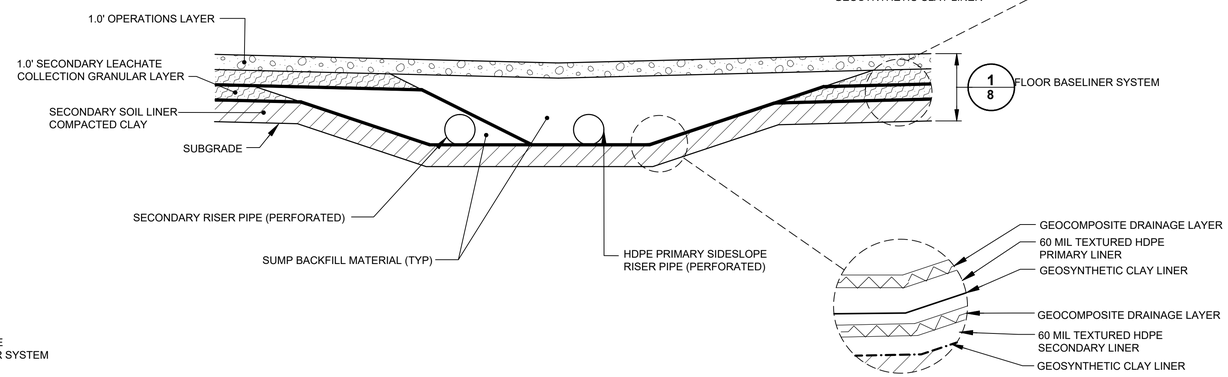
NOT TO SCALE





PRIMARY/SECONDARY RISER PIPE TRENCH 3

NOT TO SCALE



PRIMARY/SECONDARY LEACHATE COLLECTION SUMP SECTION 4

NOT TO SCALE

GENERAL NOTES:

1. ALL DESIGN FEATURES SHOWN ARE PRELIMINARY (CONCEPTUAL) ONLY AND ARE SUBJECT TO CHANGE IN THE FINAL DESIGN.

C:\Users\Ksartori\ACCDocs\Arcadis\AUS-GE-HOUSATONIC-PITTSFIELD Massachusetts\Project Files\2022\01-In Progress\01-DWG\HOUSATONIC-UDF-G07-DETAILS.dwg LAYOUT: 10 SAVED: 11/28/2022 7:58 AM ACADVER: 24.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ---- PLOTTED: 11/29/2022 2:36 PM BY: SARTORI, KATHERINE
XREFS:
IMAGES:
X-UDF-BDR-C-LD

NOT TO SCALE

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name		
Professional Engineer's No.		
State	Date Signed	Project Mgr.
Designed by	Drawn by	Checked by

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ARCADIS U.S., INC.

GE-PITTSFIELD/HOUSATONIC RIVER SITE • LEE, MASSACHUSETTS
UPLAND DISPOSAL FACILITY CONCEPTUAL DESIGN PLAN

PRELIMINARY LEACHATE MANAGEMENT DETAILS

GENERAL

ARCADIS Project No. 30132437

Date DECEMBER 2022

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SYRACUSE, NEW YORK 13202
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10

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New York 13202
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